

Olli Hietanen (ed.)

# UNIVERSITY PARTNERSHIPS FOR INTERNATIONAL DEVELOPMENT

Finnish Development Knowledge

FFRC-PUBLICATIONS 6/2005





FFRC-PUBLICATIONS 6/2005

# UNIVERSITY PARTNERSHIPS FOR INTERNATIONAL DEVELOPMENT

Finnish Development Knowledge

Olli Hietanen (ed.)

**Olli Hietanen**

Project Director, M.Sc.

Finland Futures Research Centre

Copyright © 2005 Writers & Olli Hietanen & Finland Futures Research Centre, Turku  
School of Economics and Business Administration

Layout Timo Sulanne, Finland Futures Research Centre

ISBN 951-564-290-6

Printing Esa Print Ltd.

**Finland Futures Research Centre**

Turku School of Economics and Business Administration

Rehtorinpellonkatu 3, FI-20500 TURKU

Korkeavuorenkatu 25 A 2, FI-00130 HELSINKI

Hämeenkatu 7 D, FI-33100 TAMPERE

Tel. +358 2 481 4530

Fax +358 2 481 4630

<http://www.tukkk.fi/tutu>

[tutu-info@tukkk.fi](mailto:tutu-info@tukkk.fi), [firstname.surname@tukkk.fi](mailto:firstname.surname@tukkk.fi)



# CONTENTS

<b>1. FINNISH UNIVERSITY PARTNERSHIPS FOR INTERNATIONAL DEVELOPMENT: A FRAMEWORK FOR NOVEL INITIATIVES</b>	<b>7</b>
Background and History	7
Two Future Visions for the UniPID Network	9
Vision on Network of Excellence	10
Vision of the LISA International	10
<b>2. FINNISH UNIVERSITIES FOR DEVELOPMENT</b>	<b>13</b>
Short Introduction to Finnish Universities	13
Helsinki University of Technology	15
Helsinki School of Economics	16
Lappeenranta University of Technology	17
Swedish School of Economics and Business Administration	18
Tampere University of Technology	19
Turku School of Economics and Business Administration	20
University of Art and Design Helsinki	21
University of Helsinki	22
University of Joensuu	23
University of Jyväskylä	24
University of Kuopio	25
University of Lapland	26
University of Oulu	27
University of Tampere	28
University of Turku	29
University of Vaasa	30
Åbo Akademi University	31
<b>3. CRITICAL RESOURCES AND FINNISH DEVELOPMENT KNOWLEDGE</b>	<b>33</b>
3.1. Water	34
Water and Sustainable Development: Paradigms, Challenges and the Reality	34
Science for Water Services and Related Institutions	61
3.2. Energy and Environment	92
Energy for Sustainable Development	92

## CONTENTS

3.3. Health	102
Informatics Development for Health in Africa – INDEHELA	102
3.4. Agriculture and Food	115
Management of an African Great Lake Fishery – Challenges to Research and Community	115
Co-operatives: a Pathway to Poverty Alleviation for Small-scale Farmers in sub-Saharan Africa	143
3.5. Forests	161
Global Forest Ethics Network	161
Research and Development for Sustainable Land-Use in Dryland Africa: 25 Years of Finland-Sudan Forestry Cooperation	167
Need for Partnership in Understanding Broad Implications of Forest Intervention Projects	189
3.6. Education and Learning	198
Virtual Universities Revisited – a Third Way	198
Gender and Disability – Challenges of Education Sector Development in Tanzania	204
3.7. Technology	217
Helsinki University of Technology Towards Sustainable Development: Sustainable Global Technologies Programme	217
Free and Open Source Software Strategies for Sustainable Information Society	222
ICT Education for Local Development	235
3.8. Dialogue	254
Towards a Language of Global Responsibility	254
Foresight for Development	262
3.9. Governance	268
Good Governance	268
Security, Development and Regional Organizations in Africa	282
New Ethical Tourism in Developing Countries	294
Cultural Difference in Tourism – Lessons from Five Case Studies in Asia, Africa and South America	308

# 1. FINNISH UNIVERSITY PARTNERSHIPS FOR INTERNATIONAL DEVELOPMENT: A FRAMEWORK FOR NOVEL INITIATIVES

## Background and History

The willingness and commitment of Finnish universities for promoting knowledge-based sustainable development cooperation was clearly expressed by the representatives of the eleven Finnish universities which assembled at the University of Jyväskylä on December 2<sup>nd</sup> 2002. A keynote speaker at the seminar was Dr. John Mugabe, Director of Science and Technology for the New Partnership for Africa's Development (NEPAD).

NEPAD provides African academic and research institutions, particularly universities, with a new regional and political foundation for forging and sustaining partnerships with the international research community. It is likely to become an important African framework for making the best use of partnerships as strategic ways of achieving sustainable development – as embraced by the World Summit on Sustainable Development (WSSD).

The Finnish universities expressed their interest in participating and co-operating via institutional involvement in development initiatives along the lines of partnership approaches. They stated that institutional involvement would require a strategic approach from the universities and consequently international development should become a part of the Finnish universities' international strategies. The universities also supported suggestions for a closer, inter-institutional thematic co-operation in Finland leading to the establishment of University Partnerships for International Development (UniPID).

Sustainability, multidisciplinary, ethical concerns, institutional approaches, capacity-building and policy issues were considered to be the main challenges of the UniPID partnership network. In particular this partnership supports the operationalisation of the WSSD Plan of Implementation objectives committed to by the world community. Al-

though the cooperation with NEPAD has been important for the UniPID network the network's purpose is not to restrict only to the development targets of Africa but to the global challenges of development cooperation.

*The Council of Finnish University Rectors* was informed on December 13, 2002, about the joint university initiative and the Council in its statement encouraged to elaborate this initiative further.

In the years 2002 – 2005 the UniPID network has organised network meetings: twice in Helsinki, and once in Tampere, Joensuu and Jyväskylä. During these meetings “UniPID activists” have discussed the vision, mission, objectives, activities, principles of cooperation, organisational form and areas of research included under UniPID umbrella.

The UniPID network has also participated in the Advanced Institute for Information and Communication Technology (AIICT) Workshop in South Africa, George (16–18 February, 2003) and the World Summit on the Information Society (WSIS) conference in Geneva (10–12 December, 2003). The network will also participate in the second phase of WSIS which will take place in Tunis from 16 to 18 November in 2005.

In April 2005 the UniPID network received funding from the Ministry of Education. The project proposal sets the following tasks to the current UniPID network capacity building till March 2006:

1. to create a permanent – at minimum three years' – funding for the network's support and coordination activities;
2. to start some research projects with new partner networks with a permanent multiyear third party funding;
3. to identify and build new ways to share the produced scientific knowledge among the UniPID member universities in Finland; and
4. to connect the Finnish universities to EU networks (NoE) and strengthen the Finnish capacity on questions related to development and sustainable development.

On the 9<sup>th</sup> of September in 2005 the UniPID network will organize the first official conference for the key external partners in conjunction with the Helsinki Process Conference to be held 7–9 September, 2005, in Helsinki. The conference will take place in Joensuu, Finland, and the programme will consist of a range of topics and practices con-



nected with sustainable development and the ways to move this complex debate forward, also pragmatically. During the Helsinki Conference the network will also take part in a panel on topic “EU and Global Affairs” organized by the European Movement and Finnish United Nations Association. Both these events aim at opening discussion with the world outside about the role of Finnish universities in international development and at establishing new ideas of partnerships promoted through increased dialogue between different stakeholders

In Autumn 2005 the UniPID project is to be presented to *The Council of Finnish University Rectors* with a proposal – or alternative proposals – of the organisational form of the UniPID network with vision, mission, objectives, activities, principles of cooperation and other aspects needed to be discussed at the university administrative level before cooperation within the chosen institutional form can be started.

## Two Future Visions for the UniPID Network

Finnish universities have a significant potential to carry out large-scale, multidisciplinary research projects in developing countries, together with their own researchers. In this light, it is surprising how little of this potential is utilized for the time being. The Academy of Finland has a program to support development studies, by the funds coming from the Ministry of Foreign Affairs. However, the research projects funded by this instrument are usually rather limited in terms of both the number of paid research staff and time. On the other hand, companies such as UniServices and Helsinki Consulting Group are established actors running various consulting projects on several developing countries, but those projects, although substantially funded, are in general quite pragmatic and product-oriented, at least when seen from the academic viewpoint.

In order to realize the network’s potential and support millennium goals, a lot of work has been addressed to network governance, structure, internal team protocols, and external engagement strategies. The UniPID network has been finding ways to address all the above issues and two alternative future visions for the network have been prepared. These visions will be discussed and analysed during the Building UniPID Network project, visions are not necessarily competing, but they can be realized also step by step or in parallel.

## Vision on Network of Excellence

At the Reijo Keurulainen memorial seminar in June 2005 a model was presented, based on umbrella governance between Finnish universities aiming at establishing a broadly-based collaboration Network of Excellence among researchers from various universities and research units. This “network umbrella model” would function as a collective of research partnerships between coordination and supporting structure and each of the individual members to give Finnish universities network advantage of joint value creation, increase its capacity development and strengthen engagement and influence.

In this “Hubs and Spokes” model the coordination organization will rotate every three years between the member universities and its function is to focus on the everyday operations of the network providing stakeholders support when need. These operations will include support for project lifecycle management, being a contact and information sharing point, maintain databases and being secretariat for UniPID structure. The research coordinators, who would be working in each of the member universities task would be to network in their own field, assist network members in planning applications and forming consortiums for calls as well as implementing a research study.

This kind of network can be seen as institute without walls, formed by universities coming together to assemble a critical mass of intellectual capacity and to address strategic research questions deemed vital to support sustainable development. Together, through the network universities are then capable of achieving more than the sum of their individual efforts.

## Vision of the LISA International

A meeting held by the UniPID network at Joensuu in November 2004 came up with an idea to establish a marketing unit to make the Finnish academic expertise known for international funding organizations of large-scale and long-term development research. This kind of independent unit, whether or a company or a foundation, is needed to for two reasons. First, although Finnish universities are strong in research, they do not generally speaking have either staff or skills to market their research expertise to international financiers, including governments, foundations, and private companies. Secondly, large-scale, multidisciplinary research programs need to be coordinated from the early beginning up to the final evaluation. This involves identifying the right experts, prepar-

ing them for the common task, and linking the program to the research activities of both their home and host institutions, to guarantee the sustainability of the program. Moreover, the program needs to be made known at an international level so that any related activities carried out in other contexts could benefit from and contribute to the program. The reasons described above drove the participants of the UniPID meeting to sketch the scaffolds for a unit which would raise the Finnish academic community's possibilities to work for international development onto a clearly new level. To foster the establishment of the unit, a seminar for critical stakeholders from government, academia and business was scheduled for September 2005. The unit, for the time being named as LISA International, needs naturally an incubation period which should be funded by the government of Finland. After the first three years, the unit should be self-financing. The unit should be owned by universities by shares according to their own interests in its activities. Because of its main function of attracting resources for development research, it could be headquartered close to its customers, for example in Geneva, London or Singapore.

The process behind these two visions or initiatives also shows the usefulness and pragmatic function of the UniPID network. It is possible to see UniPID as a truly academic forum for generating novel ideas in a trusting atmosphere where universities do not need to compete with each other, but really see others as complementing an individual university's capacity in development research. Therefore, it is also in the future important to see UniPID open new horizons and opportunities for the Finnish academic community as a whole to work for a better world. In this context UniPID network is a kind of a power cable which attracts the birds to sit on it for a while and then fly to their next destinations, whether in the North or in the South.

This publication is a mid term review and a state of the art analysis of the UniPID network. The first chapter of this publication is a short history of the UniPID network. The second chapter presents shortly all universities in Finland. There is also contact information about the experts in development research in every university. The third chapter describes examples of Finnish development research knowledge and practices. The purpose of this chapter is to create understanding and give examples about the substance competences of Finnish development researchers.



## 2. FINNISH UNIVERSITIES FOR DEVELOPMENT

### Short Introduction to Finnish Universities

Today, the Finnish university network is one of the densest in Europe. Of the 20 universities, ten represent the traditional multi-faculty universities, three institutions specialise in Engineering and Architecture, three in Economics and Business Administration and the remaining four are art academies. Two of the universities operate entirely in Swedish.

Education is highly valued in Finland, and the high standard of education forms one of the corner-stones of the Finnish national strategy which is based on a desire to develop the country as an information society. In order to achieve this, Finland has channeled substantial investment into research and development.

In the last decade the connections between education, culture, sustainable development and security are becoming clear and the role of education and research in sustainable development has been acknowledged also in Finnish universities. As international development work has become more important in universities' internationalization strategies, new methods to increase its effectiveness have been started to develop. Partnership has become a more functional concept, and through these partnerships new resources have been created, and the universities have helped to unite efforts in implementing development processes. But still more work is to be done in the future.

This chapter's aim is to provide a short introduction to most of these 20 Finnish universities highlighting their areas of expertise, as well as to provide contact details of the people who are able to give further information on sustainable development research prepared in them. All the listed people all are also members of the UniPID-network – highlighting the wide range of expertise UniPID-network already has on issues related to sustainable development.

The networks of scientists are one the most important ways to tackle capacity building as they provide sharing of produced scientific knowledge, identification of common in-

terests, understanding of impacts, dissemination and information gathering and support through sharing of facilities. And this is what UniPID project and its current capacity building phase is all about: building partner networks to support sustainability.

If you have any questions on the UniPID network please contact:

*Riina Yrjölä*

*Oy UniServices Ltd*

*P.O Box 35*

*FIN – 40014 University of Jyväskylä*

*Phone: +358 14 260 37 30*

*Fax: +358 14 260 37 47*

*E-mail: [riina.yrjola@adm.jyu.fi](mailto:riina.yrjola@adm.jyu.fi)*



HELSINKI UNIVERSITY OF TECHNOLOGY

## Helsinki University of Technology

<http://www.hut.fi>

Helsinki University of Technology (TKK) is a driving force of Finnish technology, its research playing a central role in the production and application of technological knowledge in Finland.

TKK, the country's largest, oldest and most diversified university of technology and architecture awards nearly half of the graduate degrees in the technological field in Finland. The proportion of doctoral degrees is even higher, about sixty percent. Over half of the funding for technological research is directed towards research projects and laboratories at TKK. Currently TKK is a study and research community composed of over thirteen thousand undergraduates and postgraduates and nearly three thousand professors, researchers, teachers and other employees.

TKK knows its responsibility in changing the world. It chooses its disciplines and research subjects on the basis of their scientific challenge and technological significance. The point of view is international and global. In the future, interdisciplinary cooperation will be emphasised

more than ever. For instance, contacts between biology and technology, medicine and technology as well as economist and technology will be strengthened and increased. Solutions to the great problems of mankind – climatic issues, long-range energy solutions, questions concerning man's health and quality of life as well as pre-requisites for sustainable development – are also current and future challenges for research in TKK. More often than before answers are sought together with researchers from different fields of study and with the commercial in industrial sectors.

For further information on development research activities at the Helsinki University of Technology, please contact:

*Salla Koivusalo*

*Project Director*

*Helsinki University of Technology*

*Lifelong Learning Institute Dipoli*

*Phone: +358 9 4514 051*

*E-mail: [salla.koivusalo@dipoli.hut.fi](mailto:salla.koivusalo@dipoli.hut.fi)*



HELSINKI SCHOOL OF ECONOMICS

## Helsinki School of Economics

<http://www.hse.fi>

Helsinki School of Economics (HSE – in Finnish Helsingin kauppakorkeakoulu) is a top-level European business school and a globally respected player in research and education.

The international education at HSE consists of the degree programs – Bachelor, Master, and Doctor of Science degree programs – and the International MBA and Executive MBA programs. Since the founding of HSE in 1911, more than 20,000 students have graduated from the school into the employ of Finnish and international economic life.

The Helsinki School of Economics promotes and develops all the central areas in business sciences and produces new knowledge through internationally significant research.

For further information on development research activities at the Helsinki School of Economics, please contact:

*Pertti Haaparanta*

*Professor of International Economics*

*Helsinki School of Economics*

*Department of Economics*

*Phone: +358 9 431 384 95*

*E-mail: [pertti.haaparanta@hse.fi](mailto:pertti.haaparanta@hse.fi)*





## Lappeenranta University of Technology

<http://www.lut.fi>

Lappeenranta University of Technology (LUT) is a national university of technology and economics, financed by the Ministry of Education. About 5000 students study in the various degree programmes offered by the university, and about 900 new students are admitted each year. There are about 500 postgraduate students, and 900 members of staff. The University has six degree programmes in Master of Technology and four for Master of Economics. The postgraduate degrees available at LUT include Licentiate in Technology and Economics, as well as Ph.D.

The Lappeenranta University of Technology places a special focus on international operations, characterised by a combined approach in technology and economics as well as by strong teaching in foreign languages. Graduates have the knowledge and competence to operate in the integrating European market. About one fourth of the university students complete a part of their studies in LUT's foreign co-operation universities in Europe, North America, Asia and Australia.

LUT's areas of strength are related to forest industry and metal clusters, electrical engineering, energy, economics as well as to information and communication technology and expertise in Russia. The most outstanding feature of the university is the way in which it has successfully integrated expertise in technology and economics. LUT's location on the border between the EU and Russia has also had a major impact on the university's activities and orientation.

For further information on development research activities at the Lappeenranta University of Technology, please contact:

*Mika Horttanainen*

*Professor, Waste management and utilization of waste*

*Lappeenranta University of Technology*

*Department of Energy- and Environmental Technology*

*Phone: +358 5 6212 726*

*E-mail: [mika.horttanainen@lut.fi](mailto:mika.horttanainen@lut.fi)*



## Swedish School of Economics and Business Administration

<http://www.hanken.fi>

Founded in 1909 in Helsinki, Hanken or the Swedish School of Economics and Business Administration is one of the oldest university-level business schools in the Nordic countries. Its professors have been at the forefront of Nordic economic and social science renewal most of the century. Today, the faculty enjoys both high national and international esteem and has close ties with the Finnish high-tech industry and world-class industry.

The academic degrees offered at Hanken are Doctor, Master and Bachelor of Science in economics and business administration. Some 2 400 students are enrolled in HANKEN's degree programmes – 200 of them are doctoral students. HANKEN graduates are working not only in Finnish private and public companies but also for leading companies all over the world.

In the year 2000 Hanken was accredited by EQUIS (European Quality Improvement System). The accreditation shows that the education and research at Hanken is of an internationally competitive standard. Due to the fact that the accreditation

is time-bound Hanken continuously develops the quality of the school's systems.

For further information on development research activities at the Swedish School of Economics and Business Administration, please contact:

*Pekka Kettunen*

*Assistant Professor*

*Swedish School of Economics and Business Administration*

*Department of Management and Organization*

*Phone: +358 9 431 33278*

*E-mail: [pekka.kettunen@hanken.fi](mailto:pekka.kettunen@hanken.fi)*



**TAMPERE UNIVERSITY OF TECHNOLOGY**

## Tampere University of Technology

<http://www.tut.fi>

Tampere University of Technology (TUT) is an international university that provides the highest education in technology and architecture and conducts scientific research. In addition to technology and architecture, the University specializes in natural sciences and economics.

Established in 1965, the University has grown to become a significant influence in the field of technology in Finland. TUT plays a pivotal role as a promoter of business life and well-being in the Tampere Region and western Finland as a whole. Within its key fields of research, TUT is also an important player on the international scale.

The University has nearly 12 000 students of which the number of postgraduate students is around 2 000. TUT personnel consists of over 1 800 people, of which in 2004 more than 65 % worked as researchers or research assistants.

The University conducts research in over 30 research units representing various fields of technology. Research has been

particularly focused on six spearhead fields: biomaterials, brain research and intelligent devices, free istic technology, lasers for optic telecommunications, geometry of electromagnetism and wireless multimedia devices.

For further information on development research activities at the Tampere University of Technology, please contact:

*Jarmo Hukka*  
*Adjunct Professor*  
*Tampere University of Technology*  
*Institute of Environmental Engineering and*  
*Biotechnology, CADWES-team*  
*Phone: +358 3 3115 2772*  
*E-mail: jarmo.hukka@tut.fi*

*Tapio S. Katko*  
*Adjunct Professor*  
*Tampere University of Technology*  
*Institute of Environmental Engineering and*  
*Biotechnology, CADWES-team*  
*Phone: +358 3 3115 2183*  
*E-mail: tapio.katko@tut.fi*



## Turku School of Economics and Business Administration

<http://www.tukkk.fi>

Founded in 1950, the Turku School of Economics and Business Administration (TSEBA) is one of the largest institutes in Finland for higher education in economic science. Backed by its internationally recognised business expertise, the university offers graduate, postgraduate and continuing education as well as expert consulting services in Turku and Pori.

TSEBA's research activities target business development and the knowledge that drives it. The School's key areas of expertise comprise Accounting and Finance, Management and Organisation, Entrepreneurship, Marketing, International Business, Logistics, Economics, Information Systems Science, Economic Geography, Economic Sociology, Business Law, Futures Research and Quantitative Methods in Management. A high standard of research is maintained not only by the departments within the School, but also by its auxiliary units, the Finland Futures Research Centre and the Business Research and Development Centre.

For further information on development research activities at the Turku School of Economics and Business Administration, please contact:

*Olli Hietanen*

*Project Director*

*Turku School of Economics and Business  
Administration*

*Finland Futures Research Centre*

*Phone: +358 2 4814 616*

*E-mail: [olli.hietanen@tukkk.fi](mailto:olli.hietanen@tukkk.fi)*



## University of Art and Design Helsinki

<http://www.uiah.fi>

The University of Art and Design Helsinki is an international university dedicated to design, audiovisual communication, art education and art. It is the largest university of its kind in Scandinavia and has a strong and active international presence. The University founded in 1871 is a pioneer in research and education.

The University of Art and Design Helsinki gives education and pursues research in the fields of design, motion picture, audiovisual communication, art education and arts. There are five schools and seventeen fields of education and research. The University is the largest art school in Scandinavia: there are nearly 1700 students, 14% of which come from abroad, and 400 teachers. Furthermore, 1700 students participate in extension studies annually and 800 students in the studies at the open university.

The University of Art and Design Helsinki is one of Finland's most international universities. Through increased student exchange during the past decade the University of Art and Design was for a long time the only institute of learning in the

country with more students enrolling from foreign countries than students leaving for studies abroad. Today, international contacts are an everyday part aspect of the University. Over 230 students, almost 14% of the enrolment, are from other countries, and a growing number of Finnish students complete their degrees abroad.

Agreements on cooperation have been signed with 130 European and 30 other international institutes of learning. There are collaborating universities on all the continents, and in recent years relations have particularly been reinforced with Southeast Asia, Japan, China and South Korea.

For further information on development research activities at the university of Art and Design Helsinki, please contact:

*Teemu Leinonen*

*Project Manager / Research Group Leader*

*Media Lab – University of Art and Design Helsinki*

*Learning Environments research group*

*Phone: +358 50 351 6796*

*E-mail: [teemu.leinonen@uiah.fi](mailto:teemu.leinonen@uiah.fi)*



## University of Helsinki

<http://www.helsinki.fi/yliopisto>

The University of Helsinki has the widest range of disciplines in Finland with eleven faculties. There are 38,000 degree students and 7,400 staff. The number of degrees taken each year is 4,200, of which 350 are doctorates.

The University concentrates on high-level scientific research and researcher education. Scientific research is also the basis of the teaching provided by the University. The University operations support the development of society, as well as business and industry. University representatives offer their competencies for the benefit of society through a number of positions of trust and expertise.

The results produced by the research and teaching carried out at the University have been widely acclaimed. The University participates in more than half of the national Centres of Excellence in Research, elected by international scientific panels. The University of Helsinki has been invited to be a member of the League of European Research Universities, a co-operation body for the leading European research universities. According to international expert panels, also the teaching provided

by the University of Helsinki is of a high European level.

The University has strong international connections. It has some 80 co-operation agreements with universities on different continents. The University researchers are in great demand as experts in international scientific communities, meetings and publications.

For further information on development research activities at the University of Helsinki, please contact:

*M.Sc. Agr. & Forestry Shimelles Tenaw  
Planner*

*University of Helsinki  
Department of Economics and Management  
Faculty of Agriculture & Forestry  
Phone: +358 9 1915 8987  
E-mail: [shimelles.tenaw@helsinki.fi](mailto:shimelles.tenaw@helsinki.fi)*

*Dr. Vesa Kaarakka  
University of Helsinki  
Viikki Tropical Resources Institute, VITRI  
Department of Forest Ecology  
Phone: +358 9 191 58648  
E-mail: [vesa.kaarakka@helsinki.fi](mailto:vesa.kaarakka@helsinki.fi)*



## University of Joensuu

<http://www.joensuu.fi>

The University of Joensuu, founded in 1969 in Joensuu, the capital of North Karelia in eastern Finland, is a multidisciplinary, research-oriented public university with six faculties: Education, Forestry, Humanities, Science, Social Sciences, and Theology. The strengths and areas of expertise of the university include multidisciplinary, broadly-based teacher education, as well as research in education and life course studies; research and teaching pertaining to forests, other renewable resources and the environment; highly advanced technology; and research on the development of border areas and interaction of cultures. The university has campuses in Joensuu and Savonlinna. The Mekrijärvi Research Station is located in Ilomantsi. The student enrollment is about 7,700. The staff numbers about 1,200.

The University of Joensuu is strongly committed to promoting global sustainable development in accordance with the United Nations Millennium Declaration, in cooperation with its partner universities. The University of Joensuu was designated a Partner University of the United Nations Environment Programme, UNEP, on May 12, 2003. Among

the activities conducted jointly with UNEP is an annual Course on International Environmental Law-making and Diplomacy. Joensuu has also profited in research-based contextualization of information and communication technologies (ICT) in developing countries, especially in the field of education. The key partners of the University of Joensuu in Sub-Saharan Africa include, e.g., the University of Namibia, the University of KwaZulu-Natal in South Africa, and Tumaini University, Iringa University College, in Tanzania.

For further information on development research activities at the University of Joensuu, please contact:

*Dr Tapani Tyynelä*  
*University of Joensuu*  
*Faculty of Forestry*  
*Phone: +358 13 2514 724*  
*E-mail: [tapani.tyynela@joensuu.fi](mailto:tapani.tyynela@joensuu.fi)*

*Professor Erkki Sutinen*  
*University of Joensuu*  
*Department of Computer Science*  
*Phone: +358 13 2517 934,*  
*E-mail: [sutinen@cs.joensuu.fi](mailto:sutinen@cs.joensuu.fi)*



UNIVERSITY OF JYVÄSKYLÄ

## University of Jyväskylä

<http://www.jyu.fi>

The University of Jyväskylä, located in a rapidly growing and modern city in the lake district of Finland, is one of the largest multidisciplinary universities in the country with almost 16 000 students, including 660 international students.

The University offers study and research opportunities in six faculties: Faculty of Education, faculty of Humanities, Faculty of Information Technology, Faculty of Mathematics and Science, Faculty of Social Sciences, Faculty of Sport and Health Sciences and the School of Business and Economics. Human, nature, and technology form the key elements of the multi-disciplinary scientific profile of the University of Jyväskylä. The University is also known for its active role in developing innovations in education and research, especially in collaboration with business and commerce, and other actors of the region.

The University of Jyväskylä has five national Centres of Excellence in Research nominated by the Finnish Academy and it has a special status as a university with high-quality adult education with three

teaching quality units named by the Ministry of Education. The University has also put a lot of effort into broadening the international dimension of the campus. Today it has student exchange programmes with some 150 universities and research collaborators in several hundreds universities all over the world

For further information on development research activities at the University of Jyväskylä, please contact:

*Liisa Laakso*

*Professor of Development & International Cooperation*

*University of Jyväskylä*

*Department of Social Sciences and Philosophy*

*Phone: +358 14 2603 109*

*E-mail: [liisa.laakso@yfi.jyu.fi](mailto:liisa.laakso@yfi.jyu.fi)*





UNIVERSITY OF KUOPIO

## University of Kuopio

<http://www.uku.fi>

The University's Foundation Act was passed in 1966, and teaching started in 1972. At present, the University of Kuopio has c. 6,200 enrolled students, of whom c. 1,400 are postgraduate students at the post-Master's level. There is an annual intake of approximately one thousand new students starting undergraduate courses.

The University of Kuopio has an international reputation in the fields of health, environment and well-being, with particular strengths in biotechnology, life sciences and biomedicine. The University contains five faculties: Faculty of Business and Information Technology, Faculty of Medicine, Faculty of Natural and Environmental Sciences, Faculty of Pharmacy and Faculty of Social Sciences.

In addition, the University is home to the A. I. Virtanen Institute for Molecular Sciences, which is one of six centres in Finland specialising in biotechnology. Altogether the University houses 40 educational and research departments and institutes, of which 14 are also clinics of the Kuopio University Hospital.

The University boasts several world class research units, for example in the fields of diabetes, atherosclerosis and climate change research. The degree programme in medicine was designated one of the high quality units of Finnish university education for the period 2004 – 2006. The University of Kuopio is also the most prolific postgraduate research training centre in Finland.

For further information on development research activities at the University of Kuopio, please contact:

*Anja Mursu, Dr.Econ*  
*Senior Assistant*  
*University of Kuopio*  
*Department of Computer Science*  
*Phone: +358 17 163521*  
*E-mail: [anja.mursu@uku.fi](mailto:anja.mursu@uku.fi)*

*Ossi V. Lindqvist*  
*Professor emeritus*  
*University of Kuopio*  
*Chair of the Finnish Higher Education*  
*Evaluation Council (FINHEEC),*  
*Phone: +358 17 163120*  
*E-mail: [ossiv.lindqvist@uku.fi](mailto:ossiv.lindqvist@uku.fi)*



## University of Lapland

<http://www.ulapland.fi>

Established in 1979, the University of Lapland is the youngest of the Finnish universities. Located on the Arctic Circle, it is also the most northern university in Finland and the European Union. Today there are about 4300 full-time students in five faculties. The University of Lapland has a staff of 600, half of which are academics including 70 Professors.

The University of Lapland is a diversified center for education and research, where science and arts come together in a unique fashion. The five faculties – business and tourism, education, law, social sciences and art and design – each combined and as a separate unit, form an aggregate that will creatively meet the challenges of the new millennium with courage and new courses of action. The aim is to contribute to the development of livelihoods and culture in Northern Finland and to further international cooperation between universities and research institutes in the northern regions.

The research strength at the University of Lapland lies in Northern Issues, in particular research into welfare, minorities,

international relations, and international jurisprudence and applied environmental research. Various research and development projects, which are conducted in cooperation with actors outside of the university, are considered as applied research. Conducting service and custom research is agreed separately with representatives of the University. The research areas emphasised, in addition to Northern Finland; are the North Calotte, Northern Europe, the Barents Region and the Circumpolar North.

For further information on development research activities at the University of Lapland, please contact:

*Aini Linjakumpu*

*Acting professor in International Relations*

*University of Lapland*

*Department of Social Studies*

*Phone: +358 16 341 3235*

*E-mail: [aini.linjakumpu@ulapland.fi](mailto:aini.linjakumpu@ulapland.fi)*



## University of Oulu

<http://www.oulu.fi/yliopisto>

University of Oulu is a science community of 3,100 employees and over 15,800 students. The university has a large scientific base of nine educational areas, which are organised in six faculties.

The focus areas that encompass the entire university are Biotechnology, Information technology, Northern and Environmental Issues. The wide scientific base of our university enables us to study the state of nature, its future development and the processes that aid its preservation. Medical sciences, technology and natural sciences in co-operation are able to create means to, for example, improve the well-being of our senior community. Technology of well-being was introduced as a subject in the autumn of 2001.

A suitable work environment and excellent research equipment enable research that requires state-of-the-art technology. The outstanding achievements of information technology have created a center of IT technology in the Oulu region. This "Oulu phenomenon" is a constant marvel for visitors from all over the world.

Study of molecular biology and biotechnology in Oulu is internationally renowned, and our university has two national Centers of Excellence. The standard of teaching is expressed in our four national Quality Units of Education.

For further information on development research activities at the University of Oulu, please contact:

*Jarkko Saarinen*  
*Professor of Geography, Tourism Studies*  
*University of Oulu*  
*Department of Geography*  
*Phone: +358 8 553 1716*  
*E-mail: [jarkko.saarinen@oulu.fi](mailto:jarkko.saarinen@oulu.fi)*

*Rauni Räsänen*  
*Professor of Education*  
*University of Oulu*  
*Department of Educational Sciences and*  
*Teacher Education*  
*Phone: +358 8 553 3732*  
*E-mail: [rauni.rasanen@oulu.fi](mailto:rauni.rasanen@oulu.fi)*



## University of Tampere

<http://www.uta.fi>

The University of Tampere is multi-disciplinary and committed to scientific research and advanced learning. The number of applicants per available student place is higher here than at any other Finnish University.

The special mission of the university is in the articulation and critique of phenomena in the society and the construction of a civil society. Research interests include society, information society, economy, administration, culture as well as health, welfare and education. There are six faculties in the fields of economics and administration, education, humanities, information sciences, medicine and social sciences.

The University of Tampere was founded in 1925 in Helsinki under the name of Kansalaiskorkeakoulu ("Civic College"). In 1930 it was renamed Yhteiskunnallinen korkeakoulu ("School of Social Sciences") which was transferred to Tampere in 1960. In 1966 the college became The University of Tampere. It has been owned by the state since 1974. The University of Tampere has

over 15 000 students in degree programmes and approximately 16 000 students in the Institute of Extension Studies. The amount of foreign students is over 700.

For further information on development research activities at the University of Tampere, please contact:

*Tuomo Melasuo*  
*Senior Research Fellow*  
*University of Tampere*  
*Tampere Peace Research Centre TAPRI*  
*Phone: +358 3 3551 7692*  
*E-mail: [tuomo.melasuo@uta.fi](mailto:tuomo.melasuo@uta.fi)*

*Professor Ari-Veikko Anttiroiko*  
*University of Tampere*  
*Department of Regional Studies*  
*Phone: +358 3 215 7009*  
*E-mail: [Ari-Veikko.Anttiroiko@uta.fi](mailto:Ari-Veikko.Anttiroiko@uta.fi)*



# UNIVERSITY OF TURKU

## University of Turku

<http://www.utu.fi>

University of Turku – Finland’s second largest university – is a highly international institution with a reputation resting on the quality of research, teaching and services. As one of the leading universities in Finland it offers study and research opportunities in six faculties: Faculty of Humanities, Faculty of Mathematics and Natural Sciences, Faculty of Medicine, Faculty of Law, Faculty of Social Sciences and Faculty of Education.

The University of Turku acts in close co-operation with scholars and other universities around the world in many different fields. The university is a member of Coimbra Group, a network of prestigious universities in Europe and a member of Baltic Sea Region University Network.

Total enrolment of students is about 18,000 and each year about 1,000 international students study at the university.

Strengths in research are life sciences, research of processes related to interaction of culture and society, mathematical research, research of learning and education and

astronomy and space research. New focus areas are study of interdisciplinary social innovations, research related to materials sciences as well as child and youth research.

For further information on development research activities at the University of Turku, please contact:

*Taimi Sitari*

*Docent*

*University of Turku*

*Department of Geography*

*Phone: +358 2 3335 582*

*E-mail: [taimi.sitari@utu.fi](mailto:taimi.sitari@utu.fi)*



U N I V E R S I T Y   O F   V A A S A

## University of Vaasa

<http://www.uwasa.fi>

The University of Vaasa is 5 000 students, 440 personnel; four faculties and five different institutes: a research university to study business, languages, culture and communication, social sciences, and technology.

The University of Vaasa has strong ties to the Nordic countries, mainly due to the active Gulf of Bothnia universities cooperation. The University of Vaasa is continually making new agreements for cooperation with foreign universities, and constantly developing its network of international exchange agreements for students and professors. Every year about 160 undergraduate students go abroad to study. This means that approximately one in five of the entering students in 2003 will complete part of their studies in a foreign university.

Through the European Union Socrates programme, exchanges are organised with universities and other institutes of higher learning throughout Europe. Exchanges in the Nordic countries come under the Nordplus programme and the network of universities it contains. In addition, the various institutes and faculties of the

University of Vaasa have made bilateral exchange agreements with universities in Canada, the USA, Russia, and Baltic countries, among other countries. Currently the number of cooperation partners is some 130 in 26 countries. There are also numerous international research and training projects at the University.

For further information on development research activities at the University of Vaasa, please contact:

*Hannu Katajamäki*

*Professor*

*University of Vaasa*

*Department of Regional Studies*

*Phone: +358 6 3248 310*

*E-mail: [hka@uwasa.fi](mailto:hka@uwasa.fi)*



## Åbo Akademi University

<http://www.abo.fi>

Åbo Akademi University was founded as a private university in 1918. It is the only comprehensive Swedish language university in Finland taking care of the higher education of the Swedish minority amounting to 300 000 individuals (6 %).

Today Åbo Akademi University is a comprehensive research university with seven faculties spread over three campuses; Turku, Vaasa and Pietarsaari. Research and teaching activities may be found in humanities, natural sciences, political sciences, chemical engineering, business and administration, theology, education and teachers training as well as social and caring sciences. About 7 000 students perform their studies in the university of which close to 300 are foreign students from 25 different countries.

Åbo Akademi comprises a variety of different departments, institutes, and independent units. Some examples of these are the national PET Centre where researchers from both the University of Turku and Åbo Akademi work, the Biotechnology Centre, and TUCS, the Turku Centre for Compu-

ter Science at the Åbo Technology Centre. The Akademi also works in cooperation with other universities, different business enterprises and organizations. The Institute for Human Rights and the Institute of Women's Studies are examples of units with important special areas of study.

For further information on development research activities at the Åbo Akademi University, please contact:

*Maija Mustaniemi*

*Researcher*

*Åbo Akademi University*

*Institute for Human Rights,*

*Department of Law*

*Phone: +358 2 2153471*

*E-mail: [maija.mustaniemi@abo.fi](mailto:maija.mustaniemi@abo.fi)*





### 3. CRITICAL RESOURCES AND FINNISH DEVELOPMENT KNOWLEDGE

UniPID network held a workshop at the University of Joensuu in the autumn 2004. In this meeting the members of this network decided to organize a seminar and publish a book. The Finnish development research experts also discussed the focus areas of the Finnish development knowledge and they also made a definition about the globally critical resources. According to the experts of UniPID network the globally critical resources are:

- Water
- Energy and Environment
- Health
- Agriculture and Food
- Forests
- Education and Learning
- Technology
- Dialog
- Good Governance and social management

The purpose of chapter 3, then, is to give some examples about the substance competences of Finnish development researchers in these focus areas.

## 3.1. Water

### *Water and Sustainable Development: Paradigms, Challenges and the Reality*

*Olli Varis*

*Helsinki University of Technology*

*Water Resources Laboratory*

*E-mail: olli.varis@hut.fi*

#### **Abstract**

Water is a backbone of economy in very many countries of the world. Equally, it is the blood of the ecosystems as well as a major social issue. Water resources management provides the foundation of the agricultural sector, much of the energy sector, an important part of urban infrastructure, health care and many other functions of the society. Water's role is very important in this complex interplay. Besides being an important fundament to many economic sectors, water is also a key to meeting many of the basic needs that are in turn instrumental in poverty reduction. The human impact on ecosystems is catastrophic in immeasurable ways. Water is largely a political good since a bulk of the mankind lives in river basins shared by two or more nations. This paper reviews the concurrent water management paradigms, presents the key driving forces to the development of water resources as well as presents a case study from the Mekong Basin.

#### **1. Introduction**

Most parts of the world face escalating difficulties in meeting the growing freshwater demand from the deteriorating supply. Decisions and attitudes concerning human development, institutional set-up, water constructions and other technological issues, given the economic and social constraints and environmental and social imperatives constitute a challenging entity with no simple answers.

The water issue is not only irrigation, hydropower, environment, water supply or sanitation, but all these and much more. Besides science and engineering, it is a political,

social, environmental and economic entity. The water sector has traditionally been split into narrow, competing branches, but the last decade showed a rising concern of interdisciplinary, holistic, and integrated water management. The water professionals should not only be able to communicate across the borders within the water sector, but they must be able to see their policies, recommendations, academic studies and other activities in a far broader framework of the development of nations and regions. The challenge to water professionals is the enormous growth in the complexity of problem solving, given these new requirements.

The quest for holistic and integrated views decorates each possible agenda. But it remains as an ornament if the domain continues to be governed by arrogant and narrow disciplines and sub-disciplines, which, being self-contained, do not communicate sufficiently with one another. This is sad, because the challenges in real life evolve just to the opposite direction.

Consequently, there should be more focus on real multidisciplinary and integration of the water sector. Freshwater should be considered in closer connection with social, economic, financial, environmental, political, and institutional issues to bring our work closer to policy-making. Comparative, cross-sectorial work is needed. A methodological challenge to cope with interdisciplinarity and extreme uncertainties and complexities is evident.

Water is one of the most strategic natural resources, being intertwined in the everyday life of humans in countless ways. Its importance as a driver for health, food security, and quality of life and as a pillar for economic development is unique. As water affects human lives, the mankind also effects the planet's hydrological cycle, in all dimensions from the very local to global scale. The production of one kg of grain consumes 1000–4000 liters of water. Food production – although not being enough for all – already accounts for 90% of water use in developing countries. Hydropower production by damming rivers evokes grand emotions, yet sustainable energy production is among cornerstones of economic development. The damage caused by floods and droughts is growing rapidly. The human impact on ecosystems is catastrophic in countless ways. Water is largely a political good since a bulk of the mankind lives in river basins shared by two or more nations.

Integrated Water Resources Management (IWRM) has been identified as one of the basic water related policy approaches in recent important recommendations and commitments such as those of the Johannesburg Summit and World Water Forums. In the Johannesburg Plan of Implementation, the preparation of IWRM and water efficiency

plans by 2005 for all major watersheds of the world was one of the two major water targets. IWRM aims at developing democratic governance and promotes balanced development of water resources for poverty reduction, social equity, economic growth and environmental sustainability.

The goal of this paper is to draw attention to the need to develop the water management principles towards a more holistic and interdisciplinary direction. So far, despite of the towering attention that water gains in international agendas and forums, the water sector still considers itself too much in isolation. The next section summarizes the most important water management paradigms as defined by recent international agendas on freshwater management. Then the challenges to the successful implementation of those principles are elaborated. The last part shows an attempt to develop water planning and research approaches towards multidisciplinary in the Mekong Basin in Southeast Asia.

## 2. Water management principles

Recent years have been very busy with international high-level events related to development and water. The Rio summit of 1992 did not put water high on the agenda and therefore the sector's development pressures started to accumulate. After the mid-1990s, the international pressure on water grew, and consequently we have seen a series of high-level events with very strong recommendations on water. The three World Water Forums, The Bonn Freshwater Conference in 2001, The Johannesburg Summit in 2002 and many other events have all highlighted water's role in sustainable development of societies, in environmental sustainability and in poverty reduction.

The recommendations of these events are not completely consistent, but certain aspects are clearly visible in all of them. Obviously the most pronounced one is the concept of IWRM. The outcomes of the three most influential events are summarized below.

### *Dublin and Rio de Janeiro 1992*

In 1992, International Conference on Water and Environment Issues for the 21<sup>st</sup> Century, was held in Dublin. It served as the preparatory event for the *Rio Conference* with respect to water. The reports of these events set out recommendations for action at the local, national

and international levels, based on four guiding principles. Current thinking on the crucial issues in water resources is heavily influenced by the Dublin Principles, which are:

- Fresh water is a finite, vulnerable and essential resource, *which should be managed in an integrated manner.*
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Women play a central role in the provision, management and safeguarding of water.
- Water has an economic value and should be recognized as an economic good, taking into account affordability and equity criteria.

### *Bonn 2001*

In December 2001, International Conference on Freshwater took place in Bonn, focusing on water as a key to sustainable development. The Bonn Conference was the major preparatory event in the water field towards the Johannesburg Summit (see below).

The conference reviewed the role of water in sustainable development, took stock of progress in the implementation of Agenda 21 and identified how its implementation can be improved. The major recommendations, called the Bonn Keys are listed below:

- The first key is to meet the water security needs of the poor.
- Decentralization is the key. National policies meet communities at the local level.
- The key to better water outreach is new partnerships.
- The key to long-term harmony with nature and neighbor is cooperative arrangements at the water basins, including waters that touch many shores. Thus *IWRM is needed to bring all water users to the information sharing and decision making tables.*
- The essential keys are stronger, better performing governance arrangements.

### *Johannesburg 2002 and beyond*

The World Summit on Sustainable Development had a strong focus on water. It took water as one of its ten focal areas, and thus many think that water is far better reflected as in Rio. The Framework for Action of Johannesburg includes many interesting recom-

mentations with respect to water. Some of the most important ones include the following ones:

- *Developing IWRM and water efficiency plan by 2005 for all major river basins of the world*
- *Developing and implementing national/regional strategies, plans and programmes with regard to IWRM*
- Improving efficiency of water uses
- Facilitating public-private partnership
- Developing gender sensitive policies and programmes
- Involving stakeholders specially women in decision making, management and implementation processes

The first two items define clear operational targets to the implementation of IWRM both in the river basin context as well as on jurisdictional level. How realistic these targets are is another question, but important is that IWRM is very high on the Johannesburg agenda.

### *IWRM*

IWRM is understood as being based on the so-called 3E principle: waters should be used to provide *Economic* well-being to the people, without compromising social *Equity* and *Environmental* sustainability. Waters should be managed in a basinwide context, with stakeholder participation and under the prevalence of good governance. Thereby, the IWRM *aims at developing democratic governance and promotes balanced development in poverty reduction, social equity, economic growth and environmental sustainability.*

The fundament of the IWRM process in any basin is the institutional set-up. Usually, in international basins, the task of implementing IWRM is assigned to a basin organization, which coordinates activities and is often an active body in planning and other activities.

There are myriad challenges in the implementation of IWRM. The way from centralized, international river basin agencies to local villages and communities seems to be very long. Geographically this is unavoidable if a basin is large – yet this is not the point. In terms of institutions and communication the remoteness is often excessive – and a far more serious problem than the geographical distance.

The opposite direction applies as well: from villages to agencies. Perhaps the detachment in this direction is still larger in all ways due to many practical and capacity-related issues. These ways should – and definitely could – be shortened and paved on a way or another.

### 3. Global challenges to freshwater management

The purpose of this section is to frame the water resources challenges in the global level reviewing the major trends and tendencies in forces that drive the development. Ten critical externalities – or driving forces – were identified as the most critical ones with respect to water resources development (Figure 1; Varis 2005). They will be discussed one by one, with a special reference to their contemporary and future impact to freshwater management.



Figure 1. Critical externalities of water resources development in South Asia.

#### *Large and Dense Population*

The expansion of human population seems to continue at least a couple of decades. It occurs chiefly in the south. The relative growth rates are gradually going down in most

parts of the world, and this development is expected to continue. The absolute growth is still linear, but starting to decline. The population growth sets a heavy burden on the development possibilities of the impacted countries and on the planet's natural resources.

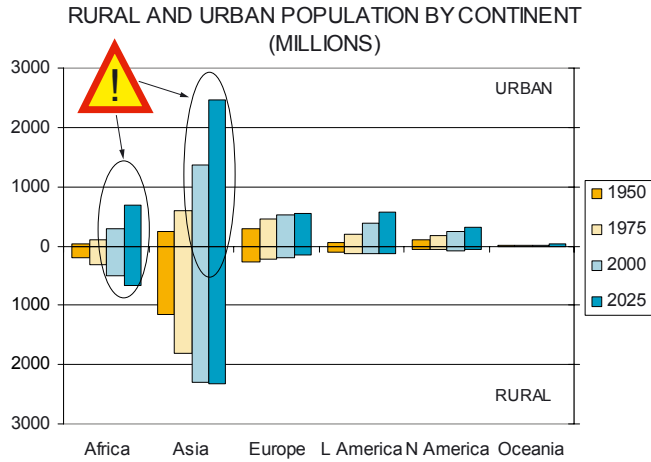
High population is a fundamental reason to growing pressure to natural resources. Land is becoming increasingly short and so are most other natural resources. The population density issue does not receive enough attention in the water debate. Excessive population densities large parts of Asia and to some extent in other continents set a unique stress to the environment. The associated poverty problem imply that many of those regions are bound and will be bound to rely very much on local solutions in meeting their basic needs such as food supply. 90% of the Chinese live in an area with a population density of over 350 persons per km<sup>2</sup>. For comparison, the Bangladesh has 935, island of Java in Indonesia has 870, and the Netherlands has 457 inhabitants per km<sup>2</sup> (World Bank 1999). The extremely land-scarce areas must be able to keep the mushrooming cities alive.

Population growth is typically considered as an externality in the water debate, which is beyond water policies. This is true, however, several issues that affect water development positively also help in population control. Many human development aspects belong to them – such as education, gender equity, poverty reduction, and so forth.

### *Massive urbanization*

Urbanization will perhaps be even a more problematic issue than population growth. Almost all population growth ends to cities (Figure 2). It will be a big issue to most individuals in coming decades, as well as when considered as a driving force in any aspect of the humans and their environment, be it the nature, social development or economy. Globally, rural and urban populations equal now in size. Till 2025, the rural population will not grow, yet the urban population will grow 60%. In China alone, the urban population has been estimated to grow from 500 to 850 millions in the period from 2000 to 2025 (UN 2002).





URBANIZATION BY CONTINENT (%)

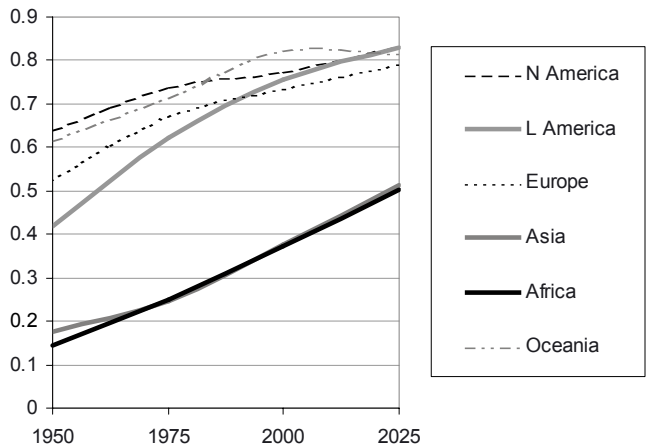


Figure 2. Rural and urban population by continent. Source: UN (2002).

The growth of cities' immense needs of water and food will be rapid challenging all aspects of the water sector. Agricultural productivity must grow sharply. This cannot take place without massive improvement in irrigation efficiency. Arable land area as well as rural labor force will remain very much on the same level as before.

Growing urban centers will face enormous problems in ensuring appropriate water supply and sanitation to their inhabitants. Urban water infrastructure should be prioritized

more than before. What comes to progress in the sanitation situation, most developing countries have a long way to go until the citizens can enjoy a safe sanitation. Obviously, the water supply and sanitation situation should be developed hand in hand in order to reach best results in public health and environmental protection, but too often the development has not been in balance. A simple comparison to the situation in South Asia shows this clearly.

After SASTAC (2000), the domestic water supply requirements are expected to reach the level of 70–80 km<sup>3</sup> a year by 2025. Although many parts South Asia are water-scarce, this required water volume is still relatively small. The problem is not water availability but finances for infrastructure investment. The total of US\$75 billion would be needed in India alone for appropriate water supply and sanitation between the years 2000–25. Compared to 1992–97, investments should grow fivefold which will be extremely difficult to achieve. One solution – yet primarily to rural areas – is to activate the people to construct low-cost latrine sanitation systems. This, however, would require a remarkable progress in human development and empowerment, which in turn will not be easy as can be seen below.

### *Low and uneven human development*

Although economic indicators such as GNP, GDP and PPP are powerful development indicators, they miss many crucial issues what comes to livelihoods, and possibilities for improving them. The most popular alternative concept is human development. It combines economic performance with social issues such as life expectancy and education.

It is common to argue that people-centered development provides many solutions, which cannot be met with the contemporary resource-based approaches. Empowering the people to help themselves, raising public awareness and enhancing public participation are all important keys to overcome the limited financial capability vis-à-vis requirements.

The limits of the people-centered development are faced very rapidly if no systematic education of the people is provided. Education has been shown many times to be the real booster to both economy and people-centered development.

### *Retarded decentralization and controversies in empowerment*

Along with the wave of globalization in trade, finance and environmental issues, another worldwide force – namely decentralization – is reshaping development efforts everywhere. One of the basic ideas behind localization and decentralization is to enhance people's participation in politics and increase local autonomy in decision-making.

This tendency is welcomed and progress in decentralization is necessary. What comes to privatization, the problems might come in the fairly low level of cost return that prevails in the water sector investments, which usually does not by far give a competitive rate of return in comparison to investments into industries.

In many parts of the world, the water sector planning is changing gradually from top-down technocratic to bottom-up grassroots approach (Ahmad *et al.* 2001). The approaches are developed towards more participatory than before, and partnerships between public and private operators are called for.

Empowerment should be far more emphasized than it is at the moment. Civil society organizations are functioning better and better in most developing regions, and in fact, the civil society might become more functional worldwide. However, big masses are beyond the appropriate control over their own living conditions. The disparities in gender, education, economy, and consequently empowerment and many other respects are enormous.

### *Unbalanced globalization and regional integration*

Globalization is one of the most hated or beloved concepts of these days. In the broad meaning of the word, it means opening of the gates and building down boundaries between nations. While the basic idea is grand and the underlying tendency is inevitable in the contemporary world, plenty of contradictions and side effects are obvious.

Arguments such as comparative benefits due to international division of labor and substitution of commodities are often used to back the benefits of international trade. The tariff barriers have gone down almost everywhere, allowing enhanced conditions to trade across borders. Yet, the protection of the poor economies is highly justified, knowing the extreme disparities in the world economy. Besides, the wealthiest econo-

mies such as US and EU are anything but tolerant in allowing foreign products to enter their markets.

World trade doubled in only 10 years in 1987–97 (World Bank 1999). The ratio of trade to world's total PPP adjusted GNI grew from 20.6 to 29.6%. Perhaps still a more sensitive indicator of economic integration is the share of gross private capital flows across the borders to PPP GNI. This grew from 7.0% to 12.7% in 1987–97, if calculated over the world.

Whatever the attitude for or against globalization is, most people agree that at least regional co-operation would be beneficial.

A great part of developing countries are expected to rely on self-sufficiency in many basic commodities for a long time ahead. This has important freshwater implications since in many countries over 90% of all the used water goes to agriculture. Along with urbanization and population growth, the water used in agriculture is expected to grow unless water saving will become far more efficient than at present. Too rapid exposition of agriculture, particularly traditional livelihoods, to globalization has many times shown to increase the vulnerability of these livelihoods, which in many cases has caused immense human suffering. The situation is different in modern, industrial sector, which is far more buffered against this exposition. Water management in this sector often improves as a consequence of globalization.

### *Malfunctions in governance and policy environment*

In a high number of the world's countries, the governance system suffers from serious malfunctions such as corruption. The legislative systems tend to be handicapped by overlaps and inconsistencies, and many laws are not implemented. National water policies may exist but are not very effective.

Policies and laws may exist but very often they never come effective. Governments are too heavily involved in controlling the resources even at the micro level. Decentralisation is seriously lagging behind, and the private-sector involvement as well. The water sector is far too fragmented in the governments, and thus IWRM is very difficult to be implemented. Serious problems in people's access to information prevail, hindering the development of transparent and democratic governance practices. A fair amount of capital-intensive water infrastructure investments have been made, but a typically instal-

lations are deteriorating due to inadequate maintenance. Women participation in water management tends to be too low.

As a partial solution, privatization and public-private partnerships have been proposed. This policy is would be justified in many cases. Yet, in situations where the governance system suffers from serious malfunctions, this policy has serious traps. If a weak government cannot properly regulate the private sector actors, there may be a partnership with the informal sector and the private sector – instead of the public sector, as is the case in many countries.

A crucial issue that is largely missing from the debate is the informal sector and thus the informal institutions. Institutions provide the rules for the society. Their various functions range from legislative, juridical, and administrative to different informal aspects such as culture, religion, and ethnicity. The former ones are often called as formal institutions, whereas the latter ones are known as informal ones.

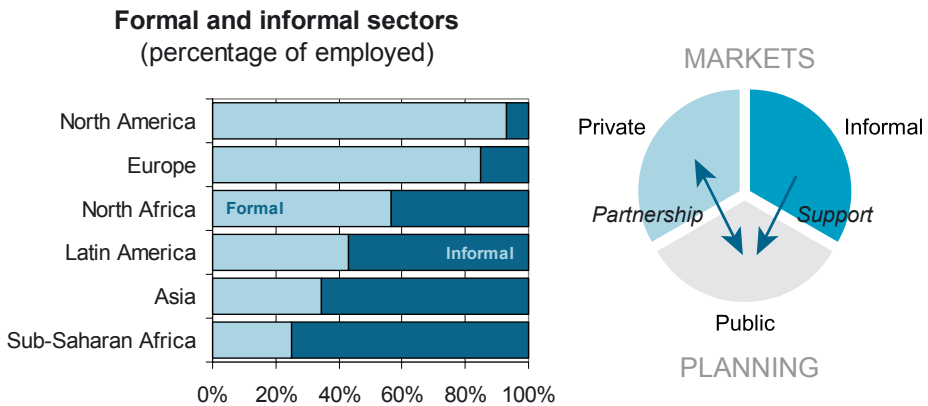


Figure 3. Left: The informal sector employs two-thirds of the Asian labor force (Charmes 1998). Right: Positive interconnections between public, private, and informal sectors. The public and private sectors should be able to work in partnership, and the informal sector should support the public sector (Varis 2001).

Along with rapid urbanization, economic liberalization, and other transitions, the various roles of informal institutions are increasingly emphasized in development programmes, although not yet properly in water agendas or visions. Policies based on public awareness, grassroots activities, participation, and so on are often targeted at least partly to the informal

sector. This sector, leaning largely on informal institutions, grows rapidly in developing and transitional countries, and incorporates a majority of the world's people (Figure 3).

Varis (2001) analyzed the various roles of informal institutions in the water sector, and the related policy principles by concluding as follows:

- Informal sector is growing in most nations.
- Informal institutions grow in importance, since formal ones fail to reach the informal sector sufficiently.
- Informal institutions should be more respected and integrated into water agendas.

This is challenging since they are deeply interwoven into the traditions and culture. Their positive aspects should be supported, and their negative sides such as corruption, bribery, local mafias, etc., should be set under control.

*Economic underdevelopment and widespread poverty*

Poverty reduction has found its way to all agendas. The definitions and the number of those living in poverty vary greatly, but roughly one-fifth of the mankind is usually classified as being poor (Figure 4). One of the eight Millennium Development Goals of the United Nations is to halve the incidence of poverty from the 1990 level to the year 2015.

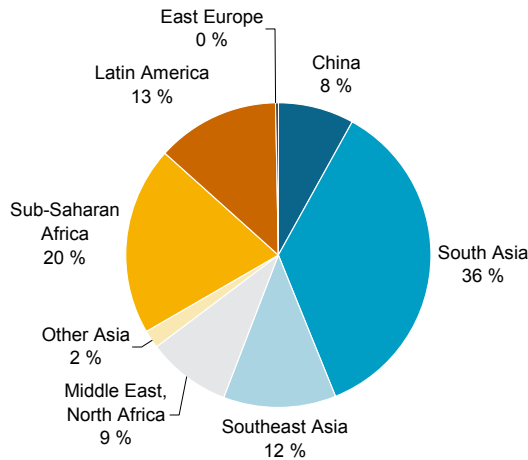


Figure 4. People in absolute poverty by region (World Bank 1997).

A simple thing to a layman but not so obvious to the experts is the fact that many of the water problems go hand in hand with the poverty problem. Those exposed to malnutrition, to inappropriate water and sanitation services and so forth are very often the same individuals who have been classified as poor by various indicators.

Another dimension is the ability of the nations to finance the huge needed investments that improve the water infrastructure to an appropriate level. In the case of Nepal, one-third of the national GNI would be needed for this purpose, which is highly unrealistic (SASTAC 2000). There is a discrepancy of one order of magnitude to any realistic investment level. The low economic growth rate in comparison to many other developing regions doesn't help the situation, nor does the low level of integration to the global economic system.

Private sector involvement has been proposed to one solution to the financial problem. Yet, who would invest massively to a sector with a very low rate of return? In Indian multipurpose river valley and irrigation projects the cost recovery is only around 13%, whereas in small-scale irrigation schemes it is not higher than 2% (SASTAC 2000).

### *Food insecurity*

Approximately every sixth human being suffers from food insecurity. Global food security projections suggest better days to come. However, the optimism is largely based on the assumption that low-income countries will increase their food imports. This means, that their economy should grow steadily, and food markets should be stable (cf. IFPRI 1997).

Around 90% of all water withdrawals in developing countries go to agriculture. Arable land area does not grow in any part of the world. The required increase in food production must take place by increased unit yields and water management including irrigation is by far the main factor in this respect (Vakkilainen and Varis 1999).

In many developing parts of the world, food production systems have been improved remarkably in the past decades. However, malnutrition is still widespread, and part of the progress is eaten away by the rapid population growth. Rapid urbanization, climatic effects such as droughts, and many social disparities continue to cause food security problems to one-sixth of the world's population, which is an alarming number. In early 1990s, more than 800 million people were undernourished in the world, among which 180 million were chil-

dren (see Figure 5). In South Asia, more than 50% of children are undernourished despite of excessive improvements in food production since the green revolution of the 1960s.

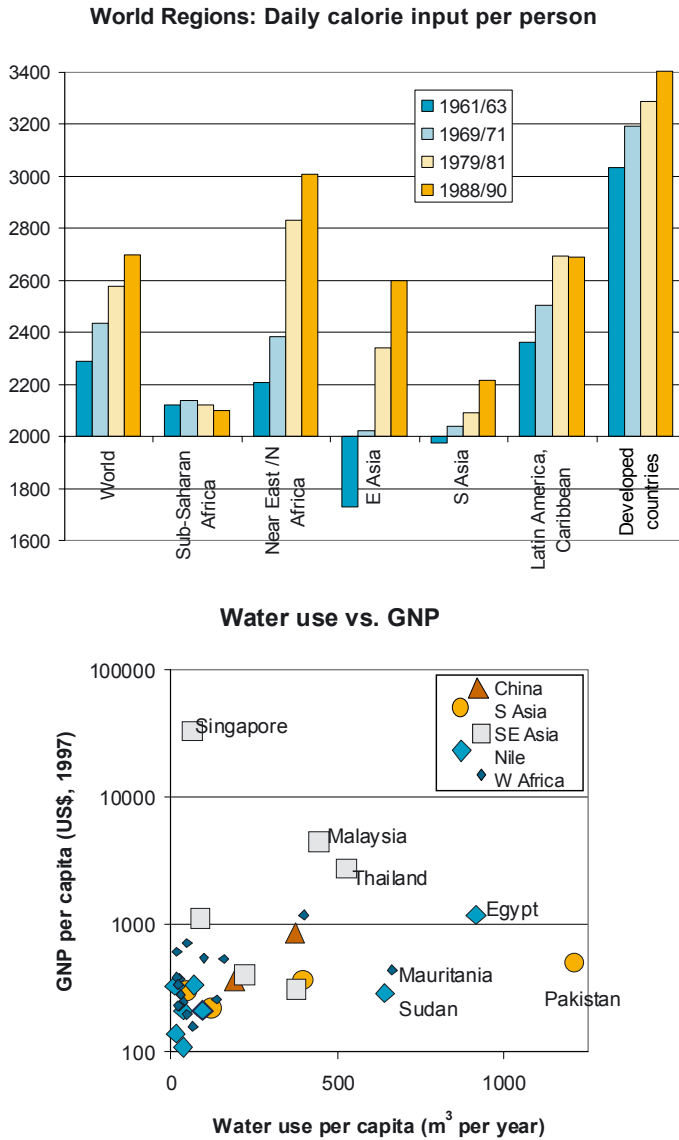


Figure 5. Up: Daily calorie input per person in different regions of the world (Alexandratos 1995). Bottom: Water use does not grow with economic growth. GNP vs. water consumption in selected African and Asian countries (World Bank 1999).



Self-sufficiency is important in most developing regions of the world, both locally and nationally. Irrigation is very often needed to increase productivity to facilitate economically rewarding farming. Impact of urbanization is large: market-driven agriculture must grow rapidly. Lack of purchasing power is a serious obstacle. Food security is not only an agricultural issue, but also a social question closely related to poverty.

### *Variations and changes in climate*

The globe's climate is subjected to variations due to innumerable reasons. The hot topics in climate change research are whether human activities have changed global climate, how this has happened and will continue, what the most important consequences will be, and how the future changes should be mitigated with present actions. These changes are most frequently attributed to increasing concentrations of greenhouse gases and aerosols in the atmosphere, together with land-use changes such as deforestation and desertification.

Such changes, however, are anticipated to vary much with respect to local and regional weather conditions. Some evidence suggests that the changes in variations are much more significant than those in the mean behavior of the climate. In fact, extremes such as floods, droughts, storms and their frequency are often critical to water resources management, and changes in their pattern or frequency can be very influential to the economy and society.

In the global scale, a particularly sensitive zone is the equatorial belt. This belt covers the range of the seasonal movement of the intertropical convergence zone. In this zone, the trade winds from the both hemispheres confront, causing the monsoon rains.

This belt, and particularly its borders, are subjected to highest uncertainties in the global climate change projections (IPCC 2001), and few decades ahead, it will be affected more by other global changes – population growth, urbanization, industrialization, and political-economic transitions – than other parts of the world. This makes the economies particularly sensitive. 80% of world's rural people are fully dependent on the monsoons.

The present status of climate projections does not unfortunately allow a concrete basis to build up other policies besides making societies less sensitive and vulnerable to any foreseeable event. It is very doubtful to base any real-world policy choices in present climate change projections. The very basic needs of the billions that are potentially affected by

changes – water, food, housing, social fabric – are in question. The models give an overly optimistic view of the adequacy of the knowledge, despite of their consistent development. In practice, precautionary policies are necessary.

### *Environmental degradation*

An obvious follow-up of the massive population growth and urbanization, combined with climatic changes and variations as well as changes in the economic systems and human development level is an escalating pressure on the nature on this planet.

The population keeps growing, and the diets change towards more meat. The agricultural production should hence grow much faster than the population. Due to rapid urbanization and other factors that open material cycles the soils are threatened by degradation in terms of loss of organic matter, salinization, erosion, etc. Competing land uses restrict a notable growth in arable land. The land resources will be subjected to exceptional pressures, which lead to massive land degradation problems. It has been estimated that about 12 million hectares of arable land is lost annually because of soil degradation (Pimentel *et al.* 1995).

Streams, lakes, reservoirs, and wetlands are used and exploited in a rich variety of ways. They also contain fundamental cultural and religious values. The exploitation of surface water contributes to the deterioration of water quality and changes in hydrology. The natural patterns of seasonality and other variations also cause mismatch between supply and demand of the resource. The water quality problems tend to accumulate into areas and regions where water is also scarce in quantity. Such particularly problematic regions include North China Plain and many parts of continental India.

Groundwater is among the major sources of freshwater, making up a substantial portion of the source in many areas. It serves domestic and municipal supplies and irrigation. Its importance of a reliable and high-quality source is rapidly increasing, but the groundwater resources are deteriorating with a growing rate. This causes, besides widely reaching social and economical problems, also ecological damage and even desertification.

The global driving forces cause pressures to wildlife, forests, other ecosystems, and biodiversity. The daily, global rate of deforestation is 430 km<sup>2</sup>, chiefly due to land acclimation to agricultural use. Solely in 1990–95, Southeast Asia lost 6.7% of its forest cover.

Biodiversity is one of the key elements of sustainability of the earth's ecological system. It has been estimated that 50,000 species disappear in the world each year.

#### 4. Paradigms and challenges in the Mekong Basin

The objective of this section is to outline how the IWRM process is institutionalized and implemented in practice in the Mekong Basin in Southeast Asia.

The study is ongoing, and is performed in close co-operation with the implementing organization, the Mekong River Commission (MRC), and a multitude of actors in the region including several ministries in the region's countries, a number of academic institutions, non-governmental organizations and external researchers.



Figure 6. The map of the Mekong Basin showing the river, the six riparian countries and the Tonle Sap Lake.

### *Mekong Basin*

The Mekong is the ninth largest river in the world if measured with runoff. Its annual discharge of 500 km<sup>3</sup> is ten times that of the Nile. Mekong is one of the world's most pristine large rivers. The basin population approaches 70 millions. The GNP per capita ranges from Cambodia's US\$260 to Thailand's US\$2,010. In Vietnam, Lao PDR and Cambodia, around 40% of population live below the poverty line. Over 50% of the GNP originates from fishing and agriculture being totally dependent on water.

Cambodia's Great Lake, the Tonle Sap, is a unique lacustrine-wetland ecosystem. It is Mekong's major natural reservoir with annual water level fluctuations of 9 meters. The area exceeds 12,000 km<sup>2</sup> during the monsoon floods, and shrinks to 2,000 km<sup>2</sup> in the dry season. The lake is one of the world's most productive large wetland ecosystems. Its biodiversity is extreme. This basin is exceedingly poor with an average income of 40 cents per capita. Fish and rice are the backbones of the traditional livelihood. The population is profoundly dependent on the lake in their livelihood, which is chiefly on a subsistence level. This lake has been the first focal area of the WUP-FIN project.

The basin has witnessed a long period of wars and disquiets in the past 60 years. The countries are now in the process of recovery on many fronts and rapid growth of economic prosperity. Infrastructure needs urgent development and is undergoing a speedy progress, and so are educational and health care systems. Government institutions, above all ministries are still weak and corrupted but maybe on the way to the better.

Economic growth and globalization have changed the traditional rural-urban balance and thus towns and cities grow very fast. At the moment around 23% of the population live in urban areas and the urban population increases over 4% per year (Heinonen 2004).

Economy of a big part of the Mekong Basin relies on very basic subsistence farming and fishery. Poverty touches a bulk of the population. Illegal activities, largely based on destructive exploitation of natural resources, mushroom. Nature will not sustain the present informal economy and poverty-driven destructive practices for very long.

There are diverse ambitions to develop the basin; dam construction in China and Lao PDR, agricultural development and exploitation of forests throughout the basin, road and settlement construction and other activities, which modify the mass flows and hydrology in a considerable way.

### *Mekong River Commission, Water Utilization Programme and Basin Development Plan*

The MRC has been the strongest international organization in the region over many decades. Among the riparian countries, Cambodia, Vietnam, Lao PDR and Thailand are members of the MRC, but China and Myanmar are not.

The MRC is currently working on a comprehensive master plan for the lower Mekong River Basin (basin's parts that are within the member countries). This Basin Development Plan (BDP) is supported by a massive 6-year background analysis – or a series of analyses – under the title Water Utilization Programme (WUP). WUP-FIN is one of the complementary projects to both of these activities and this case is largely based on the experience and results of this project.

Mekong Committee was established in 1957. Its initial members were Thailand, South Vietnam, Laos and Cambodia. Burma and China did not join it. Its functioning was particularly hampered by China's absence, several wars in Vietnam, Cambodia and Laos.

By 1995, the regional political ambience became favorable to enhanced political and economic integration in Southeast Asia. As one of the results, Vietnam, Lao PDR, Cambodia and Thailand signed the Mekong Agreement on the new modalities of co-operation in the Lower Mekong River Basin. This agreement re-established the Committee, and it was newly named as the Mekong River Commission.

The Commission was reinforced in many ways, yet China and Myanmar (formerly Burma) continue to be absent. The vision and mission statements of the MRC are:

- VISION for the Mekong River Basin: “An economically prosperous, socially just and environmentally sound Mekong River Basin.”
- VISION for the MRC: “A world class, financially secure, international river basin organisation serving the Mekong countries to achieve the basin Vision.”
- MISSION: “in accordance with the 1995 Agreement: To promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well being by implementing strategic programmes and activities and providing scientific information and policy advice.”

These strategic backbones of the MRC *are very much in accordance with the principles of IWRM*. Therefore, Mekong suits extremely well as a research basin in order to study the institutionalization and implementation of IWRM in practice.

*The analytic approach*

The WUP-FIN project makes an attempt to identify the balance between different constituents of the concept of IWRM. The approach is described in Figure 7. As defined earlier, there are five basic issues that have been defined in the IWRM. They are environmental sustainability, social equity, economic prosperity, good governance and stakeholder participation. We are performing two analyses on each of these topics, one in a more theoretical manner and the other one that analyses the practical situation in the Mekong basin. The practical ones come directly from the work within the WUP-FIN project, whereas the theoretical ones will be done principally by external experts.

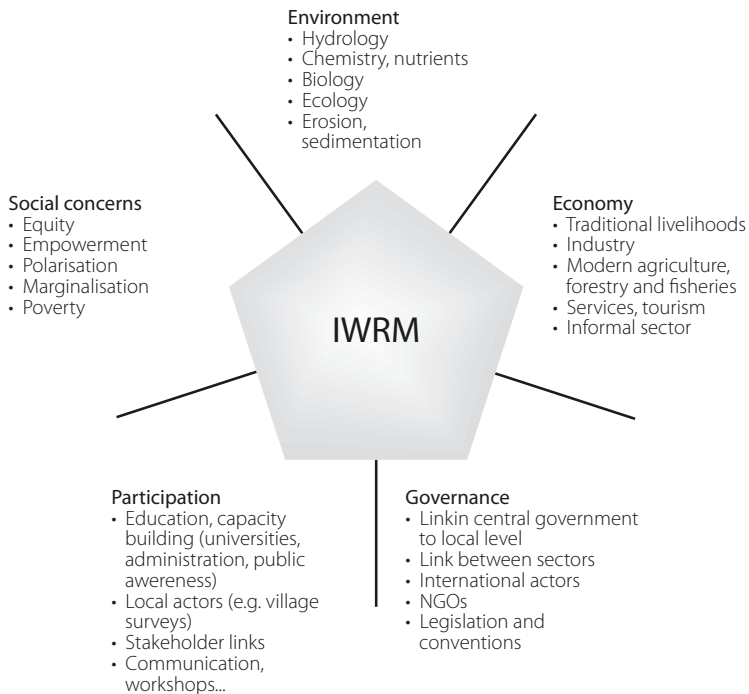


Figure 7. *The facets of IWRM.*

The balance of these components will then yield important experience on the IWRM concept and its implementation in the Mekong Basin. Besides a high practical relevance – the analysis reveals directly how well the Mekong Agreement works – the study will have a broad scientific importance due since the Johannesburg Plan of Implementation specified that all major watersheds of the world should have an IWRM plan by the end of 2005.

The scheme of the study is shown in Table 1. One component – policy diagnosis and analysis – is taken here to a closer look to demonstrate some of the approaches used.

Table 1. *The scheme of the IWRM analysis of the Mekong basin.*

Point of view	Theory, context and background	Mekong IWRM development and planning process
Environment	Biosphere sites, Ramsar sites and other international and national environmental policy tools in the Mekong Basin	Water regime, floods, sediments and biological system of Tonle Sap: what is known, unknown, and how policies influence the system
Economy	Infrastructure and other economic development constraints	The roles of different economic sectors and the links to water and other natural resources
Society	Cultures, religions and traditional institutions	Socio-economic diagnosis and major challenges for policies
Governance	Institutional set-up in the water sector and the role of the MRC	Policy diagnosis and analysis
Participation	Public participation, empowerment and the role of civil society	Village surveys, relevance of census and other available data and links to environment in the planning process

### *Policy diagnosis and analysis*

The basic question of this sample component is: “*Should a poor country such as Cambodia develop its water resources with the priority in environmental conservation, in maximizing economic growth, or in reducing poverty as much as possible?*” There is enough pressure evoked by the country’s contemporary situation to justify all of these prioritizations. However, only one of them – or a compromise of them – can be realized.

Cambodia is one of Asia's poorest countries, having suffered from disastrous violence over many decades. The economy, society and the environment have paid an enormous toll for this. The recent years have witnessed some optimism for Cambodia. Hostilities have calmed down and the government has stabilized gradually. The government agencies remain weak but get slowly on track. Still, the central government is not much aware what is going on in the provinces. The provincial and local authorities have a mélange of links with NGOs, and ties with central government are unfastened.

In terms of water Cambodia is heavily dependent on the Mekong and hence on its neighbors, since all the six Mekong countries have their varied and specific aspirations how to make living and wealth out of the mighty river. MRC is at the core of these tensions.

This case summarizes the policy model and policy analysis for the Tonle Sap. The focus is on the demanding task of analyzing where economic development, poverty reduction, and environmental sustainability conflict and where they walk hand in hand. WUP-FIN includes comprehensive watershed hydrological and environmental studies, monitoring and modeling of the lake, and several other activities besides the socio-economic part.

Altogether eleven sector policies were included in the analysis (Figure 8). They all are crucial to the development of Tonle Sap basin's water resources. Each expert would argue differently how important and powerful the policies implemented by these various sectors would be. Equally rich is the spectrum of prioritizations between environmental, social, and economic aspirations.



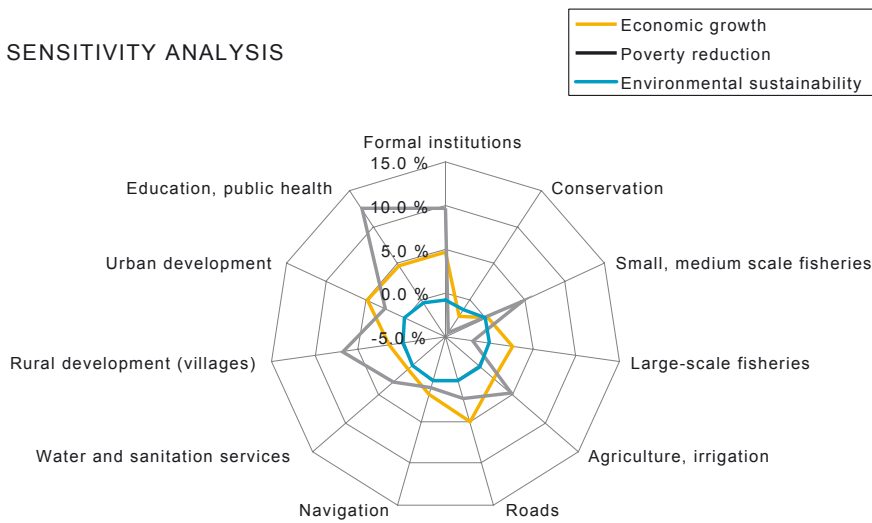


Figure 8. An example of results of the Water Policy Model: A sensitivity analysis diagram showing the efficiency of 11 sector policies in achieving three IWRM goals (economic growth, poverty reduction and environmental sustainability).

A Bayesian Network model was constructed for this controversial and manifold problem in order to analyze systematically its various aspects. The model consists of the sector policies, the major social, economic, and environmental impacts and consequences of implementing these policies, as well as development goals, namely poverty reduction, environmental sustainability, and economic growth (Varis & Keskinen 2005).

Figure 8 is an example of the results. It shows the response of these development goals to small changes in sector policies. The further the line is away from the zero line (the circle closest to the diagram's center), the more impact the policy has on that development goal. The impact is negative if the line goes inside the circle, otherwise it is positive.

Interesting enough, some sector policies would be crucial for both the economy and poverty reduction, but not all. The huge shortcomings in education and institutions are obviously the ones that most strongly support these two goals. Rural development, in turn has a very important social function although it has not much immediate economical implication. Large-scale fisheries would be economically beneficial but counterproductive for poverty reduction.

The biggest surprise is that the policies included in the model appear to be relatively toothless to environmental problems, particularly if defined as “environmental sustainability” as is done in the Mekong Agreement of 1995. This is obviously due to the following reasons:

- Environmental sustainability is not easy to be conceptualized concretely enough to be analytically clear. In our model it is a combination of various issues and problems related to the environment and natural resources.
- As the majority of the Tonle Sap’s population live in villages and make their living from the lake or the floodplain very directly, environmental issues are tied with social issues. Social developments therefore are tightly bound to the environment, and what happens in model simulations is that improvements in social conditions introduce both positive and negative environmental impacts, which tend to eliminate each other. The situation would be different if the governance system was more efficient.
- The Tonle Sap ecosystem is governed by the mighty floods of the Mekong, which raise the water level up to 9 meters, and subsequently the surface area of the lake grows fourfold. The sediments and other mass flows are dominated by these monsoon floods. There are no handles in the sector policies inside of Cambodia that would allow the control of these issues.

## 5. Conclusions

This paper drew attention to the need to develop the water management principles towards a more holistic and interdisciplinary direction. As the first part, a digest of prevailing freshwater management paradigms was presented. A special focus was on the concept of IWRM, which is emphasized increasingly in all water-related recommendations.

Thereafter, a scrutiny of the most important challenges to freshwater management was performed. These ten challenges provide the framework to freshwater management approaches. A key message from this analysis is that the water experts still tend to see their own discipline as being more isolated from the surrounding world than they should.

The third part illustrated the experience in implementation of IWRM in a large international river basin in Asia, namely in the Mekong basin. Multidisciplinarity is necessary in coping with the problems of rapidly changing and developing river basins such as the Mekong.

The water sector should be more aware and conscious of the present state of and future expectations with regards to various development processes. The water sector could even on its own part make earnest attempts to foresee and reduce their gravity by rightly targeted policies. Seeing the water issues in the broad framework of other development issues such as the ones discussed here – and integrating the visions and policies of the sector – would be the way to go towards a better future through successful freshwater management.

Acknowledgements Special thanks are due to Marko Keskinen, Mohammed Mizanur Rahaman, Ulla Heinonen, Katri Makkonen, Matti Kumm, Tommi Kajander, Virpi Stucki and Pertti Vakkilainen, as well as to Patricia Avila and the WUP-FIN team for fruitful co-operation.

## References

- Ahmad, Q.K., Biswas, A.K., Rangachari, R. & Sainju, M.M. 2001. A Framework.  
In: Ahmad, Q.K., Biswas, A.K., Rangachari, R. & Sainju, M.M. (Eds.) *Ganges-Brahmaputra-Meghna Region: A Framework for Sustainable Development*: 1–29. The University Press Limited, Dhaka.
- Alexandratos, N. 1995. *World Agriculture: Towards 2010 – An FAO Study*. FAO, Rome and Wiley, Chichester.
- Charmes, J 1998. Informal sector, poverty and gender: A review of empirical evidence.  
*Background Paper for the World Development Report 2001*. World Bank, Washington D.C.
- Heinonen, U. 2004. Bangkok, a city where all flows meet. Stockholm Water Symposium, August 15–19, Stockholm.
- IFPRI 1997. *The World Food Situation, Recent Developments, Emerging Issues, and Long Term Prospects*. The International Food Policy Research Institute, Washington D.C.
- IPCC 2001. *Climate Change 2001: The Scientific Basis*. Cambridge University Press, Cambridge.
- Pimentel, D. 1995. The Global Population, Food, and the Environment. In: Westra, L. & Lemons, J. (Eds.): *Perspectives on Ecological Integrity*: 239–253. Kluwer, Dordrecht.
- SASTAC 2000. *South Asia – Water for the 21<sup>st</sup> Century: Vision to Action*. Global Water Partnership / South Asia Technical Advisory Committee, Aurangabad.
- UN 2002. *World Urbanization Prospects: the 2001 Revision*. United Nations, New York
- Vakkilainen, P. & Varis, O. 1999. Will water be enough, will food be enough?  
Technical Documents in Hydrology 24, UNESCO/IHP, Paris.

- Varis, O. 2001. Informal water institutions. *Proceedings of the IWA 2<sup>nd</sup> World Water Congress*, 15–19 October, Berlin.
- Varis, O. 2005. Externalities of *integrated water resources management in South and Southeast Asia*. In: Varis, O. & Biswas, A.K. (Eds.): *Integrated Water Resources Management in South and Southeast Asia*. Oxford University Press, Delhi.
- Varis, O. & Keskinen, M. 2005. Policy analysis for the Tonle Sap Lake, Cambodia. *Water Resources Development*, in press.
- (<http://www.water.hut.fi/wt/research/glob/egloshow/Reports/report10.pdf>).
- World Bank 1997/1999. *World Development Indicators*. The World Bank, Washington D.C.

## Science for Water Services and Related Institutions

*Jarmo J. Hukka*

*Adjunct professor, Senior Research Fellow*

*Tampereen University of Technology*

*Institute of Environmental Engineering and  
Biotechnology*

*E-mail: jarmo.hukka@tut.fi*

*Petri S. Juuti*

*Adjunct professor, Senior Research Fellow*

*University of Tampere*

*Dept. of History*

*E-mail: petri.juuti@uta.fi*

*Tapio S. Katko\**

*Adjunct professor, Senior Research Fellow*

*Tampereen University of Technology*

*Institute of Environmental Engineering and  
Biotechnology*

*E-mail: tapio.katko@tut.fi*

*Asheesh Mohamed*

*DSc (Tech), Lecturer*

*Oulu Polytechnic*

*E-mail: mohamed.asheesh@oamk.fi*

*Ezekiel Nyangeri Nyanchaga*

*DSc (Tech), Senior lecturer/Consultant*

*University of Nairobi*

*E-mail: samez@wananchi.com*

*Osmo T. Seppälä*

*DSc (Tech), Senior Consultant*

*Plancenter Ltd., Helsinki*

*E-mail: osmo.seppala@plancenter.fi*

*\* Contact person*

*Key words: water supply, sanitation, water services, institutions, water policy, diversity*

### 1. Background and objectives

In several connections over the last decade it has been noted that the biggest challenges in water supply and sanitation, particularly in developing but also in transition and even developed economies, are institutional by nature. This is true although the problems often manifest themselves as technical failures.

The World Water Development Report 2003 noted the major problem: “Sadly, the tragedy of the water crisis is not simply a result of lack of water but is, *essentially, one of poor water governance*.” (Unesco, 2003).

As pointed out by UNESCAP, solving of the constraints in water and sanitation service production and the inefficiency of sector organisations are essentially a *governance problem* (UNESCAP 2003) in many countries. Lack of *good governance* principles is one of the root causes of all major constraints within our societies. Good governance is participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. It also ensures that corruption is minimised, the views of minorities are taken into account and that the most vulnerable members of society are listened to in decision making. It is also responsive to the future needs of society.

In international water policy discussions the issue of *water ethics* has been emphasised e.g. by UNESCO (World Conference on Science 1999, Selborne 2000) when considering the various ways of improving water services and resources management. It is strongly underscored that the access to water is a basic need and that the primary purpose of viable and sustainable water services is to serve society, not only operate efficiently.

The Millennium Development Goals (MDGs) that should be achieved by 2015 (UN, 2000) are diverse and related to development in eight key areas. MDGs classify development targets for water and sanitation improvements under “environmental sustainability”. Widespread poverty is seen as the most critical impediment to overall development and sustainability in developing countries. Poverty is no longer seen only as an economic problem, but a “multifaceted situation that involves both the material and non-material conditions of life” (UNESCO, 2003). Thus, lack of safe water and sanitation services can also be seen as part of the poverty problem.

Although poverty and economic underdevelopment are undoubtedly among the most critical constraints for overall sustainable development in developing countries, future also holds numerous new and mixed challenges for them. The reports on the “State of the Future” of the Millennium Project shed light on the future challenges at the global level, recognising that their impacts might be most adverse in the poorest developing countries (Glenn & Gordon 2000). Availability of freshwater resources, access to safe drinking water and adequate sanitation services have been ranked among the top priorities of mankind in the 21<sup>st</sup> century.

Since the mid-1980s a research team called “Capacity Development in Water and Environmental Services, CADWES” has operated at Tampere University of Technology (TUT), Finland gradually receiving “formal status”. Most of the participants have during

their career been involved in water supply and sanitation in and for developing countries, or transition economies, in addition to the Nordic countries. Thus, many of the research questions have arisen from the researchers' own findings and the real world, rather than been given "top-down". Indeed, the group points out that their research laboratory is the "global village".

CADWES is collaborating particularly with the Universities of Addis Ababa, Dar es Salaam and Nairobi and has also active members representing other disciplines and universities in Finland. It also has active links to other Nordic countries, the Baltic region, Europe, North America as well as South America.

As for developing countries, the CADWES members have also been involved for over two decades in various types of educational and research activities – from MSc courses to conferences, seminars and workshops especially in Eastern and Central Africa. The current objective is to establish more constant cooperation with Sub-Saharan universities.

One additional argument in favour of being involved in international water policy and management-related research of the CADWES team is the fact that in several international comparisons of the water and environmental sector Finland has placed near or at the top. These include, for instance, the "water quality index" (<http://www.unesco.org/water/wwap>), which emphasises water protection and quality; the "water poverty index" (<http://www.nwl.ac.uk/research/WPI>), which focuses on the availability and management of water resources; the "transparency index" (<http://www.gwdg.de/~uwvw/icr.htm>), which assesses transparency and level of corruption; the "environmental sustainability index" (<http://www.ciesin.columbia.edu/indicators/ESI>) concerned with environmental protection and sustainability as well as the European comparison of water pollution control efforts called "name, shame and fame" (<http://www.europa.eu.int/comm./environment/nsf/index.htm>). These achievements provide a good background for research activities while remembering the fact that water services, in particular, depend to a large extent on local conditions.

The objective of this paper is to describe the key research projects and results of the CADWES team since the mid-1990s, and synthesise the key results and research approaches used so far. Furthermore, recent and ongoing projects and future foreseeable research needs will be discussed and concluding remarks made.

## 2. Theoretical background

CADWES has recently defined as its mission to “produce usable knowledge, based on trans-disciplinary research on the evolution and development of sustainable use of water services and water resources in a wider institutional context: organisations, management, legislation and policy including formal and informal institutions. As their key values the team has identified: Global responsibility, Problem orientation, Innovativeness, Interaction, Trans-disciplinarity, Social effectiveness, Openness and encouragement, Importance of history and futures, and Equity and equality.

One of the cornerstone theories of the CADWES team is the new institutional economic theory formulated by the Nobel Prize Laureate Douglass C. North (1990, p.3–4) which states: “institutions are the rules of the game in a society, or the humanly devised constraints that shape human interaction” while “organisations are groups of individuals bound to some common purpose to achieve objectives”. Using the analogy of soccer, institutions are the rules of the game while organisations are the players (North 1990, p. 3). The assumptions of the neoclassical economic school of thought on rational behaviour, and thus straightforward economic calculations, seem not to hold true in real life, nor are they able to explain the complexity and diversity connected with water resources and services management.

Another more specific theoretical starting points of the CADWES team is the path dependence theory. As North (1990, p. vii), points out history matters as “time and context”. This understanding of history, however, is seriously deficient in two closely related aspects. On the one hand, despite their allowance for path dependence, the models and concepts used are ahistorical, asocial, timeless, and universal. History, time and context are confined to the random shocks or whatever leads to one rather than another pre-determined, if stochastic, path to be taken. According to Liebowitz and Margolis (1995), a technological lock-in is a lock-in to something bad, or at least a lock-out of something better. Further, they point out that these lock-ins, bad economic consequences, are avoidable by small but prudent interventions. In a way, they are analogical to the weak signals that futures researchers commonly try to identify. Although in economics path dependence is commonly interpreted as lock-in or something “negative”, some strategic decisions on technology selection can be highly positive and far reaching, such as metering-based billing, and abandoning of lead pipes.



In the old development thinking, economic development in developing countries was largely seen as an issue of growth and, on the other hand, as a result of dependence on developed countries. Despite their weaknesses compared to the current – more holistic – thinking about development, these classical theories can still to some extent be used to explain economic and social development in developing countries. Development economics has no universally accepted paradigm, and insights and understandings are continually evolving. Sustainable development is currently understood as a much wider issue than mere economic and social development. In fact, recent theories and studies on development have given rise to more diverse considerations. Development is increasingly understood as a wide societal governance issue (Seppälä 2004).

Recent holistic approaches to development include several national, regional and global partnership efforts, which aim at merging various aspects of poverty alleviation and governance into a multi-sectoral and integrated socio-economic development framework. An example of such regional partnerships is the New Partnership for Africa's Development (NEPAD). NEPAD aims at addressing current development challenges on the African continent and developing new radical interventions to develop and implement the new Africa Vision (NEPAD, 2003). Regarding WSS development, NEPAD is preparing its water programme based on the Africa Vision and Framework for Action that provides a foundation for addressing the challenges in meeting the MDGs in Africa. The prospects of achieving MDGs in WSS in Sub-Saharan Africa seem extremely challenging.

The CADWES team has incorporated organisation and management theories into its approach to the complex nature of water supply and sanitation. Organisations are essential in water management, because the various actors and stakeholders involved in water services management perform their roles as organisations. The role and performance of organisations is essential also in the water sector reform in developing countries. These organisations often behave and perform in a complex and unpredictable manner. An understanding of organisation theories helps establish a systemic approach to water services and to look for appropriate approaches and practices to manage and lead water organisations.

Water utilities and other organisations have two different roles and tasks – management and leadership, which should not be confused. The basic processes and functions of management include (i) planning, (ii) organising, (iii) directing, and (iv) controlling (Grigg 1986). Leadership is “the process of influencing others to understand and agree about what needs to be done, and how it can be done effectively, as well as facilitat-

ing individual and collective efforts to accomplish shared objectives” (Yukl 2002, p. 7). Thus, management deals more with activities and processes while leadership deals with leading people and organisations and getting things done through people.

Water service organisations – both in developing and developed countries – have been fairly conventional and conservative in their management and leadership approaches. Leadership concepts and styles are less known to water services organisations than management concepts. In general, this reflects the rather conventional and technically oriented management traditions of water utilities. Water utilities are still commonly understood as mechanistic organisations, whose main purpose is to technically run water systems in a professional and economic way. Employees are perceived as elementary contributors to this efficient and effective technical and economic performance. However, their role as knowledgeable individuals, who should be closely committed also to the organisation’s vision and strategic goals may not yet have been fully conceptualised.

The justification for the use of the approach and methodologies of futures research is that they aim at uncovering images of possible, probable, and preferable futures that enable people to make informed decisions about their lives (e.g., Bell 1997). The future indisputably incorporates uncertainties, and futures research can introduce better strategies, ways and means for the water sector organisations to better cope with these uncertainties in practice.

In terms of research approaches, the complexity and diversity of water governance and dependence on local conditions necessitate viewing the research theme in a multi-, inter- and even transdisciplinary context. Due to its limitations, the neoclassical school of thought is unable to provide the needed approaches. Thus we need a variety of theories, approaches, methods, and strategies. The ”supportive sciences” of the CADWES research team include several sciences widely distributed along the positivism/hermeneutics axis (Hukka *et al.* 2005). While we may use statistics to some extent on the positivistic side, the main emphasis of the supportive sciences is a bit closer to the hermeneutic than the positivistic tradition. These sciences include town and regional planning, architecture, municipal sciences, political sciences, new institutional economics, health sciences, management sciences, development studies, agricultural sciences, forest sciences, futures research, conflict research and educational sciences. Thus, the approach of the CADWES team can be described as “pracademic” and empirical which also makes use of tacit knowledge.

The relationships between the empirical data collected from the real world and the various theories used in this research programme and by the wider CADWES team are shown in Fig. 1. The empirical data from the real world are to be tested by various methods often according to the so-called PESTEL framework which categorises environmental influences into six main types: political, economic, social, technological, environmental, and legislative.

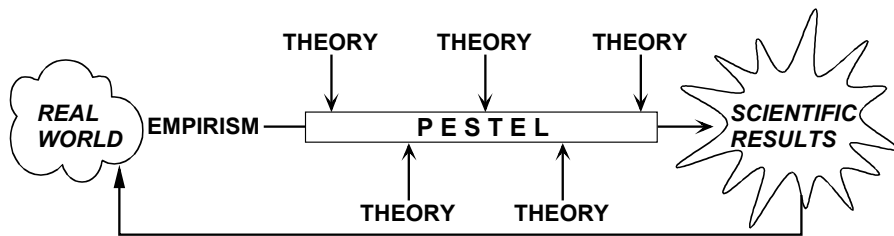


Figure 1. *The major approach of the programme: relations between real world, empirism, research theories and scientific results (Eskola 2001, p. 138; modified by the author).*

The research themes of the CADWES research projects often cover longer time horizons – pasts, presents and futures – while they also cover various levels of services: from the household level all the way to village, community, city, region, nation and transboundary regions and global issues and principles. The view of the research team is that although the focus in individual research projects is often on one of these levels, the other levels and requirements as a wider framework must also be recognised.

It seems obvious that one of the biggest challenges in problem-oriented research is to define and formulate the research problems (Haila & Jokinen 2001, p. 17–18). A less conventional definition of the role of civil engineers in societies was made by Grigg (2001, p. 166) : “Civil engineers play a key role (1) in explaining how infrastructure and environment are linked to people’s needs and (2) in fostering personal responsibility for involvement of citizens in shared problem solving”. This is also a challenge and additional justification of the CADWES team which has several members with a background in civil engineering.

All in all, the research approaches of the CADWES team differ clearly from more conventional, and more narrowly focused water research which has made a valuable contribution and is not criticised as such. Yet, it is obvious that any wider water governance research will necessitate also wider research approaches – inter-, multi- and transdisciplinarity.

### 3. Key research themes and results gained

In the early phases the emphasis of the CADWES team was on management of rural water supply and sanitation (Katko, 1992, 1993), and water pricing (Katko, 1991), while fairly soon the themes of institutional development (Hukka, 1998) as well as urbanisation and even megacities (Hukka, 1994; Hukka *et al.* 1998) were introduced. In Finland various options of managing and developing water and sewage services at various levels – from household and on-site systems (Mattila, 2001) to small communities, municipalities (Hahto 2004) and supra-municipal systems (Salonen *et al.* 2003), – have been studied. Often research projects include several stakeholders such as customers (Rajala & Katko 2004) and industries (Development of ...2000).

Doctoral and postdoctoral research by the authors covers themes such as privatisation and public-private cooperation in water services (Seppälä *et al.* 2001, Hukka & Katko 1999, 2003), policy reform implementation (Seppälä 2002), visionary management (Seppälä 2004) and knowledge management in water services (Seppälä *et al.* 2005), tacit knowledge in water sector, roles of municipalities in water services (Pietilä 2004), and management options of sanitation in dispersed rural areas (Mattila 2005). Management of transboundary water resources in the Middle East was studied by Asheesh (2003) and water supply and sanitation as a means of poverty reduction in the rural areas of Nepal are being explored by Rautanen (2001, 2005). Asola (2003) has studied the evolution of water towers from the perspectives of water engineering, structural engineering, and city-scapes. There have also been a number of projects on water history (Katko 1997), several of them carried out jointly by historical and engineering experts (Juuti *et al.* 2003, Juuti & Katko 2004). Some more specific research themes and findings will be described below followed by the presentation of a few synthesised frameworks.

Although the focus of this paper and the CADWES team is on water services, the study by Katko & Rajala (2005) on the priorities of altogether ten water use purposes (WUPs) based a two-phase questionnaire in 11 countries/regions on five continents with different water resources and use, socio-economic and cultural conditions deserves to be mentioned here. Table 1 presents a summary of "as they should be" water use priorities and their ranking in the ten countries or regions. On average, community water supply was ranked first – even in a case where some 80 percent of water was used for irrigation, while nature conservation was ranked second, and hydropower third. Interestingly enough, priorities varied less than originally anticipated. It was

further argued that the priorities should also be remembered in Integrated Water Resources Management.

*Table 1. Priorities of water use purposes in 11 countries/regions (Katko & Rajala 2005).*

AS THEY SHOULD BE Number of respondents	CO 53	FIN 167	KAR 13	KEN 16	KOS 12	LAT 8	LTU 14	MEX 15	TZA 18	VNM 23	SUM 339	AVG.
Community water supply	1	1	1	1	1	1	2	1	1	1	9	1.7
Nature conservation, reserves	4	2	2	2	2	4	1	5	5	2	23	3.7
Hydropower	3	4	5	4	5	6	3	2	3	3	31	4.6
Industrial water supply	5	3	3	3	3	9	5	8	2	4	37	4.8
Irrigation	2	7	10	5	6	2	10	3	4	7	47	5.5
Flood control, Drainage	6	9	7	7	6	3	9	4	7	5	48	6.1
Fishery, Fish farming	7	6	4	6	8	7	8	7	6	6	52	6.2
Recipient of wastewater	7	9	9	8	4	8	7	6	9	10	61	7.0
Recreational use	9	5	6	9	8	10	4	10	10	9	66	7.3
Traffic, water borne transportation	10	8	8	10	10	5	6	9	8	8	64	7.5

### *Private sector participation*

In the late 1990s private international operators faced problems with their concession and management contracts, and several of them had to be abandoned for various reasons as shown by Hukka & Katko (1999, 2003). Interestingly enough, when interviewed, Briscoe (Anon 2003) announced that “we and others vastly over-estimated what the private sector could and would do in difficult markets. And we are now, of course, in a completely different phase, where there’s wholesale withdrawal by the private sector rather than engagement”.

Around the mid-1990s it was believed that private investments would increase substantially while the opposite has happened as is now plain to see. Thus, it looks that after a short period of experimentation, the real constraints of privatisation have become apparent. Comparative analyses of the EC funded PRINWASS research project – covering some 15 countries in Latin America, Africa and Europe – clearly support the need to recognise the importance of diversity and adaptation to local conditions in the institutional arrangements and policy options concerning WSS services (Vargas & Seppälä 2003).

Recently the concept of public-private partnership (PPP) has been widely introduced to international water policy discussions. Unfortunately, PPP has been understood in a very narrow sense, meaning merely private operators, concessions, or the like, while at least

in practise ignoring the most commonly used type of private involvement – consultants, contractors, manufacturers, etc. selling their goods, equipment and services to public utilities based on continuous competition (Fig. 2). In this sense, the concept of public-private cooperation includes all possible forms. Besides, current EU legislation on public procurement requires that such services above a certain cost limit be subject to competitive bidding in the case of both public and private operators.

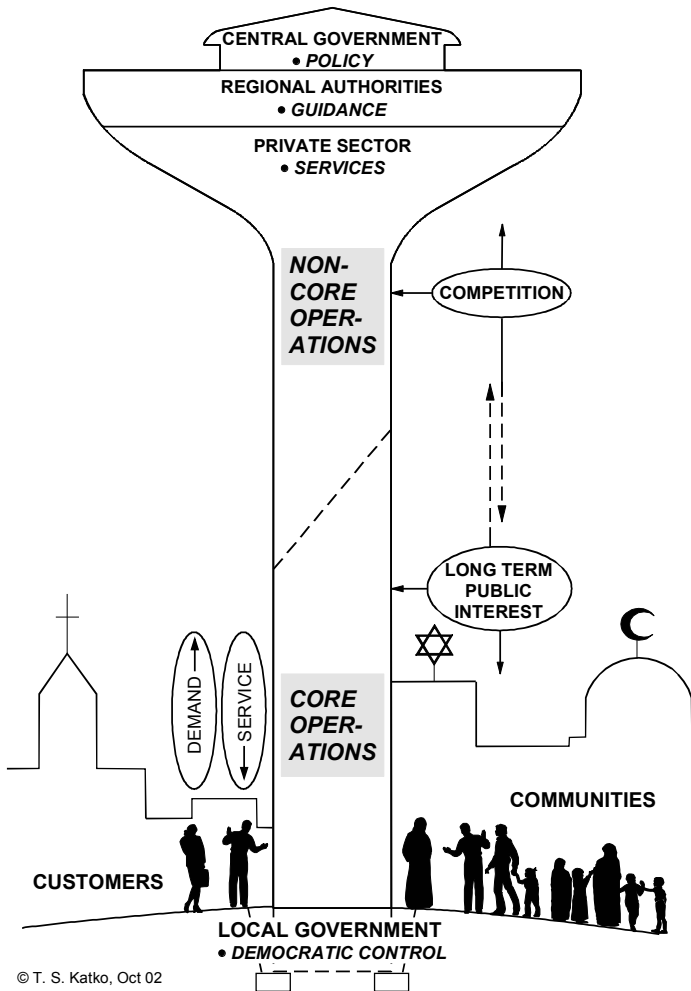


Figure 2. Public private cooperation of water services based on analysing core operations and possible outsourcing of none-core operations (Hukka & Katko 2003, p. 120).

In fact, many public utilities have bought such services, equipment and goods from the private sector since the establishment of modern systems, and even before that. Data from a few explored cases shows that over the last 150 years probably more than a half of the annual cash flow from utilities has gone to the private sector as payment for such services and goods. A clearly larger share has been used for investments than annual operating costs. The situation is obviously highly similar at least in countries with market economies.

As concerns private concessionaires, they played a remarkable role in the mid-1800s in establishing the systems. In several cases the concessions were bought back by the city before the contract expired. The full privatisation in England and Wales in 1989 was a dramatic change although a result of longer-term purposeful policy. In the 1990s only a few concessions and a few additional operation contracts were awarded, which seems to be the most recent trend in PPPs. Yet, the argument that the private sector would make additional investments in the sector has been, and continually is, largely false, or at least exaggerated. One key question is the extent to which it is sensible to outsource support activities and the number and types of core activities that the public sector should hold onto (Seppälä *et al.* 2001).

International discussion on private sector participation in water services is largely biased, since it considers the private sector to consist almost exclusively of operators and/or owners of water and wastewater undertakings. Yet, the vast majority of these undertakings are publicly owned and operated. These public undertakings buy a large share of their goods, equipment and services from private companies and hire private companies to implement capital investment projects based on competitive bidding. Current debate largely neglects these “mainstream” roles of the public and the private sectors.

Private multinationals do not have to follow the same “rules of the game” as public undertakings, and vertically integrated multinational water companies have a vested interest in purchasing equipment from and subcontracting services to their own subsidiaries in order to maximise the profit from water and wastewater operations to the benefit of their shareholders. Similar practices affect competition in the procurement of external services and goods, undermine the operator’s incentive to achieve efficiencies and may have a significant impact on operating and capital costs. The implications of privileged or exclusive access to subcontracting can be observed in France as well as in transition and developing countries. Therefore, this ‘liberalised’ situation may be called a monopoly market.

The question also arises whether this could be defined as abuse of dominant (monopoly) position (Hukka & Katko 2004).

### *Sustainable decision-making and participation*

A related sub-study “City in Time” on the evolution of water and sewerage services in 29 European cities shows the diversity of water services traditions in Europe and tries to show how certain strategic decisions have affected the development paths. Considering the cultures and traditions of urban planning, typologies of water resources management, legal and administrative families, cultures and organisations, and the variation in the roles of local governments in the European context, we obviously also face a diversity of options for water services management. (Juuti & Katko 2005)

### *Visionary development and management in water and sewerage services*

The decision-making and management models of an organisation can be divided into three groups: (i) opportunistic (operational), (ii) strategic, and (iii) visionary. Opportunistic management applies to operational activity now or in the near future. Preparation for future changes and challenges requires longer term strategic planning and decision making. Visionary management, on the other hand, is proactive activity that allows controlling the uncertainties of future. It requires creation of new possibilities, development of the organisation and its core competence as well as acquisition of new information, skills and resources (Malaska & Holstius 1999).

Most water utilities have traditionally not been very futures-oriented, and they have not been well aware of the theoretical bases and concepts of visionary (VM) and knowledge management (KM) – and do not commonly use established VM and KM methodologies and tools in their operations. Yet, operational, strategic and visionary management are interrelated and are all needed in water utilities’ strategic decision-making and implementation. In the future, water services organisations need to strengthen their long-term visionary development and management processes to look beyond the medium-term strategic management time span.



Water supply and sewerage works, and their management, should introduce the tools of visionary management and development in order to be able to meet future challenges. On-going research projects are applying the methods of futures research to the management of water supply and sewerage works and improvement of their services over the long term in Finland as well as in developing countries. (Seppälä 2004)

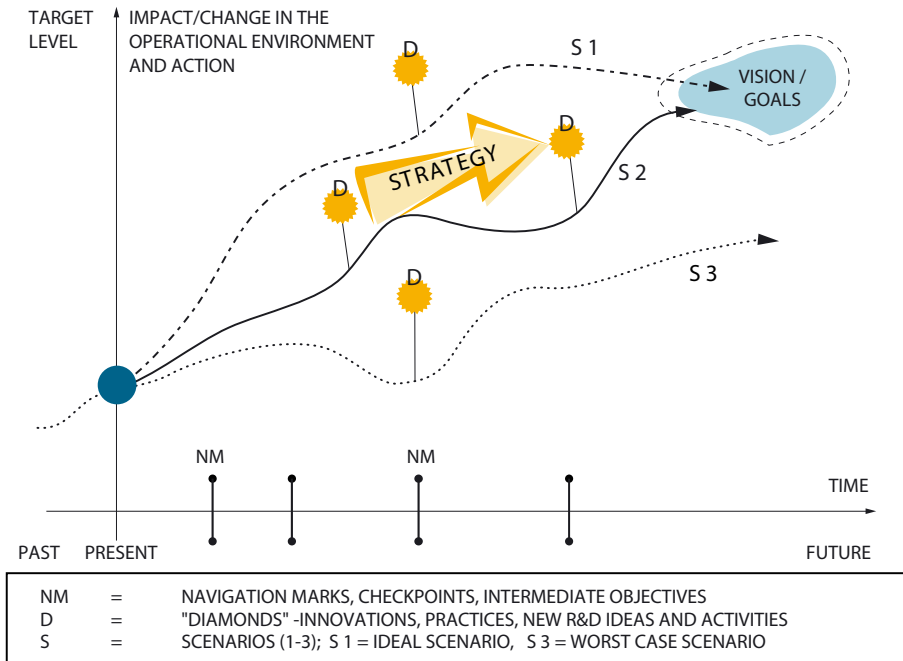


Figure 3. Integrated approach in using scenarios as a strategic management tool (Seppälä 2004, modified from Keskinen, 2002; Malaska and Holstius, 1999; Meristö, 2003).

Fig. 3 illustrates how scenarios can be effectively used as an integral tool in the strategy and strategic management process. A scenario-based strategy process incorporates a number of tools and methods, by which the key actors in an organisation explore alternative futures, develop their own strategies and concrete short-term action plans. Alternative scenarios (S1 – S3 in Fig. 3) can be utilized as a proactive approach to the organisation’s operations and strategy process. Scenarios can be used in a flexible manner to find the development paths toward the organisation’s vision and goals. “Navigation marks” (checkpoints) are important for adjusting the scenarios and selected strategies along the way as the operational environment changes (Keskinen 2002, Malaska & Holstius 1999, Meristö 2003, Seppälä 2004).

### *Development of water supply and sewerage in Lithuania*

During Soviet rule water and wastewater services were the state's responsibility. The state water and wastewater company had fourteen regional subsidiaries for the administration and operation of the systems. After Lithuania regained her independence in 1990 the responsibility for public water supply and sewerage transferred from the state to municipalities. Forty-five municipal water companies were formed based on earlier state water companies and their subdivisions. These municipal companies inherited the tasks, infrastructure and employees of the earlier units, but are required to finance their operations by the fees they collect. Lithuania's water utilities are still "full service" providers and buy very few services externally. Besides these municipal utilities, there are over 700 primarily small units that supply water to municipal or private firms, cooperatives, schools, camp centres, etc.

Since 1990 Lithuania's water consumption has dropped dramatically (Fig. 4). There are two major reasons for it: (i) since the collapse of the Soviet Union many firms got into deep economic trouble and were forced to curtail or discontinue operations, and (ii) the price of water has risen sharply making consumers use it more thoughtfully. Reduced consumption has had the positive result that the capacities of systems are generally sufficient – there is even excess capacity occasionally. On the other hand, the systems are often in poor condition and require thorough renovation or renewal. The treatment of tap water and wastewater stills needs to be improved at places. It has been estimated that investments of nearly EUR 1,000 million are needed to meet EU standards (ALAL 2003).

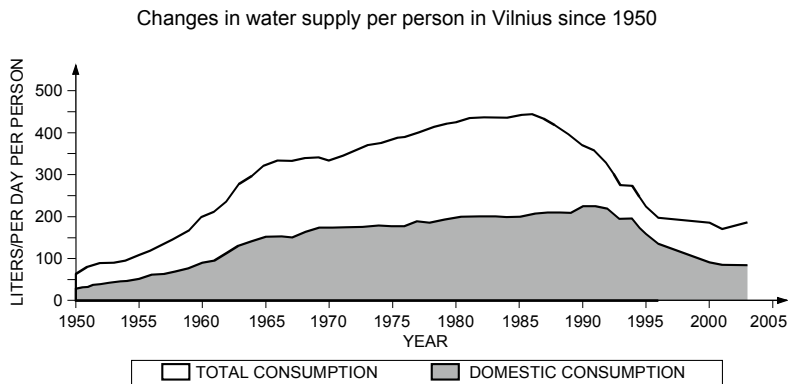


Figure 4. Specific water consumption in Vilnius, Lithuania, 1950–2002 (Pietilä 2005).

*Institutional development of water services in Kenya and Kosovo*

Kenya. Past measures and policies in Kenya have not adequately addressed the problems of the WSS sector (Nyangeri 2002). Since the 1970s, multilateral and bilateral donors have pushed major public policies as a precondition for development assistance. However, policies have lacked legitimacy and there has been discrepancy between official government policies and actual policy implementation. After a long period of unsatisfactory policy development and poor sector performance, there have been positive and encouraging developments in the Kenyan water sector since the late 1990s.

The National Policy for Water Resources Management and Development, approved in 1999, was still considered inappropriate from the water resources management point of view. Moreover, the policy and the associated action plan did not provide a proper framework and procedures for sustainable restructuring of the government's role. As a result, a strategy was for water services management and water resources management was devised for the country. As part of the actual implementation of the water policy, the old Water Act dating back to the 1970s was amended and the new Water Act 2002 was drafted and enacted. Implementation of the policy and the new Water Act was affected by further developments, namely the adoption of the National Water Services Strategy and the National Water Resources Management Strategy in 2003. A Water Sector Reform Secretariat was established to plan and coordinate the proposed substantial institutional changes, and a high-level Water Sector Reforms Steering Committee was established to supervise and oversee the process. At present, sector reform is still proceeding steadily, although slightly behind its original time schedule.

Kenya is currently receiving extensive financial and technical assistance in implementing these sector reforms and restructuring the responsible organisations and institutions to cope with their proposed future tasks. The main donors supporting Kenya in the reform process are German Technical Cooperation (GTZ) which started its reform support programme in 2004, the UNDP-World Bank Water and Sanitation Program, and the Swedish Sida and the Danish Danida, which launched their joint extensive sector support programme in 2004/2005. There are high expectations for these interventions to successfully realise the massive restructuring plans.

Members of the CADWES team have closely participated in analysing the success and constraints of the ongoing reform process and discussing the remaining huge challenges

in restructuring the sector and the key stakeholder organisations. The CADWES team has proposed the use of a visionary approach to provide flexibility and tools to deal with the uncertainties related to the complex reform process.

Kosovo. At the beginning of the reconstruction phase in Kosovo in 1999, it was noted that in order to secure the functioning of the water service systems to be renovated and built, a project had to be launched to create and develop the sector's institutional structures and intellectual resources. The Water and Sanitation Institution Building in Kosovo (WASIB) project was launched in October 2000. The aim of this Finnish-supported three-year undertaking was to strengthen especially the administrative and technical know-how of water supply and sewerage works and to develop university-level education and research for the sector.

The University of Pristina is in the process of reforming the water and environmental engineering curriculum in the spirit of The Bologna Declaration 1999. The aim of the MSc course is to train experts for administration, water and waste water works, the university and enterprises. Five visiting lecturers from TUT, IEEB have taught there.

### *Knowledge management*

The trend in water services has been increasingly shifting from traditional, technical management towards "soft" management with increased consideration of social factors. In these conditions the importance of just-in-time information and knowledge is a prerequisite for good performance. There is need to integrate knowledge from various fields and to hire a new employee able to deal with the complexity. Recent developments in IT applications, management theory and other knowledge-related fields have given birth to the concept of knowledge management. This relatively new concept, although a very old human pursuit, encompasses precise definition of knowledge flows, use of modern technologies and socialisation of people with the aim of eliciting tacit knowledge. Today, knowledge management is applied by water organisations rather hectically and nonuniformly. The nature of the water sector and interdependence of water institutions requires more integration to allow reaching KM goals. This is why some feel the need to design and build a supportive framework to enable KM to work in water services. The framework would cover the main elements needed to secure efficient management of knowledge. Furthermore, systematic application of KM would solve many of the short-

comings of water services related to cooperation and communication thus improving overall performance (Rodiqi 2005).

### *Organising wastewater service for scattered settlements*

The Finnish environmental protection legislation amended in the early 2000s poses new challenges to the treatment of wastewaters of scattered settlements and free-time housing. The widely used septic tanks that provided sufficient treatment according to earlier regulations, will need to be complemented with more advanced treatment methods. The decree stipulating the treatment requirements for on-site systems came into force in January 2004. Attainment of the required BOD removal of 90 per cent, phosphorous removal of 85 per cent and nitrogen removal of 40 per cent will not be possible without proper management of on-site sanitation. Selection of the proper on-site sanitation system is done through a process called social construction of technology (SCOT) (Fig. 5), which means that the system selected is almost always a compromise, not the best possible alternative.

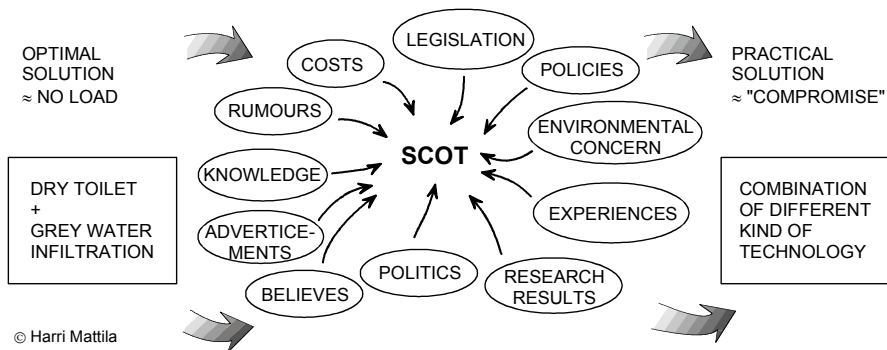


Figure 5. Social construction of technology (SCOT) approach for on-site sanitation (Mattila 2005).

The objectives of water pollution control and the demands of property owners for cheaper wastewater treatment systems can be met only if new operational modes and actors emerge in the sector. Organisations that provide wastewater services on a professional basis are a must (Mattila 2001). The approximately 250,000 all around year houses and 460,000 summer cottages in Finland are likely to keep such new organisations busy. Similar challenges will face also many other countries with large dispersed rural populations or much free-time housing.

*Utilisation and development of international water resources in the Middle East*

Globally there are some 270 transboundary watercourses shared by at least two states. They cover about 45 per cent of the earth's surface, and the affected countries are home to 40 per cent of the world's population while 60 per cent of the global river waters flow through them.

In the Middle East, especially Israel and Palestine, the utilisation of water resources is a component of regional peace processes and conflict prevention. A project by Asheesh (2003) looked into the equitable distribution of water resources and development of co-operation. At the same time, the possibilities of making water use and operation of water works more efficient was studied. In addition to establishing common rules for the distribution and use of water resources, it is highly important that water use becomes more efficient in areas where it is scarce. That requires also development of utility-level and related institutional factors.

Finland was actively involved in drafting the so-called Helsinki Rules which were approved in 1966. The rules spell out the key principles of the utilisation of international water resources, for instance, with respect to upstream and downstream water bodies. They are also the basis of international water law and transboundary water conventions. The UN Convention on the Law of the Non-navigational Uses of International Watercourses, adopted by the UN General Assembly in 1997, is partly based on them. Yet, by late 2003 only 13 member states had ratified the convention. The so-called Berlin rules accepted in 2004 include for the first time transboundary management principles also for ground water.

*History of water and environmental services*

The history and long-term development of water supply and sanitation has also been studied, for instance, in cooperation with the Department of History at University of Tampere (Juuti 2001). In these history-oriented studies it is hypothesised that dissimilar and differently timed city- infrastructure solutions may have worked well in their own time. This also helps dispel the predestined, technologically deterministic picture of water supply advancing unavoidably towards the modern, "right" solution. In several Finnish case studies this approach has worked well. These historical studies have also proved that the models and the knowledge in support of the various solutions were collected

both from abroad and other institutions in Finland. The perception of the determining role of capital, even the perception of it as a precursor in this sector, proved to be misleading, if not incorrect. Capital has, of course, played an important, but not necessarily the only and central role (e.g., Juuti & Katko 2004). This carries important implications for the current situation in developing economies.

The on-going “GOWLOP” project funded by Academy of Finland applies these ideas globally. The general objective of the project is to enhance our knowledge and understanding of the development of water use, water supply, water pollution control and sanitation services, and their overall long-term political, economic, social, cultural, technological, environmental and health impacts. The study particularly aims at explaining the strategic decisions that have taken place in the overall institutional framework over the years. The case countries are Nepal, South Africa, Kenya, and Finland. There are no colonial ties between these case countries. Still, it is hypothesised that the problems were the same: rapid population growth and poor sanitation in the study period. There is also one truly global and multi- and interdisciplinary project, “Environmental History of the Water”, going on. Its focus is the long-term development of community water supply and sanitation and its evolution and future implications on the global scale. The project involves 40 researchers and around 20 countries.

The main sources of historical research are usually official documents and minutes of the meetings of public health authorities, technical boards and other municipal authorities. Correspondence between professional organisations and neighbouring countries is important for the understanding of the spread of ideas and technical models, as well as the formation of expertise networks. Other highly important sources have been newspapers published since the latter part of the 19<sup>th</sup> century and the photographs that emerged slightly later en masse.

Historical research has, for example, contributed to and widened the understanding of the role of legislation and regulation. It has been shown that in the regional and local context regulation and implemented practises are not necessarily to be seen as parallel dimensions, that is, somehow “working together”. Local and private economic interests are often of greater importance than ideological, political and health-related issues forming the base for legislation. Thus, research has stressed the importance of analysing the economic and social context of strategic decisions. Research has also focused on the prevailing theories of disease, the related methods of prevention and the role of professional ideals. (Nygård 2004)

Several historical cases and studies have so far revealed that there is probably wider diversity of options and development paths – whole sets of institutional arrangements – than believed so far. The role of capital cities has not been as dominant as earlier assumed either. In many cases remarkable networking of professionals has taken place in the early phases – even relatively more than in our so-called modern times.

### *Other themes and projects*

Water resource management is by definition about resources and management, which in turn are about poverty, its causes and the potential for its alleviation. Management is also ideally about democratic transparent decision-making and finances, good governance practices, gender and ethnic equity and participation, and about the future. This study by Rautanen (2005) aims to increase the future chances of a water programme to address poverty, gender equity, democracy and good governance during a conflict situation in Nepal with implications for the (Finnish) development cooperation in the water sector in general. The key objective of the study is to learn how the negative impacts of chronic political conflict and poverty could be alleviated through water sector development. Earlier Rautanen (2001) conducted a Knowledge, Attitudes, Practices and Beliefs (KAPB) Survey on the rural conditions of Guyana.

The research by Sandelin (2005) deals with knowledge management in the water supply and sanitation sector. The objectives were (1) to study how knowledge management is understood on the individual, team and organisation level; (2) to study how tacit knowledge is interpreted, created and shared in the organisation; (3) to study the information needs and sources of the water utility personnel; (4) to study the networking of individuals and organisations.

The preliminary results show that information and knowledge needs are task and workplace dependent. The terms "knowledge management" and "tacit knowledge" are new to staff members. The preservation of tacit knowledge is neglected, even though the mean age is about 50 years, and there will be a retirement boom in 5–10 years. Information sharing is inefficient, and the databank is used too little. The staffs' professional networks are totally local, and there are no international contacts, not even on the organisational level.

Vinnari (2005) is carrying out research on viable pricing and related governance of water services. The Finnish water services legislation allows the owner of a water supply and



sewerage (WSS) undertaking to earn a “reasonable rate of return” on investment. At the moment, however, there are no official definitions for the term “reasonable”. This has raised the question about the need to widen the scope of the economic regulation of WSS undertakings to include, in addition to consumer prices, also the owner’s rate of return and the amount of the undertaking’s investments. It has also raised the philosophical question about the true identity of the owner of a WSS undertaking. Other issues related to water and wastewater pricing include the valuation and management of the fixed assets of a water utility, the inclusion of value added tax into customer charges, and the ways of making the operations of the undertaking more efficient, for instance, by increasing private sector participation. The aim of this doctoral dissertation is to create a framework for pricing water and wastewater in a way that takes into account the interests of the municipality, the customers and the undertaking.

Windischhoffer (2005) is studying the dominant ideas and beliefs of the relevant actors of the Finnish water sector, which should increase understanding of the decision-making process concerning Finnish water and sewerage works. In addition, the development of regional cooperation in water supply and sanitation has been studied in southwestern Finland and northern Satakunta in a few case studies.

#### 4. Synthesised research frameworks

The long-term evolution of water supply and sewerage is studied from the viewpoints of history, the present and futures. That is well in line with the findings of a Nordic research seminar held in the summer of 2001 which suggested that convergence between historical and futures research should be sought.

Futures Research (FR), incorporating Historical Research (HR), is a decision-making framework, which seeks to integrate both historical and future perspectives into today’s decision-making processes. In the context of decision-making on water services reform, futures research is innovative in that it seeks to address the nearly universal failure of (institutions and) decision-makers to retain and use institutional memory, while at the same time providing for the evaluation of alternative long-term *scenarios* to achieve the targets set for the future. This dual perspective ensures that the *diversities of the past* and *pluralities of the future* are taken into account in decision-making (Jenkins and Witzel 1999).

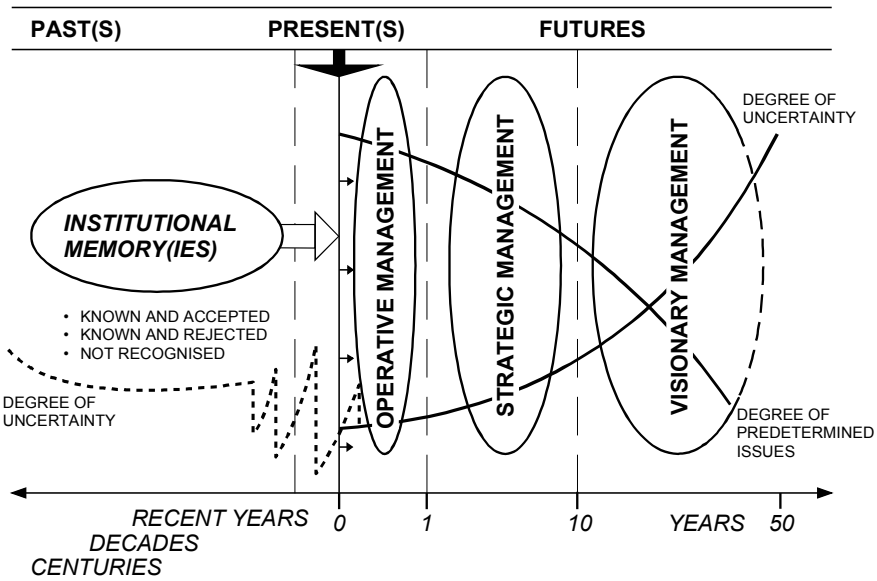


Figure 6. An overall framework for strategic management in relation to past(s), present(s) and futures (Kaivo-oja et al. 2004).

Figure 6 provides an overall conceptual framework for combining HR and FR. It could be that due to the tradition of HR, it is more difficult to assess the effects of strategic decisions on the recent pasts. These decisions have various levels of *path dependencies* – known and accepted, known and rejected, and unrecognised. Therefore, if more convergence is wanted, the gap should be filled somehow.

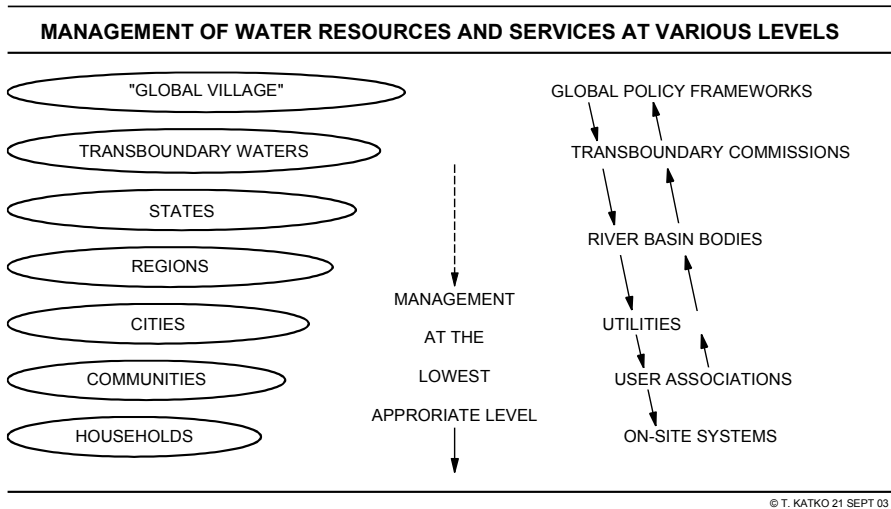


Figure 7. Management of water resources and services at various levels.

Fig. 7 summarises the research team's view on the different levels of water management and governance – from “local to global village” – and different “rules of the game”. The EU's *subsidiarity principle* and the Dublin principle of 1992 (UNCED 1992) both refer to the fact that water should be managed at the *lowest appropriate level*. That level may vary depending on the circumstances, but fundamentally water is largely a *local issue*. That is why it is also obvious that conventional neoclassical assumptions like economies-of-scale do not necessarily hold true – due to situations that may change with the scale.

The focus of the CADWES team's research topics has also evolved over the years as the overall policies and conceptual frameworks of water and sanitation services have changed. Part of the research has actually targeted the policy changes themselves. It looks like most governments have until recently supported state-of-the-art water and sanitation policies. Many policies and reforms have been donor-driven and linked to structural adjustment programmes. Thus, governments have not themselves spearheaded the development of sector strategies advocating water management principles in accordance with the agreed principles of major international agreements and organisations, such as the principles of the Dublin Statement and Rio Earth Summit agreements. Besides, policy reforms have often been based on over-optimistic plans ignoring the fact that reforms actually are lengthy and complicated, and should not exceed the capacity of local organisations.

WSS sector policies and strategies of donors and international organisations, again, have evolved over a long period of time and seem to a large extent to follow certain fashionable trends. Policies and strategies have focused on a limited number of fashionable themes while many other important aspects of holistic strategies have been neglected. Fig. 8 shows a sketch of such “dynamic rotation of fashionable trends”. While this phenomenon indicates a certain lack of a systemic approach, it also provides an empirical learning process that will help us improve policy development in the future. Thus, in the future, the *systemic policy and strategy concept* should cover the important principles and issues in a cumulative and balanced manner, to enable development of viable water and sanitation services (Seppälä 2004).

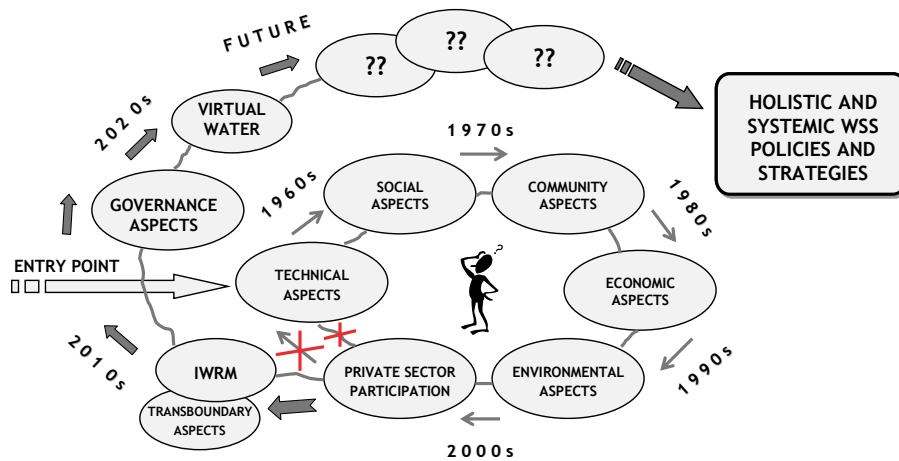


Figure 8. Development trends and priority elements in international water policies for developing countries in the last few decades (Seppälä 2004).

During the last decade the ultimate *nature of water services* has been the subject of much discussion. On one hand, water is a basic necessity to sustain life and thus should be treated as a public resource or common good to ensure that everyone has access to at least a basic supply. On the other hand, when more than one billion people still lack even basic water services, opinions are voiced that water should be treated as a private commodity letting the markets find the ways to fill the gaps.

The nature and special characteristics of water services (Fig. 9) can be approached from the political, economic, social, technical, ecological/environmental and legal angles (PESTEL).

Water services have certain special features compared with other commodities. First, water is a satisfier of a basic need and it cannot be replaced with any other product, and second, functioning water services are a prerequisite for all economic activity. Third, water supply is and will remain a natural monopoly. Furthermore, water services are of limited areal scope and are highly dependent on local natural conditions. Besides, there are competing uses of water which may exclude each other, water resources are often shared with neighbouring countries, and they have caused political conflicts will continue to do so.

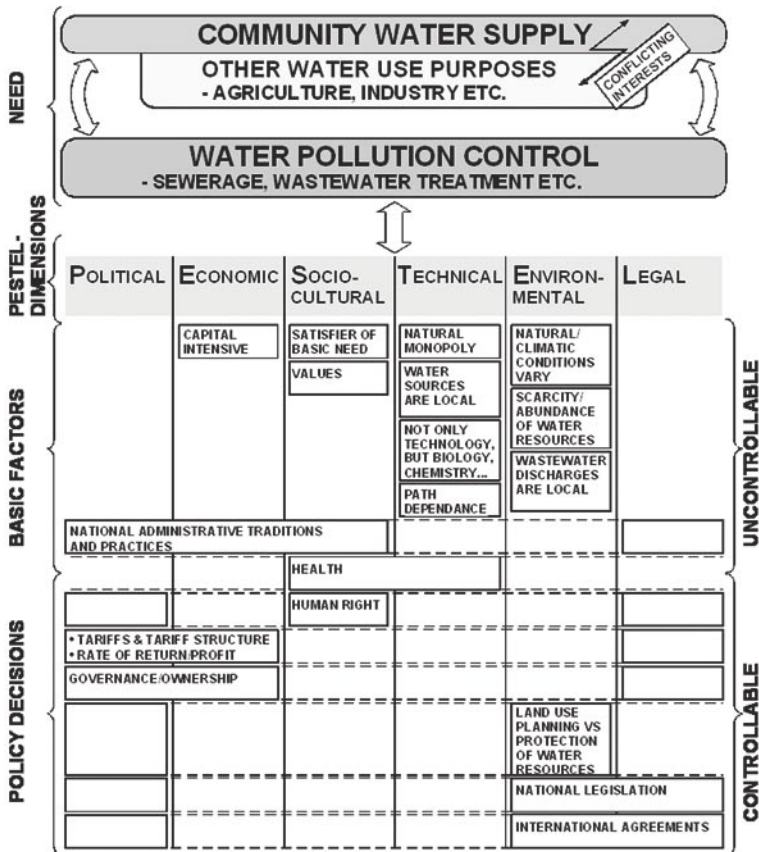


Figure 9. Special characteristics of water supply and sanitation services.

## 5. Discussion and concluding remarks

All in all, there seems to be increasing demand for institutional research and know-how in international water projects. In recent years courses focussing on international water issues and operating policy have been taught sometimes in cooperation with other universities. We also strive to participate in international water sector and fresh water processes. The complexity of water management means that there is no way for a single discipline or approach to cover all research needs. Thus we need a *variety* of theories, approaches, methods, and strategies.

It is obvious that water – and particularly water services – are highly dependent on local conditions; not only in terms of natural resources but also due to wider socio-institutional conditions. Instead of promoting one-fits-for-all ideas, we should think of alternative ways of managing water services. It should be based on visionary and strategic thinking while also utilising institutional memory and lessons learnt. In this context path dependence – negative or positive – is highly relevant. Developing and transition economies – like all countries, regions and communities – have their own conditions and needs. Yet, some general principles and practices can also be identified.

While the challenges and real needs of the “global village” are evident, the mainstream of science tends to divide into ever smaller segments. This may be an acceptable option but certainly not the only one. Especially in such a complex field as water management, wider perspectives and research on institutional, management and policy issues are urgently needed. In addition to inter- and multidisciplinary research, researchers should have the courage to develop *trans-disciplinary* approaches. In water research – like in water resources and services management – we certainly need to achieve a balance between quantity, quality and priority.

## 6. Acknowledgment

The authors wish to acknowledge the financial support from the Academy of Finland (nos. 78594, 210816), Prinwass under FP5 of EU’s INCODev (Contract: ICA4-CT-2001–10041), Watertime under FP5 of EU (contract: EVK4-2002-0095) as well as several Finnish ministries, water utilities and private foundations for their support over the years. Language check-up by Jorma Tiainen and helpful comments and contributions by

other CADWESteam members (Harri Mäki, Harri Mattila, Damas A. Mashauri, Ash-esh Mohammed, Pekka Pietilä, Riikka Rajala, Sanna-Leena Rautanen, Ilir Rodiqi, Sirpa Sandelin, Laike Selassie, Eija Vinnari, Richard Windischhofer) are highly appreciated.

## Sources

- ALAL (Association of Local Authorities in Lithuania) 2003. Increasing involvement of local authorities of the Baltic states in the EU enlargement process. Environmental protection sector. Vilnius, Lithuania. 27 p.
- Anon 2003. Return to the resources for the World Bank. *Water21*. June 2003. pp. 13–14, 16.
- Asola I. 2003. Water tower – Landmark of the Community. Finnish Association of Civil Engineers, RIL. 174 p. (In Finnish, partly in English).
- Bell W. 1997. The purposes of futures studies. *The Futurist*. Vol. 31, no. 6. pp. 42–45.
- Development of water sector export activities (2000). Water technology programme 2001. Tekes Technology Review 86/2000. Tekes. 73 p. (Katko. T., Sandelin S., Seppälä O. & Skytta T.) (In Finnish).
- Eskola J. 2001. Laadullisen tutkimuksen juhannustaiat (Magic tricks of qualitative research). Laadullisen aineiston analyysi vaihe vaiheelta. pp. 133–157. In: Aaltola J. & Valli R.(Eds.) *Ikkunoita tutkimusmetodeihin II (Windows to research methods II)*. Metodien valinta ja aineistonkeruu: virikkeitä aloittelevalle tutkijalle. PS-kustannus 2001.
- Glenn J.C. & Gordon T.J. 2000. State of the future at the millennium. American Council for the United Nations University (UNU).
- Grigg N.S. 1986. *Urban water infrastructure: Planning, management and operations*. New York: John Wiley & Sons.
- Grigg N.S. 2001. Civil Engineering Practise in the 21<sup>st</sup> Century. pp.166. In: Grigg N.S., Criswell M.E., Fontaine D.G. & Siller T.J. (Eds.). *Civil engineering practice in the twenty-first century. Knowledge and skills for design and management*.
- Hahto M. 2004. *Vesihuollon toimintaympäristön tulevaisuus luovien muutosten virrassa (The future of operational environment of water and sanitation services. Navigating in changing currents)*. MSc thesis. TUT. (In Finnish).
- Haila Y. & Jokinen P. (Eds.) 2001. *Ympäristöpolitiikka. Mikä ympäristö, kenen politiikka (Environmental politics. What environment, whose politics)*. Vastapaino. 310 p. (In Finnish).

- Hukka J. 1994. Sustainable peri-urban water and wastewater management infrastructure – A model for the future. TUT, IWEE, no. 49. Lic.Thesis. 203 p.
- Hukka J.J. 1998. Institutions, organisations and viable water services: A capacity development model for drinking water provision and production. TUT Doctoral dissertation no. 230. 175 p.
- Hukka J. & Katko T. 1999. Privatization of water services. The Foundation for Municipal Development. Publ. No. 19. 95 p. (In Finnish, summary in English). Available: <<http://www.kaks.fi>>
- Hukka J.J. & Katko T.S. 2003. Water privatisation revisited – panacea or pancake? IRC Occasional Paper Series No. 33. Delft, the Netherlands. 179 p. Available: <[http://www.irc.nl/pdf.php?file=publ/op\\_priv.pdf](http://www.irc.nl/pdf.php?file=publ/op_priv.pdf)>
- Hukka J.J. & Katko T.S. 2003. Refuting the paradigm of water services privatization. Natural Resources Forum. Vol. 27, no. 2, pp. 142–155.
- Hukka J. & Katko T. 2004. “Liberalisation of water sector”- a way to market economy or to monopoly market? Water & Wastewater International. Vol. 19, Issue 9. pp. 23–25.
- Hukka J., Katko T., Pietilä P. & Viitasaari M. 1998. Vital infrastructure – Improvements in water supply and sanitation. pp. 179–199. In: Hjerpe R. (Ed.) 1998. Urbanization, its global trends, economics and governance. Government Institute for Economic Research. VATT Publications no. 26. 221 p.
- Hukka J.J., Katko T.S., Mattila H.E., Pietilä P.E., Sandelin S.K. & Seppälä O.T. (2005, under review). Inadequacy of positivistic research to explain the complexity of water management. Int. Journal of Water.
- Jenkins A. & Witzel M. 1999. Futures studies and co-evolutionary futures. pp. 163–175. In: Sardar Z. (Ed.) Rescuing all our futures: The future of futures studies. Adamantine Press Ltd.
- Juuti P. 2001. Kaupunki ja vesi. Tampereen vesihuollon ympäristöhistoria 1835–1921. Pieksämäki.
- Juuti P.S. & Katko T.S. (eds.) 2004. From a Few to All: long-term development of water and environmental services in Finland. KehräMedia. 176 p. [http://granum.uta.fi/english/kirjanTiedot.php?tuote\\_id=9527](http://granum.uta.fi/english/kirjanTiedot.php?tuote_id=9527)
- Juuti P. & Katko T. (Eds.) 2005. Water, Time and European cities. History matters for the futures. Printed in EU. 253 p. Available: <http://www.watertime.net>
- Juuti P., Rajala R. & Katko T. 2003. Aqua Borgoensis – Stories telling us, Water works 1913–2003. (In Finnish and Swedish, Summary in English).



- Kaivo-oja J.Y., Katko T.S. & Seppälä O.T. 2004. Seeking for Convergence between History and Futures Research. *Futures, Journal of policy, planning & futures studies*. Elsevier. Vol. 36, pp. 527–547.
- Katko T. 1991. Paying for water in developing countries. TUT doctoral dissertation no. 74. 240 p.
- Katko T. 1992. The development of water supply associations in Finland and its significance for developing countries. The World Bank, Water supply and sanitation division. Discussion paper no. 8. 57 p. (Resume, Extracto).
- Katko T. 1993. Rural water supplies: what ways and means? *World Health Forum*. Vol. 14, pp. 425–428.
- Katko T.S. 1997. Water! – Evolution of water supply and sanitation in Finland from the mid-1800s to 2000. *FIWA*. 102 p.
- Katko T.S. & Rajala R.P. 2005. Priorities for fresh water use purposes in selected countries with policy implications. *IJ on Water Resources Development*. Routledge. Vol. 21, no. 2. pp. 311–323.
- Keskinen A. 2002. *Systeeminen ajattelu ja menetelmät tulevaisuudentutkimuksessa*. [Systems thinking and methods in futures research]. Unpublished course material. Finland Futures Academy.
- Liebowitz SJ, Margolis S. 1995. Path dependence, lock-in and history. *The Journal of Law Economics and Organisation*. Vol. 11. pp. 205–226. <<http://www.pub.utdallas.edu/~liebowit/paths.html>>
- Malaska P. & Holstius K. 1999. Visionary management. *Foresight. The Journal of Futures Studies, Strategic Thinking and Policy*. Vol. 1, no. 4. pp. 353–361.
- Mattila H. 2001. The role of public acceptance in the application of DESAR technology. The chapter 27. pp. 517–533. In: Lens P. Zeeman G. & Lettinga G (Eds.) *Decentralised Sanitation and Reuse – concepts, systems and implementation*. IWA Publishing, London, UK.
- Mattila H. 2005. *Appropriate management of on-site sanitation*. TUT Doctoral dissertation no. 537. 151 p.
- Meristö T. 2003. *Skenaariotyöskentely strategisessa johtamisessa*. (Scenarios in strategic management). pp. 236–244. In: Vapaavuori M. & von Bruun S. (eds.). *Miten tutkimme tulevaisuutta? Acta Futura Fennica*, No. 5. Finnish Society for Futures Studies. Tampere: Tammer-Paino Oy. 328 p. (In Finnish).
- NEPAD 2003. *New partnership for Africa's development (NEPAD)*. Available on the Internet: <http://www.touchtech.biz/nepad/files/en.html>, (05.11.2003).

- North D. C. 1990. *Institutions, institutional change and economic performance*. Cambridge University Press.
- Nyangeri E.N. 2002. International and national policies that facilitate or hinder private sector participation in WSS in Kenya. Special contribution to D2 baseline report of Prinwass, 29 p. Unpublished.
- Nygård H. 2004. Bara ett ringa obehag? Avfall och renhållning i de finländska städernas profylaktiska strategier, ca 1830–1930 (Only a bit of nuisance? Solid waste and cleansing in the profylactic strategies of Finnish cities, abt. 1830–1930). Åbo Akademi University, Dept. of History.
- Pietilä P. & Špokas R. 2004. Comparison of water services development in Finland and Lithuania. *European Water Management Online*. 5/2004.
- Pietilä P. 2005. Case Lithuania. pp. 59–63. In: Juuti & Katko (Eds.) 2005.
- Rajala R.P. & Katko T.S. 2004. Household water consumption and demand management in Finland. *Urban Water Journal*. Taylor & Francis Ltd. Vol. 1, no.1, pp. 17-26.
- Rautanen S-L. 2001. “Kaimanau wizai – Kaninui wun” Knowledge, Attitudes, Practices and Beliefs (KAPB Survey) on Water and Environmental Sanitation in 11 Amazon Programme Communities. UNICEF Guyana Working Papers. 109 p.
- Rautanen S-L. 2005 (forthcoming). Governance of water and environmental services in long-term perspectives, Case Nepal.
- Rodiqi I. 2005 (forthcoming). Knowledge management for water infrastructure and services.
- Salonen L., Seppälä O. & Katko T. 2003. Regional development of water and sewerage services in Pohjois-Satakunta. South-Western Regional Environment Centre. Report 7/2003. 61 p. (In Finnish).
- Sandelin S. 2005 (forthcoming). Information, knowledge and networking in managing water supply and sanitation services. Licentiate’s thesis. TUT.
- Selborne Lord 2000. The ethics of freshwater use: a survey. UNESCO, Comest. 49 p.
- Seppälä O.T. 2002. Effective water and sanitation policy reform implementation: need for systematic approach and stakeholder participation. *Water Policy*. Vol. 4, no. 4. pp. 367–388.
- Seppälä O.T. 2004. Visionary management in water services: Reform and development of institutional frameworks. TUT Doctoral dissertation no. 457. 300 p.
- Seppälä O.T., Hukka J.J. & Katko T.S. 2001. Public private partnerships in water and sewerage services: Privatization for profit or improvement of service and performance? *Public Works Management & Policy*. Sage Publications. Vol. 6, no. 1. pp. 42–58.

- Seppälä O.T., Rodiqi I., Nyangeri E.N. & Hukka J.J. (tentatively accepted) 2005. Visionary leadership and knowledge management in water services. *Journal of Infrastructure Systems*. ASCE. 22 p.
- UNESCAP 2003. What is good governance? United Nations Economic and Social Commission for Asia and the Pacific. 4 p. : <http://www.unescap.org/huset/gg/governance.htm>, (04.09.2003).
- UNESCO 2003. Water for people, water for life. World Water Development Report (WWDR). The United Nations. Available on the Internet: <http://www.unesco.org/water/wwap/wwdr/index.shtml>, (26.09.2003).
- Vargas M.C. & Seppälä O.T. 2003. Cross-comparative Report on Water Sector Trends regarding Policy, Institutional and Regulatory Issues. Reflections and Findings on Five Selected Countries Report D19 prepared for the PRINWASS project: “Barriers and Conditions for the Involvement of Private Capital and Enterprise in Water Supply and Sanitation in Latin America and Africa: Seeking Economic, Social, and Environmental Sustainability”. A European Commission Fifth Framework Programme Research Project, INCO<sub>2</sub> Research for Development. <http://users.ox.ac.uk/~prinwass/documents.shtml>.
- Windischhofer R. (forthcoming, 2006). The Dominant Ideas and Beliefs of Actors in the Finnish Water and Sewerage Sector, Conference paper to be submitted to EURAM (European Academy of Management Conference).
- Vinnari E.M. 2005. Economic regulation in the Finnish water services sector – is there a need for reform? International Conference on Water Economics, Statistics and Finance. Rethymno Crete, Greece 8–10 July 2005. Organized by IWA Statistics and Economics Specialist Group.
- World Conference on Science. Budapest, Hungary, 26 June-1 July, 1999.
- Yukl, G. 2002. Leadership in organizations. 5<sup>th</sup> ed. Upper Saddle River, NJ: Prentice Hall. 508 p.

## 3.2. Energy and Environment

### *Energy for Sustainable Development*

*Jyrki Luukkanen, Sylvia Karlsson, Jarmo Vehmas, Venla Kinnunen, Eeva Kuntzi-Reunanen,  
Jari Kaivo-oja*

*Turku School of Economics And Business Administration*

*Finland Futures Research Centre*

*E-mail: [firstname.lastname@tukkk.fi](mailto:firstname.lastname@tukkk.fi)*

#### **Overview of Research Activities**

The research team of Finland Futures Research Centre has long experience in energy and environment related research work in developing countries. In the early 1980's the research work was concentrated on Tanzania. The fuelwood crisis and its socio-economic and environmental aspects were the main focus of the research (see Luukkanen 1983). In addition, energy modelling and planning was analysed (see Luukkanen *et al.* 1985a, b, 1987a, b, c, 1989). The research work was mainly financed by the Academy of Finland.

Research and education was combined in a joint activity of University of Tampere and Tampere University of Technology in the "Energy, Environment and Development" course organized in 1989–1991. A half year training course for M. Sc. and Doctoral students was followed by a three month field research period in Tanzania and a half year training and writing period in Tampere (see Luukkanen *et al.* 1991a, b, c, d, e). The training and field work was financed by the Ministry for Foreign Affairs of Finland and the Academy of Finland.

In the 1990's the research team widened the research area to include also other countries and to cover other aspects, especially climate policy (see e.g. Luukkanen *et al.* 1993a, b, 1994a, b, 1995a, b, 1996, 1998, 1999). Methodological development was also an important part of the research work and especially the decomposition analysis used by the research team in energy and environmental analysis has gained international reputation (see e.g. Luukkanen *et al.* 2001a, b, 2002a, b, c, d, 2003a, b).

In the global change research programme FIGARE of the Academy of Finland, the research team co-ordinated a large research consortium consisting of researchers from University of

Tampere and University of Joensuu, The research project “Conditioning Global and Local Climate, Biodiversity and Development Policies: Changing Institutional and Environmental Contexts of Tropical Forests” (CLIMA-X) had Tanzania, Indonesia, Nepal, the Philippines and Nicaragua as case studies. The management and governance aspects related to natural resource use were the main areas of the research work of the FFRC team in this project.

The governance problematique related to natural resource use in developing countries was further studied in the research projects “Governing the development/environment problematique. Institutions balancing between local needs and global requirements” (In-Balance) and “Sustainable Energy Development in Developing Countries” (SEDCO) (see e.g. Luukkanen *et al.* 2005) financed by the Academy of Finland.

The most recent project is focusing on the increasingly complex governance context in which developing countries develop their energy plans. The four year research project (2005–2008) funded by the Academy of Finland – entitled “Energy policy for sustainable development in the emerging global and multilevel governance framework: Efficiency and institutional design in the Mekong Region” – builds on earlier historical analysis and scenario development of the energy policy in selected Mekong Region countries (primarily Thailand, Laos and Vietnam) carried out in the research team.

The team is also involved in research focused on both empirical and theoretical aspects of institutions and governance in developed and developing countries as well as the at the global and regional level. The global sustainable development governance processes from the Rio Conference in 1992 to the World Summit on Sustainable Development (WSSD) in 2002 and its institutionalised follow-up mechanism in the Commission on Sustainable Development (CSD) has been one focus of this work (see Karlsson 2002, 2005a, b, c, d). Another focus is how regional organizations such as the European Union addresses sustainable development ‘domestically’ and in its bilateral and multilateral engagements (aid etc.).

## Results – highlights

### *SEDCO project*

In the “Sustainable Energy Development in Developing Countries” (SEDCO) project the research team examined the Post-Kyoto burden sharing questions for industrial and

developing countries. Contraction and Convergence model (C&C) is one approach that has been proposed to allocate commitments regarding future greenhouse gas emission mitigation. In the study the historical rates of CO<sub>2</sub> emission intensity for different countries were analysed and compared with the future intensity rates that are required to achieve the Contraction and Convergence target of 1.8 tons of CO<sub>2</sub> per capita in the year 2040. Additionally, the amount of CO<sub>2</sub> emissions per country was decomposed into different explanatory factors. It was assumed that the CO<sub>2</sub> intensity of a country depends on the energy and production technology, the fuel shares of the primary energy supply and the economic production structure.

The results show that the decreasing trends in CO<sub>2</sub> intensity in most industrialised countries, after the oil crises in the 1970's, could be sufficient to reach the Contraction and Convergence target. However, the trends in the 1990's have usually not been sufficient due to weaker energy policy measures. The rapidly industrializing countries of Southern Europe, South-East Asia and Latin America will have to lower their CO<sub>2</sub> intensity trends significantly to reach the Contraction and Convergence target, while some developing countries can increase their CO<sub>2</sub> intensity considerably.

The C&C approach is based on equal per capita emission rights and concedes individuals' equal rights to pollution permits. The approach has a long-term perspective with respect to the distribution of rights and duties and their evolution over time. The problem with the developing country participation is that many developing economies are in the industrialising phase with increasing emission intensities. From this point of view the C&C model may not look very attractive to them although the possibilities for selling extra emission rights at the low level of emissions per capita may turn out to be attractive, at least in the short term. A new climate policy agreement needs to avoid causing economic hardship and allow developing countries to rise out of poverty, while promising sharp, long-term reductions in the GHGs. The report shows that the equal per capita target should get serious attention in climate policy negotiations for it is a Mission Possible.

### *The Mekong Project*

While the Mekong Project is still in its early days, some very preliminary conclusions can already be discerned about the multilevel governance framework in which energy governance is enmeshed in the Mekong Region and other developing countries.

In the horizontal context these countries face increasing pressures to direct energy policy not only to meet economic development requirements but also the environmental (e.g. climate) and social (e.g. equity) pillars of sustainable development and the national targets set for all these spheres. The regional and national levels along the Mekong river face challenges upon challenges of interplay with conflicting norms and priorities coming from the international community, donors, and neighbouring countries. It is the classical clash of economic development and environmental preservation, but with some additional complex tradeoffs between local and global environmental degradation. The region of ASEAN has not formed an energy regime that is focused on sustainable development, but is creating a market driven regime of energy trade.

In the vertical context, the national level of governance is increasingly situated in a nested hierarchy of governance from global to local level. Countries in the Mekong Region, like all aid dependent developing countries, struggle to fit their own governance into the mesh of diverging priorities at the global level of bilateral and multilateral donors, NGOs, and multinational energy companies. It is the realisation of horizontal linkages across sectors through the energy issue which is leading the way for the new emerging policy network on energy for sustainable development at the global level. The intensifying political linkages between the traditional socio-economic development agenda, now spearheaded by the Millennium Development Goals, the environment agenda, spearheaded but not confined to the United Nations Convention on Climate Change, and the sustainable development agenda in the post-Rio process seem to be creating a more coherent framework for addressing the issue of energy. It puts the focus on energy as the double-edged sword of being a strong driver and requirement for poverty eradication and development as well as a major driver for environmental degradation. In turn this illustrates how the need for political horizontal linkages increases when the focus of governance shifts from 'symptoms' in their e.g. environmental compartments (atmosphere, forests, water etc.) to drivers of problems.

At the same time some of the institutional arrangements that have in the last years become part of the global governance processes on sustainable development have explicitly aimed to increase the political vertical linkages, such as the bottom-up process of the World Summit on Sustainable Development (WSSD), the WSSD Partnerships and the increasing interface with various stakeholders in the Commission on Sustainable Development deliberations on implementation. This seems to partly have been driven by the stark realisation that a lack of vertical linkages, especially if those linkages are confined to a top-down implementation scheme, has serious consequences for the effectiveness of global agreements or regional

agreements. The linkages and efforts of integration has to come much earlier in the policy process, indeed in all stages, not just the implementation phase.

## Forms of Co-operation

In addition to the direct interaction with researchers and stakeholders in developing countries linked to specific projects (see below), the team has found it very fruitful to engage in international scientific networks which include top level scientists from all regions of the world. Such networks support research approaches to move beyond the 'trap' of isolated case studies upon case studies. It allows the development of more universal hypothesis and theoretical insights across regions, including across North and South. The strongest involvement has been with the International Human Dimensions Programme on Global Environmental Change (IHDP) and its project Institutional Dimensions of Global Environmental Change (IDGEC). The IDGEC project has a strong focus on, and contribution from, developing countries. When priority research agendas are developed by such global research teams as in IDGEC it incorporates perspectives and knowledge in a more profound sense than when cooperation is purely project and case oriented. Furthermore, it has been apparent that the involvement of developing country scholars in these projects has considerably influenced their direction and quality.

## Policy outreach

The research team has paid attention to the dissemination of the research results and their use in the policy planning. For example participation in climate policy committees (from 1996 onwards) has offered good possibilities for disseminating the results of different energy and climate scenario projects and providing expert knowledge for the climate policy formulation process (see e.g. Luukkanen *et al.* 2000). Participation in the Conferences of Parties (COPs) to the United Nations Convention of Climate Change (UNFCCC) has opened possibilities for both disseminating the research results of the team in scientific side events and for networking with other international top scientists and policy planners. Participation in the World Summit on Sustainable Development and meetings of the Commission on Sustainable Development have been used as opportunities for 'participant observation' of global governance, but in future CSDs participation in side-events and learning centre activities will be part of the outreach strategy.



Co-operation with UN agencies such as UNDP has opened possibilities for utilizing the expertise of the team in the actual sustainability planning processes. Renewable energy modelling work in the Philippines is one example of such type of activities.

An important part of the research strategy of the FFRC team has always been participatory approach, where different stakeholders have been involved in the research process. The utilization of futures workshops as part of the research approach has enabled the activation of stakeholder groups in the formulation of different future scenarios and in planning the activities needed for the realization of the future development paths and this tool will be increasingly used in the future.

## Future directions

The FFRC research team has established a steady foundation for developing further both research approaches and related expertise. New plans for the future work include putting more emphasis on the education sector. EU programmes such as Alfa (Latin American Academic Training), where FFRC is participating, provide possibilities of extending the cumulated knowledge of the research team. Also the Asia-Link Programme, which is an initiative by the European Commission to promote regional and multilateral networking between higher education institutions in EU Member States and eligible countries in Asia, provides new possibilities to widen the scope of activities of the team. Within the Asia Link programme a plan for developing renewable energy and environment related education in the Mekong Region countries (especially in Vietnam, Laos and Thailand) is under consideration.

The Asia Pro Eco programme is another possibility for establishing a new field of research and development activities in the Mekong Region. Within this programme co-operation with Stockholm Environment Institute and local governmental and academic stakeholders in the Mekong Region is established.

The 'Mekong Project' is, over the coming years, pursuing three main objectives:

- to support the theoretical and empirical foundation for the development of energy plans in the Mekong countries;
- to make an institutional analysis of the horizontal and vertical sustainable development governance problematique related to energy planning in these countries and;

- provide new elements and solutions for a more comprehensive understanding of what factors are affecting sustainability of the energy system and what could constitute alternative vertically and horizontally integrated energy governance systems for sustainable development and how to design institutions to build them.

Futures workshops with stakeholders will be organised towards the end of the project, both disseminating results and seeking to stimulate a dialogue on long term planning on energy for sustainable development through the development of alternative scenarios by the participants. It is the hope that the project will contribute to finding solutions for the multilevel energy governance problematique in the Mekong Region in South East Asia.

## References

- Luukkanen, J. (1983) Energy problems in developing countries, Tanzanian fuelwood crisis as a case study. Energy and development report 1, Tampere University of Technology, Tampere, 39 p. (in Finnish)
- Luukkanen, J., Lehtinen, U. (1985a) Energy Models as Tools for Policy Planning in Developing Countries, in: Proceedings of the IFAC/IFORS Conference on Control Science and Tecnology for Development, Beijing, 1985 China August 20.–22.8.1985, Vol. I ed. Yang Jiachi.
- Luukkanen, J., Majanne, Y., Haarasilta, A. (1985b) Signal Analysis in Energy Economic Modelling, in: Proceedings of the IFAC/IFORS Conference on Control Science and Tecnology for Development, Beijing, 1985 China August 20.–22.8.1985, Vol. I ed. Yang Jiachi.
- Luukkanen, J. (1987a) Dynamics of Time Variant Energy Economic System, in: Proceedings International AMSE Conference. Modelling & Simulation, Cairo (Egypt), March 2–4, 1987, ed. by G. Mesnard. pp. 141–158.
- Luukkanen, J. (1987b) Dynamic Systems Modelling; Hierarchy of Models. International 87 New Delhi Conference, Modelling & Simulation, Proceedings of the Accepted Communications. New Delhi (India), October 29–31, 1987. p. 8.
- Luukkanen, J. (1987c) Energy for Development: Energy Models as Tools for Policy Planning, Licentiate Thesis, Tampere University of Technology, Department of Electrical Engineering, Control Engineering, Tampere 1987, 97 p. + encls.
- Luukkanen, J. (1989) Energy Models in Energy Policy Planning, in: Proceedings. Congresso Incernacional 'Energia, Ambiente e Innovacion Tecnologia', Caracas,

- 22–26 de Octubre, 1989.
- Luukkanen, J. (1991a) Energy Use in Rural Tanzania, Energy and Development Report 16, Tampere University of Technology.
- Luukkanen, J., Haarasilta, A., Holm, S., Kaivo-oja, J. (1991b) Energy Problems and their Environmental Implications in Developing Countries, Final Report for The Academy of Finland, also Energy and Development Report No 9, Tampere University of Technology.
- Luukkanen, J., Kaivo-oja, J. (1991c) Planning for Development; Methodologies and Problems in Developing Countries, Energy and Development Report No 10, Tampere University of Technology.
- Luukkanen, J. (1991d) Modelling Energy Systems, Energy and Development Report No 11, Tampere University of Technology.
- Luukkanen, J. (ed.) (1991e) Energy Use and Planning in Tanzania, Report of the Research and Training Programme on Energy, Environment and Development, Unit of Peace Research and Development Studies, University of Tampere.
- Luukkanen, J. (1993a) Study of Village Life Using Cross-Impact Analysis – Planning for Development or Planning for Control, in Mannermaa, M., Inayatullah, S., & Slaughter, R. (eds), Coherence and Chaos in Our Uncommon Futures – Visions, Means and Actions. Selections from XIII World Conference of World Futures Studies Federation, Turku.
- Luukkanen, J. (1993b) Cross-impact Analysis for Planning of Energy and Environmental Development in Developing Countries, 16<sup>th</sup> International Conference of the International Association for Energy Economics, 27–29 July, 1993, Bali.
- Luukkanen, J. (1994a) Role of Planning Philosophy in Energy Policy Formulation – In Search of Alternative Approaches, Doctoral Dissertation, Tampere University of Technology, Tampere, 1994.
- Luukkanen, J. (1994b) Frames of Global Ecopolitics, *Alue ja Ympäristö*, 2/94.
- Luukkanen, J. (1995a) Energy and Environmental Models – Discourses and Reality, background paper for Euroconference 'Sustainability Dimensions of Energy Policy', Roskilde 13–24.3.1995.
- Luukkanen, J., Kaivo-oja, J. (1995b) The Frames of Global Environmental Policy in UNCED: A Critical View of Global Environmental Policy, paper presented in a seminar Environment and Society, Tampere 1995.
- Luukkanen, J. (1996) Energy and Environmental Models – Discourses and Reality, in Andersen, Mez & Kjær (eds.) Energy Policy and Sustainable Development. Roskilde, Denmark 1996.

- J. Spangenberg, M. Slessor, J. Luukkanen, D. Rivas (1998) Modelling a Socially and Ecologically Sustainable European Union, A Decision Support Tool. Technical Report. Wuppertal Institute, 343 p.
- Luukkanen, J., Kaivo-oja, J., (1999) The Frames of Global Environmental Politics in UNCED: No Alternatives to Construct Social Reality? *World Futures* Vol 42, No 2, 1999.
- Luukkanen, Jyrki, Kaivo-oja, Jari, Vehmas, Jarmo & Tirkkonen, Juhani (2000) Challenges of Climate Change and Emission Trade Policies in the European Union: Trend Extrapolations and Decomposition Analyses. A Contributing Paper. Second EFIEA Climate Policy Expert Workshop 'From Kyoto to The Hague – European perspectives on making the Kyoto Protocol work', Amsterdam, 18–19 April, 2000.
- Luukkanen, Jyrki & Kaivo-oja, Jari (2001a) Sustainability of Energy Use and CO<sub>2</sub> Emissions in ASEAN Countries: Decomposition Analysis of Energy and CO<sub>2</sub> Efficiency Dynamics. A paper presented in the conference, Global Change and Sustainable Development in Southeast Asia. A Regional Science-Policy Conference, Chiang Mai, Thailand, 17 – 19 February 2001. Session C. Greenhouse Gas Emissions and Policies. Chair Chih-Hong Sun. Southeast Asian Regional Committee for START (SARCS 2001). IHDP, IGBP and WCRP. 26 pages.
- Luukkanen, Jyrki & Kaivo-oja, Jari (2001b) Energy and CO<sub>2</sub> Efficiency in Developing Countries. Comparison of Key Developing Countries and ASEAN Countries from the Point of View of Climate Policy. In Lacuna-Richman, Celeste & Kaisti, Hanna (eds), Tropical Forests. Facing New Modes of Governance in the Global Era. Research Notes 135, Faculty of Forestry, University of Joensuu.
- Luukkanen, Jyrki & Kaivo-oja, Jari (2002a) ASEAN Tigers and Sustainability of Energy Use: Decomposition analysis of energy and CO<sub>2</sub> efficiency dynamics. *Energy Policy* Vol 30/4 (2002), pp. 281–292.
- Luukkanen, Jyrki & Kaivo-oja, Jari (2002b) Economic Development and Environmental Performance: Comparison of Energy Use and CO<sub>2</sub> Emissions in OECD and Non-OECD Regions. Finland Futures Research Centre. Tutu publications 5/2002. Finland Futures Research Centre. Turku School of Economics and Business Administration. 21 p.
- Luukkanen Jyrki & Kaivo-oja Jari (2002c) Meaningful Participation in Emission Reductions and Global Climate Policy? Comparative analysis of the key developing countries energy and CO<sub>2</sub> efficiency dynamics in the years 1971–1997. *Global Environmental Change* Vol. 12/2 pp. 117–126.
- Kaivo-oja Jari and Luukkanen Jyrki (2002d) Energy and CO<sub>2</sub> efficiency dynamics in the world regions. *International Journal of Global Energy Issues*. Volume 18, Nos. 2/3/4, pp. 274–293.

- Karlsson, S. (2002). The North/South Knowledge Divide – Consequences for Global Environmental Governance, in: Esty, D. C. and M. Ivanova (eds.) “Strengthening Global Environmental Governance: Options and Opportunities”, Yale School of Forestry & Environmental Studies, New Haven.
- Luukkanen, Jyrki & Kuntsi, Eeva (2003a) Post Kyoto burden sharing. Equity and efficiency problem. Paper presented in a conference Changing Energy Markets in Comparison: Regulatory Frameworks, Developments, and Perspectives. Salzburg, Austria, 28.9–3.10.2003
- Luukkanen, Jyrki & Kuntsi, Eeva (2003b) Post-Kyoto burden sharing. Moving forward with equity and efficiency. Proceedings of the Open Meeting of the Human Dimensions of Global Environmental Change, Montreal 16.–18.10.2003, Canada.
- Karlsson, S. (2004). The Johannesburg Summit and Challenges in Vertical Governance Integration. Paper presented at the Tenth Biennial Conference of the International Association for the Study of Common Property (IASCP) “The Commons in an Age of Global Transition: Challenges, Risks and Opportunities”, Oaxaca, México, 9 – 13 August 2004.
- Luukkanen, Jyrki, Vehmas, Jarmo, Kinnunen, Venla, Kuntsi-Reunanen, Eeva & Kaivo-oja, Jari (2005) Converging CO<sub>2</sub> Emissions to Equal per Capita Levels. Mission Possible? FFRC-Publications 2/2005. Finland Futures Research Center, Turku School of Economics and Business Administration. Turku. 139 p
- Karlsson, Sylvia & Luukkanen, Jyrki (2005a) Vertical and Horizontal Interplay in Governance of Energy for Sustainable Development: Challenges along the global policy path and the Mekong River. Proceedings of the 2005 ISA Convention, Honolulu, Hawaii.
- Karlsson, S. I. (2005b) Bottom-up Meets Top-down – Multi-level Governance Approaches in the World Summit on Sustainable Development. Paper presented at the 7<sup>th</sup> Nordic Conference on Environmental Social Sciences, 15–17 June, Göteborg, Sweden.
- Karlsson, S. I. (2005c) Contention and Consensus on ‘Selecting’ Governance Levels – The World Summit on Sustainable Development under the Magnifying Glass. Paper presented at the First Global International Studies Conference, 24–27 August, Istanbul, Turkey.
- Dahl, A. L. and S. I. Karlsson *et al.* (2005 d) Meeting Conceptual Challenges. Chapter 3 in B. Moldan, T. Hak and P. Bourdeau (eds.): “Sustainable Development: How to Measure Progress Through Indicators.” In preparation for print by Island Press.

### 3.3. Health

#### *Informatics Development for Health in Africa – INDEHELA*

*Mikko Korpela<sup>1</sup>, Anja Mursu<sup>2</sup>, Tuija Tiihonen<sup>1</sup>*

*University of Kuopio*

*<sup>1</sup> Healthcare Information Systems Research and Development Unit*

*<sup>2</sup> Department of Computer Science*

*E-mail: [firstname.lastname@uku.fi](mailto:firstname.lastname@uku.fi)*

#### **Abstract**

Information management in healthcare in Africa would greatly benefit from computer-based information systems – this argument has been approved by researchers and practitioners in Africa long ago. However, software developed for the requirements of industrialized countries do not fit African healthcare facilities' requirements, at least without major re-design. Hospitals, health centres and other healthcare facilities in Africa need purposely built software applications. Even when imported pieces of software can be used as a basis, the organizational system of information management – an information system (IS) comprising human, technical and organizational elements – must always be built up within the organization itself. Being so, there seems to be a need for endogenous information systems development (ISD) in African countries. That situation created the foundation for the long-term research collaboration that started already in 1989 between the Obafemi Awolowo University in Nigeria and the University of Kuopio in Finland. Ultimately the project searched answers to the question: “Can ISD in Nigeria by Nigerians contribute to development, specifically to health, in Nigeria?”

Since that year 1989, the collaboration has been continued, first by jointly developing an elementary hospital information system for Nigerian purposes, and then expanding the work to theoretical research funded by the Academy of Finland. The first phase of the INDEHELA programme (Informatics Development for Health in Africa) in 1998–2001 created a profile of software industry in Nigeria, including a picture of the information systems development practice in the country, and also a picture of information systems development education in Nigeria. The empirical information advised to create methods or recommendations for risk management, sustainability analysis and general systems de-

velopment as well as education. The main theoretical result was the research framework, Activity Analysis and Development, which has since been heavily utilized in national projects in Finland also.

The second phase of INDEHELA in 2004–2007 expanded the research to wider contextual issues – the socio-economic impact, sustainability and affordability in information systems development in and for Africa, with healthcare as the focus and including four partners; Finland, Nigeria, Mozambique, and South Africa. The main overall research question is: “How can African healthcare facilities and healthcare management get software applications that enable them to use information and communication technologies (ICT) to provide better healthcare services for the people?”.

INDEHELA has been based on research partnership between universities and researchers from Europe and Africa. Research partnership has built up the capacities of the African partners, but it has also contributed to the Finnish partners by more broadly contextually relevant research approach and framework that has been used nationally in Finland and has helped in embarking on a similar Finland-China partnership in using ICT for healthcare.

## **Introduction**

Information and communication technology (ICT) is supposed to create growth and development, and especially in developing countries the goal of ‘making a better world’ with ICT is emphasized. In defining the better world, we rely on the only Nobel prize winner in development economics, who argues that “development can be seen as a process of expanding the real freedoms that people enjoy” (Sen 1999). In a similar vein, the relation between better world and technology was defined by an appropriate technology conference already a quarter-century ago as follows: “Technology should be considered ‘appropriate’ when its introduction into a community creates a self-reinforcing process internal to the same community, which supports the growth of the local activities and the development of indigenous capabilities as decided by the community itself” (Pellegrini 1980).

The main emphasis should thus be on endogenous processes by people in developing countries in appropriating ICTs to support the expansion of their real freedoms. Exogenous processes of technology transfer by external actors can and do have a role, but they should also be assessed from the viewpoint of how well do they support the processes in-

ternal to developing countries. The definition above of appropriate technology does not refer to any static characteristics of a technology, but to the process of its introduction to a community, meaning information systems development (ISD), the development of organizational systems comprising people, computer-based and other technologies and processes (Avison 1997, Walsham 1993).

In the INDEHELA programme the focus has been on information systems development, endogenous ISD, since ISD forms an essential part of the diffusion and implementation of ICT. The programme also agreed with the notion made in the Software Exhibition in Lagos in 2001, that “all major IT projects must have local content and involvement for sustainability”. In this paper, we first introduce the background of the INDEHELA research program. Then the research settings, objectives, and results of the two phases of the INDEHELA programme are described: INDEHELA-Methods in 1998–2001 in Nigeria and Finland, focusing on ISD methodology appropriate to the special requirements of the Sub-Saharan African; and INDEHELA-Context, in 2004–2007 in Mozambique, Nigeria, South Africa and Finland, focusing on wider contextual issues – the socio-economic impact, sustainability and affordability in information systems development for healthcare in and for Africa.

### **The origins of the INDEHELA research programme**

The research has its origins in 1989, when a doctoral student from the University of Kuopio in Finland stayed as a visiting researcher at the Obafemi Awolowo University in Nigeria. A very rudimentary hospital information system, MINPHIS, running on a stand-alone PC, was then jointly developed (Daini *et al.* 1992). This gave rise to regular research collaboration between the two universities. The group was then authorized to organize the first Health Informatics in Africa (HELINA) conference in 1993 (Mandil *et al.* 1993). Several participants felt that ICT could be used much wider to facilitate healthcare in Africa, if there were appropriate software applications purposely developed for that end.

In the following three years, a group of activists from Finland and Norway in Europe and Nigeria, South Africa, Ghana, Senegal and Zimbabwe in Africa tried to raise European Union funding for a large research and development initiative under the name Informatics Development for Health in Africa (INDEHELA). When this turned out too difficult, the Norwegian and South African partners embarked on a bilateral project on



district-level information management (Braa *et al.* 2004), while the Finnish and Nigerian partners continued on the bilateral development of the hospital information system. The latter partners then got Finnish funding for academic research on Methods for Informatics Development for Health in Africa (INDEHELA-Methods) in 1998–2001.

## Research design in the INDEHELA-Methods phase in 1998–2001

The objective of INDEHELA-Methods in Nigeria was “to produce an Information Systems Development methodology which is appropriate for the special requirements of the Sub-Saharan African context, particularly in the health sector”. The main objectives can be divided in two parts: firstly, to produce empirical evidence and understanding of the practice and problems of ISD in Nigeria, and secondly, to facilitate the Nigerian ISD practitioners by improved methods, techniques, practices, and education. The research design is illustrated in Figure 1 (Korpela *et al.* 2000).

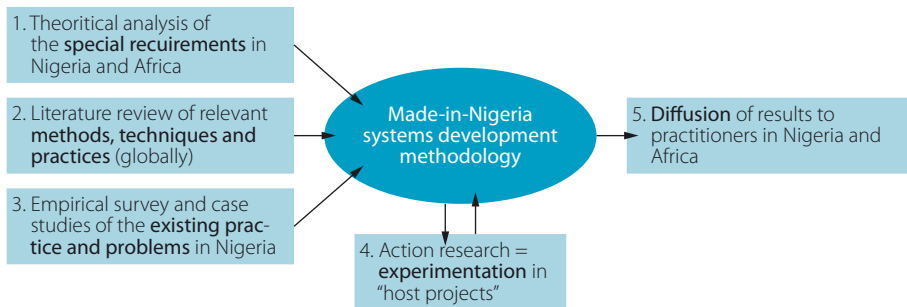


Figure 1. The overall research design in 1998 – 2001 (Korpela *et al.* 2000)

Three inputs were identified: First, the general requirements for the methodology had to be specified through theoretical analysis of the specific conditions which the methodology was intended to. Second, the relevant “raw materials” of methods, techniques and practices developed for other conditions needed to be identified through literature review. Third, more empirical information was needed on how ISD was currently practiced in Nigeria, so that the outcome would be based on actually perceived needs.

The fourth part of the design was to experiment with ideas gathered from the three inputs in practice, to gradually construct an improved methodology (which was seen as a collec-

tion of guidelines, practices and methods rather than a strict formalism). The research plan listed some special requirements the methodology should follow, namely practicability, a high socio-economic impact, community involvement, and long-term sustenance (Korpela *et al.* 2000). Action research in a pilot case setting was suggested for that purpose. The final part of the design, after the research project, was to find out how the methodology could be diffused back to everyday use by practicing systems developers.

In order to study the existing practice and problems in Nigerian software companies, the project created the core research framework, where the more detailed research questions were generated. The study covered the whole service chain of systems development, including ISD, software engineering, the use of IS in customer organization and how it affects the services they render to society, thus having an impact on the society. At the other end of the chain is the IS education at universities. This core research framework is presented in Figure 2 (Korpela *et al.* 2004).

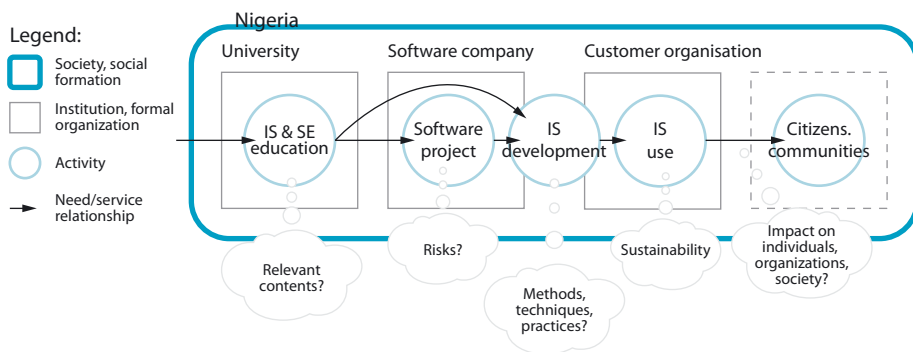


Figure 2: The core research framework: research context, objects and questions (Korpela *et al.* 2004).

The descriptive empirical research questions and the constructive practical objectives clearly did not imply a hypothesis-testing, positivist approach, but an interpretive and critical stand on the phenomena under study (Orlikowski and Baroudi 1991). A combination of methods was selected for getting both a “landscape view” and an “in-depth view”: surveys with semi-structured questionnaires and a Delphi study, case studies with in-depth interviews, and also action research with experimentation in MINPHIS.

The initial purpose was to involve practitioners from one or two software companies into analyzing their current ISD practices and then proceed into experimenting with modi-

fied practices, developed by collaborative action by the practitioners and the researchers. It was soon realized, however, that action research in the true meaning of the word (Checkland 1991) was not feasible in companies until after much foundation-laying.

The empirical part of the research project achieved the following results. Firstly, the study created a profile of the software industry in Nigeria, including a picture of the information systems development practice in the country, and also a picture of information systems development education in Nigeria (Mursu 2002, Soriyan 2004). Secondly the empirical information advised to create methods or recommendations for risk management (Mursu 2002, Mursu *et al.* 2003), sustainability analysis (Mursu *et al.* 2004) and general systems development in Nigeria as well as education (Soriyan 2004). The main theoretical result was the research framework, Activity Analysis and Development (Korpela *et al.* 2000, Korpela *et al.* 2001, Korpela *et al.* 2002, Korpela *et al.* 2004a), which has since been heavily utilized in the national PlugIT and ZipIT projects in Finland, funded by the National Technology Agency Tekes and the Finnish Work Endowment Fund (<http://www.plugit.fi>, <http://www.centek.fi/zipit>).

In summary, the results from the INDEHELA-Methods phase can be described as informational (fact-finding and knowledge-creating) results as well as initial ISD-methodological results. The objective was to collect and combine an appropriate methodology for Nigerian practitioners and education in information systems development. The research project was studying something that had not been studied before, namely information systems development practices in Africa and in Nigeria. Thus the informational part collected knowledge about these practices, problems, risks and methods. The initial methodological part consists of an overall model of information systems development process in Nigeria, risk management model and sustainability analysis model. However, contextual issues remained somewhat weak, even if in this kind of hard conditions contextuality should be considered as important. Thus there was a need to extend the research to cover more socio-economic and contextual issues.

### **Research design in the INDEHELA-Context phase in 2004–2007**

The INDEHELA-Context phase expanded the research to wider contextual issues – the socio-economic impact, sustainability and affordability in information systems development in and for Africa, with healthcare as the focus. The overall research question is formulated as:

Is it possible and how to deal with important societal and contextual issues – socio-economic impact, sustainability, affordability – in the day-to-day information systems work by a) indigenous professionals in local software companies in a severely constrained setting, b) expatriate consultants in international IT development projects?

Contextuality cannot be studied in one context only. Correspondingly, the project was extended to Mozambique and South Africa in addition to Nigeria (Figure 3; Korpela *et al.* 2004b).

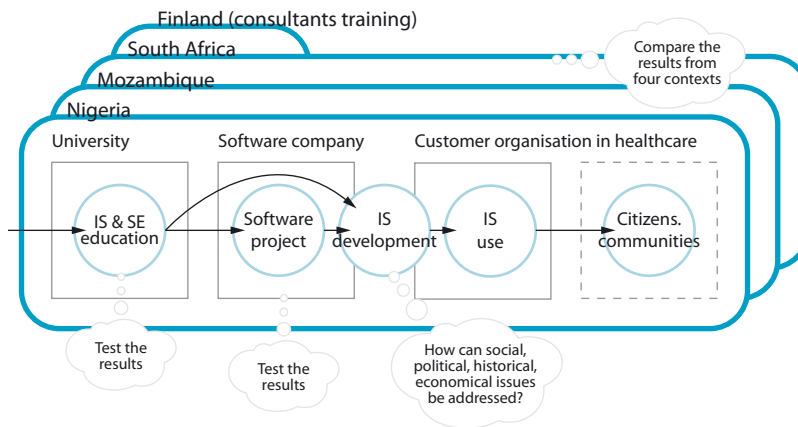


Figure 3. Research contexts, objects and questions in the second phase, INDEHELA-Context in 2004–2007 (Korpela *et al.* 2004b).

Some of the empirical studies of the first phase are repeated and expanded in the new countries to get material to analyze contextual issues. Methodological results of the previous phase are validated in practice in software projects in different countries and different software organizations. Relevant educational modules and teaching materials are produced. Researchers and students in different countries will focus on different topics within the chains of activities depicted in Figure 4 (Korpela *et al.* 2004b).

The overall research questions in the INDEHELA program are therefore formulated as the following (cf. Figure 4):

- Q1. How can African healthcare facilities and healthcare management get software applications that enable them to use ICT to provide better healthcare services for the people? (the main research question)

- Q2. What are the potential roles of local information systems (IS) professionals in the software service chains?
- Q3. What are the characteristics of appropriate software?
- Q4. How to ensure that computer-based information systems in healthcare in Africa will be sustainable and affordable, and will have a positive long-term impact on healthcare services?
- Q5. What kind of education of ICT professionals and healthcare professionals is needed to support these objectives?

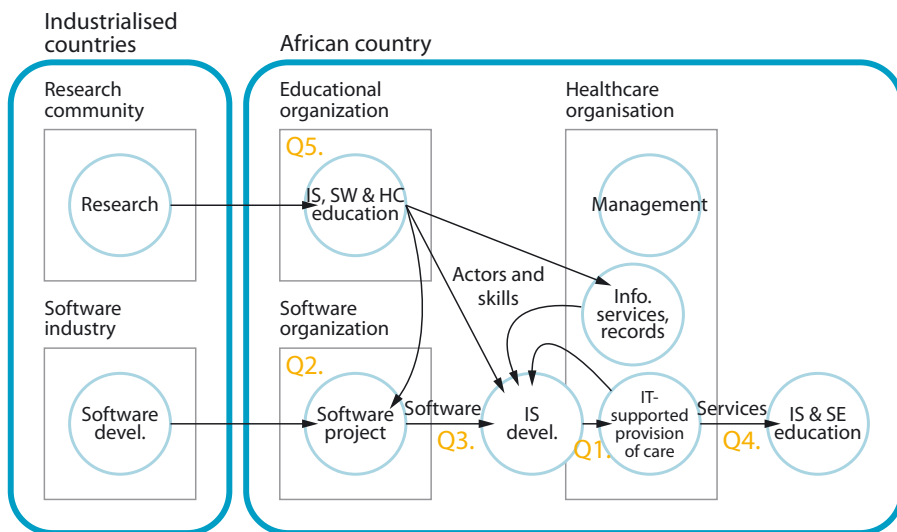


Figure 4. The main chains of activities around information systems development for healthcare, indicating the research questions (Korpela et al. 2004b).

The preliminary and introductory research plans of the Finnish site have been introduced in Mursu *et al.* (2005). The research in Finland is focusing on questions Q3 about appropriate software and Q4 about sustainable and affordable information systems. The results should contribute to Q5 about human resources development. The contributions of other countries are in brief (Korpela *et al.* 2004b):

- Nigerian focus: action research around MINPHIS (Made in Nigeria Primary-care and Hospital Information System), validation of IS development methods in companies (results of the INDEHELA-Methods phase).

- Mozambican focus: study on three types of healthcare software development (software companies, in-house IT departments and non-governmental organizations), healthcare management, and education.
- South-African focus: study on small-medium size medical practice, DHMIS (district health management information system) history, and curriculum development.

Since Finland is not an African country, the main contribution of the Finnish research group is indirect, focusing on three main areas: comparative studies between contexts, the characteristics of “appropriate” software, and the role of international consultants. Furthermore, in the previous phase the Department of Computer Science and the HIS R&D Unit at the University of Kuopio had a major role in developing the research framework, Activity Analysis and Development, which they will continue to elaborate on during this study. Besides the indirect contribution, there are some empirical efforts that Finnish researchers are planning: to test previous results like sustainability analysis ideas, and to focus on new research on contextual issues. The empirical parts are to be conducted in collaboration with research groups in Nigeria, Mozambique and South-Africa.

The same basic chain of activities around ISD than in the first phase is still studied in each country, but the domain of application is now explicitly healthcare (Figure 4; compare with Figure 2). Local companies are not any more the only form of software organizations studied, while for instance in Mozambique non-governmental organizations (NGOs) have a major role in introducing management information systems into healthcare (Braa *et al.* 2004). On the other hand, small private medical practices provide an important part of primary healthcare services in South Africa for instance, so both public and private sector must be studied (de la Harpe *et al.* 2005).

Local software and IS activities by NGOs and in the public sector can be closely collaborating with open source developers within a global network, while commercial companies often have different other types of foreign liaisons. Educational activities in universities have international research liaisons, too. It is thus justifiable to include international linkages into the set of research objects, as indicated in a generic form in Figure 4.

Some important contextual factors still need to be added in the research setting of Figure 4. The first one is the government and relations of power, control and coordination. Particularly in healthcare, the government has the power to provide much control and guidance on whether and what kind of information systems are introduced in organiza-

tions. Healthcare and education are also mostly funded by the government, and financial relations are indeed another very important addition needed to the research framework. Financial viability is one of the elements of long term sustainability, and affordability is a critical issue when money is scarce.

Having three different Sub-Saharan African countries in the research network, we are now able to accumulate empirical research results from different organizational, societal, cultural and political contexts. That will enable us to draw at least hypotheses on how the contextual differences have affected the phenomena of ISD at the activity level. The INDEHELA programme provides an ideal opportunity for sharing collected information, experiences and skills, also contributing on Information Systems curriculum development.

## Conclusion

INDEHELA-Context is a major research undertaking in African health informatics, aiming at highly practical as well as theoretical results. It is a network of collaborating, independent research groups in several organizations raising most of the funding independently, not a strictly managed “army” with a big centralized budget. Therefore each group and researcher within the network will identify the research topic of one’s own according to one’s specific interests. The collaborative network is used for coordinating the various efforts in such a way that they supplement each other without too much of overlap. The outcome by 2007 should be a mosaic of empirical research on specific issues within the framework of Figure 4 as well as comparative analysis of the contextual issues identified in Figure 3. We regard the diversity and autonomy of the network an asset in dealing with sociotechnical contextual issues, although we are aware of the risks of fragmentation and lack of common orientation.

The INDEHELA research has always been based on the idea of research partnership between universities and researchers from Europe and Africa. Research partnership has “expanded the real freedoms” (Sen 1999) that the African partners enjoy, but it has also contributed to the Finnish partners by more broadly contextually relevant research approach and framework that has been used nationally in Finland and has helped in embarking on a similar Finland-China partnership in using ICT for healthcare.

In the beginning we asked: “Can ISD in Nigeria by Nigerians contribute to development, specifically to health, in Nigeria?” The same question remains with us in the current phase of INDEHELA, but regarding African countries in general. At the current phase, the research reported in this paper gives rise to the following answers:

- Yes; it is possible and necessary to introduce ICT to healthcare in a way that strengthens healthcare services to the people.
- Yes; software professionals in local companies are technically capable to contribute.
- Not much now; there is a dearth of human resources, particularly non-technical skills of project management, sustainability and impact analysis, communication and participation, which are required to ensure that ICT does not become a white elephant.
- Don’t know; more research is needed to find out if and how the need for financial profitability of software organizations can be combined with the non-profitable need to develop information systems that contribute to health.

The same question on ISD and development applies to industrialized countries also, although it is seldom asked there.

### *Acknowledgments*

This paper is based on research funded by the Academy of Finland through the INDEHELA-Context project, grant no. 104776 (2004–2007). <http://www.uku.fi/tike/indehela>

### **References**

- Avison, D. E. (1997), The ‘discipline’ of Information Systems: Teaching, research and practice, in *Information Systems: An Emerging Discipline*, J. Mingers and F. Stowell (Eds.), McGraw-Hill, Berkeley, pp. 113–136.
- Braa, J., Monteiro, E., and Sahay, S. (2004), Networks of actions: sustainable health information systems across developing countries, *MIS Quarterly*, (28:3), pp. 337–362.
- Checkland, P. (1991), From framework through experience to learning: the essential nature of action research, in *Information Systems Research: Contemporary Approaches*



- and Emergent Traditions*, H. E. Nissen, H. K. Klein, and R. Hirschheim (Eds.), Elsevier, Amsterdam, pp. 397–403.
- Daini, O. A., Korpela, M., Ojo, J. O., and Soriyan, H. A. (1992), The computer in a Nigerian teaching hospital: First-year experiences, in *MEDINFO'92: Proceedings of the Seventh World Congress on Medical Informatics*, Geneva, Switzerland, 6–10 September 1992, K. C. Lun, P. Degoulet, T. E. Piemme, and O. Rienhoff, (Eds.), Elsevier, Amsterdam, pp. 230–235.
- de la Harpe, R., Korpela, M. and Kamanga, E. (2005), The Potential of Community Informatics in Small Private Medical Practice in South Africa, in *Proceedings of the 2<sup>nd</sup> Annual Conference of the Community Informatics Research Network*, Cape Town, South Africa, August 22–27, 2005.
- Korpela, M., Soriyan, H. A., Olufokunbi, K. C., and Mursu, A. (2000), Made-in-Nigeria systems development methodologies: an action research project in the health sector, in *Information Technology in Context: Studies from the Perspective of Developing Countries*, C. Avgerou and G. Walsham (eds.), Ashgate, Aldershot, UK, pp. 134–152.
- Korpela, M., Mursu, A., and Soriyan, H.A. (2001), Two times four integrative levels of analysis: A framework, in *Realigning Research and Practice in Information Systems Development: The Social and Organizational Perspective*. N. L. Russo, B. Fitzgerald, J. I. DeGross (eds.), Kluwer Academic, Boston, MA, pp. 367–377.
- Korpela, M., Mursu, A., and Soriyan, H. A. (2002), Information systems development as an activity, *Computer Supported Cooperative Work* (11), pp. 111–128.
- Korpela, M., Mursu, A., Soriyan, A., Eerola, A., Häkkinen, H., and Toivanen, M. (2004a), IS research and development by activity analysis and development: Dead horse or the next wave?, in *Information Systems Research: Relevant Theory and Informed Practice, IFIP TC8/WG8.2 20<sup>th</sup> Year Retrospective*, B. Kaplan, D. P. Truex III, D. Wastell D, A. T. Wood-Harper, and J. I. DeGross (eds.), Kluwer Academic, Boston, MA, pp. 453–470
- Korpela M., Hanmer L., de la Harpe R., Macome E., Mursu A., Soriyan H.A.B. (2004b), How can African healthcare facilities get appropriate software? Sociotechnical research in the INDEHELA-Context project. In: *IT in Healthcare: Sociotechnical Approaches*, Portland, Oregon, 13–14 September 2004, Proceedings [CD-ROM].
- Mandil, S. H., Moidu, K., Korpela, M., Byass, P., Forster, D. (Eds.) (1993), *Health Informatics in Africa – HELINA 93: Proceedings of the First International Conference*, Ile-Ife, Nigeria, April 19–23, 1993, Elsevier, Amsterdam.

- Mursu, A. (2002), *Information Systems Development in Developing Countries. Risk Management and Sustainability Analysis in Nigerian Software Companies*, Jyväskylä Studies in Computing 21, University of Jyväskylä, Jyväskylä, Finland.
- Mursu, A., Lyytinen, K., Soriyan, H. A., and Korpela, M. (2003), Identifying software project risks in Nigeria: An international comparative study, *European Journal of Information Systems* (12), pp. 182–194.
- Mursu A., Korpela M., Soriyan A. (2004), Generic framework for sustainability analysis of Information Systems, In *Proceedings of Tenth Americas Conference on Information Systems*, Romano N.C. Jr (ed.), New York, August 6–8, 2004, Conference website: <http://howe.stevens.edu/amcis2004>.
- Mursu, A., Tiihonen, T., and Korpela, M. (2005), Contextual issues impacting the appropriateness of ICT: Setting the stage for socio-technical research in Africa, in *Proceedings of the IFIP WG9.4 Conference on Enhancing Human Resource Development Through ICT*, A. O. Bada (ed.), Abuja, Nigeria, May 26–28, 2005.
- Orlikowski, W. J., and Baroudi, J. J. (1991), Studying information technology in organizations: Research approaches and assumptions, *Information System Research* (2: 1), pp. 128.
- Pellegrini, U. (1980), The problem of appropriate technology, in *Criteria for Selecting Appropriate Technologies under Different Cultural, Technical and Social Conditions: Proceedings of the IFAC Symposium*, Bari, Italy, 21–23 May 1979, A. De Giorgio and C. Roveda (eds.), Pergamon Press, pp. 1–5.
- Sen, A. (1999), *Development as Freedom*. Alfred A. Knopf, Westminster, MD.
- Soriyan, H.A. (2004), *A Conceptual Framework for Information System Development Methodology for Educational and Industrial Sectors in Nigeria*, Obafemi Awolowo University, Ile-Ife, Nigeria.
- Walsham, G. (1993), *Interpreting Information Systems in Organizations*, John Wiley & Sons, Cambridge.

### 3.4. Agriculture and Food

#### *Management of an African Great Lake Fishery – Challenges to Research and Community*

*Hannu Mölsä*

*University of Kuopio*

*Institute of Applied Biotechnology*

*E-mail: hannu.molsa@uku.fi*

*Jouko Sarvala*

*University of Turku*

*Department of Biology*

*E-mail: jouko.sarvala@utu.fi*

*Timo Huttula*

*TH Environmental Consulting, Finland*

*E-mail: timo.huttula@thec.inet.fi*

*Kalevi Salonen*

*University of Jyväskylä*

*Department of Biological and Environmental Sciences*

*E-mail: kalevi.salonen@jyu.fi*

*Ossi V. Lindqvist*

*University of Kuopio*

*Institute of Applied Biotechnology*

*E-mail: ossiv.lindqvist@uku.fi*

#### **Introduction**

Fisheries comprise a wide range of activities aiming at the exploitation, processing and marketing of living aquatic resources. Fishery resources are an important source of animal protein for rural and urban populations both in developing and developed countries. Approximately 60 percent of people in developing countries derive 40 percent or more of their animal protein from fish. This figure is even higher in lake-shore or coastal countries in East-Africa, South Pacific and Asia. Fish yield from inland waters of developing countries has doubled in Africa since the 1950s indicating the vital role for human nutrition, economy and livelihood of fishery at large.

In African Great Lakes (Victoria, Tanganyika, Malawi, Kariba) one can see the full range of operations in fishery sector and its contribution to the environs. Typically fishing is or has been small-scale (traditional, artisanal) and characterised by indigenous non-motorised vessels, local gear, labour intensive, low investment requirements, and traditional processing means (e.g. drying). Fishing is mainly based on subsistence economy and often undertaken

on a part-time basis along with agriculture and animal husbandry. Fishing supports a remarkable social structure in rural societies often in isolated, remote areas and promotes the food security also of the poorest proportion of population. About 40 percent of fish used for human consumption is still derived through such individually operating units.

As the yields and outputs of fishing increase due to further inputs and technical developments, operations become more commercial, markets expand and the fishery is increasingly linked with national economy. This is what has happened on the Great Lakes too. A major share of fish catch is today harvested by motorised artisanal units that are able to deliver fish in large quantities to remote markets, urban areas and even for export.

Shifting from traditional, local level into semi-commercial and fully commercial operations has created both advantages and disadvantages. Increased efficiency and value of fishing industry have direct and indirect positive implications to people's economy and livelihood, which has clearly alleviated poverty in the rural society. Where fishing is economically more viable than other agriculture livelihoods, it has naturally become attractive as source of income or simply food for migrants from other economic sectors including those removed from industry. In the absence of appropriate means to control or regulate the new entrants, an 'open access' situation has prevailed on many lakes which again is calling for an establishment of fisheries management system both at the level of governmental bodies and of local fishery societies.

This paper will investigate how much the fisheries management can rely on the use of scientific advice, and what type of information, biological or socio-economic, is required to provide sustainable development of fishery on a firm empirical basis. The discussion is largely based on the work conducted on Lake Tanganyika, second largest of African Great Lakes, by scientists from Finnish universities and research institutes since the late 1980s. This paper will shed light on the constraints and opportunities of international scientific community to contribute in the process towards sustainability together with the responsible institutes.

### **Case study: Lake Tanganyika fisheries in crisis**

Fisheries on Lake Tanganyika (East-Africa region; Western Rift Valley) represent a remarkable body of aquatic natural resources with exceptionally high biological diversity in

a unique environment. In many respects, Lake Tanganyika is a most significant feature on African continent being the longest (length 670 km) and second deepest (max 1470 m) lake in the world. It hosts one of the largest inland fisheries in Africa (second only to Lake Victoria), and therefore provides a vital source of food security and livelihood for millions of people dwelling within and around its basin. Estimated annual harvest levels in recent years vary from 165 000 to 200 000 tonnes, with annual earnings between US\$80 – 100 million. In addition to fisherfolk, the lake directly or indirectly provides other income, food, drinking water, and a means of transportation and communication for an estimated 10 million inhabitants of its catchment area.

Pressures on Lake Tanganyika and its resources have mounted alarmingly in recent years. They are driven largely by ever-expanding human populations and attendant unplanned settlement, unregulated commercial developments, wastewater disposal, pollution, destructive cultivation practices, deforestation, and unsustainable fishing activities. As elsewhere in African Great Lakes region, food security here is inherently tenuous. Episodes of civil unrest and military conflicts, and the HIV/AIDS epidemics in many localities, have worsened the underlying situation that already has been frequently subject to frequent droughts and other natural disasters. Social welfare infrastructure around the Tanganyika lakeshore is woefully ill-equipped to cope with existing high incidence of morbidity and mortality, induced by overall implications of poverty, malaria and water-borne infections, and malnutrition.

The Lake Tanganyika resources, fish, water and means of transportation, have been historically shared by villagers on the immediate lake basin in Burundi, Tanzania, Zambia and Zaïre (today Democratic Republic of Congo, DRC). Since ancient times, fish from the lake has played a significant role in providing primary livelihood and subsistence for these people. The fishermen live in scattered villages or in temporary camps on the moderately narrow strip of land between the mountainous slopes and the lake shore. In many regions, fishing activities are performed seasonally and are interrupted with farming activities, particularly during rainy seasons. Cash generation has been only secondary goal but has developed into substantial commercial fishery in the last few decades (Coulter, 1991).

The natural increase in fishing pressure and yield to respond to increased need for fish as staple food was followed by a rapid expansion of catches following technological advances in gear design and efficiency in the 1950–1960s (Coulter, 1991; Coenen *et al.* 1998). That was the advent of ‘artisanal’ and ‘industrial’ fishery and introduction of lift nets,

purse seiners and long distance fleet to harvest the open water clupeid and *Lates* stocks that were seemingly under-exploited during that time. The fish yields in Lake Tanganyika kept increasing in line with the total harvest rate that was caused by new entrants into the fishing industry, and by the developing technologies.

As main catch, dried clupeids ('ndagaa' in Burundi and Tanzania, 'kapenta' in Zambia and DRC), sometimes also mixed with young *Lates stappersi*, were sold in large quantities to the industrial area of Copperbelt in Zambia, and to other long-distance markets in the neighbouring countries. The fish markets of Lake Tanganyika partly overlap with fish coming from L. Victoria, L. Malawi, and L. Kariba, thus creating a kind of 'common market' for post-harvest fish in Eastern Africa.

First signs of depleted yields of the large *Lates* species (*L. mariae*, *L. microlepis*, *L. angustifrons*) were seen soon after the fishery expansion, and the two clupeids (*Limnothrissa* and *Stolothrissa*) and among the *Lates* only *L. stappersi* became dominant in the catch of all fishing groups. The loss of biodiversity raised some concern as such, and the simplified food web that was not known in detail was seen more vulnerable to environmental disturbances and over-exploitation than before (Coulter 1991).

Fishing industry of Lake Tanganyika faced new economic problems in the late 1980s first due to reducing markets in mining regions of Zambia because of the collapsing industry there. Decreased catches, lower profitability and lost markets have forced the industrial sector in the northern parts of the lake to refrain from further investments or to partly stop operations; many sold the vessels and gear into the south. During the 1990s the political problems (ethnic conflicts, civil war) in Zaïre, Burundi and Rwanda together with climatic disturbances (drought) have resulted in local socio-political and economic collapses. This, in turn, has ruined the food production potential also in other agricultural sectors and has contributed to poverty and hence lowered the purchasing capacity in rural areas. Together with growing population numbers, the demand for low-priced and dried fish, rich in proteins and minerals, has, however, led to increased fishing pressure close to towns and other settlements. New invaders including many refugees have entered the fishery, thus the ecological crisis in fishery resources led into socio-economic conflicts between local and migrant societies whose attitudes towards resource utilisation and conservation were likely very different. Thus the era of interacting cultures and people with conflicting values, which situation is today even more pronounced, started already in the 1980s in Lake Tanganyika fishery.

Since 1970s Lake Tanganyika fisheries were seriously facing the problems of so called ‘open access – common property’ situation, where regulatory measures by the fishery authorities were not sufficient enough to control, advice or redirect the fishing communities. Nor were the fishing communities themselves able to handle with these conflicts.

After a termination of some national projects only occasional efforts were made to compile statistical information in each country. There were no direct attempts to enhance the regional collaboration between the managerial bodies in the region, despite the many common problems seen in common. It became obvious that rapid changes in the abundance of pelagic fish stocks were due to extensive fish movements over the entire lake, which could not be effectively assessed by national projects confined to their territorial waters only, but a regional approach to resource assessment and management was required (Dunn & Hyytinen, 1987).

In the late 1970s the four riparian nations, Burundi, Tanzania, Zambia and Zaïre (D.R. Congo), took the initiative to facilitate the regional management plans through an international project to support fisheries development. Overall concern over common environmental and social disturbances led into the drafting of a regional fisheries project at the First Session of the Committee for Inland Fisheries of Africa (CIFA), Sub-Committee for Lake Tanganyika, in 1978. FAO was naturally considered the proper executing agency for the regional and international project. Finally the Lake Tanganyika Research Project (GCP/RAF/271/FIN) was started in the early 1990s. Finnish Government Aid Agency became the main donor of this intervention.

## Lake Tanganyika research – Approaches and networks

### *Alternative approaches needed in the research*

In the planning phase of the FAO regional fisheries research and management project on Lake Tanganyika (cf. Mikkola & Lindqvist, 1989; Lindqvist & Mikkola, 1989), some new approaches and methodologies in limnology and hydrophysics were applied. The lake was considered as one integral unit where the fishery and other aquatic resources are shared by the four riparian nations. Therefore the research was planned to serve the needs of establishing a common and lake-wide management policy and strategy for these countries. The implementation of the management plan should take place also with common measures, whenever possible.

Apart from the field methodologies, the objective-setting in fisheries management took place in a novel way by choosing the multi-disciplinary development of the entire sector as the ultimate goal. Conventionally the objective for fisheries management has been, also on Lake Tanganyika, just to maintain the prevailing yield by preventing resource deterioration and decline. Historically the management of fishery resources has been viewed as a holding action against the forces of resource depletion (Walters, 1986). The concern for the state of the fish stocks has led to the dominance in fishery management and respective administration of a great "conservation" attitude (Charles 1982). This view of "balance of nature" and limited fish resources has in a remarkable way affected both the development of managerial concept as a whole and the related research strategy. Therefore, the need to assess the current stock sizes and studying the populations of the target species as the main part of management procedure has supported the dominant role of the biological scientists in the process, regardless of human-oriented fishery objectives in the economic management (Charles 1994).

When considering the management implications of these population models, the control of catches became commonly the goal, and consequently, setting the catch quota, or total allowable catch quota (TAC), were used as the primary goal in fishery development. Such catch and stock-assessment driven approach has dominated the management of global fishery until today, regardless of numerous examples of consequent stock depletions, collapses, lost biodiversity and low economic returns (Rosenberg *et al.* 1993; Emerson, 1994, Palmer, 1999, etc.).

It has also been shown that the scientific advice has been not properly used in the decision making due to weak links between the respective research and management bodies. This has been the case even in developed countries with well organized fishery administrations, such as Finland (Sarvala *et al.* 1998). The same situation has prevailed also at Lake Tanganyika and other African Great Lakes. The overall lack of research and managerial resources in responsible administrative bodies has been severe. Academic fishery research has had practically no implications to the governmental fisheries administrations, and mechanisms to transfer field observations or views to the central administration hardly exist.

During the project preparation, Lindqvist & Mikkola (1989) proposed the conventional stock-assessment based studies should be replaced with new approaches. Already the logistics and insufficient research capacities in the four riparian countries would have badly hampered the collection of data for the comprehensive stock size estimations. Also



the heterogeneity in the target fishing societies and the extremely complicated biological dynamics were known, and therefore the traditional Maximum Sustainable Yield (MSY) and TAC models were not seen worth pursuing. These models were found non-practical and unsuitable for controlling or directing the current fishing effort. It was obvious these models or related research would give no concrete answers to any questions on the right moment or place of the fishing effort, nor do they help in forecasting the future. The basic problem with the MSY-concept is that it is a static one. Once the MSY-level has been determined and the new fishing quota assessed, the fish population may have (and often has) shifted to another state, possibly resulting even in depensatory reactions and contributing to the gradual demise of the stock. The fishing effort itself often gives an on-time, though imperfect indication of the state of the stock (cf. Lindqvist, 1977). The models also neglect the significance of life-history adaptations and inter-specific relationships in multi-species stocks and they also overlook the adaptive behaviour within the human communities that exploit them.

In the ensuing Lake Tanganyika Research (LTR) Programme, studies on the mechanisms regulating the lake production dynamics rather than merely assessing the production level were chosen as the primary study objectives. The role of physical and climatic factors, food web interactions as well as the spatial and temporal fluctuations were of major concern in the plan. The programme was designed to provide for the future regional and lake-wide fisheries management plan with ecological basis and concrete answers to the questions where, when and by which gear the pelagic fishery of Lake Tanganyika can be developed in a sustainable way (Lindqvist & Mikkola, 1989; Mikkola & Lindqvist, 1989; Hanek *et al.* 1996), but also without forgetting the socio-economic constraints.

### *Project objectives*

The scientific programme of LTR had the following overall research objectives:

- Modelling the major hydrophysical and climatic factors that affect the functions, dynamics and production of the pelagic zone of Lake Tanganyika;
- To work out the trophic structure of the pelagic ecosystem to describe the nutrient and energy pathways into pelagic fish community, trophic interactions within food web, and horizontal & vertical movements of the pelagic communities including fish;

- Clarifying the population biology and genetics of the three dominant target fish species in the pelagic fishery;
- To assess the development of the catch composition by nation, fishing type and gear, the trends in the unit catch, and dynamics of the dominant fish species

The mid term evaluation of the LTR Project (Roest & Salo, 1997) noted the many successes made in the physical and biological studies so far, but underlined the necessity of further including the following socio-economic studies:

- Legal and institutional issues in the four riparian countries
- Socio-economic surveys amongst the fishermen, fish processors and traders and assessment of the stake-holders' perceptions of fisheries problems and prospects, and their opinions of proposed management measures, institutional set-ups and development attempts;
- Scientific reference basis for the Framework Fisheries Management Plan

### *Project implementation, coordination and training*

To execute the scientific programme, a field station in each of the four countries was upgraded or rebuilt, all equipped with basic limnology and fish biology instruments and capacities (the Uvira and Bujumbura stations shared these resources partly), and the research staff was trained to do the respective scientific work. A total of more than 360 researchers, technicians and administrators in total took part into these training events. The project constructed a research vessel (*r/v Tanganyika Explorer*) to conduct lake-wide hydroacoustic and trawl surveys for fish stock studies, and for integrated sampling of hydrodynamics, limnology, zooplankton, fish biology and fish genetics. These studies focused also on seasonal and daily migrations, on predator-prey relationships in pelagic communities, and other food web dynamics (for details see Lindqvist *et al.* 1999a).

Lake-wide modelling of hydrophysics was supported with data from automatic meteorological stations, thermistor chains, current meters and water level recorders (Huttula, 1997; Huttula *et al.* 2005, Podsetchine *et al.* 1999). Satellite-borne remote sensing (NOAA AVHRR) was applied to measure variations of the surface water temperature. The results were integrated with the hydrodynamic modelling. Limnological studies covered the patterns of macronutrient and primary production and the physical phenomena affecting

the nutrient regime of the lake. The scientific programme was in its geographical and seasonal coverage much more comprehensive than any of the earlier investigations.

### *Contributions to research capacity and networks*

The scientific programme was in practice run by the experts and technicians of the four nations, and managed by the Project Coordinator in Bujumbura and other field personnel at the stations, involving about 70 local persons in project research or management (120 persons in total including international staff). University of Kuopio, Finland, provided scientific coordination for the programme, assisted by the sub-component leaders at other universities and research institutes in Finland. The LTR Project established a network of almost 40 scientists and students from the Universities of Kuopio, Turku, Jyväskylä, Lappeenranta and Helsinki, the Finnish Game and Fisheries Research Institute, and the Pirkanmaa Regional Environment Centre. The project provided these institutes and scientists with exceptional opportunity to conduct tropical limnology and fishery studies in developing countries. The field work and two intensive field courses arranged for Finnish students at Lake Tanganyika have created, respectively, close relationships with major research institutes, universities and fisheries authorities in each country in Tanganyika region.

Further, several international symposia and workshops on Lake Tanganyika itself, and on other related projects on Lake Victoria, Lake Malawi, and Lake Kariba, etc. have linked these people with colleagues and institutes globally. The substantial development in communication and information technology through e-mail and access to Internet that took place during the ten years of project's duration enhanced greatly this networking and project's internal follow up procedures.

One can also say that the LTR project and participation in the project's international Coordination Committees have greatly added to the possibilities for Finnish expertise to enter respective international projects and organisations in EU, UN, etc. The Lake Tanganyika Research project has thus strengthened Finnish resource basis in a considerable way which could serve also as a basis for North-South university relationships in the future. Fish Innovation Centre (<http://www.fic.fi>) in Kuopio and Tervo is today operating as one liaison unit to provide international project services and expertise in fisheries and aquaculture available in titled universities and research institutes.

## Project outcomes

### *Ecosystem analyses*

The results of the intensive scientific research programme were summarised as the scientific synthesis (Lindqvist *et al.* 1999a). The project resulted in hydrodynamic model of thermal regimes and flows in the pelagic zone (Huttula, 1997, Huttula *et al.* 2005; Podsetchine *et al.* 1999). The model was applied also to pollution studies in the parallel Pollution Control and Biodiversity Project (West, 2001). Studies of primary production patterns (Salonen *et al.* 1999) and zooplankton communities shed light on their seasonality and migrations (Kurki *et al.* 1999; Vuorinen *et al.* 1999), and the production rate (Sarvala *et al.* 1999). Fish biology studies on two clupeids and *L. stappersi* dealt with the population biology, stock abundance and distribution genetic discreteness, and finally the Production/Biomass ratios based on the trawl and hydroacoustic data and otolith readings (Sarvala *et al.* 1999). The final conclusions on the fish production potential and in fact on the entire pelagic food web were based on the carbon-energy pathway calculation (Sarvala *et al.* 1999) that summarised the entire LTR biological data.

Since 1999, after the LTR implementation phase, the limnological and fish biology studies were complemented with investigations of nutrient dynamics and zooplankton vertical migrations in the pelagic zone (Langenberg *et al.* 2002.), and new assessments of ecosystem food web interactions and trophic relationships using bioenergetic modelling (Sarvala *et al.* 2002), and stable isotope (N and C) analyses (Sarvala *et al.* 2003).

The local communities as the primary stakeholders of Tanganyika resources were studied in the LTR Project. Those most directly involved in the fisheries include harvest sector workers and owners of equipment and boats, fish processors and traders, and providers of various support services (craft repair, spares, fuel, food stands, lodging, etc.). It can be estimated that the welfare of some one million lake dwellers – perhaps one tenth of the entire Tanganyika basin population – is more or less directly dependent on the fate of the fisheries. Socio-economic data revealed the poor physical infrastructure and poverty amongst the traditional fishermen, but a moderate advanced economy and sufficient capacity of income generation amongst the artisanal operators (e.g. Meadows and Zwick, 2000; Reynolds and Hanek, 1997).

All technical documents of separate sub-component studies, workshops and syntheses were put on CD-ROM and project web site (<http://www.fao.org/fi/ltr>), and distributed to counterpart institutes at the lake and to colleagues elsewhere.

The scientific studies of Lake Tanganyika pelagic food webs and fishery communities undertaken in the LTR project, laid a firm basis for ecosystem analysis and related management arrangements. The quantitative results of the structure and dynamic interactions in pelagic fish communities could give answers towards formulation of the fisheries management plan including gear, area or seasonal regulations (Reynolds, 1999; Mölsä *et al.* 1999).

### *Challenges to fisheries management*

Cacaud (1999), Magnet *et al.* (2000), Meadows and Zwick (2000), West (2001) and Reynolds *et al.* (2002) have summarized the recent observations on the socio-economic and community welfare issues to describe the needs and challenges for the regional fisheries management, as follows:

- ***Fish supply and demand.*** The contribution of fish to the total animal protein supply within the four littoral states currently ranges from some 25% to 40% (Gréboval *et al.* 1994), but the nutritional welfare is becoming more and more difficult to sustain.
- ***Resource access.*** The current open access regime is not sustainable in the long run because it leads to an increased pressure on the resource.
- ***Local empowerment.*** Consultation between administrators and local representatives of fisher interests, operation of fisher committees, and local community participation in resource management decision-making and follow-up are required
- ***Equity.*** Prospects for developing modalities for sustainable management and conservation are clouded by widespread socio-economic inequalities, including: a) relations between fishing unit owners and fish workers; b) gender-based differences and c) relations between artisanal, traditional and industrial fishers
- ***Piracy.*** Incidents of piracy in association with political and economic chaos in the D.R. Congo, civil unrest in Burundi, population dislocations and refugee resettlement, and widespread availability of sophisticated small arms obtained from war zones threaten peaceful development in the area.

Further, evaluating the institutional and legal aspects of the Tanganyika fisheries, as based on the investigations during the LTR and Fish Code Projects, Mölsä *et al.* (1999) have summarised the major features and deficiencies:

- *Policy orientation.* The four lacustrine States share a common policy orientation towards social welfare objectives, whilst recognising a requirement to secure sustainable resource use over the long term. At the same time, there is in all cases a basic lack of institutional means to achieve policy objectives.
- *Budget shortfalls.* Chronic under-funding prevails in national fisheries departments and research agencies. Departments are unable to provide adequate extension or monitoring, control, and surveillance (MCS) services.
- *Harmonisation of legislative frameworks.* A consistent set of regulations needs to be developed for the management of stocks that are in reality unitary populations, not territorially divided sub-groups. In some cases the fisheries law derives from colonial era and there is a general need for update and overhaul.
- *Regional management co-ordination.* The CIFA Committee for Lake Tanganyika needs to be developed as a forum for technical discussions between the four States on the management of the fisheries. I
- *Enforcement and compliance.* Need exists for enforcing the regulations and establishment of co-management arrangements, through which local stakeholders would play an active role in regulatory decision-making and compliance assurance.

## Principles of ecosystem management applied

### *Establishment of the Regional Fisheries Management Plan*

The Framework Fisheries Management Plan for Lake Tanganyika (FFMP) was finalised in the LTR project and approved in the responsible Fisheries Departments and Research Institutes to outline the future actions of the regional development of Lake Tanganyika fisheries.

The Framework Fisheries Management Plan (FFMP) adopted its main procedural principles from the FAO *Code of Conduct for Responsible Fisheries*, and therefore included a rather modern and unique approach to manage the entire fishery sector in a dynamic and adaptive manner. Following the *Code* guidelines, FFMP emphasises precautionary principles in its strategy and takes into consideration the complexity and uncertainty of

the entire system. Future development attempts would involve a series of initiatives to develop community management partnerships and local infrastructure and services within a harmonised regional framework of legislation and regulatory measures, improved monitoring capabilities, and institutional arrangements (Reynolds, 1999; Mölsä *et al.* 1999; Reynolds *et al.* 2002).

The designed FFMP is an advanced framework by its multi-disciplinary, holistic and ecosystem approach while taking the fishery society's social, economic and institutional expectations into consideration. The plan reflects new paradigms of thinking in the fishery management, with recognition to multi-disciplinary views, precautionary principles and participatory management, as outlined by Charles (1994), Richards and Maquire (1998), de la Mare (1998), Pitcher *et al.* (1998), Weeks and Berkeley (2000), etc. In the design of FFMP, the role of data collection, type of information needed, and the arrangements to integrate the scientific information into the respective decision making, were taken into account.

### *Ecosystem modelling in LTR*

LTR project has been able to characterise the energy and nutrient flows between and within the trophic levels in Lake Tanganyika in a revised way (Sarvala *et al.* 1999; 2003). The ecosystem studies (Sarvala *et al.* 1999) and the modelling (Sarvala *et al.* 2002) both revealed the Tanganyika ecosystem functionally falls within the 'normal' range of deep tropical lakes, and no particular discrepancy between the trophic levels could be seen, in contrast to earlier suggestions.

Trophic food web models describe well the causal predator-prey relationships between the ecosystem parts. They enable comparison between changing states, the analysis of the ecological significance of any component of the food web, the identification of 'vacant feeding niches' and the prediction of impacts which change the balance of the system. Although reductionistic by their methodology (Larkin, 1996), they enhance understanding the current situation in the trophic structure. This may have implications while assessing the system resilience, and vulnerability to environmental disturbances and harvesting by humans. In this respect, the ecosystem modelling may provide means for the concept of ecosystem management too. But to help the managers in their managerial duties, sufficient mechanisms are required for data collation and processing.

### *Ecosystem management and precautionary principle*

Ecosystem management is a short hand for more holistic approaches to resource management. It reflects the ‘necessity of understanding multi species interactions and questions of altered structure of the biological community (ecosystem stability)’. The management implications of the term ‘ecosystem management’ presume a reasonable understanding of the physical and chemical environment and the interactions between the species as well between the organisms and the environment’ (Larkin 1996). As discussed before, now there are trends to reach broader, ecosystem-oriented objectives as well as to pay attention to small-scale fisheries sub-sectors (Sainsbury *et al.* 2000; Gislason *et al.* 2000). These views have been widely adopted in the FAO *Code* and thus also applied in the management plan of Lake Tanganyika.

Murawski (2000) has developed the goals, originally defined by Larkin (1996), into practical management actions with measurable outcomes. Management programmes usually address some of the following considerations:

- *Biomass and production* of important system components, and assessment of the total system production available for harvest (‘surplus production’). This can be made on the ecosystem or individual stock level.
- *Diversity* – excessive exploitation can influence diversity at various level or organization, owing to size and species selectivity of fisheries. Following such selective harvesting, species interactions like predator-prey relationships may alter with cascading effects through the food chain.
- *Variability* – Several types of resource variability can be used as measures of sustainability. Highly perturbed systems tend to exhibit greater year-to-year variation in yields and recruitment.
- *Social and economic benefits* – The ecosystem management, in the ideal form, will provide the entire society with highest net benefit.

In the context of Lake Tanganyika, both the biotic ecosystem and human society are regarded as the ‘ecosystem’ and therefore the ecosystem management includes the following elements:

1. Direct measures to control and redirect the fishing effort in order to avoid continued over-exploitation of *Lates stappersi* and *S. tanganyicae*, and to reduce the



excess industrial fishing capacity in the southern part of the lake (re: Precautionary principle);

2. Protection of the biodiversity through fisheries management measures. With the only exception of three large *Lates* species, the actual biodiversity was beyond the mandate of Lake Tanganyika Research Project. Pollution control and other measures to protect biodiversity was the primary goal of the UNOPS/GEF Project (LTBP) in 1996–2000.
3. Achievements in the fishery society in terms of reduced poverty, increased equity, access to the decision making over the management and conservation of the natural resources, etc. (re: Socio-economic benefits)

### *Is precautionary approach needed?*

The food-web analyses of LTR Project (Sarvala *et al.* 1999, 2002, 2003) provided detailed information on diversity and species' interactions in the pelagic zone that is characterized by a moderately simple structure. Today the commercial fishery is targeted primarily on three species only, *S. tanganyicae*, *L. miodon*, and *L. stappersi*. The studies have given a rather clear picture of the prevailing state of the stocks of these species, as well as of their trophic basis, i.e. food resources and possible vulnerability of the entire system to over-exploitation (fishing) or environmental disturbance (pollution, cascading trophic effects).

The present fishery and level of fishing effort seem to be approaching the limits of sustainability, especially in regard to *Lates stappersi* and partly also *S. tanganyicae*. Therefore limitations on industrial fishery in the south and beach seine fisheries along any coastal sites are justified (Reynolds *et al.* 1999). If any uncontrolled increase of exploitation will take place, it means that the ecosystem and fish production could become more susceptible to rapid environmental changes. In regard to its productivity Lake Tanganyika falls into the average category of deep tropical lakes (Sarvala *et al.* 1999).

### *Protecting biodiversity*

The magnificent biodiversity within the littoral dwelling fish is, in principle, not an element of the immediate fishery management strategy itself, but more an issue in environmental management strategy (Strategic Action Plan, LTBP, West, 2001). Lindlay *et al.*

(2000) have shown the importance of littoral based traditional fishery, which uses more than 50 local gears that may be quite selectively targeted in the inshore areas, and therefore bear a risk towards the littoral-dwelling fish.

The pelagic ecosystem is dominated by clupeids and *L. stappersi*. Three other centropomid *Lates* spp., are caught in smaller quantities by purse seiners, lift-net units, and hook 'n line fishermen operating often near by the lift-netters, but their status will presumably remain as it is today being subject to fish markets, as the scarce species are highly priced.

In protecting actively the biodiversity in marine ecosystems, establishment and maintenance of the 'no take' areas is also shown to be cost-effective in the developing countries as they can be managed by the low-resource institutions or fishing communities themselves. The effectiveness of even the best designed networks of protected areas will depend on conservation and fisheries efforts undertaken outside reserve boundaries (Murray *et al.* 1999). In the context of Lake Tanganyika region, this would include simultaneous managerial actions with respect to habitat protection, land based operations, and monitoring and control of tourism and fishing activities. Disparities between national authorities often hinder seriously the initiation of such actions (Coulter, 1999).

A recent assessment of biodiversity in L. Tanganyika (Allison *et al.* 2000) considered three general conservation strategies – direct protection (lake reserves), economic substitution (promoting alternative livelihood activities), and linked incentives (e.g. ecotourism). It recommended that conservation strategy should be based primarily on maintaining and extending existing land/lake parks. These parks could be complemented with Coastal Zone Management arrangements that may consider also different interests (eg. fishing) apart from conservation (Coulter *et al.* 2005).

### *Social gains in fishery*

The sustainable use of the fishery resources and the multi-disciplinary development of the fishery, including food security and enhanced economy, was clearly set as the primary goal of the entire LTR Project.

By emphasising the gains of the traditional and small-scale sectors, the project has put major concern on the economic and socio-economic sustainability of the poorest people

in the society. For the managerial point of view, this group is also the most difficult and challenging, because the operations cover a wide range of environments, technologies and cultures. This is a target of community-based and participatory management arrangement that in the ideal case might lead into a self-sufficient situation with reduced 'top-down' and formal interventions by the fishery authorities. Future project outlines would call for an increased local participation in management decision-making. The FFMP will provide venues for improved social equity and democracy by establishing Local Fishery Councils and Local Community Fisheries Zones or by supporting those already existing at some landing sites (Magnet *et al.* 2000; Reynolds and Mölsä, 2000).

Poverty alleviation has been the central objective of the Finnish foreign aid. On Tanganyika the part-time fishermen or those who fish only for subsistence are at the lower end of poverty. The LTR Project hopefully has been able to work out something that adds up to the overall economic feasibility and sustainability of fishery.

## How to pursue sustainable development

Lake Tanganyika fisheries is characterised by diverse production strategies and different production potentials amongst the fishermen groups. Weak institutional capacity of the governmental bodies to fulfil managerial duties is obvious. Competition for depleted fishery resources between the fishermen communities is reducing their interest to commit themselves to joint management operations. There are two sufficient ways of action to achieve the sustainability in these circumstances:

- *First option*, to develop a reasonable and cost-effective monitoring system to address the key points or changes in the target resources, and then adjust the managerial measures according to these observations. This results in creation of the Monitoring, Control and Surveillance (MCS) arrangement described particularly for Lake Tanganyika by Cacaud (1999).
- *Second option*, to enhance co-management and community based arrangements. The role of information and scientific knowledge needs to be newly defined in the process. This option will rely to great extent on the stake-holder groups' own reactions to the biological fluctuations and fishermen's tactics to cope with environmental and economic uncertainties, leaving the formal, top-down management secondary in use. In other words, in the absence of solid governmental

institutional presence, the community-based, self-regulatory management by the fishermen associations themselves, remains as prominent and often the only regime of management.

### *Option 1 – Fishery authorities to conduct fishery monitoring, control and surveillance*

#### *Fishery monitoring – challenges to the institutes*

It seems that the environment and fishery monitoring becomes the key element when the regional fishery management strategy is put as the institutional arrangement into place on Lake Tanganyika. Monitoring will compile information of the environmental conditions, fish resources and the stakeholder groups. In ideal case, monitoring supports also the internal evaluation of institutional efficiency and management performance.

In practice, however, there are several constraints for successful monitoring and related decision making, which depend on the pile of uncertainty issues in the system. To establish a sufficient monitoring programme, the decision has to be taken:

1. What parameters are monitored and what is the value of the information; i.e. the degree of uncertainty accepted;
2. Are the institutional capacities in the four riparian countries sufficient for doing such monitoring;
3. Who will use the monitoring results in the decision making, and how the information flows from monitoring to the end-users and finally results in formulation of the management strategy;
4. What is the function of the monitoring if the community based co-management will be paid increasing attention.

Appropriate monitoring variables should first describe the critical changes in the ecosystem or fishery, and second they should be relevant to the end-users. The staff in resource-poor institutions may consider obtaining data of the following variables on regular basis;

1. 'Early alarms' signalled by changes in hydrodynamic patterns;
2. Ecology of fish prey communities;

3. Catch per Unit Effort (CPUE) and fish biology data for main target species;
4. Continuities and changes in fishing communities (size, composition, infrastructure, trends) and the socio-economic circumstances of local harvest and post-harvest operators.

#### *Use and value of the monitoring results*

The second condition for successful monitoring deals with the possibilities to utilize the obtained information in the respective decision making. This again is subject to the institutional capacities, physical and personnel structure of the responsible fishery and environmental bodies. Critical steps while planning the relevant programme include size and training of the personnel, motivation and attitude, and the finance of the respective authorities.

To develop the fishery monitoring on Tanganyika, the experiences on Lake Malawi can be applied. Malawian Department of Fisheries runs catch monitoring and CPUE analyses of industrial trawl fisheries, and small-scale fisheries on regular basis, which results in vast quantities of data each year (Darwall & Allison, 2002). These results remain, however, sparsely analysed and processed due to lack of quality control and supervision (Turner *et al.* 1992). Effective management of the fisheries has, consequently, been extremely limited owing to a lack of finance and manpower for the enforcement of policies. Darwall & Allison (2002) have therefore suggested substantial alterations in the current stock-assessment-driven statistics and other structural changes in the monitoring regime of Lake Malawi to enhance the usage of the monitoring outcomes.

#### *Strategy formulation*

The basic difficulty for the fisheries management has been that the systems are stochastic, uncertain and as a consequence, fundamentally difficult to control (Lane & Stephenson, 1999). The fisheries and management science, and increasingly the management procedures, today recognise the need for explicit attention to be paid to this uncertainty. Also the awareness has increased that the major stakeholders must be involved in the decision-making to secure their commitment to the sustainability of the fishery resource.

According to Charles (1998) designing comprehensive fishery management involves policy components that are robust, adaptive or precautionary. These elements become more relevant if the degree of uncertainties grows bigger and the management has to cope with them all. Such thinking is applicable to Lake Tanganyika conditions in particular.

### *The precautionary principle*

The LTR Project showed that replacement of destructive gear and fishing methods (fine-mesh gill nets and dense beach seines) is ecologically justified in Lake Tanganyika. These non-selective gear are proven to bear risk of local over-fishing and threaten the breeding individuals and recruitment of new cohorts e.g. of *Lates stappersii* and *Limnothrissa miodon*. For the same reasons abandonment of fishing operations in breeding areas has to be encouraged and active driving of fish into net lines has to be forbidden. Enforcement of such gear regulations remains, however, a problem because of weak institutional capacities. Supply of alternative gear or alternative livelihood as well as micro-credit schemes to finance the new equipment may work as an incentive and enhance the fishermen's capacity to accept these changes.

In the ecological and socio-economic circumstances on Tanganyika today one has to accept the alternative that the respective fishery and research institutes fail to introduce or enforce the gear restrictions, areal closures or other control means to reduce the effort even though proven viable. This means that the final control of the fishing operations will remain mainly as local responsibility and part of the social ruling in the fishermen society. To avoid returning to the historical situation of no-control and open access, which is one of the reasons to crisis today, the second option, management in partnership, should be encouraged.

### *Option 2 – Management in partnership*

The essential idea of co-management is the sharing of decision making and management functions between government and stakeholders in the fishery. More formally, co-management can be defined as the creation and implementation of suitable management arrangements through which a set of agreed stakeholders, i.e. fishers and their organisations, work jointly with government to develop and enforce fishery regulations

and management measures (Charles, 2002). The concept focuses on the recognition that user groups have to be more actively involved in fisheries management if the regime is to be both effective and legitimate (Njaya, 2002). Following Campbell & Townsley (1996) the community participation in fisheries management means that individual fishermen or fishermen groups that are actively involved in the management of the resources have evidence that regulations and control mechanisms are working in their best interests. Private advantages may be achieved on short-term basis, or collective benefits are obtained in the society in the long run, once the common decisions are taken and various stakeholder groups commit themselves in the community decisions (Njaya, 2002).

The 'top-down' or 'command and control' management regimes, in addition to undervaluing the potential contributions of local knowledge systems and actors to the management process, often feature a heavy measure of state intervention. This may often result in an 'us versus them' response of disassociation amongst local fisherfolk, expressed in widespread indifference and even the deliberate violation of official regulations. Many examples from African Great Lakes show how inefficient the governmental regulations, gear restrictions, closed seasons or areas, etc. are in addressing the problem of over-exploitation or redirecting the fishing operations even if shown ecologically justified (Njaya, 2002; Hara *et al.* 2002; Allison, 2002; Malasha, 2002; Wilson, 2002).

In terms of rights in fishery system, the co-management arrangement provides the end users with a new type of right, 'management rights' in addition to the 'use rights' existing before. Management and use rights together belong to the broader concept of 'property rights'. If the community-based management system is inefficient and non-functional to take over the management responsibilities, the situation brings us again closer to the issue of *open access* and *common property*, the two fundamental causes of the resource over-exploitation and resulting stock depletion (Charles, 2002). But if well organised the community driven management arrangement may enhance the *use rights* towards controlled *access* or *harvest rights*, and *conservation ethic* as part of sustainability management.

## Conclusions

This review has outlined briefly the role that environment and fishery research can play in pursuing sustainable development of fisheries in African Great Lake context. The Finnish funded and FAO-executed project 1992- 2001 'Lake Tanganyika Research' was

used as an example to describe the fundamental significance of using multi-disciplinary scientific knowledge in formulating the regional management strategy of fishery resources in Lake Tanganyika basin. It was shown that the biological studies of environment and lake ecosystem can provide one necessary basis for the resource management by assessing the resource-limited constraints and opportunities for the resource utilisation. This part of the project served as remarkable platform for researcher training both in the four target countries (Burundi, D.R. Congo, Tanzania, Zambia) and in Finland. The biological investigations were complemented with substantial socio-economic surveys amongst the fishing communities involved in harvesting, fish processing, trade, and marketing. These surveys provided key information on the prevailing social and economic conditions in the society, and shed light on the values, expectations and visions of people. Their views were incorporated also in the Framework Fisheries Management Plan.

Given the vast size of the Tanganyika basin, and complex dynamics of the lake ecosystem, biological studies were very demanding and required specific technologies and research capacity that was available only during the LTR Project. At the same time, the project has, however, strengthened the research capacity and created operational links of the scientists and administrators of the counterpart institutes to the international scientific community. One cannot assume, however, such comprehensive research could be implemented or continued by national resources, but the scientific synthesis made by the wide array of national and international experts was used as the first-hand reference basis for the coming Framework Management Plan. It also resulted in design of regular monitoring programme that started independently by the national institutions.

As to the fisheries management, it was obvious the conventional bio-economic models still dominating fisheries administration in many parts of the world could not be applied in the circumstances of Lake Tanganyika fisheries. The system is characterized by highly fluctuating stocks, dynamic inter-specific relationships in pelagic waters, and of traditional and artisanal fishermen numbering 45,000. Also one has to take into account the prevailing poverty, the social and institutional conflicts, as well as the political instability in the region. The responsible institutes suffer from chronic lack of finance and resources. Therefore the government-driven, top-down approach in the fisheries administration must be replaced or at least complemented with community-driven, participatory approach in which the community representatives take part in the decision-making concerning resource utilize or conservation. In ideal case the management is made in partnership with various stakeholders.



Thus, Lake Tanganyika fisheries as an example of African Great Lake fisheries are full of challenges. The need for appropriate management of fishery resources is great and continuously growing because of increasing pressure towards their utilisation, and other threats they are facing. The logistics are poor which leave main parts of the lake beyond of access and any control. To study such highly fluctuating and dynamic fishery system requires new paradigm of thinking to serve the managerial needs. Rather than relying on exact estimations on actual fish stocks, fishery monitoring should provide information on alarming changes in the target fish populations and environment affecting the fish production. Also the future monitoring should compile information and observations on socio-economic parameters of the fishery. The use of such multi-disciplinary information in decision-making needs also new visions amongst the administrators.

Further, if management in partnership will be pursued, it requires considerable rearrangements in administrative bodies to fulfil their duties in monitoring and in enforcing the management measures. Situation is also new for many fisherfolk communities, and needs clarification in their regulations of harvest rights. Many of these challenges are known and have been identified now on Tanganyika (Lindqvist *et al.* 1999a,b; Reynolds *et al.* 2002). Fortunately, there are already good examples of successful management arrangements in other African lakes to be learnt and adopted here (see, Geheb & Terri, 2002; Allison, 2002).

## References

- Allison EH 2002. Sustainable management of the African Great Lakes: Science for development. *Aquatic Ecosystem Health & Management* 5:315–327.
- Allison EH, Paley RG, Ntakimazi G, Cowan VJ & K West 2000. Biodiversity assessment and conservation in Lake Tanganyika. BIOS final technical report. Pollution control and other measures to protect biodiversity in Lake Tanganyika. RAF/92/G32, UNDP/GEF/LTBP Report for NRI, MRAG, IFE. 166 pp.
- Cacaud P 1999. Review of a monitoring, control and surveillance system for Lake Tanganyika fisheries. FAO/FINNIDA Research for the Management of the Fisheries on Lake Tanganyika. FAO, GCP/RAF/271/FIN-TD/96, 21 pp.
- Campbell J & P Townsley 1996. *Participatory and integrated policy: a framework for small-scale fisheries in Sub-Saharan Africa*. Integrated Marine Management, United Kingdom.
- Charles AT 1992. Fishery conflicts: A unified framework. *Marine Policy* 16:379–393.

- Charles AT 1994. Towards sustainability: The fishery experience. *Ecological Economics*, 11:201–211.
- Charles AT 1998. Living with uncertainty in fisheries. Analytical methods, management priorities and the Canadian groundfishery experience. *Fisheries Research* 37:37–50.
- Charles AT 2001. *Sustainable fishery systems*. Blackwell Science, Oxford.
- Coenen EJ, Paffen P & E Nikomeze 1998. Catch per unit of effort (CPUE) study for different areas and fishing gears of Lake Tanganyika. FAO/FINNIDA Research for the Management of the Fisheries on Lake Tanganyika. FAO, GCP/RAF/271/FIN-TD/80, 92 pp.
- Coulter GW (ed.) 1991. *Lake Tanganyika and its Life*. British Museum (Natural History), and Oxford University Press, Oxford, 354 pp.
- Coulter GW 1999. Sustaining both biodiversity and fisheries in ancient lakes. In: Kawanabe H, Coulter GW & AC Roosevelt (eds.) *Ancient Lakes: Their Cultural and Biological Diversity*. pp. 177–187. Kenobi Productions, Belgium.
- Coulter G, Langenberg V, Lowe-McConnell R, Riedel F, Roest F, Sarvala J & O Timoshkin 2005. The problems confronting survival of biodiversity in ancient lakes. *Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie* 29 (in press).
- Darwall WRT & EH Allison 2002. *Monitoring, assessing, and managing fish stocks in Lake Malawi/Nyassa: Current approaches and future possibilities. Aquatic Ecosystem Health & Management*. 5:293–306.
- de la Mare WK 1998. Tidier fisheries management requires a new (MOP) management-oriented paradigm. *Reviews in Fish Biology and Fisheries* 8:349–356.
- Dunn IG & L Hyytinen 1987. Report on a Project Identification Mission, GCP/RAF/229/FIN, 59 pp. FAO, Rome.
- FAO 1995. Code of Conduct for Responsible Fisheries. FAO, Rome.
- FAO 1996. Precautionary Approach to Capture Fisheries and Species Introductions. FAO Technical Guidelines for Responsible Fisheries, 2. FAO, Rome.
- Geheb K & K Terri (eds.) 2002. *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey.
- Gréboval D, Bellemans M & M Fryd 1994. Fisheries characteristics of the shared lakes of the East African Rift. CIFA Technical Paper 21, FAO, Rome.
- Hanek G, Everett G, Mölsä H & OV Lindqvist 1996. Developing and sustaining world fisheries resources: The state of science and management. Proceedings of the 2<sup>nd</sup> World Fisheries Congress, pp. 334–338. CSIRO Publishing, Collingworth, Australia.

- Hara M, Donda S & FJ Njaya 2002. Lessons from Malawi's experience with fisheries co-management initiatives. In: Geheb K & K Terri (eds.) *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey. pp. 31- 48.
- Huttula T (ed.) 1997. Flow, Thermal Regime and Sediment Transport Studies in Lake Tanganyika. Kuopio University Publications C, Natural and Environmental Sciences 73. 173p.
- Huttula T, Huttunen O, Podsetchine V, Peltonen A, Kotilainen P & H Mölsä 2005. Hydrodynamics and thermal regime of Lake Tanganyika. *Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie* 29 (in press).
- Kurki H, Mannini P, Vuorinen I, Aro E, Mölsä H & OV Lindqvist 1999. Macrozooplankton communities in Lake Tanganyika indicate food chain differences between the northern part and the main basins. *Hydrobiologia* 407:123–129.
- Lane DE & RL Stephenson 1999. Fisheries management science: a framework for the implementation of fisheries-management systems. *ICES Journal of Marine Science* 56:1059–1066.
- Langenberg VT, Mwape LM, Tshibangu K, Tumba J-M., Koelmans AA, Roijackers R, Salonen K, Sarvala J & H Mölsä 2002. Comparison of thermal stratification, light attenuation and chlorophyll-a dynamics between the ends of Lake Tanganyika. *Aquatic Ecosystem Health & Management* 5:255–265.
- Larkin PA 1996. Concepts and issues in marine ecosystem management. *Reviews in Fish Biology and Fisheries* 6:136–164.
- Lindley R 2000. Lake Tanganyika Biodiversity Project Fishing Practices. Special Study. UNDP/GEF/RAF/92/G32.
- Lindqvist OV 1977. On the principles of management strategies of crayfish and fish populations. *Freshwater Crayfish* 3:249–261.
- Lindqvist OV & H Mikkola 1989. Lake Tanganyika: review of limnology, stock assessment, biology of fishes and fisheries. Prepared for the Regional Project for the Management of Fisheries, Lake Tanganyika. FAO, GCP/RAF/229/FIN: 51 pp, Rome.
- Lindqvist OV, Mölsä H & J Sarvala (eds.) 1999a. Lake Tanganyika Research: Summary of the Scientific Programme 1992–1998. FAO/FINNIDA Research for the Management of the Fisheries on Lake Tanganyika. FAO, GCP/RAF/271/FIN/94, 102 pp. Rome.
- Lindqvist OV, Mölsä H, Salonen K & J Sarvala (eds.) 1999b. *From Limnology to Fisheries: Lake Tanganyika and Other Large Lakes*. Kluwer Academic Publishers, 218 pp.

- Magnet C, Reynolds RE & H Bru 2000. Lake Tanganyika Regional Fisheries Programme: A proposal for the implementation of the Lake Tanganyika Regional Framework Fisheries Management Plan. FAO/FISHCODE; GCP/INT/648/NOR, Field Report F-14, 128 pp. FAO, Rome.
- Malasha I 2002. The outcome of a co-managerial arrangement in an inland fishery: The case of Lake Kariba (Zambia). In: Geheb K & K Terri (eds.), *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey, pp. 89–106.
- Mannini P 1999. Lake Tanganyika Fisheries Monitoring Programme. FAO, GCP/RAF/271/FIN-TD/90, 65 pp. Rome.
- Meadows K & K Zwick 2000. Socio-economic special study: final report. UNDP/GEF/RAF/92/G32, 55 pp.
- Mikkola H & OV Lindqvist 1989. Report on a Project Mobilization Mission. Lake Tanganyika Regional Fisheries Research Project. FAO, GCP/RAF/229/FIN, Rome.
- Murray SN, Ambrose RF, Bohnsack JA, Botsford LV, Carr MH, Davis GE, Dayton PK, Gotshall D, Gunderson DR, Hixon MA, Lubchenco J, Mangel M, MacCall A, McArdle DA, Ogden JC, Roughgarden J, Starr RM, Tegner MJ & MM Yoklavich 1999. No-take reserve networks: sustaining fishery populations and marine ecosystems. *Fisheries*, November 1999:11–25.
- Mölsä H, Reynolds JE, Coenen EJ & OV Lindqvist 1999. Fisheries research towards resource management on Lake Tanganyika. *Hydrobiologia* 407:1–24.
- Mölsä H, Sarvala J, Badende S, Chitamwebwa D, Kanyaru R, Mulimbwa N & L Mwape 2002. Ecosystem monitoring in the development of sustainable fisheries in Lake Tanganyika. *Aquatic Ecosystem Health & Management* 5:267–281.
- Njaya FJ 2002. Fisheries co-management in Malawi: Implementation arrangements for Lakes Malombe, Chilwa and Chiura. In: Geheb K & K Terri (eds.) *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey. pp. 9–30.
- Podsetchine V, Huttula T & H Savijärvi 1999. A three dimensional circulation model of Lake Tanganyika. *Hydrobiologia* 407:25–35.
- Reynolds JE & G Hanek 1997. Tanganyika fisheries and local stakeholders. An overview of the LTR lakewide socio-economic survey, 1997. FAO/FINNIDA Research for the Management of the Fisheries of Lake Tanganyika. FAO, GCP/RAF/271/FIN-TD/71, 72 pp.
- Reynolds JE & H Mölsä 2000. Environmental Impact Assessment Report. Lake Tanganyika Regional Fisheries Programme (TREFIP). African Development Bank. FAO/UN, Rome, 91 pp.

- Reynolds JE, Hanek G, Mölsä H & OV Lindqvist 1999. Lake Tanganyika Framework Fisheries Management Plan: Background, policy considerations, and main elements. FAO/FINNIDA Research for the Management of the Fisheries on Lake Tanganyika. FAO, GCP/RAF/271/FIN/97, 52 pp.
- Reynolds JE, H Mölsä & OV Lindqvist 2002. A future fraught: precautionary, participatory, and regional outlooks for the fisheries of Lake Tanganyika. In: Geheb K & K Terri (eds.), *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey. pp. 107–141.
- Richards LJ & J-J Maquire 1998. Recent international agreements and the precautionary approach: new directions for fisheries management science. *Canadian Journal of Fisheries and Aquatic Sciences* 55:1545–1552.
- Roest F & J Salo 1997. Mid-term Review. Research Project for the Management of the Fisheries in Lake Tanganyika. Ministry for Foreign Affairs of Finland, Helsinki, Blue series 7:1–46.
- Rosenberg AA, Fogarty MJ, Sissenwine MP, Beddington JR & JB Shepherd 1993. Achieving sustainable use of renewable resources. *Science* 262:828–829.
- Salonen K, Sarvala J, Järvinen M, Langenberg V, Nuottajärvi M, Vuorio K & D Chitamwebwa 1999. Phytoplankton in Lake Tanganyika – vertical and horizontal distribution of *in vivo* fluorescence. *Hydrobiologia* 407:89–103.
- Sarvala J, Helminen H, & H Auvinen 1998. Portrait of a flourishing freshwater fishery: Pyhäjärvi, a lake in SW-Finland. *Boreal Env. Res.* 3:329–345.
- Sarvala J, Salonen K, Järvinen M, Aro E, Huttula T, Kotilainen P, Kurki H, Langenberg V, Mannini P, Peltonen A, Plisnier PD, Vuorinen I, Mölsä H & OV Lindqvist 1999. Trophic structure of Lake Tanganyika: carbon flows in the pelagic food web. *Hydrobiologia* 407:149–173.
- Sarvala J, Tarvainen M, Salonen K & H Mölsä 2002. Pelagic food web as the basis of fisheries in Lake Tanganyika: a bioenergetic modeling analysis. *Aquatic Ecosystem Health & Management* 5:283–292.
- Sarvala J, Badende S, Chitamwebwa D, Juvonen P, Mwape L, Mölsä H, Mulimbwa N, Salonen K, Tarvainen M & K Vuorio 2003. Size-fractionated d15N and d13C isotope ratios elucidate the role of the microbial food web in the pelagial of Lake Tanganyika. *Aquatic Ecosystem Health & Management* 6:241–250.
- Schramm HL & WA Hubert 1996. Ecosystem management: implications for fisheries management. *Fisheries* 21(12):6–11.
- Vuorinen I, Kurki H, Bosma E, Kalangali A, Mölsä H & OV Lindqvist 1999. Vertical distribution and migration of pelagic Copepoda in Lake Tanganyika. *Hydrobiologia* 407:115–121.

- Walters CJ 1986. *Adaptive Management of Renewable Resources*. MacMillan, New York.
- Weeks H & S Berkeley 2000. Uncertainty and precautionary management of marine fisheries: can the old methods fit the new mandates? *Fisheries* 25(12):6–15.
- West K 2001. Lake Tanganyika: Results and experiences of the UNDP/GEF Conservation Initiative. UNDP/GEF/RAF/92/G32, 138 pp.
- Wilson DC 2002. Lake Victoria fisheries' attitudes towards management and co-management. In: Geheb K & K Terri (eds.) *Africa's Inland Fisheries. The Management Challenge*. Fountain Publishers, Heinemann & Currey. pp. 174–194.

## *Co-operatives: a Pathway to Poverty Alleviation for Small-scale Farmers in sub-Saharan Africa*

*Shimelles Tenaw*

*University of Helsinki*

*Department of Economics and Management*

*Faculty of Agriculture & Forestry*

*E-mail: shimelles.tenaw@helsinki.fi*

### **Introduction**

The World Summit on Sustainable Development (WSSD) held in Johannesburg – South Africa in 2002, discussed poverty eradication and sustainable means of livelihood among other things. This is due to the burden of increasing poverty which has become the greatest global challenge facing mostly the developing countries. Apparently, poverty remains a major challenge in most countries on the continent of Africa. Owing to this, at the Summit special attention was paid to the situation in sub-Saharan Africa, where there are numerous severely poverty stricken countries. It is for reasons like this that eradicating extreme poverty and hunger is one of the major objectives of the Millennium Development Goals and Targets (MDGs).

The WSSD plan of implementation consists of a number of strategies to be used for implementing actions within various development programmes in developing countries. This includes agricultural, rural and institutional development as well as the value of co-operation for which concrete measures are required to enable achievement of sustainable development goals as connected to internationally agreed poverty-related targets and goals in Africa and elsewhere in developing countries.

Generally in Africa, there are several factors of poverty and its further aggravation in particular among the African farmers, although it is unjust to put them all in the same category, since Africa is a vast continent with 54 independent countries, a multitude of ethnic groups, political systems, climatic zones, each having their own particular problems. Nevertheless, it is possible despite this multiplicity of forms and structures to discuss problems of the African farmers as a whole.

Today, the vast majority of the people in Africa live in rural areas and earn their livelihood by means of farming. In some parts of the continent, farm population accounts for 80 – 90 percent. They are typically subsistent farmers and this similarity is the crucial factor for low self-sufficiency in food production on the continent. Thus, poverty and farming seem to go hand in hand in the countryside where the absolute and relative centre of the poverty exists.

Taking into account the overall food production system in Africa, it is evident that the agriculture and especially small-scale farming to this day represents the economic foundation of most African countries. Besides deriving a livelihood for the majority of their population from agriculture, a great number of African countries also depend on this small-scale farming to earn foreign exchange. This makes small-scale farming, even more important as this foreign exchange is indispensable as a means of purchasing machinery, replacement parts, medicines and raw materials for development. Regardless of what is said above, today, the small-scale African farmers live under the yoke of increasing poverty which is caused partly on account of ineffective agricultural and rural policy which does not take their needs sufficiently into consideration.

On the basis of what has been said above, it is obvious that the major problem Africa frequently faces is lack of food security policy. This is the biggest problem of the poor segment of the population, frequently the rural poor which in the African context are the small-scale farmers. Hence, solutions must be found in order to overcome the problems.

The idea of cooperation could serve as an instrument for creating a democratically based active food security policy which might in the long run alleviate poverty. This is due to the basic fact that the co-operative movement plays an important role in the rural and agricultural development policy of most of the developing countries. This role has got new emphasis with the shift in the focus of development efforts in favour of the agricultural sector and involvement of people's own organizations. Traditionally the co-operatives have also been in particular in Africa, one of the corner stones in the democratic process – another aspect, which has been in forefront of attention recently. In addition, co-operatives have usually been an important “breeding ground” for democratic ideas in the developing African countries, while at the same time providing its members a possibility to be trained in working in practice within a democratic environment.



As for the small-scale African farmers, establishment of farmer co-operatives organizationally and financially structured and genuinely administered by themselves could be an effective way of securing sufficient food production which would gradually lead to poverty alleviation. Thus, a coordinated effort of assistance is essential in order to promote the transfer of co-operative know-how from countries where co-operatives have played a significant role in the development of agriculture, rural and national economy in the past and at present.

Within the framework of Finland's development cooperation, the support to the agricultural production and rural development in general is one of the priority areas. Additionally, Finland supports promotion of co-operative development in the Finnish bilateral aid recipient countries in Africa. For example, the Department of Development Cooperation of the Ministry for Foreign Affairs of Finland financially assisted arrangement of two important seminars on African co-operatives held in Helsinki, 1992 and in Harare, Zimbabwe, 1993. The seminars were arranged in form of North-South dialogue by the Institute for Co-operatives Studies and the Institute of Development Studies of the University of Helsinki, the Finnish Co-operative Development Centre and the Ministry of Agriculture & Forestry.

Institutional development issue involving agriculture, rural and co-operatives is one of the key areas in the development promotion agenda of the University Partnership for International Development (UniPID). This task is undertaken mainly by the University of Helsinki which is carried out in cooperation with local and international authorities and organizations engaged in development promotion duties in developing countries. Already at this stage, contact has been established with FAO's development strategic programme known as Sustainable Agriculture and Rural Development (SARD) - Initiative.

The aim of the paper is to discuss the role of co-operatives in the process of poverty alleviation especially in sub-Saharan countries, where severe poverty is prevalent and the population of small-scale farmers is abundant. A summary of a locally based co-operative research study carried out in Finland by the undersigned is presented in this paper. The intention is to stimulate the discussion as to how changes in Agricultural Policy affect the small-scale farmers and the role of co-operatives in a society, where co-operative development has reached its peak.

A brief explanation of significant factors related to food production generally in the developing countries is presented at the thought of providing background information.

## **Factors related to food production in the developing countries**

### *Agriculture*

Agriculture is the predominant economic activity for about 70 percent of the world's extremely poor and food-insecure people living in rural areas. The majority of the rural poor live in the developing countries.

Looking into the present situation of agriculture in the least-developed countries (LDCs), despite its importance to the economy, agriculture has remained largely underdeveloped in production both for the domestic market and for export. Although there was a modest growth of output during 1995–98, it barely exceeded population growth, and for the 1990s as a whole in per caput terms it actually declined. In addition, slow food production growth and sharp annual fluctuations in output remain major and chronic problems for the least-developed countries constituting the major causes of their rising poverty and food insecurity (FAO, 2002a).

In many areas of the developing world, most of the people still depend on local agriculture for food and /or livelihoods but the potential of local resources to support further increases in production is very limited, at least under existing technological conditions. Examples are semi-arid areas and areas with problem soils. In such areas agriculture must be developed through support for agricultural research and infrastructure, while other income-earning opportunities are created. If this is not done, local food insecurity will remain widespread, even in the midst of global plenty (FAO, 2002a).

According to FAO's report (FAO, 2002b), the growth rates of world agricultural production and crop yields have slowed in recent years which has raised fears that the world may not be able to grow enough food and other commodities to ensure future populations and adequately fed. The slow down is mainly because of the decline in world population growth rates which has occurred since 1960s, and fairly high levels of food consumption per person are now being reached in many countries, beyond which further rises will be limited. As a result, it is estimated that the growth in world demand for ag-

agricultural products is expected to fall from an average 2.2 percent a year over the past 30 years to 1.5 percent a year for the next 30. In developing countries, the slow down will be more dramatic from 3.7 percent to 2 percent which will make them more dependent on agricultural imports and food security in many poor areas will not improve without substantial increases in local production.

Another problem that affects the life of people in developing countries is undernourishment in that today, the number of people undernourished is estimated at 776 million (see figure 1). Thus securing food production remains the greatest challenge in the developing world.

FAO’s study on the situation of global undernourishment reveals that the proportion of undernourished people should fall significantly from 20 percent in 1990–92 to 11 percent by 2015 and 6 percent by 2030. However, in numerical terms the 1996 World Food Summit target of halving the numbers of undernourished in developing countries by 2015 is unlikely to be met.

Number of undernourished people by region, 1990-92 to 2030

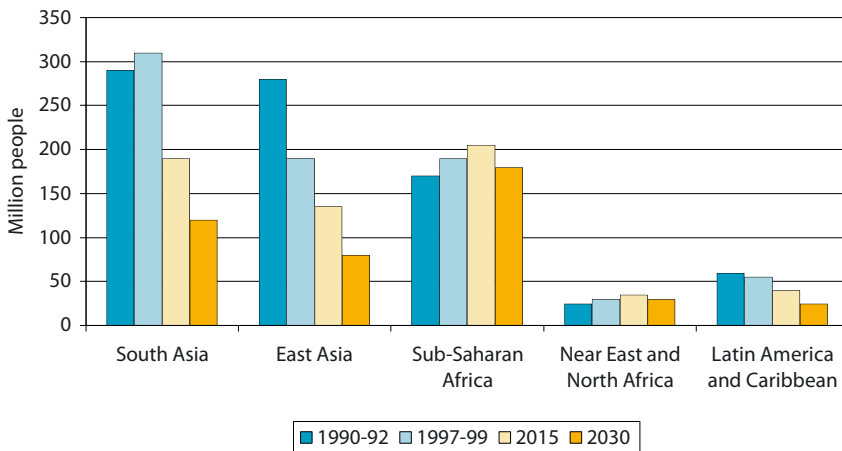


Figure 1. Number of undernourished people by region, 1990–92 to 2030. Source: FAO data and projections.

As shown in figure 1, in sub-Saharan Africa, the Near East and North Africa, there is likely to be little or no decline in the numbers of undernourished people, although the proportion will approximately halve. By 2030, an estimated number of about 183 people, 15 percent of the population will still be undernourished in sub-Saharan Africa. In fact, this will be by far the highest total for any region, and is only 11 million less than in 1997–99.

### *Food security*

Indeed, the alarming situation of food security in developing countries has been in forefront of discussion since the global food crisis began in the mid-1970s predominantly in sub-Saharan Africa whose fate is cause for serious concern.

The initial focus of attention in the discussion concerning the concept of food security was primarily on food supply problems of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level. That supply-side, international and institutional set of concerns reflected the changing organization and institutional set of concerns reflected the changing organization of the global food economy that had precipitated the crisis. A process of international negotiation followed, leading to the World Food Conference of 1974, and a new set of institutional arrangements covering information, resources for promoting food security and forums for dialogue on *policy issues* (FAO, 2003a).

Siamwalla & Valdés (1984) describe food security as the ability of food-deficit countries, or regions or households within these countries to meet target levels of consumption on a yearly basis. What constitutes target consumption levels and whose ability to maintain consumption is being referred to are two central issues of a *country's policy*.

Thus, food security exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. On the contrary, food insecurity exists when people do not have adequate physical, social or economic access to food. In order to secure food production in developing countries, thus, it is absolutely necessary to produce efficient agricultural policy, build institutions and organizations in which the small-scale farmers can be fully involved and committed to.

## The role of agriculture in reducing food insecurity

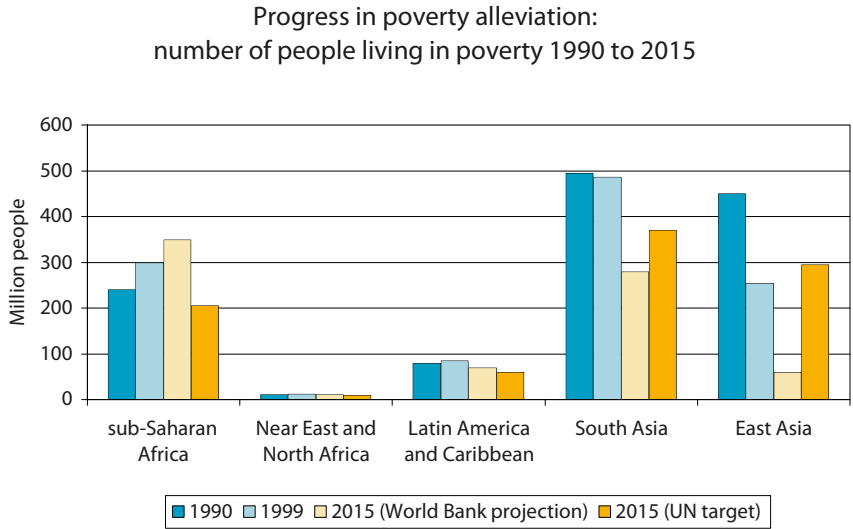
The role of the agricultural sector in reducing levels of food insecurity goes far beyond simply increasing the amount of available food. Increases in agricultural productivity have the potential to increase incomes as rural households specialize and intensify production. The 2001 FAO State of Food Insecurity report suggests that weak rates of growth in agricultural production can be related to deterioration in food security indicators, and that in countries where the number of undernourished increased significantly, the average agricultural growth rate was 0.4 percent per annum between 1990–92 and 1997–99 (FAO, 2003b).

In most African countries, cereals are the staple food and provide the basis of the livelihood of large numbers of small-scale farmers. Increasing the effectiveness of cereal marketing systems is likely to be vital to food security of these households.

### *Implication of poverty in terms of developing countries*

The problem common to most of the developing countries is the prevailing situation of *poverty* and *hunger*. This is an incidence that occurs frequently in sub-Saharan countries where there are a great number of small-scale farmers.

Woube (1987) argues that in order to understand the root causes of hunger one needs to examine the characteristics of poverty. Poverty is understood as scantiness, poorness or neediness. Furthermore, poverty is examined in places where only the few are wealthy. The most common explanation for mass poverty usually refers to a country's or region's physical endowment, where the soil may be rocky or arid. When too many people struggle with such a meagre environment the carrying capacity of the land decreases, the climate deteriorate, and all become poor. However, the nature of the socio-economic and political systems of a country serves as the most realistic explanation of poverty. Alternatively, people are poor because they are exploited over a long period of time. The current situation of poverty in sub-Saharan Africa is a good example of this (see figure 2).



*Figure 2. Progress in poverty alleviation: number of people living in poverty, 1990 to 2015. Source: FAO data and projections*

The present poverty situation in developing countries is not caused by indigenous deficiencies alone, but also by external factors. As such, poverty must be the result of previous economic exploitations, especially where for example in Africa the colonial powers proclaimed their intention to exploit their colonies and used their military and political power for the purpose. Thus, poverty results not from natural resources, but rather through colonial exploitation, landlordism and international economic systems.

Following the above explanation, for example, the reason for the backwardness of agricultural development in developing countries is due to wrong economic policy followed earlier. During the 1950s and 1960s it was widely believed that only industrial growth could deliver economic development in developing countries. As a result, industry was protected while agriculture was heavily taxed or afforded low priority. By the end of the 1970s, there was increasing emphasis on the structural reform of economies. It was hoped that privatisation, the liberalization of internal and external trade, lower taxes and reduced government intervention would produce higher economic growth and reduce the bias against structure.

These measures have been widely adopted. However, there is little evidence to show that they have done much to increase growth, either in gross domestic product (GDP) as a whole or in agricultural GDP. This suggests that badly needed though they were, these measures are not enough in themselves and need to be supplemented with other policies. These are constraints typically faced by the African agriculture.

Moreover, the potential for agricultural growth to alleviate rural poverty in the developing countries is exemplified by the fact that, on average, agriculture employs about 75 percent of the total labour force (over 80 percent in several cases) and that the percentage of poor in the rural areas is generally much higher than in the urban areas (see table 1). Hence, agricultural growth can increase the income of the poor both directly, through input, output and expenditure linkages with non-farm productive activities in the rural sector (FAO, 2002b).

*Table 1. Rural and urban poverty in selected least-developed countries (LDCs) (percentage of total rural or urban population). Source: IFAD Rural Poverty Report 2000, Rome (2000).*

Country/Region	Year or period	Poverty	
		Rural	Urban
<i>West and Central Africa</i>			
Burkina Faso	1998	50.7	15.8
Chad	1985–1986	67.0	63.0
Guinea-Bissau	1991	60.9	24.1
Mauritania	1996	58.9	19.0
Niger	1989–1993	66.0	52.0
Sierra Leone	1989	76.0	53.0
<i>East and Southern Africa</i>			
Ethiopia	1994–1997	45.9	38.7
Lesotho	1993	53.9	27.8
Madagascar	1993–1994	77.0	47.0
Uganda	1997	48.2	16.3
Zambia	1996	74.9	34.0

The above-mentioned fact is similar to the situation in Africa where more than 80 percent of the continent's poor live in rural areas who earn their livelihood mainly by means of farming. According to Haggblade et al. (2004) even those who do not live in

rural areas will depend heavily on increasing agricultural productivity to lift them out of poverty. 70 percent of all Africans and nearly 90 percent of the poor work primarily in agriculture. As consumers, all of Africa's poor both urban and rural count heavily on the efficiency of the continent's farmers.

## **On cooperation and the concept of co-operatives**

### *Background*

The point of departure for considering co-operatives as a tool for poverty alleviation in sub-Saharan Africa is basically on account of the remarkable results achieved by their activities globally in the socio-economic life of people. Indeed, co-operatives have quite naturally been faced with problems as have other forms of business undertakings.

The basic conception of cooperative activity in any country and circumstances is that cooperation is economic activity, aiming at assisting members of cooperatives to procure such commodities and services which they think necessary when taking charge either of their domestic households or of their occupation or trade.

The individual contribution of any one member in the supply of services with the aid of the co-operative remains smaller than when standing alone. Cooperation, then, is in a certain sense the outcome of the division of labour. The principles of cooperation and the practical activity of co-operatives are always interrelated (Tenaw, 1995).

The aim of co-operative formation is to offer an opportunity for local people to take development into their own hands and make it a meaningful concept at the local level. Co-operatives have arisen, too where the cost of adjustment to economic change has threatened to destroy communities, where local people needed power to control the pace and direction of change in order to preserve what they valued.

Co-operative development is an important part of the developing countries rural development policy. The strengthening of the rural institutions has become one of key areas in the rural development efforts; the most important of these institutions is the co-operative movement.



### *The co-operative response to poverty alleviation*

The root causes of poverty and the impact on agricultural development in developing countries was mentioned earlier in this paper. In general, the key to overcome the problems of poverty lies in improving the living conditions of the masses of the rural population.

The co-operative enterprise is the only form of organization meeting so fully all dimensions of poverty:

- *Opportunity:* Co-operatives through their capacity to involve all sectors of the economy, represent a means for the poor to identify those opportunities. For instance, co-operatives give farmers, unable to market their products, the chance to get together and enjoy economies of scale. This way, they can obtain goods at affordable prices. To those excluded from classical financial systems, co-operatives give the chance to obtain credit in best conditions and to secure savings.
- Acting through their own organizations, small-scale producers and workers and the poor especially in rural areas, access goods, markets and government services more efficiently aimed at improving their livelihoods and undertake other self-help action to improve their communities.
- *Empowerment:* Co-operatives are a means through which empowerment of disadvantaged people is possible. Their democratic organization, based on their “one member, one vote” rule, and the active participation of their members, give to every one the possibility to defend its own interests.
- *Security:* Co-operatives allow people to convert individual risks into collective risks by putting together members wishing to protect themselves from the same risks at an affordable cost. In addressing risk and vulnerability, co-operatives have an impact upon poverty reduction. For instance, through co-operatives, rural people elect their own resources to improve their livelihoods and their communities and learn the value of cooperation. This reduces the risk of conflict and the growth of more stable and democratic institutions serving the interests of rural people (ICA & ILO, 2005).

*A note on co-operative structure and operation in Africa*

Cooperation is not new to the African environment, because cooperatives which usually are called informal (unregistered) and formal (officially registered) have basically the same task and objectives and are very dominant ones. Co-operative operation in Africa can be discussed from two perspectives:

Informal co-operatives: mode of cooperation in the African traditional context based on the principle of giving supporting hand to people living in neighbourhood. In Ethiopia, for example, rural people usually small-scale farmers conduct such collaborative work when it comes to crop harvesting, when money saving is needed and when it comes to wedding or funeral ceremonies. Such traditions lasted long and happen to exist to this day merely because they are successful and in getting their objectives.



*Figure 3. Map of Africa. Sub-Saharan countries, members of the International Cooperative Alliance (ICA). The International Cooperative Alliance (ICA) is an independent, non-governmental association which unites, represents and serves cooperatives worldwide. ICA represents more than 760 million individuals.*

Formal co-operatives: In various parts of Africa, the formal types of co-operatives have been in existence since the early years of the 19<sup>th</sup> century. Consequently they have operated in pre-independence and post-independence periods, as well as in a variety of political and economic situations. Their activities in rural areas include the distribution of improved seeds, fertilizers, pesticides and water for irrigation; the granting of agricultural loans; and the collection, transport, storage, processing and marketing of agricultural produce.

Indeed, in spite of the facts mentioned earlier concerning the functions and the role African co-operatives have played in rural, agricultural and other sectors of African economies, co-operatives in are facing numerous problems which limit their potential for success. Too much State interventions have characterized many African cooperatives and especially this act has often discouraged the farmers to become fully involved in and committed to the cooperative movement. As such cooperatives in Africa have played marginal role.

### **Case study: Impacts of changes in Agricultural Policy on farmers and modes of co-operative operations in the municipality of Loppi, Southern Finland, 1998–2001**

#### *Background*

It is evident that policy changes owing to either internal or external factors will always have impacts on the structure of the economic activities and livelihood of people in any society. Apparently, the agricultural sector is particularly sensitive to policy changes and new operating environments.

Since Finland joined the European Union in 1995, immense changes occurred which gradually began to bring impact on different sectors in the entire Finnish society. In particular, the integration process of the Finnish agriculture to the EU's Common Agricultural Policy (CAP) brought new phenomenon in the structure of Agricultural Policy which ultimately affected the agricultural entrepreneurs. Especially as the economic situation of

the small-scale farmers began to decline, there was a sign that the possibility for them to earn livelihood by means of farming was likely to be hampered. Additionally, significant structural and operational changes were observed in the producer co-operatives.

On the basis of what was said above, thus a research study was conducted in 1998–2001 in the municipality of Loppi located in the Province of Southern Finland, in the Region of Kanta-Häme. The aim was to investigate what new ideas could be produced in the context of the new co-operatives in order for the farmers to explore new ways of diversifying their livelihood.

The reason for referring to new co-operatives is because in the mid-1990s, there was a strong increase in the number of new co-operatives alongside the traditional Finnish co-operatives. Nowadays, in Finland there are about 2200 new co-operatives operating in various sectors. Especially in rural areas, new co-operatives in the fields of supply, marketing, tourism and energy were established which has enabled the rural residents and farmers to diversify their means of livelihood.

## **Summary of the research results**

In order to carry out the field research, the sample areas and the farmers to be surveyed were selected with the help of the local agricultural advisor. Altogether 281 active farmers under the age of 60 living in 18 different villages in Loppi were involved in the research study. Questionnaires consisting of a set of questions relevant to the research theme were sent out to the target groups. In all, 108 responses, which is 38% of all the questionnaires sent, were returned.

### *Farmers' knowledge about the new co-operatives*

In principle, it is presumed that Finnish farmers have some knowledge about the role of co-operatives due to their involvement in their everyday life. As a first step, the study focussed on investigating the farmers' knowledge about the new co-operatives, in what respect they differ from the traditional co-operatives and to what extent they are utilized by the farmers in the sample areas.

On the basis of the research results, the new co-operatives were unknown to a large number of especially the small-scale farmers in the sample areas. At the same time, the farmers' understanding of the differences between the new and the traditional co-operatives differed tremendously.

From the point of view of the farmers, quite many of them have experienced the traditional co-operatives as hard and unnecessarily large, covering a wide range of activities. In spite of this, however, some of the farmers were strongly of the opinion that the traditional types of co-operatives are enough for the rural areas. They were convinced that the new co-operatives could be used in urban areas, in towns and big cities.

On the other hand, the vast majority of the farmers expressed their positive attitude towards the role of the new co-operatives and issues related to local level decision-making process as well as channelling services of the new co-operatives based on the local demand. As for the utilisation of the new co-operatives, the majority of the farmers were of the opinion that the new co-operatives were of no use. It can be concluded that quite many of the respondents lacked knowledge about the new co-operatives as essential means of diversifying the farmers' sources of livelihood at the local level.

The few farmers who replied that they made use of the new co-operatives had the opportunity to receive knowledge about the new co-operatives at advisory meetings, where they were told that the new co-operatives were one possible way of exploring other sources of livelihood. Actually they were strongly of the opinion that via the new co-operatives it is possible to promote the joint acquisition of agricultural implements, product marketing and sales. Above all, it was clear to the farmers that the new co-operatives will help to increase cooperation, acquire knowledge and make it possible to establish new contacts with other people.

### *Training course on the new-cooperatives*

The agricultural sector is not the only means of livelihood for the farmers in the sample areas, especially for the small-scale farmers, and thus, the new co-operatives can be one possible way of creating new employment opportunities in the future. This idea can be best implemented by the provision of the necessary training and advice to the farmers at the local and regional level.

As part of the study's programme, training course on co-operatives was arranged for the voluntary farmers in order to provide them with basic knowledge about the concept and role of new co-operatives in diversifying the economic activities in rural areas. At the end of the course, the participants initiated several ideas and made plans both in groups and on their own to establish new co-operatives in different fields in order to provide employment opportunities for themselves and other local people. This operation was highly successful. Whenever ideas for the establishment of new co-operatives are initiated from the real local needs, there is no doubt that it lays on a sustainable basis.

Finally, the study showed clearly that development at the local level and interaction among the target groups, decision-makers and researchers is of primary importance in gathering information so as to pinpoint the potential human or natural resources which could bolster the sustainable development of agriculture and the rural areas (Tenaw, 2001).

## Conclusions

Self-sufficiency in food production can be guaranteed when agriculture is practised on the basis of reasonable policy and optimal system. In this regard co-operatives play a significant role. A good example of this is the Finnish producer co-operatives which have now reached their "golden age". This is due to the fact that the operational pattern of co-operatives generally has been based on a bottom-up approach.

The present food production system in many sub-Saharan African countries is such that much of the food supply is produced by small-scale farmers owning less than 5 hectares of arable land and with 75 percent or more owning less than one hectare. This might be a reason for the creation poverty problem to which attention should be drawn to in terms of co-operative movement.

In order to give a brief outlook of the situation in the developing countries, a number of issues in respect to agriculture, food security, poverty and co-operatives were brought up earlier in this paper. The cooperation aspect and the role of informal and formal co-operatives in sub-Saharan Africa as well as the Finnish co-operative case example were mentioned in connection with the discussion of poverty alleviation.

Finland has assisted co-operative development in Africa in order to enhance participation of small-scale farmers in co-operative activity and encourage poverty alleviation. This can be explained by past accomplishments as follows:

Bearing in mind the fact that co-operatives in Africa will have to develop their own specific structures in order to be fully accepted by the local community and to fit into the environment has been discussed during the two internationally important co-operative seminars arranged by Finnish institutions: Rural development and the Challenges to Developing Countries held in Helsinki, Finland, 1992 and the Role and Potential of Rural Co-operatives in Liberalizing Economies of Africa held in Harare, Zimbabwe, 1993.

Through the recommendations and resolutions of the seminar, it was possible to spread the message that co-operatives in Africa must operate as self-help organizations at the local level, administered and controlled by the members whose interests they were created to serve such as the small-scale farmers. Only then can co-operatives become effective agents of socio-economic change.

Self-help is not a strange life style for the vast majority of the rural people in Africa. In fact, without even being poverty and hunger stricken, rural Africans by nature have adapted the tradition of sharing with each other and cooperating through family ties in their communities (ref. earlier discussion on informal and formal co-ops).

In reality the dilemma is that in several African countries, where there is too much State intervention and domination not only on co-operatives but on agriculture too, administration of co-operatives follows the path of misadministration in that co-operatives are not allowed to operate in liberalized and democratic environments. Therefore, unless co-operatives in Africa are established on a democratic basis for self-help purposes as in Finland (ref. Loppi research project), the poverty problem will be increasing.

The poverty problem among the small-scale farmers in sub-Saharan Africa is immense. In order for co-operatives to be effective, there is need for them to change their current institutional set-ups. Co-operatives should be rooted in communities and respond to their members and the interests of their communities. This would enable them to respond to the current socio-economic and poverty problems faced by the small-scale farmers presently. With the increased independence and efficiency of operation, the co-operatives in sub-Saharan Africa countries have the ultimate potential of alleviating poverty.

## References

- FAO 2002a, The role of agriculture in the development of LDCs and their integration into the world economy, 125 p, Rome.
- FAO 2002b, The role of agriculture in the development of LDCs and their integration into the world economy, 125 p, Rome.
- FAO 2002a, World agriculture: towards 2015/2030 Summary report, 97 p, Rome.
- FAO 2002b, World agriculture: towards 2015/2030 Summary report, 97 p, Rome.
- FAO 2003a, Trade Reforms and Food Security Conceptualising the linkages, 263 p, Rome.
- FAO 2003b, Trade Reforms and Food Security Conceptualising the linkages, 263 p, Rome.
- Haggblade, S. et al., 2004. African Agriculture: Past Performance, Future Imperatives, in: currents No. 34, pp 7–11, Uppsala.
- ILO & ICA, 2005 The Global cooperative Campaign against Poverty Cooperating out of Poverty, 29 p, Geneva.
- Siam, A. & Valdès, A. 1984. Food Security in Developing Countries, in: Eicher, C. K. & Staatz, M. (ed.): Agricultural Development in the Third World, pp 189 – 206, USA.
- Tenaw, S. 1995. Time is For All, 157 p, Helsinki.
- Tenaw, S. 2001. Impacts of the Common Agricultural Policy on the Development needs of Co-operatives and Advisory services – a case study among farmers in Loppi in Southern Finland, 47 p, Helsinki.
- Woube, M. 1987. The Geography of Hunger, Some Aspects of the causes and Impacts of Hunger, 49 p, Uppsala.



### 3.5. Forests

#### *Global Forest Ethics Network*

*Reijo E. Heinonen*

*Initiated by the University of Joensuu*

*E-mail: reijo.e.heinonen@jippii.fi*

#### **The genesis of the initiative**

The idea to establish a global forest ethics network was developed over several years in connection with the international global ethics discourse. There are also some conferences on global ethics in Finland which encouraged thinking about applications of international common ethical principles.

In connection with the Joensuu International Song Festivals 1997 a seminar was held on “Ethical World Order” which aimed to define the national commitments to cement contributions. One of the most interesting speakers was Elisabeth Rehn, the UN human rights observer in Bosnia. She pointed out how small and almost trivial things might inflame violent conflicts, but how small, positive things can also create confidence and release tensions. She spoke about ordinary football games between Serbs and Bosnians. As a sign of hope after the horrific atrocities she mentioned a marriage of a Serb-Croatian couple. Small happenings which can change much.

The Minister of the Environment, Pekka Haavisto, stressed the important contribution of ethical basic values in environmental decision-making. In every concrete proposal to improve the environmental responsibility, there are valuable alternatives which should be noticed in order to make a conscious decision.

This conference made it clear that for global ethics to have an impact on international environmental policy, it must be transformed to alternatives in concrete cases. The debate in 1990 on the protection of forests and the problems on cop downs of Carelian forests gave material to this kind of reflection.

Following a lecture on global ethics, Professor Paavo Pelkonen asked me what the common global ethical principles accepted in every great culture of the world, would mean in the context of forestry. In many places of the world we meet conflicts between the cultural and religious values of the people caused by cop downs of trees. Not only Aborigines are aware of the large variety of values which are connected with forests but also in industrialized civilizations spiritual sensitivity has arisen as highlighted by the green movement. This means that forests should be assessed not only from an economical point of view, but also from a social and existential aspect.

It seemed not to be enough to repeat the concept “sustainable development” with its four dimensions: economical, ecological, social and cultural. The cultural dimension which came to supplement this concept after the Rio Summit 1992 is not clear enough to stress the importance of an ethical standpoint in decision-making.

In its report “Our creative diversity” (1995) UNESCO suggested that sustainable development should mean also a “culturally sustainable development”. 1) As we now know the attribute “cultural” was taken to be the average definition of sustainability, but something important was forgotten. UNESCO stated in its report, that “global ethics” is necessary for a peaceful cultural development. The strong emphasis on ethics laid down by UNESCO in this report unfortunately did not achieve enough international response in order to have an impact on the usual way to define “sustainable development”. This can be seen as one of the reasons why the ethical goals defined in the Rio Summit have not been implemented in a way which could have controlled the widening of the rich – poor gap through globalization. 2) (Ethics & Agenda 21)

In a “Seminar on environment and security: sustainable development, durable peace” organized by the Ministry of Foreign Affairs in Finland, 21.–22.1.2002, in Hanasaari, the aim was to prepare the common tasks of the European Union (EU) in the Johannesburg Summit.

In the lecture “Global ethical sustainable development”, I had the opportunity to emphasize the lack of implementation of the ethical goals posed by the Rio Summit.

The great vigor for technological and economical partnership programs showed that if the ethical principles were taken into account there must be solid programs for action, otherwise appeals for ethical principles easily would remain a dead word.

That is why we decided in the Faculties of Forestry and Theology at the University of Joensuu to attempt to convince the Ministry of Foreign Affairs on the importance of arranging of a global forest ethics panel in Johannesburg Summit 2002.

As a result of these activities the panel for Global Forest Ethics was arranged by the Governments of Finland and Indonesia, August 29, 2002, in the Johannesburg Summit (WSSD). In his opening words, Minister Jouni Backman stated:

*“At our age, economic, cultural and ethical values are increasingly interconnected. Internationally, there is a growing conviction that ethic plays a decisive role in integrating sustainable practices for development. Globalization needs a global ethic.”* 3)

In the lecture “Need for a Global Forest Ethics Network”, we challenged the audience to think about what “global interconnectedness” means for ethically responsible forestry. It seemed especially important for us to create a new awareness about the ethical dimensions of forest policy in the realms where the hard values traditionally had ruled.4).

With the help of The Foundation for Finnish Culture it was possible to arrange a follow-up seminar for the Johannesburg Summit focusing on the implementation of the global forest ethic network. The seminar took place 16.–17.10.2003 in Mekrijärvi Research Center of the University of Joensuu by Ilomantsi in North Carelia. The theme of the seminar was “Metsät ja ettinen argumentaatio” (Forests and Ethical Argumentation), an interdisciplinary meeting aiming to prepare an international conference for forest ethics.5) The question was asked what ongoing globalization means in the forest sector and what are the values of conflicts we will face in the future. The seminar was aware that rhetoric on ethical issues can easily lead to instrumentalization of ethics for various aims, profit making etc. One way to avoid this is to stress the variety of values aside from economical values and point out the social and existential meaning of forests.

Representatives from 18 nations participated in the Berlin Conference “European Forest in Ethical Discourse”, 18.–19.1.2005, thus demonstrating the urgency of the topic.

John Attfield pointed out in his lecture, the necessity to promote the initiative of Maurice Strong and Michael Gorbatshev in the “Earth Charter”, which attempts to articulate ethically important ecological problems and encourages to remember the spiritual capacity of humans to overcome global challenges

It was decided to continue the discussions, on a global perspective, in South Africa.

## Concept of forest ethics

Ethics means in this context critical reflection on the relationship between the moral codes defined by the society and morality, which can be seen as their situational application. As the basis of the moral codes set by various societies there can be found some common ethical principles on which there is a consensus, “consensus gentium” eg “respect for life”, “golden rule” and ten commandments. These principles are broken time and again, but attempts to undermine them usually turn out to be counterproductive. The contraventions cannot invalidate the basic rule: ”abusus non tollit usum”. The forest ethics discourse and applications take, as starting point, these global ethical principles and norms and attempt to ask, what they should mean for the solutions of our recent problems concerning forests.

Questions raised in forest ethics discourse converge with bioethics and environmental ethics. (They are described in the figure with three concentric circles.) They are transforming, differentiating and becoming timely in a new way in scientific studies. One of the common questions posed is how genetic engineering is affecting the balance of nature. What are the effects of products produced by genetic engineering to the health of people and to the interaction of vegetation? Forest ethics combine problems on climate change, soil pollution and conflicts caused by lack of water resources, which are also concerned by bioethics and environmental ethics. In all of these three types of ethics the values conflicts can be derived from three realms of values: from economic, “having” values, from social “loving” values and spiritual “loving” values. (See the figure). The task of forest ethics is to identify the key values conflicts (perhaps: “having” values of industry contra “being” values of environmentalists) which reflect further their effects on other values conflicts of environmental policy (perhaps: “loving” values of families of foresters contra “being” values of environmentalists).

This means that forests, nature as a whole and environment with its social dimensions should be understood as a whole, a culture and an ecosystem. They are in many ways interconnected and need to be assessed in this relationship.

From the four dimensions of sustainable development (ecological, economical, social and cultural) outcomes demands towards forests ethics, bioethics and environmental ethics.

They are sometimes inconsistent, however, and seldom have an articulated, ethical point of view which could combine these four dimensions. How should for instance “human solidarity” from a point of view of “ecologically sustainable development” be interpreted in forests ethics, bioethics and environmental ethics. (See figure 1)

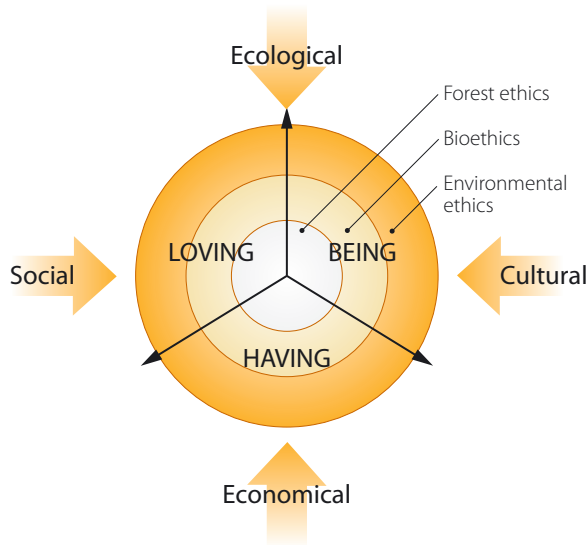


Figure 1.

None of the ethical codes of various professional groups can alone safeguard an acknowledgement of the ethical viewpoint if the critical discourse has not previously taken place.

International agreements on environmental and bioethical issues, bring new material and new questions. These should be taken into account in the global forests ethics network. The environmental problems of China are reflected throughout the world. This emphasizes the necessity of international co-operation in resolving these problems. When forest resources become scarce in China, illegal logging will take place in other parts of the world. The fast economic growth of this country, the expanding gap between rich and poor, the migration from country to cities and the increasing environmental problems of cities, are not only a problem for China but a global one.

We live in a process of change in global dimensions, which impacts also on the discourse concerning the role of forests in the ecosystem.

## Notes

Our Creative Diversity. Report of the World Commission on Culture and Development. Paris:WCCD 1995, 24. 'Culture then is not a means to material progress:it is the end and aim of 'development' seen as the flourishing of human existence in all its forms as a whole.'

Noel J. Brown, Introduction. In:Ethics&Agenda 21. Moral implications of a Global Consensus.New York:UNEP 1994,2.

Jouni Backman, Opening words:Panel for Forest Ethics. In:Forest Ethics inspired by the Johannesburg Summit 2002.Ed. Antti Erkkilä, Paavo Pelkonen.Joensuu: University Joensuu Faculty of Forestry 2004,7.

Reijo E. Heinonen, Paavo Pelkonen, Olli Saastamoinen, Need for a Global Forest Ethics Network.In:Erkkilä,Pelkonen 2004,9-16.

Metsät ja eettinen argumentaatio. Toim.Antti Erkkilä, Reijo E. Heinonen, Olli Saastamoinen..Silva Carelica 42 . Joensuun yliopisto 2004.S.137.

Earth Charte:info@earthcharter.org.

## *Research and Development for Sustainable Land-Use in Dryland Africa: 25 Years of Finland-Sudan Forestry Cooperation*

*Jörn Laxén, Mohamed Elfadl, Vesa Kaarakka and Olavi Luukkanen*

*University of Helsinki*

*Viikki Tropical Resources Institute (VITRI)*

*E-mail: [firstname.lastname@helsinki.fi](mailto:firstname.lastname@helsinki.fi)*

*<http://www.honeybee.helsinki.fi/mmeko/vitri>*

### **Abstract**

Sudan offers a unique example in the history of the Finnish development research and development cooperation. It is a country where research was connected to long-term Finnish development cooperation from an early beginning. It is a country where, because of global political changes, all Finnish and other Western development aid was abruptly discontinued after more than a decade of vigorous activities, forcing the recipient country to continue on its own. However, it is also a country where research cooperation with Finland has now been maintained for more than two decades. This has been achieved despite abrupt development cooperation policy changes, international and national wars and conflicts, and global and local environmental threats affecting the work. Research results from Sudan offer guidelines for natural resources management in other countries of dryland Africa.

Until 1991, when the development aid to Sudan was discontinued, the main responsibility for Finland-Sudan cooperation in the field of forestry was with consultants in the industrial private sector (Enso-Gutzeit company or its affiliates) and with a training consultant (FTP International, Finland). The institutional cooperation between VITRI and various organisations in Sudan started in 1983, continued after the changes in development cooperation policy in 1991, and is now firmly established. The main Sudanese organisations involved as VITRI partners include the University of Khartoum, the Forestry Research Center of the Agricultural Research Corporation (FRC), the national forest service (Forests National Corporation, FNC) and the University of Juba. With these organisations, VITRI has offered training of key senior staff in Finland and established a network of field research sites in Sudan, especially for studying traditional dryland agroforestry and for developing more sustainable land-use systems for production of food, as well as gum arabic and other tree products.

The newest phase of VITRI activities in Sudan, from 2004 onwards, includes implementation of a new CIMO “North-South” academic exchange programme of the Finnish Government with the University of Khartoum, as well as a study commissioned by the Finnish Ministry for Foreign Affairs on public-private partnership in the forestry sector, so as to provide guidelines for more efficient implementation of the UN Millennium Declaration goals in the fields of poverty reduction and environmental conservation.

### **Introduction: background of VITRI and the Finland-Sudan cooperation**

The Viikki Tropical Resources Institute (VITRI) was reorganised under its present name in 2002. However, it was originally established in 1980 as the Tropical Silviculture Unit at the Department of Silviculture (now Forest Ecology) at the University of Helsinki. VITRI’s early history is closely connected with the Finnish-Thai educational and research cooperation that had started in 1966. That was the year when the Ministry for Foreign Affairs of Finland (MFA), as part of its first development cooperation activities, initiated a scholarship programme in which Thai M.Sc. and doctoral degree students in forestry were the most dominant group. Over the years until the early 1990s, a total of about 30 Thai students visited Finland and ten of them completed a doctoral degree at the University of Helsinki. After some of the first Thai doctoral degree holders had returned to their home country, joint field research was initiated in Thailand. This contributed to the formal establishment of the tropical unit at the University of Helsinki in 1980 (Luukkanen and Hakulinen 1991). In the early 1980s, VITRI research activities started in other countries, including Indonesia, Kenya and Sudan.

In 1982 Statcon Oy, a subsidiary of the (then) Enso-Gutzeit company, contacted the tropical forestry researchers at the University of Helsinki. The company was implementing a forest nursery and industrial plantation development project in Indonesia funded by Finnish ODA. It sought VITRI’s assistance for conducting research on nursery techniques and tree species selection. This kind of research support was highly needed as at that time Finnish foresters had not much previous experience in tropical forestry.

VITRI’s involvement in Sudan started a year later after a similar request by Statcon Oy. The Sudan contact proved to be crucial for the future development and specialisation of VITRI research (cf. Luukkanen and Hakulinen 1991). Since 1979 the Finnish company had been in charge of a forestry project which, by 1983, included nursery operations and



plantation establishment in White Nile and North Kordofan provinces in central Sudan. The research objectives were similar to those in Indonesia, but the setting differed drastically between the two countries. The Indonesian sites (first South Sumatra, later South Kalimantan in Borneo) belonged to the humid tropical forest zone, while those in Sudan fall within the arid and semi-arid zones bordering the Sahara desert.

When the Finnish development aid project had started in Sudan, the country's forest sector was virtually at a standstill as a result of low investment and high forest removal combined with an absence of appropriate policies and programmes. The domestic energy supply consisted almost entirely of fuelwood, and as a consequence, the forest resources had diminished to about half of what they had been in the 1960's. The loss of forests and woodlands had affected different land user groups, including the livestock herders. Severe environmental degradation took place, and desertification was conceived as a threat. As a result, numerous multi- and bilateral financing agencies became involved in development collaboration with Sudan in the late 1970's and early 1980's (Ibrahim 2004).

Statcon Oy had been contracted by the MFA to send two forestry experts for one year to Sudan under the framework of a project "Support to Forestry and Forest Industry Sectors". The aim was to identify and prepare project profiles for these sectors. One of the experts studied the logging and wood transport development potential, while the other focused on the gum arabic production potential and provided recommendations on industrial forest plantation establishment. The two Finnish experts were working in central Sudan establishing and undertaking research on Sudanese trials as well as identifying commercial forestry opportunities (Temmes 2002).

From 1981 – 1982 Statcon Ltd. started plantation establishment in North Kordofan and White Nile provinces using the indigenous gum arabic acacia (*Acacia senegal*) and the introduced prosopis or mesquite (*Prosopis juliflora*) trees. This included the setting up of the Um Hager forest nursery near Tendelti, about halfway along the railway line from Kosti to El Obeid and without road connection at that time. The site had already previously been used for tree nursery activities, but a completely new Finnish-designed nursery was constructed for the production of about 1 million tree seedlings annually. A second phase included several studies on logging and transport activities, forest industry development in the Blue Nile province and studies on prospects for pulpwood plantations and rehabilitation of sawmills in Sudan (Temmes 2002).

In 1983 – 1985, afforestation with *Acacia senegal* and prosopis continued and the project was renamed “Sudan-Finland Afforestation Programme” (SAFP). Apart from afforestation in the Tendelti area, fuelwood production in Rahad and Ed Damazin areas in the Blue Nile region was also initiated. Substantial training on tree harvesting and chain-saw operations started in both Finland and in Sudan. The surveys for potential forest industry development in Sudan continued until early 1983, after which the concept was abandoned and the work was refocused on activities related to desertification control and local livelihood improvement. From 1983 onwards, there were tree nursery, afforestation, forestry extension, training and research activities ongoing in the project implemented by Enso-Gutzeit company or its affiliates and partners (Temmes 2002).

VITRI became involved in the Sudan project at the outset of the afforestation activities in 1983 by providing research support to the Finnish consultant (by now Enso-Gutzeit Consulting Oy). Researchers assisted in tree species selection for different sites and supported further development of nursery techniques. Some research was also conducted on soil types and soil hydrology at planting sites, and the ecophysiology, especially as related to water use, of the gum arabic tree *Acacia senegal*. The Finnish ODA project offered annually, from 1983 – 1989, for one or two Finnish M.Sc. degree students an opportunity to travel to Sudan and collect data for their M.Sc. theses, against providing research support for the project.

The Finnish students with their Sudanese counterparts were also able to obtain on-site training in nursery management, dryland afforestation and forestry extension, particularly at and around the Tendelti nursery site in Um Hager village. Several of the Finnish M.Sc. students who prepared their thesis on data from Sudan continued, after this first field assignment and graduation, with a career in tropical forestry and rural development in ODA projects, international development organisations, or with Finnish commercial companies working internationally. Several also became professionals in development research.

In the first year of the fourth phase (1986 – 1988) of the Finland-Sudan programme, two new nurseries were constructed by the Finnish consulting company, at Soba in the Khartoum Greenbelt (with an annual production capacity of 1.5 million seedlings), and at Kosti (for 1 million seedlings annually) in White Nile province. The local population had at first been against tree planting around the first nursery in the Tendelti area, as people thought that trees provided nesting places for birds which eventually destroy the crops by eating the seeds.

This led the project to revise its forestry extension to become more innovative in relation to the local attitude towards trees. In the Tendelti region, a Sudanese extension forester, who had the necessary religious credentials, adopted the role of an Islamic cleric, when he and his Finnish colleague went on extension tours in the surrounding villages. There the Sudanese extension technician first delivered a sermon and then discussed with the villagers about tree planting. The extension team often also showed documentary films and cartoon movies with a portable projector and a generator. These events were appreciated by the villagers all over the Tendelti region. The attitude against tree planting changed to a positive one, and people became interested in growing trees on their land. With support from the forest service (FNC), this formed a strong base of educational programmes for the television and newspapers. These media programmes survived the disruption of Finnish development cooperation work in Sudan in 1991 and they are still alive in the television and other media in Sudan today.

Phase IV of the Sudan-Finland Forestry Programme implemented by Enso-Gutzeit company and its affiliates and partners included a number of training events. In 1986 a four-week study tour was arranged for four Sudanese counterparts to acquaint them with nursery and forest management operations in Finland. In 1986 there was also a visit from the Bura Fuelwood Plantation Project (another ODA project by MFA) in Kenya to Sudan, as both projects were implemented by Enso-Gutzeit and supported by VITRI research. Both projects operated in drylands. Much of the training in the Sudan-Finland Forestry Programme was carried out as on-the-job training of field workers and maintenance and management staff.

The links between research in the two countries, Sudan and Kenya, proved to be important for future VITRI activities. VITRI had its permanent research officer posted at Bura in eastern Kenya for a total of ten years, from 1984–1993. The combined experience from both Sudan and Kenya (where irrigated tree plantations were a central study target) created by the mid-1990s the critical mass of dryland research and development expertise that characterises the VITRI activities today.

During the whole period of the Sudan-Finland programme from 1978–1991, other Finnish researchers than those directly working at VITRI were also active in carrying out work on Sudan and its development problems. Some early studies were made on socio-economic problems (Kelles-Viitanen 1983). The staff of Enso-Gutzeit Oy or its affiliated companies carried out intensive trials on nursery management and afforestation techniques. Especially

the research work done by Kalevi Karsisto was significant. Several comprehensive nitrogen fixation studies on Sudan acacias (later also leading to doctoral theses at the University of Helsinki) have also been completed by a research group led by Kristina Lindström (cf. Elsheikh and Luukkanen 1989, Luukkanen and Hakulinen 1991).

### **International politics reshapes cooperation: the Gulf War leads to intensified forest research for Sudan**

In 1990 the new Phase V of the Sudan-Finland Forestry Programme (SFFP) eventually started after some delay. The programme included the following six sub-projects implemented by EFD (Enso Forest Development Ltd.; a new name for Enso-Gutzeit Consulting Oy), FTP International, and, together, VITRI and the Helsinki University Knowledge Services (VITRI/HUKS):

1. White Nile Rural Forestry Development Project (EFD).
2. Khartoum Greenbelt Rehabilitation, Afforestation on Farmlands, and Support to the Fuelwood Plantations in the Rahad Area (EFD).
3. Support to the Forestry Technicians Division of Sudan University of Science and Technology (FTP).
4. Rehabilitation and Management of the *Sunt* (*Acacia nilotica*) and Upland Forests of the Central Region (EFD).
5. Institutional Support to the Forest National Corporation at Headquarters, Khartoum (EFD).
6. Strengthening of the Forestry Research Centre at Wad Medani (VITRI/HUKS).

The project activities only ran properly for some eight months before the Gulf War broke out. In the wake of this war all activities were forced to cease in Sudan in August 1991. However, the research sub-project implemented by VITRI/HUKS continued in Finland as a doctoral scholarship programme (1991 – 1996) funded by MFA. The institutional support to the Wad Medani unit of the Forestry Research Center, also assigned for VITRI/HUKS implementation, was discontinued.

One reason for continuation of the scholarship programme in Finland was that three Sudanese researchers had already started their data collection and arrived as registered Ph.D or M.Sc. students at the University of Helsinki. Two other Sudanese foresters who

were in Finland based on a small University of Khartoum scholarship joined the new scholarship programme. The result was now a critical mass of Sudan-oriented research to function as a project of its own. The sudden discontinuation of the Wad Medani field activities was more understood as a result from politics in Europe than from any unrest or threats against foreign people in Sudan.

During Olavi Luukkanen's visit to Sudan in 1989, three new research topics were identified and elaborated. Stig Johansson (as acting professor during Luukkanen's leave of absence for consultancy work in Thailand) visited Sudan in 1990 to check on the research progress. The first proposed studies focused on ecology of *Acacia seyal* (Mustafa 1997) and on the management of the introduced prosopis tree in agroforestry systems (Elfadl 1997). In 1991 two more doctoral thesis topics, on socio-economics of *Acacia nilotica* and eucalypts (Sharawi 1997), and on the genetic population structure of the important indigenous agroforestry tree *Faidherbia albida* (Ibrahim 1996), were added to the scholarship programme. The four doctoral theses were completed in 1995 – 1997 and they presented, *inter alia*, the following conclusions:

1. Integration of *Acacia seyal* (a dominant tree in the natural woody vegetation on the eastern clay plains of central Sudan) into rainfed farming systems enhances the natural regeneration of trees. A management model with 24-year tree rotation divided into six compartments allows a sufficient production of agricultural crops and fuelwood and supports well animal grazing.
2. Prosopis contributes to soil fertility and soil organic matter maintenance in agroforestry systems and improves the microclimate, thus promoting food production and the environmental rehabilitation.
3. Pruning and thinning improve the annual diameter growth of prosopis with an average of about 1.7 cm in managed stands. This will yield 15 cubic meters of woody biomass per hectare in about 24 years in 10x10 m spacing, in addition to the agricultural crop production.
4. Management and utilization of prosopis in agroforestry provides opportunities for economic development, combating desertification and poverty eradication. A negative perception of this exotic tree by local people arises from its invasiveness on irrigated agricultural land where its management and control is hampered by conflicting goals by different state authorities, lack of precise information on its management in different situations, and lack of facilities and funding for research.

5. The evaluation of the land-use alternatives, especially *Acacia nilotica* and eucalypt plantations, on floodplain land of the Blue Nile made it clear that natural resource policies can have undesirable or not anticipated impacts with respect to their ineffectiveness in maximising incomes and removing inequalities in income distribution. More attention to the policy-making process is thus required. As expected, deforestation leads to land-use changes from forestry to other uses, but the alternatives are limited.
6. The agricultural sector contributes significantly to development, but it is neither the only way to maximise economic growth, nor does it represent the optimum land-use choice. Among the alternatives studied, eucalypt plantations constituted the optimum land-use on the basis of economic growth maximisation, followed by plantations of the native *Acacia nilotica*, while banana performed poorly with negative contribution in most cases.
7. The choice and implementation of policies and projects should be preceded by thorough policy analysis and by evaluation on their impact on national objectives as well as their environmental impacts.
8. *Faidherbia albida* (Haraz), a tree of wide distribution on the drylands of Sahelian, eastern and southern Africa, and an important species for traditional agroforestry, is characterised by high genetic variability that has resulted in the separation of the species into two ecological races with large differences between Sahelian and southern African types. Southern African genotypes are superior to the Sahelian ones in growth, whereas the Sahelian types are more drought-tolerant. This suggests a great potential of tree genotype selection and breeding that has implications for dryland management and conservation programmes.

The importance of and need for agroforestry for food production and environmental protection on drylands was clearly indicated by these doctoral theses completed by Sudanese researchers working at VITRI. The studies presented practical examples for increasing food production while protecting the natural resource base. Discussions between the Sudanese forest service (FNC) and VITRI emphasised the need to promote practical dryland rehabilitation and management approaches that integrate the objectives of food production with ecosystem conservation, so as to make better use of scarce resources.

Two Finnish researchers from VITRI visited Sudan in 1994 to supervise the Sudanese doctoral students' research trials in the field and also to check the Sudan-Finland forestry programme facilities as they were left after the discontinuation of the development coopera-

tion work in Sudan in 1991. Two of the original three tree nurseries, now run by the FNC, were operational with seedlings produced in plastic tubes instead of Finnish-manufactured container trays. The nursery irrigation systems also appeared fully operational. The Tendelti nursery in White Nile province west of the river was closed in the mid-1990s due to logistic problems (lack of non-saline irrigation water and spare parts), but FNC has managed to keep the nurseries in the Khartoum Greenbelt (Soba) and Kosti (at the White Nile river) running without Finnish or other foreign support up to the present date. The housing facilities and vehicles provided by the Finnish aid up to 1991 are also largely still in use.

The Sudan-Finland Forestry Programme financed by the MFA was, despite the sudden discontinuation of the field activities in 1991, an example of close and fruitful interaction between development, research, human capacity building, as well as North-South cooperation. The Scholarship Programme resulted in training of core high-ranking forestry professionals for academic education, research and national forestry administration in Sudan, as well as M.Sc.-level Finnish forestry professionals specialising in dryland forestry.

### **Third wave of Finland-Sudan research cooperation: multidisciplinary development research**

The Academy of Finland started to fund a new phase of VITRI's research in Sudan in 1998. Partners in Sudan in this research project included the University of Khartoum, the Forestry Research Center of the Agricultural Research Corporation (FRC), the national forest service (National Forests Corporation, NFC), and the University of Juba (which was transferred to Khartoum during the war in South Sudan). The aim was to study traditional agroforestry systems and forest plantations in three environmentally contrasting sites in central Sudan:

1. In Ed Damazin (upper Blue Nile region), where private commercial gum arabic production has been initiated on clay soils previously not used for gum gardens, field trials will test the genetic variation and adaptation of *Acacia senegal*, as well as its intercropping with agricultural crops, such as sesame, sorghum and sunflower.
2. Land rehabilitation techniques for smallholder farming, mainly using plantations of *Acacia senegal* and *A. seyal*, are tested in Dali, on the clay plain between the Blue Nile and the White Nile, where massive land degradation has occurred after failures in large-scale commercial mechanised agriculture. This research is linked

with socio-economic surveys among the smallholder farmers carried out by the University of Khartoum.

3. Domokeya, near El Obeid in North Kordofan State, represents the sandy soils west of the White Nile with well-preserved natural *Acacia senegal* forests used for gum arabic production and agricultural cropping in traditional agroforestry systems. Here the main aim is to develop optimal agroforestry practices for preserving the natural *A. senegal* forests while providing livelihoods for the local farmers.

As part of the new research activities in Sudan, the previous Finnish cooperation with Sudan was discussed and analysed at an international workshop organised by VITRI in Finland in 2003, “*Trees, Agroforestry and Climate Change in Dryland Africa, TACCDA*”. The workshop constituted the final stage of an EU INCO-DEV project implemented by VITRI and aiming at management, policy and research recommendations for the African drylands. Co-sponsors of this workshop were the International Union of Forest Research Organizations (IUFRO) and the European Forest Research Network (ETFRN)<sup>1</sup>.

According to Sudanese views (cf. Ibrahim 2004), the Sudan-Finland forestry cooperation (built until 1991 on the programme mainly implemented by Enso-Gutzeit company and its affiliates and partners) has been the most fruitful international forestry activity in Sudan. Especially the many multi-level training aspects (academic, vocational, on-the-job and extension training) were seen as useful for Sudanese forestry. Forest plantation and nursery operations were also acknowledged as valuable achievements. The still continuing doctoral training of Sudanese researchers at VITRI in Finland (now with Academy of Finland financing) is also highly appreciated in Sudan.

After a one-year total lack of funding, the Academy of Finland continued to finance VITRI’s research in Sudan in 2001–2004. This work was based on data continuously collected from the permanent research sites set up by VITRI and its Sudanese partners in 1998, on soils, gum and crop yields, as well as tree and agricultural crop ecophysiology and water use. As an additional activity, new research was also initiated on participatory natural resource management in and around a selected village in Gedaref State in the Blue Nile region of eastern Sudan.

---

<sup>1</sup> Workshop proceedings, including the final recommendations and summaries of the preceding e-mail discussion contributions are available at [www.etfrn.org](http://www.etfrn.org). Proceedings are also available in CD-ROM edition from IUFRO, ETFRN or VITRI.



In addition to the four doctoral theses earlier completed by Sudanese researchers at VITRI, an additional eight doctoral thesis on Sudan were underway or completed after the start of Academy of Finland-supported research in Sudan, between 1998 and 2005. The general aim for all these theses has been to contribute to dryland rehabilitation and sustainable agricultural and forest production, on lands that are already degraded or under threat of degradation. Another general aim is also to provide guidelines for dryland management elsewhere in Africa.

One of the first new studies (Ballal 2002, Ballal *et al.* 2005) demonstrated how the gum arabic yield is affected by the amount of rainfall, tapping date and the management regime applied. Optimal management regimes for gum gardens (in natural forests or plantations) for the western sandy soil regions were also developed. These results can be used for improving the gum arabic yield through management interventions and for predicting the gum yield under different conditions. These results also show that the production of gum arabic in western Sudan is less risky than that of agricultural crops. The intra-specific variation in gum yield can be addressed through genotype selection or tree breeding.

A second study (Gaafar Mohamed 2005) focused on the relationships between water use of gum arabic trees or agricultural crops and the gum yield, in agroforestry systems. Previous studies had indicated that the gum yield was below the physiological potential, possibly due to limited water availability or water uptake by the trees. The water supply can then be improved by reducing the competition between trees, or between trees and agricultural crops, or by increasing the availability of water by collecting it with microcatchments.

Increasing the gum yield per tree and per unit area and reducing the associated unit cost of production is an important factor for sustained production and competitiveness in the global gum arabic market. Trees grown in low-density stands produce more gum compared to those grown at high densities, with considerable variation in water use and uptake. Present studies show that when trees and agricultural crops are intercropped, sorghum as a crop plant increases the gum yield of the trees more than karkadeh, a local crop for producing a traditional herbal drink (Gaafar Mohamed 2005).

Genetic improvement and silvicultural practices are also important strategies for achieving higher gum arabic yield. Selection for high-yielding and well-adapted tree genotypes and delineation of seed transfer zones are potential management measures. Earlier, many of the established plantations failed to grow to maturity, possibly due to poor genetic

quality of seed that led to poor adaptation and drought resistance of the trees (Sawsan 2003). Subsequent studies related to water availability and tree and agricultural crop root development, separately on sand and clay soils, may answer some of these queries. Subsoiling or other soil working methods seem to have no effect on tree seedling survival in sandy areas, whereas on clay these methods may reduce the mechanical resistance to root and thus increase the uptake of water and nutrients.

At an early stage of agroforestry system management, *Acacia senegal* has no detrimental effect on crop yields (sorghum or sesame), and it is possible to combine *A. senegal* trees and agricultural crops to efficiently maximise water use and nutrient cycling. However, patterns of resource capture by trees and crops may change as the system matures. At a stocking of 400 trees per hectare, *A. senegal* clearly improved the soil fertility and contributed to the maintenance of the soil organic matter (Raddad, unpublished).

According to another study, on community-based participatory approaches in Gedaref, the Blue Nile region in eastern Sudan, there are different patterns of resource allocation for different categories of farmers (smallholders, farmers in large mechanised schemes, and collaborative reserve farmers). The different preferences of different community groups should be taken into account when the aim is effective land rehabilitation by the local communities. Policy should focus on means of participation and on raising the technical efficiency. Selective policy interventions are needed according to target groups and their environment, and also for improving the local-level capacity to manage the resources (Glover 2005).

Community participation and private-public partnerships have become more important approaches as the Forests National Corporation (FNC) has realized that it lacks the capacity to alone manage the national forest reserves. At present, natural forests classified as reserved forests (and thus, in theory, managed by the State alone) can hardly be protected against illegal and destructive uses. However, in some promising cases the local communities have already become true forest managers, and this example could be followed elsewhere in Sudan and other countries (Glover 2005).

## **Emphasis on poverty reduction**

The development research funded by the Academy of Finland supports the Finnish Government decision-in-principle on development cooperation (MFA 2004). The latest re-

search project carried out by VITRI in Sudan from 2005 onwards with support from the Academy of Finland, “*Trees, agroforestry and livelihoods in dryland Africa, TALDA*”, also covers most of the objectives of that development policy document and focuses specifically on poverty reduction and combating of global environmental problems.

The objectives of the decision-in-principle paper are development objectives and not research objectives *per se*. Fig. 1 presents in a simplified way how poverty reduction is in the ongoing VITRI project linked to forests and trees and how these can be incorporated into sustainable livelihood strategies for the rural population. The ongoing research will, apart from generating scientific knowledge that directly changes existing management and policy practices, also contribute to equity, equality, democracy, human rights and good governance.

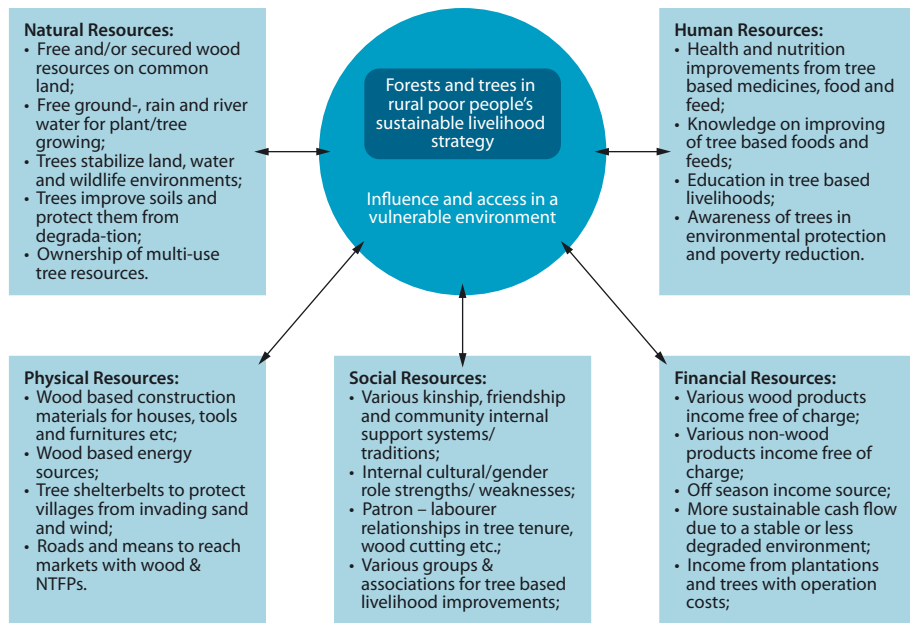


Figure 1. *The link between poverty reduction and forests and trees from rural people's point of view.*  
(J. Laxén 2004)

The role of trees and forests in poverty reduction, sustainable agricultural production and improvement of food security is widely acknowledged (CIFOR 2002, Dubois 2003, FAO 2003, VITRI 2003). In rural areas, trees and forests provide direct benefits and uses to the poor people, with significant contribution to their livelihoods, including

firewood for cooking, poles for building and agricultural implements, fodder, gum and many other non-timber forest products. Trees also yield fruits at low cost on marginal lands and even under extreme climatic conditions and thus can save lives at times of famine and food scarcity. Trees increase the supply and availability of nutrients in the soil through nitrogen fixation, provision of organic matter, improved water infiltration and storage, enhanced nutrient cycling, reduced erosion and leaching, and improved soil structure and biological activity. Trees and forests also create a favourable microclimate for plant growth and increase crop production (Elfadl 1997, Tilman 1999, Altieri 2002).

The main components of the ongoing VITRI research in Sudan are presented separately below.

*Agroforestry systems for soil improvement: gum gardens on clay soils.*<sup>2</sup> Previous research by VITRI and FRC on clay soils in Ed Damazin, the Blue Nile region, since 1998, showed that yields of crops and gum arabic can be increased by improved management (Raddad, unpublished). This experience will be utilized for development of low-cost, sustainable and high-yielding gum gardens capable of reversing the trends of land degradation, as well as of reducing poverty and promoting food security (cf. Ballal *et al.* 2005).

Research work also continues on the clay plains at Dali, between the Blue Nile and the White Nile, for studying the soil nutrient balance over time and the role of trees in land rehabilitation for farming purposes.

The data from these two sites will be pooled so as to be able to examine the effect of trees and crops and their different combinations on soil fertility. This will potentially provide immediate results for the benefit of tens of thousands of local small-scale farmers in need of land management guidelines especially in the Dali area. The two data sets together, combined with the separate socio-economic survey conducted by collaborating researchers at the University of Khartoum, can then give a more comprehensive view on soil processes and intercropping dynamics over a full, approximately 25-year, tree rotation.

*Environmental and socio-economic analysis of an alien invasive tree species.* Another doctoral thesis<sup>3</sup> focuses on prosopis (*Prosopis juliflora*), a tree originating from Tropi-

---

<sup>2</sup> Research by Elamin Y. Raddad.

<sup>3</sup> By Jörn Laxén.

cal America and introduced in Sudan since 1917. The tree can grow under low rainfall and on different types of soils. It can outperform all other species on nutrient-deficient soils. It can also provide commercially useful products that are both traded and used locally, particularly by the poor, landless people. Prosopis can also be used for sand dune and soil stabilisation, windbreaks, shelterbelts and shade functions (Pasicznik *et al.* 2001). Many properties of prosopis appear to have potentially positive environmental, economic and social significance that also includes contribution to mitigating the effects of climate change (Laxén, unpublished). Because of the potential risks of this tree species as an invasive alien tree, however, a Presidential Decree from 1995 urges its complete eradication in Sudan (Elfadl 1997).

New research on prosopis at VITRI aims at defining its overall risks and benefits. Environmental and socio-economic methods (AsDB 1996, Hanley and Spash 1998, Abeygunawardena *et al.* 1999, Gernea 1999, Campbell and Luckert 2002) are combined in order to also analyse the role of prosopis in combating desertification and poverty, and for determining non-market values for the tree in Sudan. The research is based on household surveys, satellite image interpretations, as well as on existing data from other sources. The research sites are the New Halfa Agriculture Scheme in Kassala State on clay soil, and Shendi rural areas in Nile State on sandy soil.

*The role of rural women in forest-based land rehabilitation in North Kordofan State.* Land degradation affects negatively the livelihoods of the rural people and contributes to increased poverty, particularly when the choice of agricultural crops is limited and there are fewer trees and less grass for grazing available (Olsson 1993, Stiles 1995, Warren 2002, UNCCD 2003). An additional doctoral study<sup>4</sup> at VITRI focuses on the role of women as natural resource managers, e.g. as agricultural producers or firewood collectors. Their knowledge and skills can be used in forest and tree-based rehabilitation of degraded land. The study is based on qualitative research methodology, and the focus is on people's perceptions and interaction with their environment. The study compares a group of sedentary farmers and a group of nomadic pastoralists. The bulk of information on local people's environmental perceptions and their environmental behaviour is collected by interviewing the local people individually. The interviews are complemented with general observations and group discussions, key-informant interviews, and mapping exercises.

---

<sup>4</sup> By Anu Eskonheimo.

*Biotechnology for management improvement and gene conservation in date palm.* Still another doctoral thesis<sup>5</sup> focuses on the date palm, which is a long-living crop tree of significant economic importance in Sudan and North Africa. There is a general lack of understanding of the genetics of the date palm. This information is needed for evaluation and manipulation of the genetic diversity within the gene pool to achieve sustainable production and gene conservation.

In Sudan there are about 400 varieties and strains of date palm producing dry, semi-dry and soft types of dates grown in diverging ecozones especially in the northern part. The general policy of Sudan is now to improve the date production in northern Sudan and to spread the date palm cultivation to eastern and western Sudan. This will add a high-value food crop to the area and play an important role in reducing desertification and occurrence of famines. The present characterisation of date palm cultivars in Sudan uses different approaches that include morphological traits and molecular markers, drought-adaptive traits, and physiological adaptation to water stress (Li 1999, Appiah 2003).

## Other ongoing project activities with Sudan

*Public-private partnerships in forest-sector development.* As a separate commissioned research project funded by the MFA, VITRI, in collaboration with its Sudanese partners has started extracting information related to public-private partnership in forest resource management, drawing on existing data sources in Sudan and on previous VITRI work. This study is particularly appropriate in Sudan, because of the different types of collaborative forest management initiatives that have been in use for a long time in many parts of the country. The work in Sudan forms part of an overall study on land tenure systems, property rights and forest-related land use that also covers Kenya, Laos, Mozambique, Nepal, Tanzania and Vietnam. It aims at presenting the potentials of public-private partnership in the management of forest resources. The forthcoming results will include recommendations also for the benefit of other countries involved in Finnish ODA.

Examples and case studies of well-run and less successful public-private partnerships are being analysed. Results will allow differentiation between problems in policies and those that arise from practical implementation. They will also provide guidelines and options for

---

<sup>5</sup> By Sakina Elshibli.

outsourcing and decentralisation of forest management from the exclusive domain of the state, for better supply of forest and tree-related benefits and services. This also includes functions traditionally covered by governments, such as law enforcement and forestry extension. Recommendations will also be made towards fulfilment of national obligations in respect to global environmental and forest-related conventions, agreements and processes.

*North-South higher education exchange.* The University of Helsinki has expressed a strong wish to maintain and develop contacts with African universities. Exchange of academic staff and students is essential in such contacts. The University of Helsinki (through VITRI) and the University of Khartoum in Sudan have since 2004 been involved in exchange of teachers and students in forestry, within the framework of the “North-South” programme funded by the Centre of International Mobility (CIMO) under the Finnish Ministry of Education.

The visiting periods are typically 2–3 and 4–6 months for teachers and students, respectively. The teachers participating in the exchange give lectures, attend seminars and supervise M.Sc and Dr.Sc theses. They also participate in the development of curricula and joint research projects. The student exchange strengthens the personal self-esteem and self-awareness of the participants. Care is taken to include both male and female students in this exchange. The exercise will also promote South-South cooperation by exposing teachers and students arriving to Finland to methods and approaches used by researchers and students from other developing countries presently residing in VITRI.

The “North-South” exchange will further develop the relationships between the collaborating institutions which both benefit from the course contents and curriculum of the other. The isolation of Sudan from the international scientific community for political reasons has had implications on the quality of education in the country. The ongoing programme will give new opportunities to the students and teachers of the University of Khartoum to access information that is now urgently needed in the post-war reconstruction and institution building of the country.

## Conclusions

The history of development and research cooperation between Finland and Sudan in the field of forestry and dryland management already extends over a period of more than 25

years. This cooperation has resulted in positive impacts on both research and development in the recipient country. These positive impacts may be, in relative terms, among the highest achieved in Finnish bilateral aid programmes. Lessons learned from Sudan are thus relevant for Finnish international actions in the future.

A key for successful development research is its linking with actual development work. In Sudan, research was intimately connected with a development cooperation project from an early beginning. The initial emphasis of research was on narrow technical and silvicultural management problems that were easy to solve even for inexperienced researchers. Only later there was sufficient capacity to tackle complex problems requiring multidisciplinary approach.

The perhaps most important lesson learned from Sudan is the importance of human capacity-building. The Sudan-Finland Forestry Programme – from 1978–1991 mainly implemented by a Finnish commercial consulting company – was unique in putting much emphasis on training. This training was done at all relevant levels, extending from teaching of tree nursery labourers at their workplace to intensive training of professionals in formal vocational training and in academic degree studies up to doctoral degrees.

Different levels of training were the responsibility of different Finnish or international organisations working in cooperation with the main consultant, each specialised in a particular type of training support. The total number of forestry professionals trained for Sudan with Finnish development aid on intensive formal courses exceeds 70. Peculiar for Sudan was the fact that those trained in the programme had positions in their home country where they were able to use their improved skills. Training also included key decision-makers in forestry administration, research and education. Later this allowed research results to be easily applied for management or policy improvement. This last feature still characterises the research carried out in Sudan.

Until 1997, the main support for development research carried out in Sudan came directly from the Finnish Ministry for Foreign Affairs. This was crucial for achieving successful results. This fact should also be kept in mind when new strategies for development research and its financing are planned in Finland. Support from the Academy of Finland alone would not have resulted in similar outcomes, and especially the training of Finnish professionals for practical development work would not have been possible without direct MFA financing. The current situation, with a heavy reliance on the Academy of Finland for research in Sudan, is clearly not optimal.



Much of the human resource that was once well trained by the bilateral MFA project is still available both in Sudan and Finland, for instance, for development work in land rehabilitation and the production of food and other livelihood necessities. In Sudan, this would be particularly urgent now when Finland, the EU, and the whole international community are opening up the development cooperation with the country after a gap of nearly 15 years. Mobilisation of all available resources is especially needed for South Sudan, after the end of a prolonged civil war, and for other regions in the country once the still ongoing conflicts are solved.

Most of the development research carried out in Sudan was, and still is, of applied nature. Few scientific articles appeared in international journals during the first ten years of research, since most results were published as technical reports or M.Sc. theses. This was sufficient for development project implementation, but it was not satisfactory from a research viewpoint. Only in the 1990s did the efforts start to make research results available in scientific journals, and routine publication of the results from Sudan in high-level international scientific journals was achieved only after the year 2000.

It is essential to widely distribute the research findings not only to the global scientific community but also to policy-makers and natural resource managers. Research activities in Sudan have been presented at international seminars and workshops, including the UN Convention to Combat Desertification (UNCCD) and the UN Forum for Forests (UNFF). A comprehensive summary of the Sudan-Finland research cooperation was given at the 2003 workshop "Trees, Agroforestry and Climate Change in Dryland Africa, TACCDA" held in Finland and supported by the EU INCO-DEV programme, together with IUFRO and ETFRN. Its main aim was to produce policy recommendations for improved dryland management in Africa.

Development research related to forests or trees needs a sufficient time span in order to produce any results. In Sudan, there has been a long enough history of research to allow its results to be applied in development efforts.

Multidisciplinarity and interdisciplinarity are considered as essential in successful development research. The Sudan case offers arguments both against and in favour of wide-spectrum research covering different disciplines or approaches simultaneously. At the beginning in Sudan, there was a definite need to answer narrow technical and silvicultural management problems. Only after these urgent research needs were solved was there an

opportunity to tackle more complex issues, such as how dryland agroforestry systems function, or what are the local people's perceptions and expectations in regard to forests. For complex problems it was essential to apply participatory and multidisciplinary research methods. The Sudan case demonstrates that, for successful development research, the local research capacity should be utilized as much as possible.

The experience on dryland rehabilitation and management achieved in Sudan can be utilized for the benefit of other countries in Africa, for fulfilling the UN Millennium Declaration goals especially in poverty reduction and environmental conservation.

## References

- Abeygunawardena P., Bindu N.L., Bromley D.W. & Barba R.C.V. 1999. Environment and economics in project preparation: ten Asian cases. Asian Development Bank Series. 394 p.
- Altieri, M. 2002. Agroecology: the science of natural resource management for poor farmers in marginal environments. *Agriculture, Ecosystems and Environment* 19:1–24.
- Appiah M. 2003. Domestication of an indigenous tropical forest tree: Silvicultural and socio-economic studies on Iroko (*Milicia excelsa*) in Ghana. D.Sc. thesis. Univ. Helsinki Tropical Forestry Reports 25.
- AsDB (Asian Development Bank) 1996. Economic evaluation of environmental impacts – A workbook. 394 p.
- Ballal M.E. 2002. Yield trends of gum arabic from *Acacia senegal* as related to some environmental and managerial factors. Ph.D. thesis. University of Khartoum.
- Ballal, M.E., Elsiddig, E.A., Elfadl, M.A. & Luukkanen, O. 2005. Gum arabic yield in differently managed *Acacia senegal* stands in western Sudan. *Agroforestry Forum* 63: 237–245.
- Campbell B.M. & Luckert M. 2002 (ed.). Uncovering the hidden harvest – Valuation methods for woodland and forest resources. People and Plants Conservation Series. 262 p. Earthscan.
- CIFOR 2002. Household livelihoods in semi-arid regions: Options and constraints. 153 p. Centre for International Forestry Research (CIFOR), Bogor.
- Dubois, O. 2003. Forest-based poverty reduction: A brief review of facts, figures, challenges and possible ways forward. In: Oksanen, T., Pajari, B. & Tuomasjukka, T. (ed.), *Forests in Poverty Reduction Strategies: Capturing the Potential*. Workshop

- Proceedings, Tuusula, Finland, 1–4 October 2002, pp. 65–85. EFI Proceedings 47. European Forest Institute (EFI), Joensuu.
- Elfadl M. 1997. Management of *Prosopis juliflora* for use in agroforestry systems in the Sudan. D.Sc. thesis. Univ. Helsinki Tropical Forestry Reports 16. 107 p.
- Elsheikh E.A. & Luukkanen O. (ed.) 1989. Special issue on the Sudan – Finland Programme. Sudan Silva 8 (27).
- FAO 2003. Forestry outlook study for Africa. African forests: A view to 2020. 92 p. FAO, Rome.
- Gaafar Mohamed, A. (2005). Improvement of traditional *Acacia senegal* agroforestry: Ecophysiological characteristics as indicators for tree-crop interaction on sandy soil in western Sudan. D.Sc thesis. Univ. Helsinki Tropical Forestry Reports 26. 100 p.
- Gernea M.M. 1999 (ed.). The economics of involuntary resettlement – Questions and challenges. 79 p. World Bank, Washington D.C.
- Glover, E. (2005). Tropical dryland rehabilitation: Case study on participatory forest management in Gedaref, Sudan. D.Sc thesis. Univ. Helsinki Tropical Forestry Reports 27.
- Hanley N. & Spash C.L. 1998. Cost-benefit analysis and the environment. 4<sup>th</sup> edition. 278 p. Edward Elgar, Cheltenham.
- Ibrahim, A. M. 1996. Genetic variation in *Faidherbia albida*: Implications for conservation of genetic resources and tree improvement. D.Sc. thesis. Univ. Helsinki Tropical Forestry Reports 11. 86 p.
- Ibrahim A.M. 2004. 25 Years of forestry sector co-operation between Finland and the Sudan. Paper presented at UNFF Conference, Geneva, 12 May 2004. 8 p. FNC, Khartoum.
- Kelles-Viitanen A. 1983. Trees to villagers. Report on socio-economic conditions and effects of *Acacia senegal* afforestation in villages in Tendelti District, Sudan. Sudan – Finland Afforestation Programme Technical Report 1. 46 p.
- Li, C. 1999. Drought adaptation and genetic diversity in *Eucalyptus microtheca*. D.Sc. thesis. Univ. Helsinki Tropical Forestry Reports 18. 33 p., app.
- Luukkanen, O. & Hakulinen M. (ed.) 1991. From Bangkok to the Blue Nile – Review of the first decade of the Tropical Silviculture Research Group 1980 – 1990 and abstracts of research reports. Univ. Helsinki Tropical Forestry Reports 7. 109 p.
- MFA (Ministry for Foreign Affairs, Finland) 2004. Development Policy. Government Decision-in-Principle (5 Feb. 2004). 40 p.
- Olsson, L. 1993. On the causes of famine – Drought, desertification and market failure in the Sudan. *Ambio* 22:395–403.
- Mustafa, H.F. 1997. Regeneration of *Acacia seyal* forests on the dryland of the Sudan clay plain. D.Sc thesis. Univ. Helsinki Tropical Forestry Reports 15. 103 p

- Pasiecznik N. M., Felker P., Harris P. J., Harsh L.N., Cruz G., Tewari J.C., Cadoret K. & Maldonado L.J. 2001. The *Prosopis juliflora* – *Prosopis pallida* complex: A monograph. 162 p. DFID.
- Sawsan, A.A. 2003. Early establishment of *Acacia senegal* (L.) Willd (some provenances and from bulk seeds) in sandy soils. M.Sc. thesis. University of Khartoum, Khartoum.
- Sharawi, H. 1997. Socioeconomic evaluation of land-use alternatives in the Blue Nile flood basin of the Sudan. D.Sc. thesis. Univ. Helsinki Tropical Forestry Reports 14. 62 p.
- Stiles, D. 1995. An overview of desertification as dryland degradation. In: Stiles, D. (ed.), *Social Aspects of Sustainable Dryland Management*, pp. 3–20. UNEP and John Wiley Sons, Chichester.
- Temmes, M. 2002. Sudan – Finland Forestry Programme. Paper presented at International Tropical Drylands Workshop, Hyytiälä, Finland, 10–14 June 2002.
- Tilman, D. 1999. Global environmental impacts of agricultural expansion: The need for sustainable and efficient practices. *Proc. Natl. Acad. Sci. USA* 96: 5995–6000.
- UNCCD 2003. UNCCD. Part 1, Introduction. <http://www.unccd.int/convention/text/convention.php?annexNo=-1>.
- VITRI 2003. Trees, agroforestry and climate change in dryland Africa. Proceedings of TACCDA workshop, Hyytiälä, Finland, 30 June–4 July 2003. <http://www.etfrn.org.etfrn>
- Warren, A. 2002. Land degradation is contextual. *Land Degradation & Development* 13: 449–459.

## *Need for Partnership in Understanding Broad Implications of Forest Intervention Projects*

*Harun Makandi*  
*University of Dar es Salaam, Tanzania*

*Taimi Sitari*  
*Docent*  
*University of Turku*  
*Department of Geography*  
*E-mail: taimi.sitari@utu.fi*

Forestry is one of the main sectors of Finnish international development cooperation and Finland has been involved in the development of forestry in many countries, especially in Africa and Asia. Of the development policy goals the forest projects relate most directly to alleviation of poverty and sustainable management of environment, and to good governance and human rights,

In Zanzibar (Unguja and Pemba islands) the cooperation started in 1980 with the establishment and operation of the Zanzibar Forestry Development Project (ZFDP). Finland provided technical and financial support. The project was planned and executed in three phases over a span of 16 years. Each phase had its special emphasis. During the initial phase, there was a need to establish a functional forestry administration, as none existed before. Equally important was the need to address rampant soil erosion in the deep soil areas, particularly in the villages (shehia) of Chaani and Dole in Unguja. The project established nurseries and started large tree planting activities. These activities were mainly conducted in government plantations.

Tree planting was also introduced in the villages from the very start and gradually gained in momentum. During the second phase, the project carried out an extensive training programme, which was the means of creating the human resource base for the development of forestry. In the final stages of the ZFDP in 1996, over 50 forestry professionals had been trained. In the third phase, community work received more emphasis. The intervention involved practically all the villages in Unguja and many others in Pemba.

As the project approached its conclusion, government support for tree planting in the villages was gradually phased out and private entrepreneurs were encouraged to establish nurseries and to sell seedlings to the villagers. This strategy of supporting sustainable

activities was used to ensure that seedling production would continue after the forestry project was completed.

The Ministry for Foreign Affairs of Finland and the University of Turku made an agreement to implement the research project 'Interaction between forest plantation and community and its impact on biodiversity in Zanzibar, Tanzania'. The project was planned to last 2 years. It commenced in early March 2003. The University of Turku made an agreement of cooperation with the Department of Geography, University of Dar es Salaam. The research project was a part of a larger forest biodiversity research programme called MOSSE (Metsien monomuotoisuuden tutkimuksen ja seurannan kehittämisohjelma), which was otherwise financed by the Ministry of Agriculture and the Ministry of Environment. The MOSSE programme consists of a large number of projects covering a variety of themes. With the exception of the Zanzibar project, the entire MOSSE research is conducted in Finland.

The Zanzibar forestry research has looked at the forestry intervention from the community perspective. The impacts of the intervention on the community space, on the lives and livelihoods of the people have been studied to find out what kind of responses the forestry activities have caused and continue to cause, and how these are perceived and experienced in the local communities. The specific research questions were as follows:

- Has the forest project had a sustainable impact on people's livelihoods?
- Has there been a change in relationship between people and biodiversity?
- Do the new resources help people to use the available resources in a sustainable way and to conserve more of the local biodiversity?
- Has the intervention impoverished the biodiversity or has the total impact on the biodiversity been positive in for example offsetting pressure of people's demand on the natural forest areas?
- Has the project's impact been temporary or permanent?

## Theoretical Background

In analysing a community and its environment the project took the notion of *lifeworld* as the central theme. *Lifeworld* refers to the everyday life experience of the people. The notion of *lifeworld*, which was first developed by philosopher Edmund Husserl and soci-

ologist Alfred Schütz was used and further developed by Jürgen Habermas in his discussion about public space (Erikson & Weigård 2003:35–47). It has later been adopted into many fields of study, including nursing, psychology, media research etc.

*Lifeworld* consists of institutions, normative structures and social practices. It encompasses culture, society and personalities of the individuals. In geography, Ann Buttimer expands the notion and defines *lifeworld* as ‘*the culturally defined spatio-temporal setting or horizon of everyday life*’. It encompasses the totality of an individual person’s direct involvement with the places and environments in ordinary life (Johnston et al. 2000:449).

The *lifeworld* of a community rather than individual was taken as the theoretical framework for analysing the impact of the forestry development intervention. *Lifeworld* of a community is formed by environment, history, culture and sociology according to the values and norms shared by the members of the community. Interventions cause waves and/or ripples in the *lifeworld*. The events that follow do not depend on the intentions of the actors but on the consequences of the acts (Erikson & Weigård 2003:86). Any development intervention is planned with defined good intentions to change the circumstances and the lives of the target population to the defined better. However, to know what effect the intervention actually has, we have to focus on the events that follow in the *lifeworlds* of the people and the consequences of these events.

Another theoretical notion, which was used, is *systems*. Gjessing (2002:96) defines a *system* as ‘*a structured set of objects with identified attributes, which show discernible relations to one another, and operate together in a complex whole*’. Its components and interactions are identified by qualitative properties and either described verbally or expressed quantitatively by suitable scales. Systems may be open or closed and they are characterized by series of cause-and-effect relations.

In society there are many systems, which influence the life of the community and its *lifeworld*. Such are for example economic and political systems, which do not operate through norms, but rather through media, such as money for economy and power for politics. There are also physical and biological systems, which act in the *lifeworld* of the communities, such as climatic systems, ecosystems, erosion and deposition systems, hydrological systems, just to mention some.

In an isolated and self-reliant community the societal systems would be internal to the community and be driven by communal 'good' as defined by the shared values of the community. They would be created by the community itself and their function would be the survival of the community. Such communities hardly exist nowadays anywhere and certainly not in Zanzibar. In the real world situation all communities are linked to the wider society, nowadays even to the global society, by various systems, which cause responses and vibrations in the community. These vibrations may cause the community to lose its coherence or they may cause the community to become stronger, depending on the capability of the community to have a common perception of its 'common good', and of its capacity to act accordingly. However, obviously there are situations in which the wider society, national or international, overruns the local community's attempts to control its development.

On the other hand, different systems, be it government forestry administration, international tourism development or any other; bring new opportunities and resources to the disposal of the community. The response of the community, its capability to use the opportunities and resources for the good of the community depends on the values and norms of the community, of its strength to organize itself and the knowledge and skills of its members.

## **Partnership in Research**

A partnership in the research was developed between the University of Dar es Salaam, Department of Geography, University of Turku, Department of Geography and the Department of Commercial Crops, Fruits and Forestry (DCCFF) of the Ministry of Agriculture, Natural Resources, Environment and Cooperatives, Revolutionary Government of Zanzibar. During the research, a closer cooperation with the development project Sustainable Management of Land and Environment (SMOLE), which is financed by the Finnish government, began to develop and this cooperation is expected to grow during the second phase of the research project. In addition, DCCFF will assume a stronger role during the second phase. The financing partner of the research has been the Ministry for Foreign Affairs, Finland, which has also assumed an active role in following the progress, advising and providing assistance to secure links with the SMOLE project. All parties in the partnership have the common aim of developing capacities in Tanzania mainland and Zanzibar for effective environmental planning and research.



Although the main objectives of the project were expressed as research questions, the cooperation had also goals for institutional and human resource development, especially capacity building in the use of research technologies. The research team consisted of four researchers, four student research assistants and one junior staff trainee.

When working in partnership for learning and research the parties share the technology. If one of the parties is from a developed country and the other from a developing country, the partnership often involves transferring technology from the former to the latter. In research partnership especially new equipment may bring new methods for acquiring and processing data, and this has sparked an evolution of new methodologies which have to be transformed into fitting into the societal conditions of the research area.

Von Troil (1986) talks about the three aspects of technology, namely material, organizational and intellectual aspect. Material refers to among other things equipment, machines, and tools. The organizational aspect refers to the systems and structures, which are needed in order to the sustainable functioning and use of the material means. The intellectual aspect is the capacity to maintain and further develop the technology (Von Troil 1986:39). Unless all these three aspects are present, technology cannot serve in a sustainable way the purpose for which it has been developed.

Since technology has to function in a given society, in a given societal and cultural environment, it has to transform itself accordingly. Arnold Pacey (1983) talks about '*technology practice*' with three aspects, namely technical, cultural and organizational. Given the same universal techniques, different local societies and cultures produce different technology practices.

Training is an integral part of the partnership. Students from the partner universities have worked as research assistants, which has given them an opportunity to get experience of working in a research team and write their own research papers. A particular need to enforce the adoption of the recent spatial research methods has been identified in Tanzania and therefore two Tanzanian team members have been provided an opportunity to acquire training in these methods in Finland. The partners are looking for ways to develop remote sensing and GIS teaching methodology in the University of Dar es Salaam. DCCFF has expressed the need to train its officers in these methods as well. Training to this affect has been included in the plans of the second phase of the research project. The knowledge base so acquired will enable them to use the spatial data such as

air photographs and various societal surveys for planning purposes. As the society develops so does the generation and availability of such material. The same need has been identified in the partner ministries of the SMOLE project, and cooperation in training has been agreed upon. This will be implemented by making together a full analysis of two pilot areas.

Establishment and operation of new technologies to the extent that their further development takes off requires that they are incorporated into the teaching curriculum at the universities. Only this can create a human resource and an intellectual base, which is broad enough for further development of the technologies in their respective societies and for the creation of innovative applications relevant to regional and local needs. Jeffrey Sachs (2005) emphasizes the need to invest into science in the developing countries, presently especially in Africa, in order to create the capacity to develop home grown technologies for the societies. He regards that these technologies, which are applicable in the society, have an essential role in the successful reduction of poverty.

## **Components of the Research and Main Findings**

The approach to understanding the effects of forest intervention was threefold. The research components covered the action's impacts in the community lifeworld, on plant diversity, and the landscape (in particular the plant cover and change).

### *Community Survey*

Community study made an analysis of the intervention from the point of view the villagers, seeking knowledge on how the intervention influenced their lifeworld. Information was gathered through interviews. Special focus was placed on the impact to community's relation with the environment and the community economy.

Forestry activities in Zanzibar are considered economically beneficial to both the government and the people of Zanzibar. The people acknowledge the benefits of tree planting related activities both at individual and communal level. They measure the benefits mainly in terms of increased income opportunities. However, these benefits are not divided equally. The level of men's engagement in tree planting the activities is greater

than that of women. The result is unequal gains, with men benefiting more than women. There is the need to empower women for them to realise more returns from the activities. In addition, the importance of providing the local people with legal empowerment cannot be overemphasised in the wake of the forthcoming land ownership reforms. (Mhache 2005, Misana 2005, Sitari 2005).

### *Biological Survey*

Biological analysis about the impact of the exotic tree species on plant diversity was made by studying sample plots made in areas planted with trees of interest to the study (in tree plantations and in individually owned sites) and in areas with undisturbed vegetation and determining the differences among them. The nature of spread of *Acacia auriculi-formis* species was examined using linear survey.

The rate of growth and regeneration of the exotic tree species studied differs with habitat characteristics. Their growth is more pronounced in the western deep soil areas of the island of Unguja than it is in the eastern coral rag areas. Moreover, the *Acacia auriculi-formis* thrives well in areas with open and semi-open vegetation characteristics, such as those with open bushes. The species are almost absent in dense indigenous forests, and their regeneration in actively farmed lands is limited. The rate of growth of the indigenous plant species under the planted trees is related to the extent of growth and regeneration of the trees. Where there is vigorous growth of the trees the indigenous plants exhibit repressed growth and diversity. (Kotiluoto 2005, Makandi 2005).

### *Landscape Change Analysis*

Landscape analysis was based on the existing air photograph and cartographic material, datasets of which covered the period from 1930s to 2004, fused with local knowledge to provide more discernible results.

Cheju and Unguja Ukuu feature extensive areas of varied native vegetation, which are components of the relatively unchanging landscape. The significant change of land cover in specific areas is attributed to human activities, which include tree planting and encroachment. Nevertheless, natural landscape factors determine the distribution of the

types of land cover and land use practices. As a whole, forest area has increased on the cost of open land. (Käyhkö 2005).

In the aforementioned areas the structure of vegetation has been significantly influenced by both extractive and tree planting activities. Mature forests have been replaced by young ones and scrubs. This is partly a result of extensive clearing to reclaim areas for shifting cultivation and short rotation cycles. (Käyhkö 2005)

### **Communication of the research results**

The research process and its results were communicated in writing, both in English and in Swahili, and in five seminars. Two seminars were organized for the officers from different government departments, which are involved in environmental issues, and one seminar was organized for the representatives of the villages that were involved in the study. These three were conducted in Unguja, the two first ones in English and the third in Swahili. One seminar was conducted in Turku, Finland. It was an intensive course, which involved students in the University in of Turku. The fifth seminar was organised in Helsinki by the Ministry for Foreign Affairs. This seminar was aimed at presenting the final results.

### **Looking Forward**

During the next phase of the cooperation from 2005 to 2007, the research will focus more on the continuing landscape analysis as a method of studying environmental change. There exists a good set of spatial data in Zanzibar, which offers researchers an opportunity to analyse landscape changes starting from the 1930s. The cooperation will also include substantial training in using spatial data and GIS methodology to produce information that forms the basis for sound decision making. During this phase the cooperation between the Universities of Turku and Dar es Salaam will continue, and that with DCCFF and SMOLE will be strengthened.

## References

- Eriksen, Erik O., Jarle Weigård (2003). *Understanding Habermas. Communicating action and deliberative democracy*. Continuum, London. 292 p.
- Gjessing, Just (2002). *Resource geography. Conceptual approaches. Resource and environment geography, Series A, No 22*. Department of Geography, University of Oslo. 174 p.
- Johnston, R. J., Derek Gregory, Geraldine Pratt, Michael Watts (2000) *The dictionary of human geography*. Blackwell Publishers Ltd. UK. 958 p.
- Kotiluoto, Riitta (2005). *Tree planting and biodiversity in Zanzibar*. In Sitari, Taimi (ed) (2005). *Forestry, community and biodiversity in Zanzibar. Final report*. Turku University Department of Geography Publications B Nr 3: 59-70.
- Käyhkö, Niina (2005). *Remote sensing and GIS techniques in the analysis of landscape changes in the Cheju shehia in Unguja, Zanzibar*. In Sitari, Taimi (ed) (2005). *Forestry, community and biodiversity in Zanzibar. Final report*. Turku University Department of Geography Publications B Nr 3: 71-90.
- Makandi, Harun (2005). *Impact of tree planting on plant species diversity in Unguja, Zanzibar*. Turku University Department of Geography Publications B Nr 2. 96 p.
- Mhache, Emmanuel (2005). *Impacts of tree planting on the livelihood of communities in Unguja, Zanzibar*. Turku University Department of Geography Publications B Nr 1, 89 p.
- Misana, Salome (2005). *The impact of tree planting on the livelihoods of communities in Unguja island, Zanzibar: A gender perspective*. In Sitari, Taimi (ed) (2005). *Forestry, community and biodiversity in Zanzibar. Final report*. Turku University Department of Geography Publications B Nr 3: 13-36.
- Pacey, Arnold (1983). *The culture of technology*. Basil Blackwell, Oxford.
- Sachs, Jeffrey (2005). *End of poverty. Economic possibilities for our time*. Penguin group, USA. 416 p.
- Sitari, Taimi (2005). *Forestry in the community lifeworld in Unguja, Zanzibar*. In Sitari, Taimi (ed.) (2005) *Forestry, community and biodiversity in Zanzibar. Final report*. Turku University Department of Geography Publications B Nr 3: 37-58.
- von Troil, Margaretha (1986). *Exchange of knowledge in technology transfer from Finland to Tanzania. Report 11, 1986, B. TTECO Publications No. 12*. Institute of Development Studies, University of Helsinki. 286 p.

### 3.6. Education and Learning

#### *Virtual Universities Revisited – a Third Way*

*Antti Auer*

*Dr (Regional Sciences)*

*University of Jyväskylä*

*Virtual University Project*

*E-mail: antti.auer@jyu.fi*

Whatever one perceives as belonging to the concept of Virtual University, its reputation has been severely questioned after some remarkable failures followed by bad publicity. Most infamous is the termination of the British e-University (UKeU) after only one year of operation and spending £50m of public funding (House of Commons... 2003). Before that Fathom (<http://www.fathom.com>), a project of several prominent universities and institutions, was run down after two years' development period. These are just the two most recent examples in the list of unsuccessful virtual university efforts. All of these have not necessarily been complete failures, yet they have not, for many different reasons, been able to become sustainable efforts. (Paulsen 2003)

#### **Different approaches**

Cullen states that the development of e-learning models, technologies, services and practices has reinforced, rather than undermined, some outmoded forms of pedagogy. In fact, there is evidence that technology based education actually reinforces exclusion. The influence of the human capital model, which tends to emphasize individual rates of return, has been shaping e-learning agendas, systems and services. This has led to the domination of a highly individualized vision of learning, focused firmly on 'reproduction' rather than on 'transformative learning'. (Cullen 2005)

According to Turoff, there are two main approaches to the concept of Virtual University; 'correspondence model' and 'collaborative model'. Turoff claims that information and communication technologies will inevitably lead to skill training becoming largely automated, and that commercial organizations will be able to deliver such canned con-

tent at prices universities and colleges cannot compete with. Still, Turoff argues for the collaborative model as the proper model of Virtual University for traditional universities. Actually, in a way, according to Turoff, higher education would return to the Middle Ages where instructors were the facilitators of seminar groups of students who worked together to master a subject. (Turoff 1999)

Even though the correspondence model can be criticized from the pedagogical point of view, the few virtual university success stories seem to have required scalable and economically sustainable models. *“While other companies charged into online education with dazzling digital content, Phoenix Online offers a text-heavy format that can easily be accessed with dial-up modems.”* (Symonds 2003) The question is, therefore, about efficiency vs. effectiveness. Turoff emphasizes that there is nothing wrong with inexpensive ways of providing education. The problem is that administrators in both universities and governments seem to think that computerization will bring about cheaper higher education. According to Turoff, this is only attainable for items that are learned by drill and practice, not for items that are considered to be at the core of problem solving and the associated thinking processes in given application domains. That is why institutions of higher education should become *“clearing houses for good skill and training material”* yet should *“eliminate courses that are almost totally based upon such material.”* (Turoff 1999) The examples of the Phoenix Online, The NKI Internet College and the calculations by Turoff indicate that the collaboration model, even when employed in modest sized groups, can be economically sustainable and lead to low dropout rates. (Symonds 2003; Paulsen 2005; Turoff 1997a)

### **The missing vision**

It seems obvious that the recent failures essentially originate from the lost vision of what Virtual University should actually stand for. Unfortunately, the idea of making or saving money through virtual education is not a vision. It is also evident that there is no single model or metaphor for virtual university. A sustainable vision should fit both external and internal contextual requirements, as well as the organisational setting. External requirements refer to demand and competition in higher education, and the value added customers are supposed to get by using virtual supply. Internal requirements include mission and values, systems and practices of organisations engaged in virtual university activities. The organisational setting is obviously different depending on whether the

virtual university is one organisation commercial enterprise or a cooperative effort of research university network. The vision of virtual university in campus-based research universities and those involved in distance teaching cannot be the same.

What would the idea of virtual university look like in universities whose mission and focus is on research? Turoff suggests forgetting separate distance education units, because the technology used for group communications and the collaborative learning methodology can significantly improve regular courses at colleges and universities. Still, we seem to need an even more inclusive vision for establishing research as a genuine part of the virtual universities. Obviously, this vision would have to combine campus-based and virtual activities, or more than merely combine them: integration of research and teaching would be crucial in order to build on the priorities research universities are setting. This might indicate that research- and problem-based learning methods could be well supported and dominating. It would take us far from the conventional idea of virtual universities merely wrapping and delivering content.

### Third way

The main challenge for the research universities is how to produce, manage and share the intellectual property universities have. This property exists partly in the brains of scholars and instructors and partly in research materials, data repositories and extracts based on that data such as analyzed data, reports, articles and publications. In virtual university setting the sharing of this intellectual property with teaching and learning is essential.

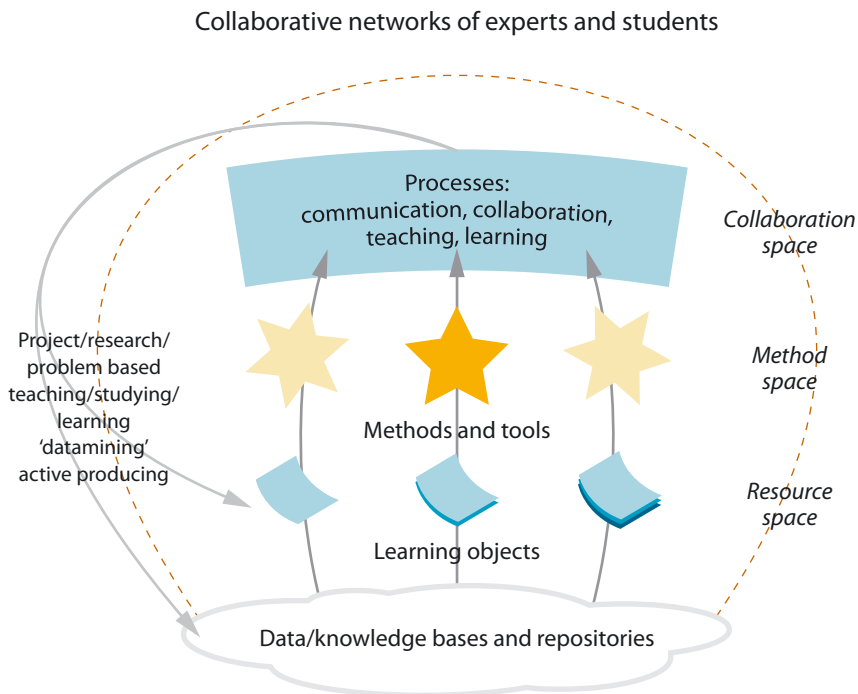
Integrated services that enable new environments for research and education have been called cyberinfrastructure. (NSF 2003) Architecture that allows the virtual integration of learning and research is termed Grid meaning *'an infrastructure that enables flexible, secure, coordinated resource sharing among dynamic collections of individuals, institutions and resources.'*<sup>6</sup> Resources in this context include computational systems and data storage, specialized experimental facilities and integrated services for knowledge management, observation and measurement, analysis, visualization, interaction, and collaboration. Such infrastructures enable teams to share knowledge and collaborate over time ignoring geographic, organizational, and disciplinary obstacles. *"They enable individuals*

---

<sup>6</sup> Research Councils UK (2004) referring to Foster and Kesselman.



*working alone to have access to more and better information and facilities for discovery and learning. They can serve individuals, teams and organizations in ways that revolutionize what they can do, how they do it, and who participates.”* (NSF 2003) This union of e-Science and e-Learning would establish the core of university and prevent virtual universities from being just simulations of ‘real-life universities’. The picture below illustrates different levels in the research-based virtual university vision.



*Figure 1.*

This kind of learning environment architecture would provide a suitable platform for the constructivist classroom that typically exploits raw data and primary sources. In such a classroom, students are able to engage in experiences that challenge hypotheses and encourage student autonomy and dialogue to provide a genuine window on how experts work, think and learn. (Schön 1983; SEDL 1995) Research-based learning environment is appealing for research universities also because resources invested in cyberinfrastructure serve both research and education.

Cyberinfrastructure, Grid and e-Science refer usually to large scale natural sciences, very large scale computing resources and huge financial investments. This might, however, not always be necessary, because Grid could also act as an archipelago of smaller repositories and specialised resources. A lot can also be done by exploiting cheap open source technologies and open interfaces to prevent what NSF-report called ‘increased technological balkanization’ rather than interoperability among disciplines. Not just hard sciences, but also social and humanist sciences could create cyberinfrastructures to dive deep into the demographic and social processes and build repositories of digital cultural heritage and virtual museums.<sup>7</sup>

## Conclusions

Cullen’s argument that new technologies may be working to increase rather than reduce inequality and to promote rather than eradicate ‘the digital divide’ should be taken seriously. In development work context this could mean that virtual universities based on ‘wrap and deliver’-metaphor might become one form of colonialism in a worldwide marketplace of higher education. It is therefore extremely important to create virtual university models that support developing countries in building their own expertise, knowledge and resources applicable to their own contexts. Research-based virtual university metaphor can lead to genuine collaboration, co-development and sharing of resources between partner universities and institutes. Realizing this vision would call for networks of committed experts in different disciplines as well as remarkable financial investments to create the cyberinfrastructure required. These investments would serve both research and education, enabling existing universities to evolve into profoundly technology supported universities. Future prospects for this kind of virtual universities and the interest groups involved are boundless. Furthermore, risks would appear significantly smaller and unlike those of recent virtual university attempts. Finally the question is about policy; after all reported failures, is there enough courage to claim a vision large enough to be effective enough, and is cooperation preferred to competition and markets.

---

<sup>7</sup> See e.g. [http://www.jyu.fi/musica/sks/index\\_en.html](http://www.jyu.fi/musica/sks/index_en.html) and <http://www.cs.helsinki.fi/group/seco/museums/>.

## References

- Cullen, J. 2005. *The Learning Underworld: How Technology Supports Bad Education*. The GLObal Systems Analysis and Simulation Association. Archives, available at <http://makeashorterlink.com/?H2CF5193B>
- House of Commons Education and Skills Committee / UK Parliament 2005. *UK e–University Third Report of Session 2004–05*.
- NSF (National Science Foundation) 2003. *Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the NSF Blue Ribbon Advisory Panel on Cyberinfrastructure (the “Atkins Report”)*
- Paulsen, M. F. 2003. *Online education and learning management systems. Global e-Learning in Scandinavian perspective*. NKI Forlaget.
- Paulsen, M. F. 2005. *Success Factors in Large-Scale Online Education*. Presentation in EDEN 2005 conference.
- Research Councils UK 2004. *e-Science*. <http://www.rcuk.ac.uk/escience/>
- Schön, D. 1983. *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.
- SEDL (Southwest Educational Development Laboratory) 1995. *Classroom Compass. Constructing Knowledge in the Classroom*. <http://www.sedl.org/scimast/resources/cc.html>
- Symonds, W. 2003. *University of Phoenix Online: Swift Rise*. Business Week online June 23, 2003. <http://www.businessweek.com/>
- Turoff, M. 1997a. *Costs for the Development of a Virtual University*. *The Journal of Asynchronous Learning Networks (JALN)* Vol. 1, No. 1. [http://www.aln.org/publications/jaln/v1n1/v1n1\\_turoff.asp](http://www.aln.org/publications/jaln/v1n1/v1n1_turoff.asp)
- Turoff, M. 1997b. *Alternative Futures for Distance Learning: The Force and the Darkside*. <http://eies.njit.edu/~turoff/>
- Turoff, M. 1999. *Education, Commerce, and Communications: The Era of Competition*. *WebNet Journal*, Vol. 1, No. 1. <http://www.ace.org/pubs/webnet/v1no1/turoff.pdf>

## *Gender and Disability – Challenges of Education Sector Development in Tanzania*

*Mari-Anne Okkolin*  
*M.Soc.Sc., Researcher*  
*University of Jyväskylä*  
*Institute for Educational Research*  
*E-mail: mari-anne.okkolin@yfi.jyu.fi*

*Elina Lehtomäki*  
*University of Jyväskylä*  
*Institute for Educational Research*  
*E-mail: elina.lehtomaki@saunalahti.fi*

In line with the UN Millennium Development Goals, the government of Tanzania has set poverty reduction as the most important challenge for the future. Education is a key sector in the long-term process of poverty reduction. Three of the Millennium Development Goals (MDGs) focus on gender. The Progress report (UN Secretariat, 2005), however, fairly strongly states that it is unlikely, that any of these three MDGs can be met, if women lack the education, influence and resources to care for their families, and to fully participate in the development process. In this paper, we analyse findings of previous research on gender and disability in the education sector development and explore ways to bring the socio-cultural perspectives into the sector development discussions.

### **1. Socio-cultural Approach to Education Sector Development**

According to the World Education Forum, held in Dakar in 2000, the socio-cultural factors which contribute to girls' successful participation in education are: short distance between home and school, female teachers as safe role models, legislation and regulation that increase security in schools, and participation of family and community in decision-making concerning school management, selection of teachers and contents of curriculum. On the other hand, several international studies and policies have emphasised that education of girls actually means educating future families, contributes to lower birth rates, healthier children and overall socio-economic development (e.g. Stromquist, 1998; Mella, 2003; PRSP 2000). In addition to social and economic investment perspective, it has to be borne in mind, that education is an undisputable right of every child.

The Dakar summit participants agreed that in order to eradicate discrimination of disadvantaged groups, based on e.g. gender and disability, usually deeply rooted in education

systems, committed involvement of the whole community around schools is required (Savolainen *et al.* 2000; UNESCO, 2003b). Recent studies investigating reasons for gender gaps in achievements in schooling have concluded that, whilst poverty at both national and household levels is associated with under-enrolment of school-aged children, the gendered outcomes of such under-enrolment are more a product of adverse cultural practice than of poverty in itself (Colclough *et al.* 2000; Peasgood *et al.* 1997). It has also been pointed out (e.g. Swainson *et al.* 1998) that the trend towards programme and sector policy approach raises a risk that gender responsive initiatives could be lost. Therefore, in addition to mainstreaming, specific policy interventions and gender specific actions are still required in order to remove adverse cultural practices.

The emphasis on mainstreaming gender perspectives in education sector shows that the interests and needs of girls' and women are recognised, and they are systematically pursued in the formulation of all government policies and programmes. In addition to mainstreaming at the policy and programme levels, knowledge regarding socio-cultural interpretations of the meaning of education at the community-level is needed for realistic and meaningful planning. In-depth qualitative information regarding values and cultural views on educated girls and disabled children would significantly support the education for all process and poverty reduction strategies.

In Tanzania, the abolition of tuition fees in 2000, a move that was introduced in the Poverty Reduction Strategy Paper (PRSP), stimulated an enormous demand for schooling. It also created the need to safeguard educational quality through adequate classrooms and supplies, and sufficient numbers of teachers (UNICEF, 2005). According to the IDT/MDG Progress document (UNDP, 2001a, 10) key factors that affected enrolment levels were public expenditure constrains, lack of capacity for management and planning, poor quality and poor relevance of curriculum, poverty, lack of community and parental involvement in the education process and low participation in decision making. The progress document pointed out that especially the lack of community and parental involvement created a challenge to achieving universal primary education. Similarly, the Poverty and Human Development Report (The United Republic of Tanzania, 2002, 24) demanded greater involvement of parents and communities in school management.

## 2. Gender and disability in the education policies and programmes

UNESCO (2003a) emphasises that international declarations have to be interpreted in the context of each country. In Tanzania, gender balance and inclusion of disabled children are goals of the current education sector reforms. The Tanzanian Assistance Strategy (TAS), the National Poverty Eradication Strategy (NPES) and the PRSP all identify education as a national priority. The present education policy framework in Tanzania provides also supportive environment and opportunities of promoting education and empowerment of girls. The Government is signatory to many international and regional human rights agreements asserting equity policies and non-discrimination policies in education. It has also initiated a series of policies and reforms in the education sector with the aim of ensuring that all children have equitable access to a compulsory primary education of good quality.

In addition to the general Education Sector Development Programme (ESDP, 2000), there are three guiding plans for pre-primary, primary and secondary education. The Primary Education Development Plan (PEDP, 2001) is the first outcome of efforts to formulate international commitments, especially poverty eradication, Education For All (EFA) and Millennium Development Goals into feasible strategies and actions for the development of primary education. As a five-year plan (2002–2006) the PEDP provides a framework for follow-up of progress achieved, problems encountered and recommendations for future action at national level. The PEDP has four strategic priorities: Enrolment Expansion, Quality Improvement, Capacity Building and Institutional Arrangements. It is implemented through the existing Local Government Structures, and the whole chain of roles and responsibilities from the central ministerial level to school level is defined in the plan.

In the PEDP, there are some explicit gender objectives, but all down the line, gender specific objectives and systematic strategies to operationalise gender objectives are missing (see FAWETZ, 2002). Research reports focus on education as a means to reduce poverty in general, ignoring the gender differences in education and economic participation. For instance, Jung and Thorbecke (2003) found that well-targeted patterns of education expenditure have efficiently reduced poverty in Tanzania. The research takes into consideration urban and rural poverty but ignores gender and other socio-cultural aspects associated with poverty.

During the last decade enrolment of girls has increased in Tanzania. It is an expected result of the national commitment to the global EFA process, which emphasises girls'

access to education. According to the EFA 2000 Assessment (UNESCO, 2000) the progress towards EFA goal in Tanzania has been much slower than anticipated. The Situation Analysis of Children in Tanzania (The Government ... 2002) stated however, that the enrolment rates have risen impressively and gender parity in primary education at the national level has almost been achieved and in secondary education may be met by 2005. It has to be noticed however, that regarding universal access to primary education by 2015, annual rate of increase should improve substantially, because in 2001 the net enrolment rate was 65.5%. The net enrolment rate for girls was 65,2%, and the rate for boys was 65,8%; almost half of the districts recorded net enrolment rates of below 50%.

Still, girls tend to drop out at a higher rate than boys and even those who stay in school perform less well (Primary School Leaving Examination PSLE pass rate 28.6% in 2001; 21.4% for girls and 36.2% for boys). In addition, gender parity becomes a severe problem at the higher secondary (36% in 1999) and tertiary grades. (The United Republic of Tanzania, 2002). Disparities between urban and rural districts, and even wider differences across districts and between schools were revealed both by The Situation Analysis of Children in Tanzania (2002) and a nation-wide school-mapping study (JICA, 2002). The studies emphasised that schools and districts differed not only in enrolment but also, especially in performance and attainments. Furthermore, they suggested that social and cultural factors played a more crucial role than sector policies and strategies in education development.

Rising enrolment rates and simultaneous prevailing dropout rates indicate clearly that one of the goals may be achieved through policy and strategy work, while another goal requires a different approach. From gender perspective the emphasis should be put on addressing the performance of girls and avoiding dropout of girls during the final stages of primary education and throughout secondary education. On one hand this means addressing issues related to gender relations in the classroom and in the curriculum, but on the other hand it reaches beyond the realm of the education sector and relates to social and cultural values towards girls, especially at or after puberty. (See e.g. The United Republic of Tanzania, 2002; UNESCO 2003b, 2004).

The lack of specific objectives and strategies, and community level contributions to planning is even more evident in the case of disability. It may be assumed that the MDGs and EFA process include also people with disabilities, but research does not support this assumption. Different from the education sector development data concerning gender, there are no reliable numbers and proportions of children with disabilities in any of the

previous study and reports. One of the reasons is the difficulty in defining disability that is always a complex phenomenon and experienced in contact with the social and physical environment (Peters 2003; Traustadóttir & Kristiansen 2004; Wiman & Sandhu 2003; Yeo 2003); what is a disability in challenging socio-economic and ignorant environments, may be easily overcome in other contexts, e.g. by providing eye-glasses or adapted learning materials.

According to Wiman and Sandhu (2003) interpretations of the MDGs and implementation programs have ignored the poorest of the poor, people with disabilities. They suggest that particular attention must be paid to people with disabilities when interpreting the MDGs. To understand the goal of achieving universal primary education (MDG 2) means that we ensure all children in any community, without exclusion, have access to school and successfully complete primary education. Promoting gender equality (MDG 3) requires enabling all girls to perform well in school and all women to participate in society.

Several researchers have pointed out that while mainstreaming is essential, specified data, focused support and follow-up measures are required (e.g. Stubbs 1999; Wiman & Sandhu 2003; Wirz & Meikle 2005; Yeo 2003). The socio-cultural interpretations and barriers to participation associated with impairments, health, and physical and social environments require the participants' view. Families, people with disabilities and their organisations should be involved in identifying their needs, planning and making decision on education and poverty reduction. We assume that mainstreaming gender and disability may fail to address the complex phenomenon of girls with disabilities.

According to previous research (Dale, 1999; Schafer, 1999), international resolutions, agreements and cooperation programmes strongly direct national education policies. Their impact on district, ward, village and community level education sector implementation strategies and process is far less evident. In collective cultures, such as in Tanzania, socio-cultural interpretations at community level may however, have a stronger influence on girls' opportunities than international and national policies. The Government of Tanzania and UNICEF (2002) have suggested that education establishment and communities have to come together and envision ways to improve schooling. To take full advantage of strategic opportunities for institutionalising gender and disability at all levels of the education sector, vertical and horizontal dialogue, and well-articulated initiatives of how to turn principles into sustainable practices is required. Views of girls, their families and communities are crucial in the dialogue and contribute to sustainability. In order to



achieve the defined objectives, there is a clear need to incorporate *both mainstreaming* and gender and disability *specific approaches* in education sector.

### 3. Education as an Enabling Environment

As suggested in the Poverty and Human Development Report (The United Republic of Tanzania, 2002), an important challenge to policy makers and the Government is how to transform primary schools into providers of life skills i.e. to enable learners successfully to manage their environment for their own betterment and that of the whole society. There is little point in providing the opportunity for a child to enrol in school if the quality is so poor that she will not attend, become literate, numerate, or become equipped with facts and skills for life. For this reason, for example UNICEF defines Life Skills-Based Education (LSBE) critical for quality education (see [http://www.unicef.org/girlseducation/index\\_quality.html](http://www.unicef.org/girlseducation/index_quality.html)). Furthermore, it has to be noticed, that parents with limited resources say that the quality of education plays an important role in their decision of whether or not to put or keep their daughters in school: if girls are not learning, if what they learn is not useful, or if the school environment is not safe for them, parents will not invest in sending their daughters to school (ibid., see also Colclough et al., 2003, 53–90).

According to UNDP (2001b, see Figure 1) girls' empowerment is closely connected to enabling environments. If we view education as an enabling environment, there are findings concerning legal, political and economic factors; hardly any on social and familial factors. Still, these two factors form the basis of the enabling environment and empowerment process.

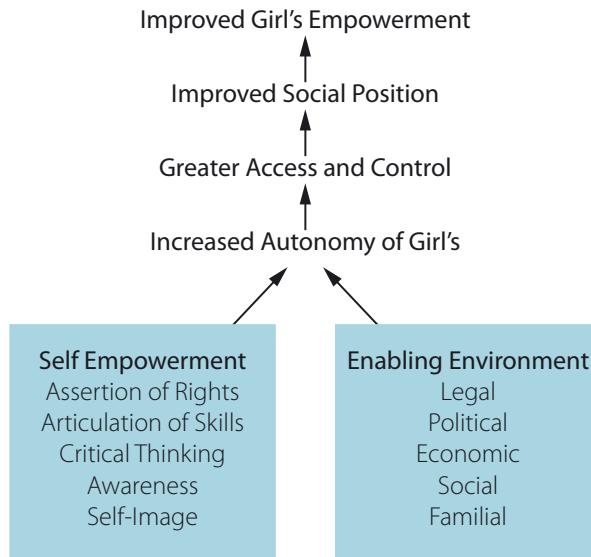


Figure 1. *Process Towards Improvement in Girl's Position (UNDP, 2001b).*

Changes in the rationales show that educating girls has gained a broader foundation. According to Cream Wright (2003), it is not just about redressing a gender disparity in education, but about focusing on the most pivotal groups in order to help eradicate poverty, prevent and ameliorate the impact of HIV/AIDS, promote democratic decision making and good governance, mitigate the impact of food deficits and malnutrition, as well as safeguard children from harmful practices like child labour and sexual exploitation. Consequently, there are vital linkages with other sectors and operational areas, and especially, with the closest socio-cultural context – family and community.

Kenneth King, Robert Palmer and Rachel Hayman (2004) point out that education needs to be embedded in a wider environment of a particular kind for its social and economic impact to be fully realised. They emphasise that we have to ask how primary education is intimately affected by post-primary education and training environment, and how the education system as a whole, including particularly primary education, is affected by the wider economic and social environment. King, Palmer and Hayman divide education environments into two categories: first, the internal, referring to the education and training system itself, and second, the wider non-educational environment outside the education system (including legal, political, economic, social and familial spheres).

King, Palmer and Hayman (2004, 3) demand planning of holistic systems of education. This may well be a prerequisite for achievement of MDG for primary education, since large number of poor parents will require pathways and opportunities for continuation (secondary, technical and vocational, and tertiary education) of basic education for their children. Additionally, there is a clear need of research for secondary and tertiary levels. Quoting the Millennium Project Task Force, King and his colleagues propose, that for the many claimed benefits of girls' education to be effective, a positive and egalitarian environment in respect of women's work and status is necessary. This environment would include e.g. following critical systems: strong macro-economic environment (growth that creates employment); strong political commitment, a strategic political framework; a need to balance quality/quantity; a focus on equity; adequate financing; data to guide policy; partnerships with community, donors, countries etc.; cultural and contextual factors; enforceable contracts in relation to property rights; access to capital and to micro-finance; infrastructure; and access to technology. So far, research on impacts of holistic enabling systems is lacking.

Additionally, it is important to see, that the relationship between schooling and the wider environment is not a one-way street. More accurately, there is probably a two-way influence, where the very provision of mass schooling will itself play a role in determining whether the environment is enabling or not (King *et al.* 2004, 7–10). From gender perspective, current policy initiatives give extremely central position for education: “education is a significant part of empowerment process for girls, leading to greater participation, decision-making power and control, and transformative action” (UNDP, 2001b). In this regard, the accounts of educated girls would reveal essential information of “survival and social change throughout the life course”, as Stone (2001, 62) writes.

Referring to King and his colleagues (2004) we doubt whether the policy literature on the benefits of education, especially at the primary level, has paid sufficient attention to the enabling environments and contexts essential to achieving full potential of schooling. Furthermore, we need to explore processes of addressing barriers to schooling from the social and familial perspectives, regardless of mainstreaming and/or gender specific approaches adopted at the legal, political and economic levels.

#### 4. Agents of Their Own Development – Voice of Educated Girls

There is a great amount of information on quantitative changes in enrolment rates and participation in education (regular country reports and statistics by UN, donor community and NGOs). Conclusions have, however, emphasised the need for *qualitative indicators* to assess *quality of education* and its *impact on participation and attainment*. Previous research on education development has mainly focused on policy reforms (e.g. Cammish & Brock, 1997; Dale, 1999; Takala, 1998) and reasons of exclusion (Colclough *et al.* 2000, 2003). Tanzanian researchers (e.g. HakiElimu, 2001) have pointed out that *community-level perspectives on relevance and quality* of education are seldom recognised.

According to the Poverty and Human Development Report (The United Republic of Tanzania, 2002) specific studies focusing on obstacles to participation in education and factors causing dropouts and poor performance among girls are needed. We suggest, however, that as important is to recognise *differences between districts and/or schools* and to identify socio-cultural factors that support *successful participation*. Different from previous emphasis on access and participation, our pre-study aims at giving voice to *educated girls* and finding out whether education sector development programmes “create conditions whereby girls can become the agents of their own development and empowerment” (OECD, 1998).

There are communities *successfully implemented equity policies*, and what is more important, families who have find ways to *address or remove barriers* to educating their girls, including girls with disabilities. We are interested in identifying these successful processes and practices. So far there has been hardly any research on district, community and family level interpretations of the right to education, and on dialogue between districts, communities, and families. We assume that research of this kind, would disclose essential information of enabling environments supporting girls’ education and empowerment.

Education policies and systems reflect socially and historically constructed views of pupils’ future role in society, and, at the same time education may have a significant impact on constructing new identities (Antikainen 1998; Bhalalusesa 2001; Vavrus 2002). It has been suggested that priorities in education sector will become shared through international dialogue and development cooperation (e.g. Buchert 1998; Dale 1999; Eleweke & Rodda 2002; Schafer 1999). This would mean that equality and equity become global goals, e.g. education of girls and children with disabilities would be recognised as right. Our research interest focuses on local dialogues and interpretations.

Similarly to international declarations, academic research does not bring any change without contextualised interpretations and practical applications (see Stubbs 1999; Yeo 2003). Our study analyses the education sector development process context from gender and disability perspectives. It forms a foundation for joint planning with our Tanzanian colleagues, researchers on gender and disability. Our shared goal is to explore how education enables agents of their own development and empowerment, and how the agents' voice is included, and could be better included, in planning of education and poverty reduction policies, strategies and programmes.

## References

- Antikainen, A. 1998. Between structure and subjectivity: life-histories and lifelong learning. *International Review of Education*, 44 (2–3), pp. 215–234.
- Bhalalusesa, E. 2001. Supporting Women Distance Learners in Tanzania. *Open Learning*, 16 (2), 155–168.
- Buchert, L. 1998. *Education reform in the South in the 1990s*. UNESCO.
- Cammish, N. & Brock, C. 1997. *Factors affecting female participation in education in seven developing countries*. Education Research Paper No. 9. Department for International Development (UK), Education Division.
- Colclough, C., Rose, P., Tembon, M. 2000. Gender Inequalities in Primary Schooling: the Roles of Poverty and Adverse Cultural Practice. *International Journal for Educational Development*, Vol 20(1), pp. 5–27.
- Colclough, C., Al-Samarrai, S., Rose, P., Tembon, M. 2003. *Achieving Schooling For All in Africa. Costs, Commitment and Gender*. Ashgate. UK.
- Dale, R. 1999. Specifying globalization effects on national policy: a focus on the mechanisms. *Journal of Education Policy*, Vol. 14, No. 1, 1–17.
- Eleweke, C.J. & Rodda, M. 2002. The Challenge of Enhancing Inclusive Education in Developing Countries. *International Journal of Inclusive Education*, 6 (2), 113–126.
- FAWETZ. 2002. *The Detailed FAWETZ Programme for 2002 – 2004*. Forum for African Women Educationalists, Tanzania Chapter.
- Government of Tanzania and UNICEF Tanzania. *Situation Analysis of Children in Tanzania*. January 2002.
- HakiElimu. 2001. *PEDP Implementation – Lessons from the Field*. Research Proposal (draft). Dar Es Salaam.
- JICA (Japan International Cooperation Agency) and the United Republic of Tanzania.

2002. *The study on school mapping and micro planning in education in the United Republic of Tanzania*.
- Jung, H-S. & Thorbecke, E. 2003. The Impact of Public Education Expenditure on Human Capital, Growth, and Poverty in Tanzania and Zambia: A general equilibrium approach. *Journal of Policy Modeling*, 25, 701–725.
- King, K., Palmer, R., & Hayman, R. 2004. Bridging Research and Policy on Education, Training and their Enabling Environments. *Annual Conference of Development Studies Association. Panel: Bridging Research and Policy in Education*. London, UK.
- Mella, P.P. 2003. Major Factors That Impact on Women's Health in Tanzania: The way forward. *Health Care For Women International*, 24, 712–722.
- OECD. 1998. *DAC Guidelines on Gender Equality and Women's Empowerment in Development Cooperation*. Paris.
- Peasgood, T., Bendera, S., Abrahams, N. & Kisanga, M. 1997. *Gender and Primary Schooling in Tanzania*. IDS Research Report. Sussex, UK. (<http://www.id21.org/education/index.html>)
- Peters, S.J. 2003. *Inclusive Education: Achieving Education For All by Including Those With Disabilities and Special Education Needs*. Prepared for the Disability Group, The World Bank.
- Savolainen, H., Kokkala, H. & Alasuutari, H. (eds.). 2000. Meeting special and diverse educational needs: making inclusive education a reality. Ministry for Foreign Affairs, Department for International Development Cooperation. Helsinki.
- Schafer, M. 1999. International non-governmental organizations and third world education in 1990: A cross-national study. *Sociology of Education*, Vol. 72 (April), 69–88.
- Stone, E. 2001. A complicated struggle: disability, survival and social change in a majority world. In M. Priestley (Ed.) *Disability and the Life Course: Global Perspectives*, pp. 50–63. Cambridge: Cambridge University Press.
- Stromquist, N. 1998. *Increasing girls and women's participation in basic education*. UNESCO.
- Stubbs, S. 1999. Engaging with Difference: soul-searching for a methodology in disability and development research. In E. Stone (Ed.) *Disability and Development*, pp. 257–259. Leeds: Disability Press.
- Swainson, N., Bendera, S., Gordon, R. & Kadzamira, E. 1998. *Promoting Girl's Education in Africa: the design and implementation of policy interventions*. Report to Education Division, Department for International Development. Education Research Paper No. 25. UK. (<http://www.id21.org/education/index.html>)

- Takala, T. 1998. Making educational policy under influence of external assistance and national politics — a comparative analysis of the education sector policy documents of Ethiopia, Mozambique, Namibia and Zambia, *International Journal of Educational Development*, Volume 18, Issue 4, July 1998, 319–335.
- Traustadóttir, R. & Kristiansen, K. 2004. Introducing gender and disability. In Kristiansen, K. & Traustadóttir, R. (Eds). *Gender and Disability Research in the Nordic Countries*, pp. 31–48. Lund: Studentlitteratur.
- The United Republic of Tanzania.
- 2000. Education Sector Development Programme (ESDP). Programme Document.
  - 2000. Poverty Reduction Strategy Paper (PRSP).
  - 2001. Education Sector Development Programme. Primary Education Development Plan (PEDP).
  - 2002. Poverty and Human Development Report.
- UNESCO. 2000. *The Education For All 2000 Assessment, Country Report: Tanzania*. National EFA Assessment Group, Tanzania.
- UNESCO. 2003a. *Overcoming Exclusion through Inclusive Approaches in Education, A Challenge & A Vision*, Conceptual Paper.
- UNESCO. 2003b. Education For All. Global Monitoring Report: Gender and Education for All. The Leap to Equality. UNESCO. Paris.
- UNESCO. 2004. Education For All. Global Monitoring Report: Education for All. The Quality Imperative. UNESCO. Paris.
- UNICEF. 2005. Progress for children, a report card on gender and primary education, number 2. In UN Secretariat. Department of Economic and Social Affairs. 2005. *Progress towards the Millenium Development Goals, 1990–2005*.
- UNDP. 2001a. IDT/MDG Progress: *International/Millenium Declaration Development Goals*. Tanzania Country Team. (<http://www.undp.org/mdg/Tanzania.pdf>)
- UNDP. 2001b. *Learning & Information Pack, Gender Analysis*.
- UN Secretariat. Department of Economic and Social Affairs. 2005. *Progress towards the Millenium Development Goals, 1990–2005*. UN. New York.
- Vavrus, F. 2002. Uncoupling the Articulation Between Girls' Education and Tradition in Tanzania. *Gender and Education*, 14 (4), 367–389.
- Wiman, R. & Sandhu, J. 2003. *Integrating Appropriate Measures for People with Disabilities in the Infrastructure Sector*. GTZ & STAKES.
- Wirz, S. & Meikle, S. 2005. Breaking barriers, Building access for disabled people. *Id21 Insights, Communicating International Development Research*, 55.

- Wright, C. 2003. Understanding UNGEI as an EFA Flagship. Issues of Leadership and Coordination in Girls' Education. Fourth Meeting of the Working Group on EFA. UNESCO HQ, Paris, 22–23 July 2003.
- Yeo, R. & Moore, K. 2003. Including Disabled People in Poverty Reduction Work: “Nothing About Us, Without Us”. *World Development*, 31 (3), 571–590.



### 3.7. Technology

#### *Helsinki University of Technology Towards Sustainable Development: Sustainable Global Technologies Programme*

*Ulla Heinonen*

*Coordinator*

*Helsinki University of Technology*

*Sustainable Global Technologies Programme*

*E-mail: ulla.heinonen@hut.fi*

#### **Background**

Universities have a significant role in reaching the goals of United Nation's Millennium Development Goals and Finnish Development Cooperation Policy. Hence, the Foreign Ministry of Finland encourages Finnish universities to enlarge their teaching and research towards developing countries and advises them to participate in mutual co-operation with the universities and institutes of developing countries. The Ministry underlines that there will be increasing need in the future for experts with developing experiences in government, private companies and non-governmental organisations. In addition, the Ministry of Education supports Finnish universities to educate foreign students from developing countries and this way increase the capacities of the developing countries.

The new practises and mechanisms would, however, be needed to increase the capacities of universities to participate more effectively to the development cooperation. Traditionally, the capacities of the universities in development cooperation have strongly been sidelined. Fortunately, presently, the role of education and research has raised its head in the international forums and statements. United Nations have also noticed the significant capacity of the universities as a producer of scientific information, monitoring mechanisms and practical solutions. One example of this kind of awareness is the newly started collaboration between the programmes of United Nations' (UN-HABITAT, UNEP) and Finnish universities (Helsinki University of Technology, University of Joensuu).

Long-term institutional collaboration where universities would be taken as equal partners to development projects would help to gain the maximal benefits of the universities' capabili-

ties. The equal participation of universities to the development projects would increase the Finnish know-how, increase the local level participation (e.g. universities), rise funding for university research activities related to developing countries and ensure adequate capacity building along the projects. One positive example of this kind of partnerships is the Finnish funded Water Utilisation Project (WUP-FIN) in Mekong River, which involves researchers from private sector, governmental institute and university. In addition, the project interacts closely with local universities and institutes and is one of the main financiers for the Water and Development Group of Helsinki University of Technology.

Sustainable development is one of the main goals in the Finnish Development Cooperation Policy. The Decade of Education for Sustainable Development (2005–2014) will increase the sustainable development also in the teaching and research agenda of many universities. Already, the decade has increased the attention on sustainable development in many international universities. For instance, the USC Berkeley and Harvard University have put significant resources to meet the challenge of sustainable development. The Finnish Universities should also participate to the theme of the decade and emphasize sustainable development in education and research. Increasing the capacities in this field would increase the development of sustainable technologies and open up markets for Finnish know-how.

## **Helsinki University of Technology and Sustainable Development**

Helsinki University of Technology (TKK) as a leading university in technology in Finland is in crucial position educating majority of the Finnish civil engineers and thus training most of the Finnish experts in the field of technology. Therefore, the university should give for its students besides basic education a holistic picture of the state of the world, world's greatest challenges, problems and solutions.

Today, majority of the world's problems are related to globalisation and its effects. Finland has participated very actively on the globalisation discussion and have emphasised democratic and sustainable principles. Finnish expertise is greatly based on democratic institutional systems and pro-environmental approach. High education and capacity, however, act as an important ground for this expertise.

Many of the Finnish technical expertises are schooled at the Helsinki University of Technology and thus the university has an important role in Finnish international cooperation as well as reaching the Finnish development goals through technology and research. Presently, the developing research in the university is sprinkled to different departments and thus the work has not benefited from co-operation and synergies. Centralized education and research of sustainable, global technologies and developing countries would secure the continuous development of education and innovation development in TKK and offer better tools for Finnish development cooperation. This way also the sidelined role of technology could be highlighted in the Finnish development cooperation.

Stronger collaboration between TKK and the universities in the developing countries would enable increasing development of technologies, education and research suitable for developing countries. As a whole, the cross-scientific teaching and research related to developing countries in TKK would strengthen the growth of Finnish know-how, give civil engineers and architects knowledge about developing countries and their needs and allow increasing collaboration between technical expertises in TKK and in developing countries.

### **Sustainable Global Technologies Programme**

To answer the international development goals, recommendations of Finnish Ministries and Finnish Development Cooperation Policies, Helsinki University of Technology has geared up a new programme on sustainable global technologies. Design phase of the programme started in spring 2005 and according to the current plans the programme will start to work in spring 2006 depending on the funding resources.

The Sustainable Global Technologies Programme aims to react the needs of developing countries, improve TKK's role in international competition and widen the education of Finnish civil engineers. It aims to give engineers and architects a holistic education and up-to-date information, improve sustainable innovations in the field of technology and developing countries, increase collaboration between universities in North and South and teach Finnish and developing countries' students and researchers to act in a multicultural working environment. In addition, the programme aims to increase education and research in the fields of technology in the developing countries. Cooperation, coordination, education and research are the ways to fulfil the goals of the programme.

The Sustainable Global Technologies-programme increases collaboration between Finnish and foreign specialists in technologies suitable for developing countries and opens up a forum for interactive discussion and collaboration. The programme will join forces closely with other Finnish and foreign universities, which have education and research related to developing countries. In addition, programme will exploit the partnership with the United Nations' Human Settlement Programme (UN-HABITAT).

The programme will arrange training programme for 20 ECTS, which aims to give students a holistic picture of today's challenges, technologies and mechanisms suitable for developing countries, understanding of international communication, experiences from the development projects and classic problems that international projects are facing. The training programme will be arranged together with other universities in Finland that have interest in developing countries such as the Institute of Development Studies of the Helsinki University. Teaching language will be English and the programme invites students and teachers from abroad from developing countries in particular. To maintain interactivity and practical approach in the lectures and courses of the study module, the annual maximum amount of participants will be around 30 students.

The research of the programme will mainly be directed to architecture, urban planning, surveying, civil- and environmental engineering and energy technologies. The programme aims to create sustainable innovations and do research on infrastructure, environment and community planning in the developing countries. Research will be done together with the partner universities and institutions in Finland and developing countries.

The programme will coordinate TKK's expertise in the different fields of technology and exploit the benefits of synergies. The programme links the know-how of the different departments of TKK such as Architecture, Civil and Environmental Engineering and Surveying Departments, which already have work related to developing countries. One example of this kind of activities is the Water and Development group of the Water Resources Laboratory of Civil- and Environmental Engineering, which has active research group of around ten researchers. The researchers are involved in sustainable and integrated water resources management particularly in developing countries. This group is selected as one of the four research teams of excellence in TKK for years 2004 and 2005. (More information: Varis, O., Water and Sustainable Development: Paradigms, Challenges and the Reality.)

## Partnership between TKK and UN-HABITAT

The Helsinki University of Technology was nominated "a UN-HABITAT Partner University" in February 2005. Being designated as a Partner University pledges TKK to promote together with UN-HABITAT socially and environmentally sustainable development of towns and cities in accordance with the UN Millennium Development Goals and the targets and objectives agreed upon at the World Summit on Sustainable Development in Johannesburg. The United Nations Human Settlements Programme welcomes its partnership with TKK as means of enlarging cooperation between universities in Finland, other developed countries and those in the developing world, both in education and research aimed at achieving sustainable development of human settlements. In addition, the collaboration aims to build bridges between science, education, fieldwork and decision-making.

Regardless of its short duration, the collaboration has started actively and many proposals for co-operation have emerged. The proposals for collaboration vary from small student assignments to large policy analyses. Courses, internships, researcher exchanges, e-learning courses, seminars and workshops are the ways to fulfil the partnership in reality. UN-HABITAT finds collaboration useful and needed due to the noteworthy research capacity that universities have to offer.

One example of the collaboration is the Sustainable Communities course, which will be organised by TKK and UN-HABITAT. The course seeks to transfer past experiences in the field of urban planning to the future city planning and management. In addition, the course aims to provide a forum to strengthen North-South co-operation and give learning experiences from different cultures and working methods. The Finnish involvement in the course planning and lecturing will give the discussion a special Nordic view and focus the discussion towards sustainable planning of towns and cities.

The course on Sustainable Communities is further education course and aimed for experienced government officials engaged in community planning, sustainable development and infrastructure. Other stakeholders, such as representatives from non-governmental organisations and private sector as well as academics and researchers are additionally eligible to participate in the course. The course is intended to be an annual event for government officials and experts in community planning and to open up innovative discussions and recommendations of sustainable development and planning of cities and towns.

## *Free and Open Source Software Strategies for Sustainable Information Society*

*Tere Vadén*

*Assistant Professor*

*University of Tampere*

*Hypermedia Laboratory*

*E-mail: tere.vaden@uta.fi*

*Niklas Vainio*

*Researcher*

*University of Tampere*

*Hypermedia Laboratory*

*E-mail: niklas.vainio@uta.fi*

The first phase of the World Summit on the Information Society (WSIS) held in Geneva, 10–12 December 2003 declared as its goal to build a “people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life” (WSIS Declaration of Principles). The declaration notes that information and communication technologies (ICTs) can have “an immense impact” on all aspects of life and these tools can be used to reduce many traditional obstacles. It is mentioned that these technologies “can be a powerful instrument, increasing productivity, generating economic growth, job creation and employability and improving the quality of life of all” and “promote dialogue among people, nations and civilisations”. The summit agreed that all stakeholders should work together to improve access to ICTs, information and knowledge, “build capacity”, increase confidence in the use of ICTs, create an enabling environment, “development and widen ICT applications”, “foster and respect cultural diversity” and others.

A central element in ICT capacity building is *connectivity*, meaning technical and social access to information networks such as Internet. To provide access to the information in the network, equipment – *hardware* – is needed. Third layer in the picture is *software*, the layer that actually defines the actual possibilities and limits of access to information. We can think *user skills* as the fourth layer (for more detailed analysis of “digital empowerment requisites”, see Mäkinen 2005). Research work has been done on all the four layers. The WSIS declaration also mentions all of them. However, research on layer three has been quite narrow – software and hardware are often seen as mostly economical issues, devoid of deeper social or cultural aspects. However, the intrinsic properties of software and its development and ownership models have effects on the user, on economics

and, not the least, on the other three layers. Therefore, deeper investigation on the role of software in ICT for development is required.

Software, as a digital resource, is not intrinsically scarce in the way of material resources. Instead of physical limitations, use and distribution of software (in the manner of all digital data, information and cultural products) is regulated by the international “intellectual property” system through copyright, patent, trademark and related laws. Therefore also the political obstacles for using ICTs for development are different: in the case of software, the problem is not about raising money to buy computer equipment but rather about getting *permission* to use and distribute software.

The WSIS declaration recognises the need for a “rich public domain”, i.e., wide availability of cultural works – art, scientific research, works of popular culture, statistical data, news, photos, historical documents and so on – that can serve as a basis for future works. According to the declaration,

A rich public domain is an essential element for the growth of the Information Society, creating multiple benefits such as an educated public, new jobs, innovation, business opportunities, and the advancement of sciences. Information in the public domain should be easily accessible to support the Information Society, and protected from misappropriation. Public institutions such as libraries and archives, museums, cultural collections and other community-based access points should be strengthened so as to promote the preservation of documentary records and free and equitable access to information. (article 26)

“Public domain”, as defined in the declaration, does not include computer programs. The declaration talks about computer programs in article 27, where diversity of software production and licensing models is argued for:

Access to information and knowledge can be promoted by increasing awareness among all stakeholders of the possibilities offered by different software models, including proprietary, open-source and free software, in order to increase competition, access by users, diversity of choice, and to enable all users to develop solutions which best meet their requirements. Affordable access to software should be considered as an important component of a truly inclusive Information Society. (article 27)

## Software development models

The three software models mentioned, *proprietary software*, *open source software* and *free software*, are ways of producing, distributing and licensing software. These models, while partially separable by technical criteria, are also fundamentally different in socio-political terms. All of the three models define in their distinctive ways how software is developed, by whom, according to whose interests, and, crucially, who ends up controlling the software.

The *proprietary software* paradigm is the dominant model of current information technology industry on which the major software companies like Microsoft, Oracle, SAP, Nokia and the games industry base their operation. This model is based on the idea of software as “intellectual property”; something that can be commodified, owned and sold, and which is legally protected by copyright and patent laws. The model was created around 1969 when IBM that had previously sold only large-scale software projects bundled with hardware, unbundled them. In the 1970s and early 1980s mass-market for software was created with the introduction of personal computers (Välimäki 2005, 14). The proprietary software model is based on the exclusive rights the copyright law gives to the author of the software. By having the right to choose who may use, copy or modify the software, the copyright holder (typically a company) has a monopoly on sales of that software.

In this model, the software, especially its *source code* (human readable and modifiable version of the program) is seen as a central asset of the company. The business model of proprietary software companies requires that the source code is kept secret. They rely on the exclusive right granted by the copyright law and sell *licenses* (permission grants) to customers. Proprietary software licenses (end user license agreements, or EULAs) allow the customer to use the software, on the condition that the software is not redistributed or modified.

*Free software* and *open source software* are two close, related concepts that share the basic idea that software (essentially the source code) should be available to anyone without restriction. The idea of free software was born in the Artificial Intelligence laboratory of Massachusetts Institute of Technology during the 1960s and 1970s among a group of programmers who called themselves hackers, a word originally meaning someone who enjoys solving computing problems in an efficient and clever way. Programs developed and used in the lab were available for anyone to use and explore, but in the beginning of the 1980s, the idea of proprietary software entered the AI lab through commercialisation of software production. Richard M. Stallman, one of the hackers, disagreed with



the notion of software as property. Restricting software distribution and modifications was in strong conflict with the ideology of the hacker community – freedom of sharing information. Stallman resigned from the lab and wrote the “GNU Manifesto” (Stallman 1984) in which he described the moral dilemma he had to face:

I consider that the golden rule requires that if I like a program I must share it with other people who like it. Software sellers want to divide the users and conquer them, making each user agree not to share with others. I refuse to break solidarity with other users in this way. I cannot in good conscience sign a nondisclosure agreement or a software license agreement. For years I worked within the Artificial Intelligence Lab to resist such tendencies and other inhospitalities, but eventually they had gone too far: I could not remain in an institution where such things are done for me against my will.

So that I can continue to use computers without dishonor, I have decided to put together a sufficient body of free software so that I will be able to get along without any software that is not free.

For Stallman, computer systems are ground stones of social systems, and therefore any restrictions on distribution or modification of the system are “antisocial”, “unethical” and “simply wrong”. Freedom is fundamental because of the integrity of community: nothing should prevent people from helping and co-operating with each other. In 1984, Stallman started the GNU project to create the GNU operating system that would be freely available. (Stallman 1984.)

When speaking of “free”, Stallman is referring to freedom, as in free speech, not as in zero cost (“*affordable* access to software” in the WSIS declaration). Although free software is often available at zero cost, what Stallman sees fundamental is the freedom of the software. According to Stallman, software freedom means:

- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this. (Stallman 1996)

Stallman could have released his software into the public domain, i.e. abandoned his copyright. But he wanted to be sure that a piece of software that he wrote would remain free also in the case somebody else distributed it, in modified or unmodified versions. To guarantee this, he wrote a software copyright license, GNU General Public License (GPL) that was designed to give users some of the rights that by law are the privilege of the author. The license implemented the concept of *copyleft*: if you distribute the software, modified or unmodified, the same license and all its freedoms also apply to the distributed version:

You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License. (GPL section 2.)

The intention of this requirement is to create a free software commons: a pool or 'snowball' of free, collaboratively created software. Anyone can build software on the commons, but it cannot be made proprietary. You may use free software parts in your program but only if the resulting software is also freely available – it's a reciprocal deal (Rosen 2005).

Stallman's GNU project was successful technically, but not so much socially. During the 1980s and 1990s, Stallman's philosophy was translated into millions of lines of computer code, creating tools that became popular in Unix and server environments, like the Perl programming language, the gcc compiler, Emacs text editor, and all the important components of the Internet infrastructure: the free Sendmail e-mail server, the free Apache web server and the free domain name server software BIND. Until the beginning of 1990s, free software was developed mostly by small groups of academic professionals or enthusiasts and distributed via Internet newsgroups and open file archives. With the growth in Internet connectivity, also the free software community grew larger, which made it possible to have global, distributed software development projects. Programs like the Linux kernel, started by Linus Torvalds in 1991, gained interest and became successful development projects. The networked technology made the success of the Linux kernel possible and free software solutions started becoming popular around the end of the 1990s.

Eric Raymond, in his groundbreaking anthropological study of hacker culture, *The Cathedral and the Bazaar* (1999), noticed that collaborative work on a software on the net was faster and cheaper than the traditional model of software development and made software more secure and robust and more suitable for its function. According to Raymond, this was because programmers collaborate to fulfill their personal (or business) need at hand: "Every

good work of software starts by scratching a developer's personal itch." Personal need drives developers to make the software better and then release their modifications to others so they can build on that work. Raymond compared this model of development to "a great babbling bazaar of differing agendas and approaches", contrasting it with the "cathedral" style of closed, secretive software development taking place in software corporations. The cathedral model defines software as a product: the properties and design of the software are not defined by the users or programmers-users but by the marketing section.

The Open Source movement was founded in 1998 to encourage businesses to participate in the free software development. The movement emphasised the technical and development aspects of free software, calling it "open source software". This was because the term "free software" is ambiguous – free as in "no money charged" or "free as in free speech" – and because "the term makes a lot of corporate types nervous" (Raymond 1998). In 1998, Bruce Perens wrote the "Open Source Definition" (OSI 1998) as a guideline to define when a piece of software can be called "Open Source" software. The definition is similar to the free software definition but is more neutral regarding its social goals. The key points of the definition are:

- the software must be freely redistributable
- it must come with the source code
- the user may make modifications and derived works (modified versions of the software)
- the license must not discriminate against any person or group of persons
- the license must not restrict any specific field of use.

Open source, although having a different definition and different agenda, is a movement that has very close ties with the free software movement. In practice, all free software is open source software and the communities overlap each other. Therefore it is often practical to speak of these movements with a single name: free and open source software, or FOSS.

During the 1990s, FOSS started challenging proprietary solutions with the success of software like GNU/Linux systems, MySQL database, KDE and GNOME desktop environments and OpenOffice.org office suite. The market share of FOSS solutions is increasing. For instance, Sendmail server currently operates about 42% of the Internet e-mail traffic, the Apache web server runs now about 75% of web sites and BIND operates about 70% of the name servers. Free and open source solutions are increasingly used

by companies all around the world; depending on the region and other factors, research reports tell that 20–60% of companies use some free and open source software. Some of the reasons given by the users are decreased general costs, lower software licensing costs, better control over development of the software, vendor independence, and improved security (Wheeler 2005).

### **Benefits of free and open source software for development**

The benefits of FOSS for development are, as noted above, several and fall into multiple intersecting categories. First, there are the purely technological advantages. Free and open source software may be more reliable, faster, more compact than the proprietary alternatives. Secondly, there are advantages that have to do with the development model: tailoring and localisation of software are possible, which promotes local entrepreneurship and capacity building. The benefits of the development model – widely distributed volunteer work – are closely tied with the technological side. The development of FOSS can be both faster and provide higher quality (in terms of the number of bugs, etc.) than proprietary software. (For general arguments for the technological benefits of FOSS, see [opensource.org](http://opensource.org), DiBona 1999, Raymond 1999, for the development context see Rajani 2003; Weerawarana & Weeratunga 2004; UNCTAD 2003; Dravis 2004).

The fact that the actual price of FOSS is often small if not zero, is definitely important, as well. Prohibitive license costs of proprietary software may well work for FOSS in circumstances where one works with tight or non-existent ICT budgets. However, the price issue should not be overstated. In many developing countries up to 80–90% of all software is used without paying the license fees (“pirated”); a practice that in some cases has been suspected to be supported by major software companies in the hope that after the markets mature the users will be locked in the proprietary software environment. In this kind of situation, where most software is essentially free as in zero price, FOSS has no economical edge. Nevertheless, for instance in the initiative that Vietnam launched in 2003 towards the increased use of FOSS, cutting down license fees as well as “piracy” rates has been cited as a main motivation (the WTO agreement signed by Vietnam demands a cut-down in the use of illegal software: see Stocking 2003; cf. also Mannila 2005).

However, in the development perspective the interface between the two topmost layers mentioned earlier, software and skills (or, more widely, digital literacy), is of particular

interest. The democratic and developmental potential of ICT can be realised only, if there is a genuine leap from consuming digital goods to digital authorship. To quote the Civil Society Declaration to the WSIS:

Software provides the medium and regulatory framework for digital information, and access to software determines who may participate. Equal access to software is fundamental for inclusive and empowering digital information and communication societies, and a diversity of platforms is essential to this.

We must recognise the political and regulatory impact of software on digital societies and build, through public policy and specific programs, awareness of the effects and benefits of different software models. In particular, Free Software, with its freedoms of use for any purpose, study, modification and redistribution should be promoted for its unique social, educational, scientific, political and economic benefits and opportunities. Its special advantages for developing countries, such as low cost, empowerment and the stimulation of sustainable local and regional economies, easier adaptation to local cultures and creation of local language versions, greater security, capacity building, etc, need to be recognised, publicised and taken advantage of. Governments should promote the use of Free Software in schools and higher education and in public administration. (Article 2.3.3.3)

This means that in the development context notions like “digital literacy” have to be understood in a wide sense. An essential part of digital literacy is the ability to produce digital content and to use digital technology in ways that have not been predetermined by commercial interests. In terms of non-digital literacy, a crucial question has been and remains the access to information using one’s native language. The question easily translates to questions of, for instance, the language in which information on the Web is presented or the localisation of computer software. Again, this view from the perspective of non-digital literacy and software should be widened to the issues of skills and capacity building: the ability to produce digital content (e.g. web content, software, images, video and sound). These abilities are closely related to skills that have to do with the use of the computer and other digital devices; these skills crystallise in their most basic and most powerful form in the skill of programming.

In sociology, the “prisoners’ dilemma” is a well-known example of a social setting that systematically encourages anti-social and selfish behaviour. In a similar vein, the proprietary

closed-source model of software distribution and development strongly discourages digital literacy in the wide sense, for instance, the skills of programming, modification and localisation. Indeed, it can be claimed that even in the affluent countries digital literacy is partly in the process of deterioration: while digital literacy could and should mean the use of digital technology in the service of autonomously defined goals, it is being reduced to the capacity of using one particular computer operating system and its application programs.

The possibilities of strong digital literacy and autonomous development of digital resources are not affected only by ownership of channels of distribution or so called “intellectual property” laws, but also by trade agreements and the framework of international trade. As the so-called “Friends of Development” group, comprised of Brazil, Argentina, India, amongst others, has argued in the framework of the WIPO, international organisations should pay closer attention to the effects that trade agreements and IP laws have on issues of development (see WIPO 2004). There is much too little research on this side of the issues.

The crux of the issue is, therefore, not only technological or infrastructural, but social and cultural. The technological equipment and the accompanying user cultures have to be seen in the larger context of the organisation of social, economical and political life. In the case of ICT, the old slogan “architecture is politics” gains new pertinence, not least because often digital resources are not only the tools for doing something, but also the end results of the process. This fact, in turn, is closely connected to the formation of self-organising and self-determining communities of communication. In the digital era, the creation of communities implies questions of the ownership of code – the ‘code’ that is more like an abstract form than a material quantity.

As information technology becomes a more important way of accessing knowledge in today’s world, a critical look needs to be taken into the information infrastructure of the society. As more of our activities (knowledge seeking, learning, business, trade, communication, publishing) are moving into the virtual world, the architecture of the digital world begins to affect our behavior and activities more and more. It sets the limits and rules for our behavior; different architectural decisions offer us different possibilities and set us different limitations. While in the physical world we are guided mostly by norms and laws, in the virtual world the code of law is partially being replaced by computer code – the software instructions that define what we are allowed to do and when our access is denied (Lessig 1999, 2001; Rushkoff 2003).

As the eminent peace researcher Johan Galtung has observed, digital authorship may challenge the existing socio-economic balance in a radical way. According to Galtung's (2003) optimistic view:

The access monopoly is to some extent broken. Even a poor village, with neither electricity nor telephone, may sustain one computer powered by solar cells, and connect with a cellular phone if the signal is good enough. They can download technologies produced by intellectuals who have not sold their souls in those Faustian deals with State and Capital. And they may make inputs themselves to the WGNIP, the World Gross Idea Product. Sooner or later this will have revolutionary impact particularly on the position of the intelligentsia. The world's libraries are available, search engines do the search, people not educated/brain-washed by established institutions may see new connections, or prefer to work on the basis of immediate, less mediated experience. The sky is the limit.

It is clear from the above, that the FOSS model of development has potential outside the field of software. Projects like the free encyclopedia, Wikipedia, have taken the FOSS model to territories that lie closer to e-learning and knowledge production in general (see also Mulgan *et al.* (2005) for application of the FOSS model in agriculture, pharmaceuticals and other areas). Indeed, the buzzwords *open content*, *creative commons* and *free culture* point towards the possibilities that FOSS has beyond the narrowly understood software agenda. The aim should be digital resources that "provide a local community with a sound basis for reading and responding to global and informational influences it encounters" (Lankshear & Knobel, 2003, p. 106). Shared and communal self-knowledge forms a point of view and a form of expertise from which to interact, interpret and respond to more global forces. "Producing, accumulating, and disseminating local knowledge will consequently become increasingly valuable to communities as they become caught up more and more in global-level trends and processes" (*ibid.*).

### **FOSS4D: Research challenges**

According to a research report by Weerawarana and Weeratunga (2004), free and open source software could empower IT industries of developing countries, increase efficiency and effectiveness of government and help capacity building of local software industry. A report funded by the World Bank infoDev program (Dravis 2004) saw free and open

source software as increasing choice, technological self reliance, transparency and having potential for local ICT capacity development. United Nations has started an International Open Source Network program to promote use of open source technologies in the Asia-Pacific region (<http://www.iosn.net>). Many developing countries have decided on or are considering their open source strategies and policy, and there are several proposals or decisions to mandate use of FOSS in public administration, especially in Latin America countries like Brazil and Argentina (CSIS 2004).

If and when it is the case that the possible benefits of FOSS for development are closely connected with the social, cultural and political setting in terms of information society development in general, it is clear that future research has to assess the intricate questions connecting software adoption to the larger sphere. While the technological benefits of FOSS are relatively well known and argued for, the real-world socio-cultural obstacles for its adoption are less well known (however, see Rajani's 2003 pioneering work).

Let us take an example. It is often claimed that FOSS excels in the area of support through community platforms, such as newsgroups, user groups, discussion and chat sites. While it may be true that for many types of software these fora are quite lively and useful, they do have their setbacks, too. One of the interesting cases of software transition to FOSS has been completed in the Martyrs University of Uganda (see the article by van Reijswoud & Mulo 2005). As van Reijswoud & Mulo observe, the frequency of power failures in the area already necessitated a revision of received wisdom on which GNU/Linux-distribution would be best suited. More alarmingly, however, van Reijswoud and his team encountered a significant lack of support from the peer groups. The hypothesis is that the questions were too alien and "low-level" to interest peers located in different and more affluent circumstances.

The case also illustrates the fact that FOSS projects often rely on the Internet for distribution, support and communication. While this method has proven its revolutionary potential, it is also a source of exclusion when it comes to the developing countries. Similar exclusive properties are produced also by issues of gender: females, who often are at key positions with regard to local development goals, may find the male dominated and geeky atmosphere of FOSS off-putting if not offensive (Lin 2005).

As these examples point out, careful and sustained sociological analyses of FOSS adoption in the development context are needed. This work has to be supported by a detailed



analysis of the different causes for adoption (such as political economy, see Vadén & Suoranta 2004) and the motivations of FOSS developers and end-users.

## References

- “Civil Society Summit Declaration ’Shaping Information Societies for Human Needs”  
[http://www.worldsummit2003.de/download\\_en/WSIS-CS-Decl-08Dec2003-eng.rtf](http://www.worldsummit2003.de/download_en/WSIS-CS-Decl-08Dec2003-eng.rtf)
- CSIS 2004. “Government Open Source Policies”. The Center for Strategic & International Studies, Washington D.C. Available at: [http://www.csis.org/tech/OpenSource/0408\\_ospolicies.pdf](http://www.csis.org/tech/OpenSource/0408_ospolicies.pdf)
- DiBona, C *et al.* (eds.) 1999. *Open Sources*, O’Reilly, Sebastopol.
- Dravis, P 2004. *Open Source Software. Perspectives for Development*. infoDev.
- Galtung, J 2003. “The Role of the Intellectual II – this time as other-criticism”. Available at: <http://www.transcend.org/tpu/>
- Lankshear, C & Knobel, M 2003. *New Literacies: changing knowledge and classroom learning*. Open University Press, Buckingham.
- Lessig, L 1999. *Code and Other Laws of Cyberspace*. Basic Books, New York.
- Lessig, L 2001. *The Future of Ideas: the fate of the commons in a connected world*. Random House, New York.
- Lin, Y 2005. “Inclusion, diversity and gender equality: Gender Dimensions of the Free/Libre Open Source Software Development”. Available at: [http://opensource.mit.edu/papers/lin3\\_gender.pdf](http://opensource.mit.edu/papers/lin3_gender.pdf)
- Mannila, M 2005. *Free and open source software. Approaches in Brazil and Argentina*. Hypermedia Laboratory, University of Tampere. To appear.
- Mulgan, G & Steinberg, T & Salem, O 2005. *Wide Open. Open source methods and their future potential*. Demos, London. Available at: <http://www.demos.co.uk/catalogue/wideopen/>
- Mäkinen, M 2005. “Digital Empowerment as a Process for Enhancing Citizens’ Participation”. Hypermedia Laboratory, University of Tampere. To appear.
- Noronha, F 2005. “The Social Implications of Free Software”. Free Software Magazine, issue 4. Available at: [http://www.freesoftwaremagazine.com/free\\_issues/issue\\_04/social\\_implications/](http://www.freesoftwaremagazine.com/free_issues/issue_04/social_implications/)
- OSI 1998. “The Open Source Definition”. Available at: <http://opensource.org/docs/definition.php>

- Rajani, N 2003. *Free as in Education. Significance of the Free/Libre and Open Source Software for Developing Countries*. Ministry for Foreign Affairs of Finland, Helsinki. Available at: [http://www.maailma.kaapeli.fi/FLOSS\\_for\\_dev.html](http://www.maailma.kaapeli.fi/FLOSS_for_dev.html)
- Raymond, E 1998. "Goodbye, 'free software'; hello, 'open source'". Available at: <http://www.catb.org/~esr/open-source.html>
- Raymond, E 1999. *The Cathedral and the Bazaar*. O'Reilly, Sebastopol.
- Rosen, L 2005. *Open Source Licensing. Software Freedom and Intellectual Property Law*. Prentice Hall, New Jersey.
- Rushkoff, D 2003. *Open Source Democracy: how online communication is changing offline politics*. Demos, London.
- Stallman, R 1984. "The GNU Manifesto". Available at: <http://www.gnu.org/gnu/manifesto.html>
- Stallman, R 1996. "The Free Software Definition". Available at: <http://www.gnu.org/philosophy/free-sw.html>
- Stocking, B 2003. "Vietnam Embracing Open Source Products" in [http://linuxtoday.com/it\\_management/2003103001226OSDPPB](http://linuxtoday.com/it_management/2003103001226OSDPPB)
- UNCTAD 2003. *United Nations Conference on Trade and Development E-Commerce and Development Report 2003*.
- Vadén, T & Suoranta, J 2004. "Breaking Radical Monopolies: towards political economy of digital literacy", *E-Learning*, Vol. 1, no 2.
- van Rejswoud, V & Mulo, E 2005. "Applying Open Source Software in a Development Context: Expectations and Experiences. Case study of a University in Uganda". Hypermedia Laboratory, University of Tampere. To appear.
- Välimäki, M 2005. *The Rise of Open Source Licensing. A Challenge to the Use of Intellectual Property in the Software Industry*. Turre Publishing, Helsinki.
- Weerawarana, S & Weeratunga, J 2004. *Open Source in Developing Countries*. Sida, Stockholm.
- Wheeler, D 2005. "Why Open Source Software / Free Software (OSS/FS, FLOSS, or FOSS)? Look at the Numbers!" Available at: [http://www.dwheeler.com/oss\\_fs\\_why.html](http://www.dwheeler.com/oss_fs_why.html)
- WIPO 2004. "Proposal by Brazil and Argentina for the Establishment of a Development agenda for WIPO." Available at: [http://www.wipo.int/documents/en/document/govbody/wo\\_gb\\_ga/pdf/wo\\_ga\\_31\\_11.pdf](http://www.wipo.int/documents/en/document/govbody/wo_gb_ga/pdf/wo_ga_31_11.pdf)
- "WSIS Declaration of Principles." Available at: [http://www.itu.int/wsis/documents/doc\\_multi-en-1161%7C1160.asp](http://www.itu.int/wsis/documents/doc_multi-en-1161%7C1160.asp)

## *ICT Education for Local Development*

*Erkki Sutinen, Marcus Duveskog, Pasi J. Eronen, Matti Tedre, Mikko Vesienaho*

*Educational Technology Research Group*

*University of Joensuu*

*Department of Computer Science*

*E-mail: [firstname.lastname@cs.joensuu.fi](mailto:firstname.lastname@cs.joensuu.fi)*

*<http://cs.joensuu.fi/edtech/>*

### **Abstract**

Our research group has been working with contextual, culturally sensitive ICT education, applications and technologies in developing countries for ten years now. Our work is based on a reciprocal development in an international and interdisciplinary network. From this reciprocity, our partners in developing countries gain technological know-how and theoretical understanding of modern technologies, whereas we gain new, practical viewpoints to computing, technology, and education. In this paper we describe the main features of our work, focusing on Tanzania in general, and on four distinct projects in particular. First we discuss some aspects of development, then present our collaboration, and finally analyze the features and outcomes of our projects from an educational point of view.

### **Introduction**

Many experts believe that information and communication technologies (ICTs) may widen rather than narrow the gap between industrial and developing countries (*e.g.* Naidoo & Schutte, 1999). The vision of the World Summit on the Information Society (WSIS, 2003a) calls for an opportunity for all the people around the world to make use of ICTs. Schools and other educational institutions – no matter how rural or urban, rich or poor – should not be excluded.

The WSIS action plan (WSIS, 2003b) encourages the development of content and technical conditions to facilitate the presence and use of all world languages in the Internet. The promises that this kind of progress makes are numerous, yet doubtful: easier knowledge dissemination, increased and varied social interaction, more efficient economic and

business practices, political empowerment, better access to independent and diverse media, better education, awareness of health issues, improved health services, and diversified leisure and entertainment possibilities.

It seems to be a common idea that an information society leads to affluent society. We neither believe that information society would be a prerequisite of welfare society, nor that an affluent society would be a prerequisite of information society. Furthermore, we do not claim that information society is a *sine qua non* of a good society: there has been stable, just, and prosperous societies long before the whole concept of information society. But we think that the two may indeed nourish each other, and our work aims at finding out ways in which information technologies and ICT education can support local development without sacrificing local identity.

Therefore we have been working for contextual, culturally sensitive ICT education in developing countries (Lund *et al.* 2005), better applications and technologies for HIV/AIDS education (Duveskog *et al.* 2003), and teaching the basics of programming (Duveskog *et al.* 2004). There are four overarching themes in our research projects:

- to design and develop ICT education to meet the needs of developing countries;
- to design and implement computer-based tools for subject areas such as health education and business;
- to encourage interaction and cross-dialog between countries on different levels – between students, teachers, people, and institutions; and
- to create opportunities for a bi-directional learning process: new prospects for, say, Tanzanian students and at the same time, new perspectives and models for their Western counterparts.

Our research projects aim at non-zero-sum development: on one hand, we can develop our practical and theoretical knowledge as well as technology in an environment that differs greatly from what we are used to. On the other hand, our partners will gain technological know-how and theoretical understanding via ICT education and technological tools. And finally, all participants gain the advantage of an international, interdisciplinary network. Our main target area is Tanzania, which has been lagging behind in this field for a long time, with only occasional development in ICTs, and which, according to the UN, belongs to the least developed countries (LDCs).

From our point of view, computers should serve as tools for education. The oft-criticized “no significant difference phenomenon” (*i.e.*, students who use expensive technologies learn the subject matter identically with students who are taught with traditional methods) does not matter if the students in the first group learn computer literacy and further computer skills at the same time with the subject matter. After all, after their graduation, students who master computers will have a wider range of opportunities than students without any computer literacy. Two students, both knowing the same subject matter, but only one being computer literate, are definitely not on an equal footing in modern labor market, and this difference is significant.<sup>8</sup>

Therefore, students should be familiarized with different ways of applying ICT in various situations, and we believe that this is best done by using computers in various subjects. And by this, we do not mean only as educational tools (such as PowerPoint slides at lectures), but students taking ICTs to productive uses (such as using spreadsheet programs for accounting). Even further, because the needs for ICT differ, for instance, between communities, countries, and genders, contextualization should not be limited to the applications of technology, but local matters should be included also in teaching the fundamentals of computing. We believe that when contextualization is done on a general, non-application-specific level (even in theoretical computer science), ICT education can strengthen rather than undermine local identity. In our projects, communities are encouraged to utilize ICTs in creative and functional ways, in their own world, with familiar mental models.

## Development

We are aware of the multiplicity of words that are used to classify countries – words such as developed and developing; industrialized, pre-industrialized and post-industrialized; modern and postmodern; NICs, MEDCs, and LDCs; first, third, and fourth world, *etc.* However, in this article we use the term *industrialized countries* to refer to countries whose economic system is diversified and relies on manufacturing, high technology, large service sector, or knowledge production, countries that have influence in the different

---

<sup>8</sup> UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States: <http://www.un.org/special-rep/ohrlls/ldc/list.htm>

strands of globalization, whose infrastructure is well-developed, and whose human assets index (based on nutrition, health, education, and adult literacy) is high.

In contrast to *industrialized*, we use the term *developing* to refer to countries whose economic system is mainly underdeveloped (*e.g.* based on exporting raw materials and vulnerable to instability in agricultural production or to fluctuations in exports), whose GNI (gross national income) per capita and human assets index are low, and that often are torn by internal conflicts, instability, and corruption.

Our view on development (if understood as making something better) is that without a human aspect, development cannot be measured. Making processors smaller, networks broader, computers faster, or programs more versatile is, from our point of view, not development. Granted, in computing faster enables new things to be done, but on what grounds is faster better? Those who claim technology to be value-free, do not label speed either good or bad (for it is value-free). In this case, technological development is reduced to an observation that computing gets faster, without any value statements (Tedre & Eskelinen, forthcoming). Also those who claim that technology is *not* value-free find it hard to label computing speed either good or bad: the very same increase in computing speed has enabled the Human Genome Project (that most people perceive as good) but also the research on biological warfare (that most people perceive as bad).

As we see it, the very essence of development lies in the territory of human affairs: for instance, increased computing speed is development if it makes human conditions more comfortable, eases certain tasks, or satisfies human curiosity (Tedre & Eskelinen, forthcoming). Furthermore, in order to be sustainable, development must be able to meet the current needs of people without compromising the ability of future generations to meet their own needs (WCED, 1987: p.24). This kind of development must not rely on patterns of production and consumption that the global ecosystem cannot support in the long run, nor exclude ethnic, social, or gender groups from participating in societal activities.

As implied earlier, there are no “culturally neutral” technologies. Localized technologies are not an exception – quite the opposite. The internationalization – localization process embeds into technology at least two kinds of cultural assumptions. Internationalization (writing software so that possible local changes or extra features are easy to implement afterwards) plants in the software the mental models of those who internationalize. Localization (implementing these local changes or features) plants in the software the mental models of

those who do the localization. Yet, from the fact that ICTs are not culturally neutral, also arises the power and potential of ICT systems: *relevance* (Tedre *et al.* forthcoming).

First, in our model of ICT production, modern ICT tools are not detached from other technologies, but because complete systems are bound to and based on the design decisions of pre-existing tools (MacKenzie & Wajcman, 1999), they have to be *relevant to the existing infrastructure*. ICTs can be implemented in highly variable situations, as long as the local infrastructure (electricity, phone lines, or *e.g.* OSI layers – Open System Interconnection layers) is known. Second, the ICT systems have to be *relevant to local needs*. Technologies that are not advantageous from the viewpoint of the users, are not easily taken into use – no matter how great their “objective” advantage is (Rogers, 2003).

Third, ICT systems have to be *relevant to the local users*. Systems that are hard to use are adopted more slowly than those that are easy to use, or they may be rejected altogether. The more new skills and understandings a technology requires the adopter to develop, the slower it is adopted than a technology that links to knowledge the user already has (Rogers, 2003). Fourth, ICT systems have to be *relevant to the local culture and society*. The structure of a social system may facilitate or impede the diffusion of technologies. For example, the adoption of family planning and contraceptives differ greatly in different social systems. The adoption of an incompatible innovation often requires prior adoption of a new value system, which is a relatively slow process (Rogers, 2003).

### *ICT Education in Tanzania: an Overview of Collaboration*

In Tanzania we are working for local development and sustainability by providing and improving localized ICT education and building long-term collaboration with various educational institutions (see Table 1 for a ten-year overview of our projects). Our activities in improving learning and teaching environments in developing countries started in 1995 at Kidugala Secondary in Tanzania, when professor Erkki Sutinen gave a localized Visual Basic programming course where students got a new ICT platform to express and represent local stories.

In 2000 one of our researchers gave the course “*Introduction course to computer science and global educational technology*” for the Master’s level students at Tumaini University, Tanzania. Two of these candidates were selected to come to the University of Joensuu

to study for a Master of Science degree in computer science. The focus of their studies was ICT in Tanzanian context, and the final titles of their Master's theses were "The opportunities of ICT for small and medium size enterprises and regional development in Tanzania" and "Design of culture-sensitive visualization tools for teaching programming in developing countries".

In spring 2002 a contextualized Java programming course was held at Kidugala Secondary School. During the course, students developed educative web-based material on HIV/AIDS. In 2002 and 2003 there were two workshops on "programming by building" using intelligent building blocks (I-BLOCKS), one at Tumaini University and one at Pommern Secondary School. In 2005 we also held similar workshops on a lower level – aimed at hospitalized and orphan children at Ilembula Hospital. These workshops were held together with students from Tumaini University. In these workshops, hospitalized and orphan children receive entertaining ICT education by playing with the I-BLOCKS. At the same time we have received important feedback on how to make the technology easier to use for younger Tanzanian users.

In 2004 the 5ARTS teacher and student exchange project (a part of North-South Higher Education Network Programme, funded by CIMO – Centre for International Mobility) was launched. In this project teachers from four African universities came to University of Joensuu in two periods to give lectures for the course "ICT for development". Furthermore, three researchers from University of Joensuu lectured on ICT-related topics at four of our African partner Universities. In the end of the year 2004 our researchers gave the first contextualized programming course at Tumaini University – a pilot course for the "contextualized ICT programme" that Tumaini University is launching with our assistance. Furthermore, during 2005 we conducted a teacher training program at College of Business Education in Tanzania. During the past few years we have extended our activities in Tanzania, and expanded our collaboration to several other countries in Africa.



Table 1. *An overview of our project activities in Africa.*

Year	Activity	Partner	Funding/Support
1995–1998	Localized Visual Basic Programming Courses	Kidugala Secondary School	FELM <sup>9</sup>
2000	Introduction course to computer science and global educational technology	Tumaini University	FELM
2000–2002	Tanzanian Master of science students	University of Joensuu	Joensuu Evangelical Lutheran Congregation, Missionmen
2002	Contextual Java (HIV/AIDS) programming in Kidugala Secondary	Kidugala Secondary School	Uppsala University
2003–2004	Programming by Building -workshop I & II	Tumaini University, Pommern Secondary School	AoF <sup>10</sup> , UniSD <sup>11</sup>
2004	5ARTS Teacher Exchange program	Kabarak University, Tumaini University, University of Namibia, University of Pretoria	AoF, UniSD, CIMO <sup>12</sup>
2004–2005	Contextualized Programming course	Tumaini University	AoF, UniSD
2005	Teacher Training	College of Business Education	Embassy of Finland, Tanzania
2005	ICT as a Therapeutic Tool for Hospitalized children	Ilembula Hospital	AoF, UniSD

## Sample Projects

### *High School Students Designing Digital Learning Materials for HIV/AIDS*

One of our first Tanzanian projects, which was related to HIV/AIDS education, helped us to see the importance of contextualization in ICT education. Originally, we intended

<sup>9</sup> Finnish Evangelical Lutheran Mission.

<sup>10</sup> Academy of Finland.

<sup>11</sup> University of Southern Denmark.

<sup>12</sup> Centre for International Mobility.

to give a group of secondary school students a course in programming. Despite the initial enthusiasm, the students soon lost their interest and started to drop out of the course. At that point, the teacher came up with an idea for contextualizing his teaching – instead of teaching programming concepts from alpha to omega, he encouraged the students to design a website on HIV/AIDS, which required technical skills such as programming.

The students got excited by the challenge and learned programming because it was the intermediary tool that they needed to create an interactive HIV/AIDS website. By learning programming, they acquired a new tool to express their emotions, fears, taboos, and attitudes. This tool led to a change: the students were no longer only passive receivers of information but they needed to actively process it (see Figure 1 for an example of the course outcomes). Learning programming was one part of this process of change, and, in essence, it was of a contextualized nature (Duveskog *et al.* 2003).

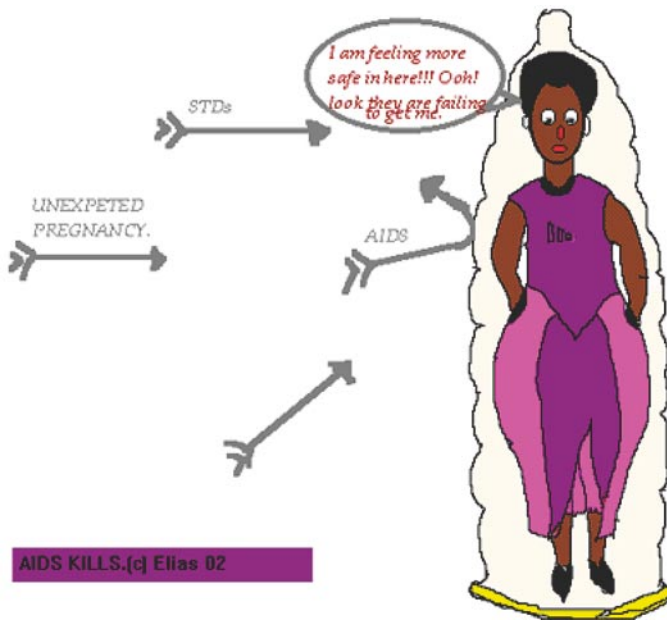


Figure 1. “Safe Inside the Condom” visualization on the HIV/AIDS website

### *Introductory Course in ICT for Undergraduate Students*

In fall 2004, we launched an introductory ICT course at Tumaini University, Iringa University College. It was natural to start designing the course using the contextualized approach: the idea was to prepare students to think of the opportunities that ICT might create, starting from their own points of view. From the very beginning, we understood that the course content and assignments should be linked to the aspects of cultural heritage, community building, as well as to societal and economic challenges via what we call *points-of-contact*. These points-of-contact are such connectors to the local environment that are relevant to learning and development. With these connectors, ICT education can be linked with regional development, both governmental and private.

The current implementation of the course is based on several years of collaboration between Tumaini University and two European universities: the University of Joensuu, Finland, and the University of Southern Denmark. During these years, two Tanzanian students have obtained M.Sc degrees from the University of Joensuu. Furthermore, several workshops have been organized in Tumaini to test novel educational approaches for ICT education, for instance, robotics and program visualization (Sutinen *et al.* 2002; Vesisenaho & Lund, 2004). The ICT infrastructure of Tumaini University has been developed during the past years with the help of Finnish sponsors and expertise from Finnish expatriates.

The participants in the first course were 27 students who had been working as secondary school teachers for nine years on average, and who were participating in a Bachelor's degree program in education to get a formal teaching qualification. The degree program takes three years altogether, and the course was given during their second year of studies. The course consisted of about 50 hours of contact teaching plus project work. The learning material was mainly located on a web site. In addition, students got some lecture material as handouts. The course was taught on-site by two teachers, and online support was provided from both of the European partner universities. Besides doing the weekly assignments, the students kept learning diaries where they, among other things, evaluated the level of contextualization of the web-based learning materials (see Figure 2 for an example of the localized learning material).

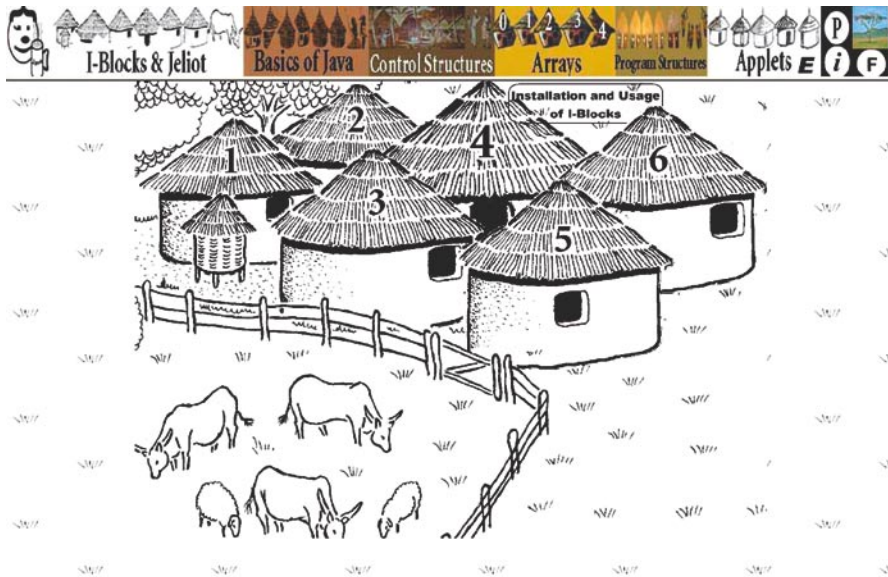


Figure 2. Example of a course web site where each module is represented as a traditional African village.

In addition to web-based learning materials, the course made use of several other technologies which were supposed to help students to actively process and practice what they learned during the lectures. These technologies included the use of a visualization engine, Jeliot, for illustrating how a Java program works and the use of I-BLOCKS (Lund & Vesisenaho, 2004) for concrete, hands-on experimentation (Figure 3 shows participants from Tumaini University teaching secondary school students programming by building with I-BLOCKS). The course was intended to expose the students to the realm of ICT from an experimental instead of theoretical starting point. This kind of hands-on approach is unorthodox to Western ICT teaching (at least on university level), and also uncommon to the traditional African method of instruction, which is largely based on rote learning and imitation of authorities.

The contextualized approach of the course was not restricted to learning ICT in a culturally or socially meaningful way. We also encouraged students to come up with their own mental models, patterns and interpretations of ICT. In short, we promoted contextualized cognition of ICT concepts, referred to as *ethnocomputing* (Tedre *et al.* 2002).

The results from the project showed that the students' interest to ICT grew throughout the course. The course opened their minds towards creative thinking about technology. Part of this opening is apparently due to contextualization and concretization used during the course. However, we also discovered apparent limitations with the course. In particular, we are still developing the algorithmic parts of the course, because they seemed to be quite difficult for the students (Lund *et al.* 2005).

The course was developed as a pilot course for the localized ICT program we are co-developing with Tumaini University. Later the program will make it possible for students at Tumaini University to earn a Bachelor's degree in ICT. As a result of our co-operation, Tumaini University will host the 4<sup>th</sup> IEEE international workshop on Technology for Education in Developing Countries (TEDC) together with NEPAD (The New Partnership for Africa's Development) in 2006.

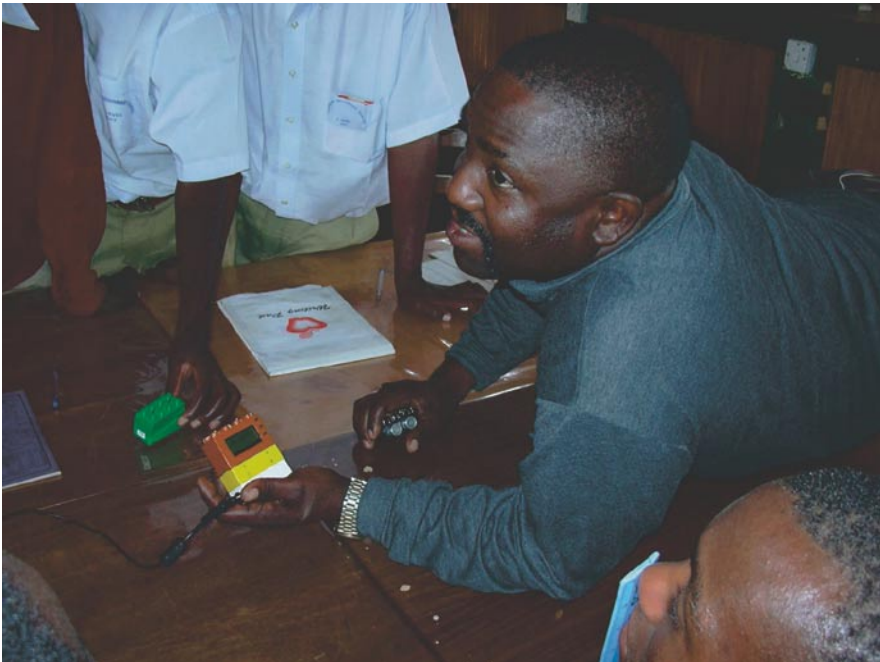


Figure 3. *I-BLOCKS: Teaching programming by building.*

### *Applied ICT Skills for Business College Students*

Our collaboration with the College of Business Education (CBE), Dar es Salaam, Tanzania, started with our existing contacts from Tanzania in 2004. The contact person in Tanzania informed us of the difficulties concerning the application of ICT to the field of business; there was clearly a need to improve the ICT skills of both teachers and students. The main task was to work the ICT knowledge and skills of teachers and students specifically in the field of business education. The situation at the moment is that ICT skills are generally learned on the job or at the students' own expenses in private ICT training institutions. We found out that there was a need for a course that would allow future business students to develop basic, business-related ICT skills (*e.g.*, using typical office, accounting, marketing, and management applications) while still in school.

A survey that was conducted before the start of collaboration revealed that the teachers and students at the CBE had only basic knowledge of and experience with computer applications such as Internet browsing and office applications. Although some of the teachers had had some encounters with computing as early as 1970s, they had not updated their skills since then. The survey also revealed that many of the teachers and students did not have any experience in using computers at all. Therefore it was decided that this project should emphasize the development of basic skills and knowledge, or computer literacy, which would lay a foundation for their future studies. It was also noted that in order to be successful, the studies had to have a point-of-contact to the teachers' and students' own lives and current or future professions.

We started our project by giving a course called "Foundations of ICT as a Teaching Tool" for teachers between February – May 2005. Altogether 20 lecturers (both male and female participants) started the course. As a part of the training the participants in the course also conducted a 20-hour course for 60 of the students at the college. Emphasis was put on the idea that being able to use ICTs is a skill that needs to be concretely practiced if it is to become useful in daily activities. Therefore the approach in the project was to provide immediate and concrete ICT practice (see Figure 4 of the course participants at CBE dismantling a computer and trying to create a theory of how computer works).



*Figure 4. Figuring out a computer.*

More specifically, the teachers with whom we started, were encouraged to apply their knowledge right away in their daily professional tasks such as administration, preparing lectures and working with students. Bridging ICT with the realities of Tanzania was an important factor affecting the project and its implementation all the time. Therefore we included a Tanzanian ICT-expert into the project to bring general-level and western biased topics and examples into the Tanzanian context. This approach proved to be beneficial both to the students and the Finnish teachers alike.

In teaching and learning we used a problem-based approach with emphasis on group collaboration, which enabled students to directly apply their skills in their specific fields, and to solve, with their colleagues, the problems that were acute for them. Problem-based approach differs greatly from the traditional rote-learning approach as it puts the student into more active and deciding role in the learning process. It also promotes creativity which, in turn, supports local development. An important factor for success is to create a learning culture where knowledge and skills are not learned in a rote way, but through collaborative action.

Out of the 20 participants who started the course, 15 passed and received a course completion certificate. Those 15 participants will create a core group for more advanced courses. Through this collaboration CBE is about to start ICT certificate and ICT diploma courses for their students. University of Joensuu will assist in developing the curricula and in developing an ICT strategy for the college as well as in continuing the teacher training in the following phases of the project. In addition, one of the teachers at the college will come to the University of Joensuu to study for a Master's degree in computer science.

#### *5ARTS – Student and Teacher Exchange Projects*

The 5ARTS project, funded by CIMO, makes use of teaching staff exchange visits in order to build a collective learning community of Joensuu and four universities from Sub-Saharan Africa (Kabarak University, Kenya; Tumaini University (Iringa University College), Tanzania; University of Namibia; and University of Pretoria, South Africa). The learning community explores and develops novel uses of ICTs for concrete challenges in the contexts of the partner universities. A special emphasis is given to the educational approach, *i.e.*, how to use technology for refreshing conventional learning and teaching settings, and how to make the community more aware of the existing problems and approaching those problems with technology. Therefore, all the exchange teachers, together with students from Joensuu, will form a network that will continue developing the learning module on “*ICT for development*”. This learning community, including exchange students, will be elaborated further in the following years.

The profile of our program is different from most of the other teacher-student exchange programs. Unlike the typical pattern of sending teaching staff and students back and forth to give and receive knowledge, we aim – following the modern idea of learning communities – at establishing a long-term ICT-supported environment that is comprised of teaching staff and students from different institutions and diverse cultural backgrounds, each sharing in the activities on an equal basis. Therefore, the exchange teaching staff or students do not just give or take individual courses but participate in their creation as a community.

The learning community approach above means that the program is supposed to create novel learning and teaching approaches, methods, and practices, especially for ICT, computer science, and educational technology. The modus operandi in the proposed exchange program will ensure that the novel ideas that are developed will have long-term, permanent impact on each of the participating institutions.



Our 5ARTS exchange project started with a bidirectional teacher exchanges between North and South. During academic year 2004–2005 we organized, with our partners, an “ICT for development” seminar for advanced-level computer science students. The seminar focused on overcoming the difficulties in the use of ICT, especially in the target countries. One practical outcome of the first year was also the development of a first prototype of “ICT for development”-course. This course focuses on ICT education, different contexts, environment, and technologies. It is to be used in several countries simultaneously, which will increase interaction and diversity of viewpoints.

### *Theory and Practice*

Many authorities in the field of computer science agree that theory and practice (or abstract and concrete) both belong inextricably to computer science. For instance, Donald Knuth (1991) advised technologists that those computer professionals who spend almost all of their time on theory should start turning some attention to practical things – “*It will improve your theories*”. On the other hand, those who spend almost all their time with practice should start turning some attention to theoretical things – “*It will improve your practice*.” We wish to nurture this thinking, and to bring into consideration the whole gamut of practical issues. In reality ICT professionals meet not only theoretical and technological limitations, but also economic, ecologic, and geographic limitations – as well as cultural, social, and philosophical barriers.

In our teaching we wish to avoid the trap that, for instance, many elementary algorithm books do: to present algorithms for minimum spanning trees but do not explain what minimum spanning trees are used for (Stevenson, 1993). It has been claimed that computer science is devoid of meaning, programming devoid of empirical import, and problem solving devoid of problems (Stevenson, 1993). In our projects we have introduced a contextualized approach to ICT education. To complement the traditional *content*-dimension approach, that consists of a predefined set of learning goals related to knowledge, skills, and values, our new approach introduces another dimension for describing the *context* of learning (Table 2). The *content*-dimension is determined by the particular learning content and the nature and needs of the target group, whereas the *context*-dimension describes the environment of the teaching – studying – learning process (Sutinen & Vesisenaho, 2005).

Table 2. A Contextualized Approach to ICT Education in Tanzania

Context Content	Cultural Heritage	Community Building	Societal Challenges	Economic Challenges
<b>Cognition: concepts</b>	concepts such as <i>variable, recursion, time or order</i>	networking	link to societal situation or structure	connection to business concepts
<b>Behavior: Skills</b>	programming, applying the concepts in local culture	authoritarian-instructivist education versus constructivism	development of education or, e.g., vaccination database	development opportunities of companies in Tanzania
<b>Value system: Attitudes</b>	(short) time thinking	family-oriented behavior application	local aspects, e.g. the health situation	short or long time profit, ethical rules

We have analyzed the feasibility of the contextualized approach in four different cases of ICT education that we have carried out in Tanzania (Table 3). This approach helps the course designers and implementers to be more sensitive to the needs of particular settings. We believe that in the long run, the contextualized approach to ICT education helps developing countries to increase participation in the global ICT industry. After all, the global economy is increasingly an information economy. Development towards this direction would result as growing gross national income, but also as more relevant ICT applications, able to meet national and local needs (Sutinen & Vesisenaho, 2005).

Table 3. Some examples of the contextualized approach in our projects

	Cultural Heritage	Community Building	Societal Challenges	Economic Challenges
<b>Cognition: Concepts</b>	<i>Ethnocomputing:</i> supports rather than undermines local cultures			
<b>Behavior: Skills</b>		<i>I-BLOCKS:</i> applied in development of learning methodology		<i>CBE-project:</i> knowledge applied in business immediately
<b>Value System: Attitudes</b>			<i>HIV/AIDS project:</i> confronting taboos, giving correct information	

## Conclusion

We believe that computer science – information processing – is a field where theory and practice come together more than in any other discipline, because of the nature of computing machines (Knuth, 1991) as well as the nature of information. Many institutions train future ICT professionals in classrooms with artificial problems that may not actually exist outside the laboratory. We believe that the computer science student should not get *a* tool for understanding computing, but a full toolbox – instead of one (academical) perspective to computing, we encourage our students to learn the practice by getting their hands off the books and downright dirty. At the field some problems may require unorthodox approaches, and, unlike in academy, some shortcuts may prove to be necessary.

We wish to connect ICT with real-world problems, and often the best way to do it is to work at the field, not in the laboratory. Algorithmic thinking and theoretical knowledge are important parts of computer science, but they are not the only ones. Traditional mathematical approach is a useful approach to teaching computing, but it is not the only one. Together with our network of teachers and students, we give a new face to algorithms and theories; a face that is familiar to the students and often illuminating for the teachers. From this viewpoint, we construct meanings for technology together, meanings that may sometimes be rough, but that are certainly real and tangible – meanings that contribute to development that is rooted in local identity.

## References

- Duveskog, M., Sutinen, E., Tedre, M. & Vesisenaho, M. (2003) In Search of Contextual Teaching of Programming in a Tanzanian Secondary School. In proceedings of Frontiers in Education -conference (FIE), November 5<sup>th</sup>-8<sup>th</sup>, 2003, Boulder, Colorado, USA, IEEE.
- Duveskog, M., Sutinen, E., Vesisenaho, M. & Yusha, E. (2004) Simputer as a Platform for ICT Education in Tanzania. In proceedings of Technology for Education in Developing Countries (TEDC) / International Conference on Advanced Learning Technologies (ICALT), August 30<sup>th</sup>– September 1<sup>st</sup>, 2004, Joensuu, Finland, IEEE: 1018–1023.
- Knuth, D. E. (1991) Theory and Practice. *Theoretical Computer Science* 90(1991): 1–15.
- Lund, H. H., Nielsen, J., Sutinen, E. & Vesisenaho, M. (2005) In Search of the Point-of-Contact: Contextualized Technology Refreshes ICT Teaching in Tanzania. In

- Proceedings of the 5<sup>th</sup> Technology for Education in Developing Countries (TEDC) / International Conference on Advanced Learning Technologies (ICALT), IEEE: 983–987.
- Lund, H.H. & Vesisenaho, M. (2004) I-Blocks in an African Context. In M. Sugisaka (ed) Proceedings of the Ninth International Symposium on Artificial Life and Robotics (ISAROB), January 28<sup>th</sup> -30<sup>th</sup>, 2004, Beppu, Oita, Japan, Oita University: I7-I12.
- MacKenzie, D., Wajzman, J. (eds.) (1999) *The Social Shaping of Technology*, 2<sup>nd</sup> ed. England: Open University Press.
- Naidoo, V., Schutte, C. (1999) Virtual Institutions on the African Continent. In Glen Farrell (ed.) *The Development of Virtual Education: A global perspective*, The Commonwealth of Learning: 89 – 124. Available: <http://www.col.org/virtualed/index.htm> (8/8/2005)
- Rogers, E.M. (2003) *Diffusion of Innovations*, 5<sup>th</sup> ed. Free Press.
- Stevenson, D.E. (1993) Science, Computational Science and Computer Science: At a Crossroads. *Communications of the ACM* 37(12), December 1994: 85–96.
- Sutinen, E. & Vesisenaho, M. (2005) ICT Education in Tanzania: a Contextualized Approach. In Proceedings of the HCI International / 11<sup>th</sup> International Conference on Human-Computer Interaction International 2005, July 22<sup>nd</sup>-27<sup>th</sup> Las Vegas, USA.
- Sutinen, E., Vesisenaho, M. & Virnes, M. (2002) e-Based and Contact-Based Computing Studies for Tanzania: Action Research from Challenges via Changes to Chances. In Proceedings of the 7<sup>th</sup> International Working Conference of International Federation of Information Processing (IFIP), Information Technology in Developing Countries (WG 9.4), IFIP, May 29<sup>th</sup>–31<sup>st</sup>, 2002, Bangalore, India: 444 – 452.
- Tedre, M., Sutinen, E., Kähkönen, E., Kommers, P. (forthcoming) Universal is Local in Computing: ICT in Cultural and Social Context. *Communications of the ACM* (Accepted to publication September 29, 2004)
- Tedre, M., Eskelinen, T. (forthcoming) Three Dogmas of Computing: Universality, Liberation and Progress. (Unpublished manuscript)
- Tedre, M., Kommers, P., & Sutinen, E. (2002). Ethnocomputing: considering ethnological factors in computer sciences. In M. Wyness and A. Richardson (eds.), *Exploring cultural perspectives: integration and globalization*. Edmonton: ICRN Press.
- Vesisenaho, M. O. & Lund, H. H. (2004): I-BLOCKS for ICT Education Development, Case Iringa, Tanzania. In Proceedings of the 33. International Symposium IGIP / IEEE / ASEE, September 27<sup>th</sup>-30<sup>th</sup>, 2004, Fribourg, Switzerland, University of Applied Sciences of Western Switzerland: 364–371.

World Commission on Environment and Development / WCED (1987) Our Common Future. (Also known as the Brundtland Report) Oxford University Press, Oxford.

World Summit on the Information Society, WSIS, Geneva, 2003a. URL: <http://www.itu.int/wsis/> (2/11/04)

World Summit on the Information Society, WSIS, Action Plan, Geneva, 2003b. URL: [http://www.itu.int/dms\\_pub/itu-s/md/03/wsis/doc/S03-WSIS-DOC-0005!!PDF-E.pdf](http://www.itu.int/dms_pub/itu-s/md/03/wsis/doc/S03-WSIS-DOC-0005!!PDF-E.pdf) (2/11/04)

### 3.8. Dialogue

#### *Towards a Language of Global Responsibility*

*Reijo E. Heinonen*

*Emeritus professor*

*University of Joensuu, Faculty of Theology*

From time to time there arises a call for a new language for social, political and religious use. There are often expressions of dissatisfaction towards bureaucratic, juristic or religious ways of speaking and preaching. The origin can be the simple case that the vocabulary is unknown or the combinations of words are quite specific and understandable only to the professionals of an inner circle of a society. It is akin to the Latin of physicians to those who have no knowledge of this language. In the second case we hear the call for a new language in a political arena. We recognize the phrase: “They did not find a common language”. It is not meant that the partners did not understand the language and the lexical meanings of the words. It is presumed that the partners could not comprehend the deeper, many dimensional meanings of the relevant concepts so that the intended goals of both partners could be realistically compared. If we think how important the climate and vocabulary in political negotiations are, we could remember the 1977 Near East negotiations in Camp David. The rhetoric on Abrahamic religions – intimate ties over hundreds of years – was paving the way and perhaps made it easier to accept the agreement on the epochal Camp David I between Egypt and Israel.<sup>1)</sup> Conversely the negotiations between the Palestinians and the representatives of Israel in Camp David II chaired by Bill Clinton, was unsuccessful for many reasons, but it was also impossible to articulate the needs, hopes and beliefs on both sides in a valid terminology, so that the intended goals could be realistically comprehended. The tools for elaborating a consensus were missing.<sup>2)</sup> In the third case we hear the call for a new language, when words and concepts have lost their deeper meanings and connotations. The many-dimensional symbols have degenerated to one-dimensional signals. This occurs when the concepts are no more able to signify their original cultural or religious abundance of meanings but are more like vehicles of a narrow political or religious ideology. The concepts are no more able to awaken individual thinking but are much more like signs, which are conditioned to political slogans or religious phrases.<sup>3)</sup> The language is “broken preached” (*zerpredigt*) and doesn’t encourage regeneration and development of a culture or a religion. Is it

so that we have reached the point, in which the language of environmental policy has frozen up to slogans unable to challenge the conscience of individuals? Are we seeking automatic mechanisms which could, without our personal engagement, realize the righteous goals? What kind of contribution can our language have in this process of delusion? With the help of some examples from religious, political and environmentalist studies, I am seeking to answer the question.

### **A new language for a new responsibility**

One of the most well known calls for a new language was voiced in World War Two in the final years of the Third Reich. Dietrich Bonhoeffer, a protestant pastor and scholar, was jailed in the Tegel prison in Berlin because of his commitment to the resistance movement against Hitler.<sup>4)</sup> In his last letters out of the prison, he proclaimed that no institution, not even the church can be so important that its apology and survival could be the main goal of a believing citizen. Not even the persecution of churches should legitimatise the believers to concentrate all energy to apology and rescue operations. There were still more important tasks to realize. Bonhoeffer was one of the few individuals, who realized the situation of the German Jewry. He heard its moral challenge. Already in the first months Bonhoeffer wrote: “Who now is willing to cry with the Jews is allowed to sing Gregorian songs in the church”.<sup>5)</sup> Asta von Oppen later assessed this ethically motivated part taken on behalf of the weakest by stating that this challenge remained as a lone cry which, unfortunately, was not heard. It remained as “unerhörter Schrei”.<sup>6)</sup> In order to be heard, the ethical challenge should be expressed in a new language. In Bonhoeffer’s concept it meant a new way to point out the priorities in ethical decision-making. The theological concepts “Nachfolge”, imitatio Christi should be interpreted in a new way. “That is why the earlier words must loose their power and keep silent..... It is not our task to predict the day, but it will come – when people again hear the call to proclaim the Word of God in a way under which the world will be renewed and changed. It will be a new language, perhaps totally non-religious but so free and liberating, as the language of Jesus, that people will be afraid but at the same time stay in its power, it is a language of a new righteousness and truthfulness....”.<sup>7)</sup> Crucial in this “non-religious interpretation of biblical concepts” was that it should be found in the centre of our knowledge and modern culture. He denies the usual way to take “Deus ex macina”, Divinity solving all the problems in questions which science cannot solve. Vice versa the believers should find the Divinity in “what we already know, and not in issues we do

not".8) It means that we already have knowledge enough in order to pose the message of evangelism in the centre of our lives. It depends on how we read the symbols of time. At this point our challenge to create a new language of global ethical responsibility leans in the same direction. We have enough knowledge about the miseries and ecological catastrophes in global dimension for decision-making and personal commitment. And what is most important in this analogy, the challenge for responsibility is not a peripheral question of personality but belongs to the very centre of our human existence. Just this place of our global responsibility reminds us of Bonhoeffer.

How could we find a language which could place our global ethical responsibility into the very centre of our human existence? The task of the new language is to give priority to the ethical question- as the Rio Summit 1992 proclaims- before profitability, particular interests and unilateral security. It should educate us to speak about poverty, human rights and sustainable development as issues, which not only concern political decision-making in current elections but personal things which have an impact on our whole existence and lifestyle. The new kind of language is not primarily a result of a technical or linguistic approach, but is a result of a creative innovation on the basis of earnest ethical awareness.

The first task is to develop a sensitivity to realize which values are behind the current political rhetoric and environmental policy. The meaning of the concepts and words in every day life is changing sometimes subconsciously and sometimes with deep calculations as we can state by reading studies on the history of concepts, *Begriffsgeschichte*. Every political and ideological worldview and hegemony is trying to change the meanings of the concepts so that they support their regime, power or worldview. From the political current history we know of attempts to use new definitions of concepts in ideological indoctrination. Some examples show how powerful an indoctrination through linguistic means is supposed to be and also how the can have deep moral impacts. The ideological cohesion of Nazi Germany could hardly have been possible without "lingua terti imperi", the unique language of the Third Reich. It was the goal of the Ministry of Propaganda of Joseph Goebbels to give to the central words of cultural life new "German" meanings or to forbid the use of some others. Accordingly, it was Goebbels' plan to edit a lexicon for the occupied Warthegau regions in Poland in order to indoctrinate the new citizens of the Reich.9) How deeply the ideological changes in the meanings of concepts and new words had influenced public mentality can be realized from the debate after World War Two in which it was taken as an attempt to eliminate the vocabulary used during the twelve years of national-socialistic dictatorship.10)



In the German Democratic Republic (DDR) there was also some kind of socialistic vocabulary.<sup>11)</sup> Differences with the language of the other German state, the Federal Republic of Germany, were not difficult to realize. Some words, important in the ideology of the communistic party, became overemphasized. To these belonged the word “work”, (Arbeit). Sometimes it was almost ridiculous how on both sides of the Berlin wall the differences could be recognized in the religious vocabulary of the churches. As the protestant churches in West Berlin called the believers to “Bibelstunden”, (bible lessons), in the socialist world the churches spoke about “Bibelarbeit”, (bible work). The connotations and meanings of words stand out only so long as the political system and society is bearing this kind of values basis and language game. After the fall of the wall and the collapse of East European socialism, studies have been made to show differences of western capitalistic and eastern socialistic German vocabulary.<sup>12)</sup> If we recommend establishing a language of global responsibility, we must take care over the mistakes of such kinds of political one-sided enterprises. First of all it should not be based on any particular political ideologies but on globally accepted ethical norms and principles. Its ethical challenge should not be instrumental in any particular concrete aims. The ethic which the language is reflecting should be valuable in itself and not as a means. Is there then a “contractio in adjecto”, (inner dilemma), when we try to create a language which could promote our global ethical responsibility, but not accept in advance its direct use to some concrete actions? The problem is mainly solved if we aim for a global ethical responsibility which is open to various solutions on the basis of a global ethic. This makes it easier to avoid announcing in advance what we know is ethically righteous. Irrespectively, global ethical principles steer the direction in which the concrete solutions are to be found.<sup>13)</sup>

### **Some characteristics of the new language**

In order to avoid the illusion that any change of language as such could represent righteous, sober or responsible thinking, it is good to remember the Goethe word: “Nicht die Sprache an und für sich ist richtig, tüchtig, zierlich sondern der geist ist es, der sich darin verkörpert.”<sup>14)</sup> This poses the question, how the language and the consciousness of the user are mutually interconnected. For the realization of a new global responsibility a new ethical consciousness is needed, but at the same time a new language can contribute to its awakening. A new consciousness can create new ways to express this by linguistic means. What lies between these approaches in the awakening of consciousness and its linguistic expression? Or what lies between an innovation of a new concept and its im-

pact to consciousness? On the basis of the cognitive processes and historical research of imagination we see it as a moral imagination. How this is dependent on our ability to symbolize our doctrinal concepts, how the symbolizing level determines our values basis, how our values basis create various strategies of perception, how these models of perception contribute to our imaginative capacity, are studied in other connections.<sup>15</sup>) This is needed in the creation of new concepts and also in the assessment of their impact on consciousness. One of the problems in this evaluation has been the lack of universally accepted norms and principles. The creation of a new language of global responsibility needs a common world ethos or global ethic. No word or state of mind is as such a guarantee for globally responsible thinking, if it does not reflect ethically acceptable goals. Some examples about a combination of sound-minded consciousness and concept implicating one-sided politics could be found in our highly respected concepts so called mirandas as “sustainability”, “democracy”, “tolerance” and “dialogue”.<sup>16</sup>) When we think that “sustainable development” today factually means “sustainable growth” the concept “sustainable” must be critically assessed.<sup>17</sup>) In the long run no growth concerning material and economical development causing environmental and social harm can be sustainable. The warnings of the Club of Rome from the 1970s should be taken into account: “In a limited ecosystem no limitless growth is possible”.<sup>18</sup>)

If we think how much content the concept of “democracy” has achieved in history, we face the problem, how to assess the values and aims behind these concepts. What is real “democracy”? Is it the Scandinavian model, the US model or the former DDR model? How well the Human Rights Declaration 1948 or the Global Ethic Declaration in Chicago 1993 or “A universal Declaration of Human Responsibilities” 1997 could provide the criteria for assessment of the superiority of each of these models? Although we have these problems of assessment, we usually think, that we have a common definition for democracy. If we think about “tolerance”, an important aim for individual growth and social responsibility, it also has its one-sidedness. Tolerance can usually apply only to a person who is in a somewhat privileged position. He can afford himself the luxury of being tolerant as it does not question his position or security. We could say: “We tolerate you although you do not belong to us.” Those who are powerless in society either accept other people, obey or revolt. We could say: “We accept you, because you have the same problems as ourselves”. The good-minded use of the concept of “tolerance” reveals from where we are coming. In the best case “tolerance” can be a halt for promoting an approach to real understanding of the position of the other and to commitment with their problems.

In order to assess the words, concepts and language, we need the question, what does this word or concept mean from the point of view of the global community.

Also “dialogue”, one of the most important tools in the pursuit towards human solidarity and a peaceful future, can mean different things and implicit various spiritual and political goals.

If “dialogue” is instrumental for the mission of religions and churches, it has lost the possibility to create a mutual trust between believers. It is like a lengthened arm of competition. If “dialogue” is instrumental for hegemonic political aims in bringing the western idea of democracy without ability to change oneself, without openness to learn about ones own weak sides and limitations, it is a lengthened arm of political competition.

The task of the language of global responsibility is to reveal these basic contradictions between concepts and their implicit values and aims. It should not stay in the critics. It should moreover promote the search for terms and concepts, which better take into account the global responsibility and human solidarity in a global village.

It can mean a) to find out new words and concepts. The positive role of religions for instance could be emphasized pointing out their ethical functions as “values memory”.

It can mean b) the interpretation of old concepts in a more responsible way such as emphasizing ethical perspective in the development. Sustainable development could then mean “ethically sustainable development”.

It can mean c) criticizing the current slogans and mottos revealing their values basis. The ideology of a neo-liberal market economy, which is hiding out in the concept of “globalization” could get a competing contents as “globalization of responsibility” reminding about contributions, which the “two third world“is waiting from us.

## Notes

Camp David I Peace Agreement between Egypt and Israel was undersigned by Anwar as-Sadat, Menachem Begin and Jimmy Carter (17.9.1978).

The peace process between Israel and Palestine promoted by Bill Clinton did not succeed in 2000. The main negotiators gave reasons why the process did not lead to

- an agreement. Scholom Ben-Ami, Arafat is das Unglück seines Volkes. Der Spiegel. Jahres Chronik 2001,256. "Die Palästinenser sollten endlich zentrale Elemente unseres Glaubens respektieren." - Ahmed Kurajji, Der Premierminister ist depressiv. Der Spiegel. Jahres Chronik 2001,257. "Ohne Jerusalem gibt es für uns keinen Staat, ohne Jerusalem gibt es keinen Frieden."
- Victor Klemperer, LTI die unbewältigte Sprache. Aus dem Notizbuch eines Philologen. München:DTV 1969,1. "Der Nationalsozialismus drang in das Unterbewusstsein der Menge an durch einzelne Worte, Redewendungen, Satzformen, die er ihr in millionenfacher Wiederholungen aufzwang und die mechanisch übernommen wurden."
- Eberhard Bethge, Dietrich Bonhoeffer. Theologe, Christ, Zeitgenosse. München:Kaiser 1967,7. "In unserem Zusammenhang musste der singuläre Tatbestand in seiner Härte stehen bleiben, dass zum ersten Mal in der deutschen Geschichte Männer und Christen zu" Verschwörern "wurden, die dazu weder geboren noch erzogen worden waren." Bethge 1967,882–883.
- Asta von Oppen, Der unerhörte Schrei. Dietrich Bonhoeffer und die Judenfrage im Dritten Reich. Hannover:lutherisches Verlagshaus 1996,70. Eberhard Bethge, Dietrich Bonhoeffer und die Juden. In:Heinz Kremers. Hg. Die Juden und Martin Luther – Martin Luther und die juden. Neukirchen 1985,232 f.
- Oppen 1996,78.
- Dietrich Bonhoeffer, Kirjeitä vankilasta. (Widerstand und Ergebung) Pieksämäki 1963,196.
- Dietrich Bonhoeffer, Widerstand und Ergebung. Quoted in: Dietrich Bonhoeffer,Lesebuch Hg. Otto Dudge. München:Kaiser 1985,44–45.
- Walter Dieckmann, Information und Überredung. Zum Wortgebrauch der politischen Werbung in Deutschland seit der Französischen Revolution. Marburg 1964,114.
- At 12.2.1942 Goebbels writes in his diary: "Ich veranlasse, dass von unserem Ministerium Wörterbücher für die besetzten Gebiete vorbereitet werden, in denen die deutsche Sprache gelehrt werden soll, die aber vor allem eine Terminologie pflegen sollen, die unserem modernen Staatsdenken entspricht. Es werden vor allem Ausdrücke übersetzt, die aus unserer politischen Dogmatik stammen. Das ist eine indirekte Propaganda, von der ich mir auf die Dauer einiges verspreche."
- Klemperer 1969,1.
- Dieckmann 1964,89. "Dass die Wörter aber immer noch eine religiöse Aura mit sich führen, zeigt sich indirekt darin, dass sie vom politischen Propagandisten weiter hin bevorzugt und bewusst verwendet werden. Ein Indiz ist auch, dass die Verknüpfung von "Glaube", "Schuld," "Gewissen", "Bekanntnis", "heilig", "unsterblich" mit

dem Kommunismus durch die SED-Sprache in der Bundesrepublik sofort als unangemessen empfunden wird.“

Dieckmann 1969,23–25.

Reijo E. Heinonen, Kymmenen vuotta Chicagon globaalien etiikan julistuksesta.

In: Metsät ja eettinen argumentaatio. (Forests and ethical argumentation) Ed.

A. Erkkilä. R.E. Heinonen, O. Saastamoinen. Joensuu: Joensuun yliopistopaino 2004, 21–58. - Hans Küng, Karl-Josef Kuschel, A Global Ethic. The Declaration of the Parliament of World's Religions. New York 1993.

Cornelia Berning, Vom "Abstammungsnachweis" zum "Zuchtwart". Vokabular des Nationalsozialismus. Berlin: de Gruyter 1964, 2–3.

R.E. Heinonen, Imagination. In: Lexikon der Religionspädagogik. Ed. Norbert mette, Folkert Rickers. Neuenkirchen – Vluyn: Neuenkirchener 2001, 859–863. - Heinonen, Arvomuisti kehitysyhteistyössä. Kulttuurien kohtaamisen lähtökohtia. Turku: Gillot 2001, 145–148.

Dieckmann 1969, 34, 45, 49.

Ronnie D. Lipschutz, Global Environmental Politics. Power, Perspectives, and Practice.

New York: CQ Press 2004, 70. "For the Brundtland Commission, sustainable development was clearly sustained economic growth, and this does not seem a likely answer to global environmental damage to those who have given thought to the issue... Growth was not sustainable, and no amount of rhetoric would make it so. Today there is little conceptual difference between sustainable development and sustainable growth."

Donella H. Meadows *et al.* The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind. New York: Universe Books 1972.

## *Foresight for Development*

*Olli Hietanen*

*Project Director*

*Turku School of Economics and Business Administration*

*Finland Futures Research Centre*

*E-mail: [olli.hietanen@tukkk.fi](mailto:olli.hietanen@tukkk.fi)*

*The Global Challenges of eDevelopment* project (eDeve), 2003 – 2005, aims to study a variety of cultural and social aspects regarding the development of the democratic and sustainable uses of ICT in developing countries, as well as, initiate co-operation between developed and developing countries. Its main objective is to identify joint practices and interaction that cuts through the existing (local national and international) digital divides. One purpose is also to systematically monitor the ecological, social, cultural and economic consequences of the ongoing ICT revolution in today's developing countries. (<http://www.globaledevelopment.org/>)

Finland Futures Research Centre is participating in this extensive eDeve research with a pilot project called *The Digital Balance Between Industrialized and Developing Countries – A Case Study: The Development of an Information Society on the African Continent*. (<http://www.tukkk.fi/tutu/gisdeve/>) The purpose of this pilot research is to discover how ICT technology, content and e-services developed in Finland will work on the African continent – and vice versa. The aim of this study is to gain experience of the characteristics unique to African countries in developing an information society. There are five stages in this study:

1. The first stage is to identify potential best practice technologies, content and e-services in Finland.
2. The second stage is to identify the most important scenarios and needs of the African continent and gain a better understanding of the unique characteristics of the African continent's Information Society development.
3. The third stage is to invite several African partners to participate this pilot project.
4. The fourth stage is to identify potential best practice technologies, content and services on the continent of Africa.

5. The fifth and final stage is to raise new questions for those studies and development projects, which are needed in developing countries.

The main finding of this project was, however, that Africa doesn't need Finnish technology or e-services, but it needs more skills and competence to create its own future. Therefore it was suggested that the best practice for this pilot project would be some form of innovation organisation – for instance *Futures Research Centre*, *The Committee for the Future with the Parliament*, *The Futures Academy* or *The Society for Futures Studies*. Such types of institutions are an important part of Finnish innovation and foresight system:

1. The Finnish Society for Futures Studies (established 1980) aims to influence the long-term development of society by advancing futures research and its utilization. Efforts in promoting futures studies focus on for example fostering contacts among futures researchers and communicating the latest results of futures research to the public and emphasising the necessity of such research. Members can either be institutions or individuals. All members receive the society's journal, which contains feature articles, research reports, seminar presentations and functions as a forum for the exchange of information and opinion. (<http://www.futurasociety.fi/>)
2. The Finland Futures Research Centre (established 1992) is an organisation for futures research, education and development, which operates on the local, national and international level. The Centre produces and promotes visionary information on the future trends of society and the environment. With its multidisciplinary resources it is able to meet the needs of its customers, which range from academic institutions to public organisations and the business world. Extended networks of co-operation guarantee the Centre access to the latest ideas, visions and methods to deal with and evaluate perceptions of the future. (<http://www.tukkk.fi/tutu/>)
3. The Committee for the Future with the Parliament of Finland (established 1993) is unique in the world. It is one of the Parliament of Finland's 15 standing committees. The Committee has 17 members who are all members of Parliament and represent different political parties. In 1992 a large majority of mps approved an initiative that called for the Government to submit a report to Parliament on Finland's long-term development options. In 1993 Parliament established a temporary Committee for the Future to prepare responses to the policies outlined in the Government's report. The Committee for the Future had temporary status up to 2000. (<http://www.eduskunta.fi/efakta/>)

4. The Finland Futures Academy (established 1998) is a national network of universities (17) created with the aim of supporting academic, educational and research programmes in futures studies. The network has its basis in the extensive, multi-disciplinary scope of futures studies. The forms of learning and study materials are adapted to the local learning environment with the aid of information technology and interactive study methods. (<http://www.tukkk.fi/tutu/tva/>)

### Futures thinking and a pro-active foresight system

One of the special features of the late-modern world is the accelerating speed of change, which has brought insecurity into our lives and made prognoses and planning the future extremely difficult. The purpose of scenario building is to be able to cope with a rapidly changing world, where insecurity is high.

Futures studies and foresight are concerned with the collection of knowledge about the future and its critical analysis, creatively synthesising a desirable future from the many alternatives, and systematically presenting that.

The aim of a foresight system is to produce futures oriented knowledge and to help actors become prepared for possible changes. It is not enough simply to collect knowledge, analyse it systematically and calculate probabilities. An effective foresight system is a participation process for producing and controlling multidisciplinary knowledge. It includes data, evaluation, innovativeness, networking, strategic decision-making and the pro-active creation of the future. (Kaivo-oja 2003).

This type of foresight system indicates possible changes in our environments, but it also indicates how we can influence the future and who we should co-operate with in order to achieve the desired future (Ahokas 2003; Keenan, Loveridge, Miles & Kaivo-oja 2003; Hietanen and Kaivo-oja 2005):

1. The starting-point for foresight is the **scientific data/knowledge** of the phenomena being studied and the structures and processes that are involved with the research subject. By this way we can use create *probable futures*. Many foresight systems stop at this and unfortunately lose the most fruitful benefits of futures knowledge.



2. As we start to build scenarios and futures images from the data available it becomes possible to create not only probable but also *possible futures*. The purpose of this stage is to open as big space of possibilities as possible. At this stage of the foresight process scientific knowledge and **imagination** are combined in a multidisciplinary process.
3. Possible and probable futures are quite objective: all those futures are possible can be realised. Some events are of course more likely to occur than others. *Desirable and avoidable futures* however, are related to values. At this stage of the foresight process scientific knowledge and **values** are combined.
4. At the fourth stage of the foresight system, *strategy steps* from the present to the desired future are built. After deciding upon a desired future it is logical and necessary to choose the most effective method of working through the subject. At this stage futures studies evolves into **futures creating**.

As all the above phases are repeated regularly, the foresight system develops into a process of proactive visionary management (Figure 1) that becomes an effective tool for producing knowledge and managing environmental change. (Hietanen and Kaivo-oja 2005).

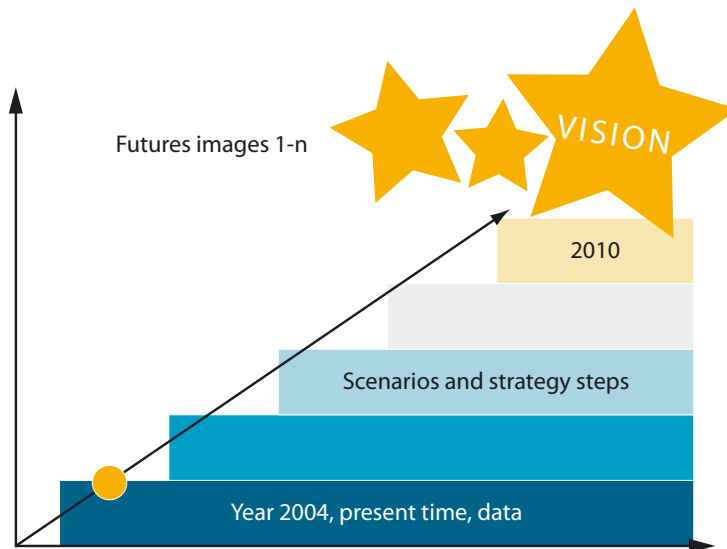
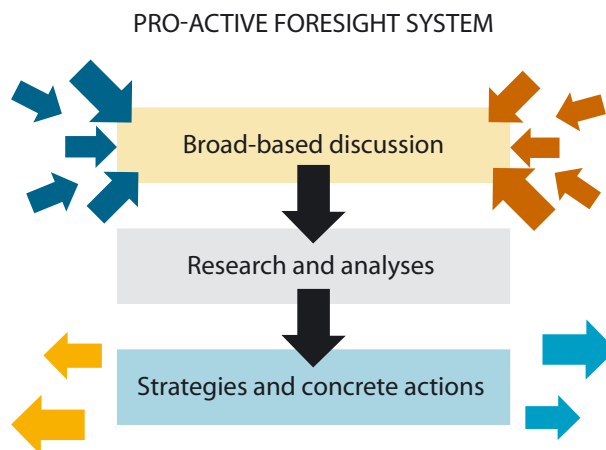


Figure 1. *A futures process is based on the evaluation of the present, and the envisioning of possible and probable futures (both desirable and avoidable) deciding upon a future vision to aspire to and creating strategy steps in order to achieve that. In this way a bridge can be built between the present and the future. (Abokas 2003, Hietanen 2004)*

## The co-operation of social partners

The methods of futures studies are suitable as tools for developmental projects and networking since through them synergy between different actors and the planning of individual actions can be sought in order to promote common understanding. (Ahokas 2003; Lauttamäki and Hietanen 2004)

Therefore if we want to promote innovation and the potential for pro-activity inherent in the foresight system it is essential to engage with the system itself as well as with the other actors involved. In this way it is possible to get even more data and more points of view out of the foresight system. The keywords are **networking and the co-operation of social partners** (Figure 2).



*Figure 2. The idea of a pro-active foresight system based on co-operation between social partners is that broad-based and multi-faceted knowledge can be collected from the subject being studied. The greater the number of actors involved in a discussion the more comprehensive it becomes. In the second stage the value discussion is analysed by multidisciplinary experts. In the final stage that becomes the basis for concrete action i.e. future creating. (Ahokas 2003, Hietanen 2004)*

The task of a pro-active foresight system is not to invent new common modes of action for everybody, but to develop special modes of action for each actor. Even though the vision of the social partners is the same, the means of achieving it can be very different.

A map can be used as an analogy. The starting-point is a situation in which every actor is in a different location. If the task is to reach the same goal, all parties have to start from a different direction and take different paths. Everybody has to choose a direction based on their present location. (Ahokas 2003)

## References

- Ahokas, I. 2003. Tulevaisuus ja turvallisuus: poliisin toimintaympäristö muutoksessa. Esiselvitys 2003. Länsi-Suomen lääninhallituksen julkaisusarja 13/2003. <http://www.tukkk.fi/tutu/poltu/>
- Hietanen, O & Kaivo-oja, J. 2005. Ennakoivaan arviointiin. Teoksessa Kehittämissuuntaa arvioinnista, Heikki K. Lyytinen & Anu Räsänen (ed.). Koulutuksen arviointineuvoston julkaisuja 6. Jyväskylän yliopistopaino.
- Hietanen, O. 2004. Future and Security: Scanning the Changing Environment of the Police. Presentation in Seminar on the Future of Police Management 8<sup>th</sup> – 9<sup>th</sup> of June 2004, Nagu, Finland. Available on Internet: <http://www.tukkk.fi/tutu/poltu/>
- Kaivo-oja, J. 2003. Tulevaisuuden tekeminen strategisen ajattelun valossa. Teoksessa Kamppinen, Matti & Kuusi, Osmo & Söderlund, Sari (toim.) (2003) Tulevaisuudentutkimus. Perusteet ja sovellutukset. Suomalaisen Kirjallisuuden Seuran toimituksia 896, Tammer-Paino. Tampere, s. 226–249.
- Keenan, M., Loveridge, D., Miles, I. & Kaivo-oja, J. 2003. Handbook of Knowledge Society Foresight. Prepared by PREST and FFRC for European Foundation for the Improvement of Living and Working Conditions. Final Report. Dublin.
- Lauttamäki, V. & Hietanen, O. 2004. Poliisin toimintaympäristö muutoksessa (POLTU). Länsi-Suomen lääninhallituksen julkaisusarja nro. 18/2004. (36 p.) <http://www.tukkk.fi/tutu/poltu/>

## 3.9. Governance

### *Good Governance*

*Professor Ari-Veikko Anttiroiko*  
*University of Tampere*  
*Department of Regional Studies*  
*E-mail: Ari-Veikko.Anttiroiko@uta.fi*

*Assistant Professor Pekka Valkama*  
*University of Tampere*  
*Department of Economics and Accounting*  
*E-mail: Pekka.Valkama@uta.fi*

#### **1. Introduction**

Good governance has become a prominent topic in the development agendas of national governments, regional institutions and international organisations. There is a common understanding that democratic and good governance is an imperative for development. The absence of good governance has generally been perceived as a major cause of slow economic and social development wherever it occurs. Thus, it is only natural that good governance is seen as one of the key issues in promoting economic, political and social life by responsible organisations at different institutional levels. One expression of this relevance is that representatives of the G8 believe that good governance, accountability and transparency are crucial to realising the benefits of the planned debt cancellation for the heavily indebted poor countries. This implies that the focus in development policy at global level is gradually shifting from conditionality based on neo-liberal economic doctrine to a general emphasis on good governance as a precondition for sustainable economic development.

In this article the idea of good governance and its role in development policy is outlined. In addition, a brief description of the Finnish experience of good governance is presented. The main message is that Finland has a lot of potential to contribute to the development of good governance in different parts of the world within its development cooperation programmes and projects.

#### **2. The concept of good governance**

*Governance* is a generic term that refers to the manner in which organisations interact with their key stakeholder groups in order to achieve their goals. In the public domain

this refers to governments' goal-oriented interaction with various stakeholder groups from public, for-profit and non-profit sectors in democratic decision-making processes, service delivery, and development activities. Good governance entails certain principles of decision-making and conduct of public affairs – such as transparency, efficiency and accountability – that apply to all the processes that constitute public sector operations and related interactions with stakeholders.

Even if the concepts of 'governance' and 'government' are sometimes used more or less interchangeably, they have different meanings. 'Government' refers to a political-administrative institution with a hierarchical structure whereas 'governance' in the public sector (public governance) refers to activities or processes by which public organisations interact with their stakeholders in public policy design and implementation (Anttiroiko 2004). Doig and Riley (1998) have seen *good government* as a precondition for good governance, which is one way of understanding the relationship between these two concepts. Doig and Riley have included the following components in their framework of good government: political legitimacy, accountability, separation of powers, effective audit, effective means of combating corruption and nepotism, official competency, realistic policies, human rights, impartial and accessible criminal justice system, and absence of arbitrary government power. Most of these features attributed to government have direct implications for government's governance relations, which explains their close resemblance to the elements of good governance.

The notion of *good governance* was introduced in the late 1980s in the World Bank's report on Sub-Saharan Africa, emanating from the discussions about the crisis of governance. This was the context in which a normative dimension addressing the quality of governance was brought to light (Santiso 2001, 5). In the 1990s the OECD started to widen its anti-corruption activities towards the promotion of good governance. Its Development Assistance Committee (DAC) adopted 'Orientations on Good Governance and Participatory Government' in the mid-1990s and the Public Management Committee (PUMA) started to work on ethics infrastructure and on managing ethics in the public service in the late 1990s. (OECD 2000.)

The World Bank Institute has distinguished the following six main dimensions of good governance: voice and accountability, effectiveness, the lack of regulatory burden, the rule of law, independence of the judiciary, and control of corruption (Santiso 2001, 5; cf. World Bank Institute 2005). Drawing on the discussion within the World Bank, the

Asian Development Bank has adopted a definition that includes four elements of good governance: accountability, participation, predictability and transparency (ADB 1995). As a third example, the OECD's (2005) widely applied definition includes the following basic elements of good governance:

- Accountability: showing the consistency of government's decisions and actions with clearly-defined and agreed objectives
- Transparency: availability of public sector information and openness of government activities to an appropriate level of scrutiny by relevant stakeholders in different sectors
- Efficiency and effectiveness: striving for cost-effective quality public outputs
- Responsiveness: responding to stakeholders' demands and societal changes
- Forward vision: ability to anticipate future problems and opportunities
- Rule of law: proper laws, regulations and codes of conduct and their appropriate implementation.

In a similar way the United Nations Economic and Social Commission for Asia and the Pacific has listed eight major characteristics of good governance: it is participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. Such government assures that corruption is minimised, the views of minorities are taken into account and the voices of the most vulnerable in society are heard in decision-making. (UNESCAP 2005.)

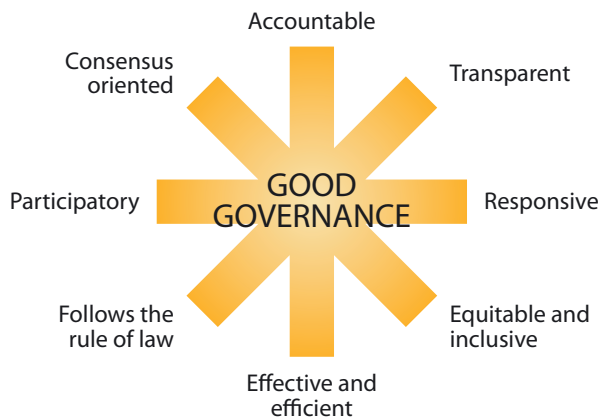


Figure 1. Characteristics of good governance. (Source: UNESCAP 2005)

To summarise, good governance refers to the quality of institutional arrangements and interactions between public organisations and stakeholders in public policy processes. This kind of ‘good’ governance includes such characteristics as accountability, effectiveness, participation and transparency. They are needed to ensure that government cost-effectively brings maximum benefit to the people it serves and to society as a whole.

### 3. Consequences of corruption and poor governance

Previously the discussion about good governance was mainly about corruption. Even today the fight against corruption is at the core of policies for good governance, and for good reason. Namely, corruption is the single greatest obstacle to economic and social development, as summarised by the World Bank. Corruption not only robs countries of their potential and afflicts most of the developing world; it also adversely affects the poorest within societies, imposing the highest costs on those who can least afford them (Transparent International 2005).

Corruption has long historical roots, and it can be found in some form in every country. In its characteristic form it arises in the interaction between government and the market economy (Andvig & Fjeldstad 2001). Corruption is conventionally understood as the private wealth-seeking behaviour of someone who represents the public authority. Thus, it centres around the abuse of public power for private-regarding wealth or status gains. We can distinguish the following forms or manifestations of corruption (Andvig & Fjeldstad 2001, 8–10):

1. *Bribery* is a form of corruption *per se*, referring to payment given or taken in a corrupt relationship.
2. *Embezzlement* is the theft of resources by people appointed to administer them. In practice it refers to disloyal employees who steal from their employers.
3. *Fraud* is an economic crime that involves some kind of trickery, swindle or deception, thus involving a manipulation or distortion of information, facts and expertise by public officials who are positioned between politicians and citizens and who seek “private-regarding wealth” or private enrichment.
4. *Extortion* is money or other resources extracted by coercion, violence or threats of force (e.g. blackmail).

5. *Favouritism* or cronyism is a mechanism of power abuse implying highly biased distribution of public resources to favour family members (nepotism) or in a wider sense kin or some other reference groups (clientelism).

Corruption has a negative impact on economic development and growth. There is some evidence to show that the more pervasive the corruption, the more likely foreign investment is to be short term in nature. (Transparency International 2005. See also UNDP 1997.) Corruption and other forms of bad governance bring about unfavourable institutional environment, which tends not only to inhibit foreign direct investments but also to block the development of endogenous entrepreneurship. For instance, failure to guarantee the protection of property rights implies higher transaction costs and reduced entrepreneurial incentives. Similarly, extensive public investments and political regulation of economic activities trigger rent seeking to transfer public resources to lobbying groups. In cases like these the levels of trust and social capital remain low and organising collective action becomes extremely difficult, thus making it hard to achieve changes in these critical institutional factors. These are fundamental reasons why poor regions are likely to stay poor, as concluded by Millock and Olsen (1993).

#### 4. Shaping of the policies for good governance

Corruption and other problems of bad governance have proved to be persistent. Nevertheless the Global Corruption Report of 2005 still claims that corruption can be reduced (Transparency International 2005). There is even some evidence that there is progress in improving the rule of law and good governance, in controlling corruption, and in improving institutional quality in different parts of the world (Kaufmann 2003). However, many experts have challenged optimistic views of the fight against corruption on the basis of their observations and experiences. The lessons learnt so far are that policy decisions themselves either have little significant impact on corruption or else they just work extremely slowly (Andvig & Fjeldstad 2001, 101).

The OECD (2000, 23–26, 58) has developed a concept of *ethics infrastructure* to serve as a framework for supporting ethical behaviour in the public sector. It has three main components: guidance, management and control. Conventional compliance-based ethics management tends to emphasise strict compliance with administrative procedures, control mechanisms and detailed rules. It also emphasises policing and punishing wrongdoing.



ing, using such sanctions as warning, monetary and material disadvantage, impact on career development, suspension from office and dismissal. As important as these are for the functioning of any ethics infrastructure, they form only the tip of the iceberg. Disciplinary sanctions alone cannot correct systemic failures and a culture which does not put adequate emphasis on ethical behaviour.

It has been claimed that corruption and bad governance have until recently been approached from too narrow a perspective. The case of the World Bank is paradigmatic in this respect. Santiso (2001), for example, has concluded that the World Bank interprets the concept of good governance restrictively, focusing on its economic dimensions. Good governance has thus been equated with 'sound development management'. Santiso argues that "the *quality* of governance is ultimately attributable to its democratic content. Neither democracy nor good governance is sustainable without the other. Consequently, democracy and good governance need to converge, both conceptually and practically, in the study and practice of public policymaking." Bringing politics back into the picture requires that we strengthen accountability, enhance the rule of law, and promote civic participation. (Santiso 2001.)

*Democratisation* as a framework for good governance has three basic dimensions: (a) strengthening democratic institutions; (b) supporting and empowering civil society, including media and (c) conducting public sector reforms. All of these require a good relationship between government and citizens. The key ingredients for success in engaging citizens in policymaking include information, consultation and public participation (Caddy 2001). An interest in promoting civic engagement and democracy is corroborated by a strong correlation between authoritarian modes of rule and high levels of corruption. This is why democracy and pluralism are fundamental to long-term anti-corruption strategy. At the same time it should be noted that democratisation does not have statistically noticeable effects until it has lasted for decades. (Andvig & Fjeldstad 2001.)

In a similar way there are new ideas about how to approach the design and implementation of anti-corruption and good governance policies. Daniel Kaufmann (2003) of the World Bank has challenged the notion that passing laws by fiat, creating new public institutions, or embarking on anti-corruption campaigns, are effective. Traditional public sector management doctrines and conventional legal/judiciary reform approaches may not, after all, be that suitable for many developing countries and emerging economies. What is needed, instead, is a sharper focus on external accountability, focusing on trans-

parency mechanisms and empirically-based monitoring tools (including e-governance), as well as participatory 'voice' and incentive-driven approaches for prevention. These should play a prominent role in providing checks and balances on traditional public institutions, in empowering non-traditional stakeholders, and in ameliorating state capacity and mitigating the very unequal field of influence in many countries. This hints that the fight against corruption should always be connected to the *public sector reform* and the reform of the state in particular (Tanzi 1998). Another general precondition for effective anti-corruption strategy is that measures are tailored to the social environment in which corruption occurs (Doig & Riley 1998).

Lastly, policies that boost economic growth are likely to reduce corruption in the long run. It has also been claimed that a very radical trade liberalisation is needed to make a noticeable reduction in corruption. (Andvig & Fjeldstad 2001, 101–102.) It goes without saying that in order to provide such benefits liberalisation needs to be well managed and supported by favourable cultural climate and adequate institutional arrangements. A market is not a natural order but an institution, after all (Hodgson 1988). This is why liberalisation in the wrong place at the wrong time may merely increase social polarisation, inequality, and exploitation.

These observations give good reason to assume that economic development and democracy are both causes and effects of good governance in the sense that they can be seen as a means to improve governance on the one hand and as social phenomena that can be improved with the help of good governance on the other.

## 5. Finnish experience of good governance

Finland is well-known for its clean and transparent government. In the Corruption Perceptions Index of Transparency International Finland for several years has ranked as the least corrupt country in the world. The situation is much the same in all the Nordic countries. (Transparency International 2004. See also OECD 2000; OECD 2002a; OECD 2002b.)

Ordinary Finns do not encounter corruption in their daily lives at all, which partly explains why they trust in their public institutions. (Koskinen 2003.) Part of this picture is also a well-developed legislation, which, it is as well to remember, has never included

either a separate corruption law or a separate body controlling corruption. Instead, corruption is treated as a part of criminality and poor governance, and is thus handled at all levels of legislation and control systems, including the Constitution, the penal code, civil service legislation, administrative directives and ethical norms. (Tiihonen 2003; OECD 2000.) This implies that the aspects of corruption and bad governance are approached in a holistic manner.

While gradually transforming into a welfare society in the 20<sup>th</sup> century, Finland seemed to witness a co-evolution of traditional legal-administrative system and an emerging integrity-based ethics regime. Well-functioning public administration was and still is the backbone of the Finnish ethics regime, placing great emphasis on administrative (rather than political) accountability. Since the late 1980s there has been a transformation towards new managerialism resulting in greater emphasis on measurable results, outputs, cost-effectiveness and self-determination, thus bringing new elements into the practical framework and the understanding of good governance.

What explains the success of the anti-corruption regime in Finland? To cut a long story short, we may identify the following reasons for the extremely low level of corruption in Finland (cf. Tiihonen 2003; Koskinen 2003; OECD 2000):

*Characteristics of society*

1. Egalitarianism and fairly equal income distribution
2. Democracy and rule of law
3. Universal welfare services and social benefits

*Administrative principles*

4. Core administrative principles and values for the public service: legality, justice, independence, impartiality, objectivity, trustworthiness of government, transparency, service-mindedness, proportionality, and being purpose bound
5. Strong tradition of legality

*Administrative structures*

6. Low hierarchical structures
7. Strong position of the Chancellor of Justice and the Parliamentary Ombudsman. There are also state auditors who perform independent scrutiny of public administration.

8. Well-functioning system of local government

*Civil servants*

9. Good status: civil service has been highly regarded as a career
10. Recruitment: everyone can aspire to a good career. In addition, civil service careers are relatively closed and based on meritocracy (i.e. it is rare to appoint someone from outside the administration to a senior post)
11. Adequate salary level
12. Well-educated civil servants in both national and local government

*Decision-making and administrative procedures*

13. Collective and collegiate decision-making structure
14. Non-political civil servants as heads of ministries (note: there have been plans to introduce a system of political state secretaries)
15. Referendary system (i.e. a system in which a civil servant examines a matter under advisement, presents alternative proposals and makes a final proposal to a decision-making body)
16. Obligation to provide public argumentation for the reasons behind a decision

*Politics and political parties*

17. Consensus-oriented political culture
18. Public funding of political parties.

Finland is a small country with a great respect of democracy, transparency and legalism. These together with a fairly high standard of living, equal distribution of income and high level of education help to prevent corruption and to promote good governance. It is also worth mentioning that in a small country loss of respect in society would be a serious loss for any official or politician. Thus, as emphasised by Tiihonen (2003), the price of being accused and condemned and eventually being excluded from the normal circles of life is exceptionally high, thus keeping individual cases of corruption rare.

## **6. Exporting culture and institutions of good governance?**

One of the most important aspects of current development policy in Finland is good governance, including respect for human rights, gender equality, democracy and the rule

of law. This policy is in line with the priorities of the European Union (cf. Rasi 1999). This is partly because good governance is among the most important preconditions for the development of any country or region.

Finland has a lot to give for developing countries and emerging economies in strengthening their governance practices. Its senior politicians and civil servants have contributed in this area in international arenas as well as in bilateral development processes. The Ministry of Foreign Affairs of Finland has given various aspects of good governance a high priority in its development aid, of which the bulk is directed to African countries. There are also other initiatives and programmes, such as the *Helsinki Process on Globalisation and Democracy*, which was initiated by the Government of Finland in co-operation with the Government of Tanzania in 2002 with the aim of searching for novel and empowering solutions to the dilemmas of global governance and offering a forum for open and inclusive dialogue between major stakeholders.

Even if traditional areas of development aid are still given priority – including reduction of poverty, promotion of human rights, prevention of environmental problems etc. – some new elements have been taken onto the development agenda. *Decentralisation* is one of the areas that have become increasingly important due to the decentralisation efforts that are common to many developing and emerging countries. Another new element is the utilisation of information and communication technologies (ICTs) and developing their relevant application areas, such as e-procurement, e-governance and e-democracy (Anttiroiko 2004). One of the outcomes of this process is a need to consider how e-enabled practices can be used to support the development of urban and rural communities in developing countries (Anttiroiko 2003).

In recent years local governments and the associations of municipalities have begun to assume a new role in international arena (e.g. Borja & Castells 1999). Beside the leading cities, such as Helsinki, Espoo, Vantaa, Tampere and Turku, there are some internationally oriented middle-sized municipalities, such as the Municipality of Lempäälä, which have taken steps towards genuine international development-oriented co-operation. This is one area in which Finland has a lot to learn but at the same time a lot to offer to urban and rural communities in different parts of the world.

An interesting example of development projects in which local and multi-level governance is in focus is Capacity Building for Local and Regional Authorities (CABLE 1999–2004).

The overall objective of the project was to improve capacities of Namibian local authorities to deliver key services to the communities. The main result of the project was improved managerial, administrative and technical capacities of the seven pilot local authorities (Karibib, Katima Mulilo, Khorixas, Okahanja, Opuwo, Otavi and Rundu) and increased co-operation between key stakeholders, including ministries, associations of local authorities and universities. It applied the idea of information society in some of its activity areas, thus offering a new framework for development activities. CABLE was definitively a good learning process for all parties concerned from Finland and Namibia. It also showed that in order to be able to build institutional capacity in the best possible way all the critical pieces must fit together synergistically in the created multi-actor setting.

An example of small-scale development co-operation between local governments is the North-South Local Government Co-operation programme financed by the Ministry of Foreign Affairs and co-ordinated by the Association of Local and Regional Authorities 2002–2004. It was established to support several co-operation projects between Finnish local authorities (Vantaa, Vaasa, Salo, Lahti, Hauho-Hartola-Janakkala, Tampere and Turku) and local authorities in several African countries. For example, the City of Tampere co-operated with the City of Mwanza in Tanzania and the City of Vantaa with the City of Windhoek in Namibia. The areas of co-operation included exchange of information, planning, promoting industrial development and supporting cultural activities. (Palola *et al.* 2003.) The Council of European Municipalities and Regions set up a network in autumn 2003 to support similar kinds of activities, known as the North-South Local Government Co-operation Network. It stresses the importance of the role of local government in combating poverty, and of good governance as a development tool (CEMR 2005).

Good governance can hardly be “exported” to developing countries. To develop good governance is a lengthy process in which both cultural and institutional dimensions need to be given sufficient weight. Finnish culture of good governance as such cannot be “exported” to any country, but sharing our experiences and telling about our values and practices of good governance may have a role to play in developing countries that are in the process of designing and implementing their policies for good governance. The same goes for our experiences of institutionalised anti-corruption arrangements and the formal features of our ethics regime, which are evidently easier to transplant to a recipient country than cultural values. Pekka Hallberg, the President of the Supreme Administrative Court, recently presented an idea that Finland should export “the rule of law”, but not only as a collection of legal norms but as more holistic model of a good society (Suomen

Kuvalehti 2004). However, in order to make such development activities effective, they need to be tailored to the social environment of each recipient country.

## References

- ADB (1995) Governance: Sound Development Management. Policy Papers, WP1-95, August 1995. Asian Development Bank (ADB). Accessed 16 June 2005. URL: <http://www.adb.org/Documents/Policies/Governance/default.asp?p=policies>
- Andvig, Jens Chr. & Fjeldstad, Odd-Helge (2001) Corruption. A Review of Contemporary Research. CMI Reports, Report R 2001:7. Bergen: Chr. Michelsen Institute, Development Studies and Human Rights. Accessed 16 June 2005. URL: <http://www.cmi.no/publications/2001/rep/r2001-7.pdf>
- Anttiroiko, Ari-Veikko (2003) Global Responsibility for Leading e-Cities. Tampere Business, June 1, 2003, 18–19.
- Anttiroiko, Ari-Veikko (2004) Introduction to Democratic e-Governance. In: Matti Malkia, Ari-Veikko Anttiroiko and Reijo Savolainen (eds.) eTransformation in Governance. New Directions in Government and Politics, pp. 22–49. Hershey PA: Idea Group Publishing.
- Borja, Jordi & Castells, Manuel (1999) Local & Global. Management of Cities in the Information Age. First published in 1997. Reprinted 1999. United Nations Centre for Human Settlements (Habitat). London: Earthscan.
- Caddy, Joanne (2001) Why citizens are central to good governance. OECD Observer. Public Management Service (PUMA), November 2001. Accessed 16 June 2005. URL: [http://www.oecdobserver.org/news/printpage.php/aid/553/Why\\_citizens\\_are\\_central\\_to\\_good\\_governance.html](http://www.oecdobserver.org/news/printpage.php/aid/553/Why_citizens_are_central_to_good_governance.html)
- CEMR (2005) North South Cooperation. [News release] 22/03/2005. Paris: Council of European Municipalities and Regions (CEMR). Accessed July 3, 2005. URL: [http://www.ccre.org/champs\\_activites\\_liste\\_news\\_en.htm?ID=3129](http://www.ccre.org/champs_activites_liste_news_en.htm?ID=3129)
- Doig, Alan and Riley, Stephen (1998) Corruption and Anti-Corruption Strategies: Issues and Case Studies from Developing Countries. In: Corruption and Integrity Improvement Initiatives in Developing Countries. New York: UNDP. Accessed 16 June 2005. URL: <http://magnet.undp.org/Docs/efa/corruption/Chapter03.pdf>
- Hodgson, Geoffrey (1988) Economics and Institutions. A Manifesto for a Modern Institutional Economics. Cambridge: Polity Press.

- Kaufmann, Daniel (2003) Rethinking Governance. Empirical Lessons Challenge Orthodoxy. Discussion Draft, March 11<sup>th</sup>, 2003. World Bank Institute (WBI). Accessed 16 June 2005. URL: [http://www.worldbank.org/wbi/governance/pdf/rethink\\_gov\\_stanford.pdf](http://www.worldbank.org/wbi/governance/pdf/rethink_gov_stanford.pdf)
- Koskinen, Johannes (2003) The Finnish experience in preventing corruption. High-Level Political Conference for the Signature of the United Nations Convention against Corruption, Merida, Mexico, 9–11 December 2003. Accessed 16 June 2005. URL: <http://www.un.org/webcast/merida/statements/finl031209en.htm>
- Millock, Katrin & Olson, Sophie (1993) Why Poor Regions Stay Poor. *Journal of Regional Policy*. 1/93, Vol. 13 – January/March, 1993, 51–71.
- OECD (2000) Trust in Government. Ethics Measures in OECD Countries. Paris: Organisation for Economic Co-operation and Development.
- OECD (2002a) Finland. Review Of Implementation Of The Convention And 1997 Recommendation. Report issued at the 2000 OECD Ministerial on the implementation of the OECD Anti-Bribery Convention in Finland. 27-Jun-2000. Accessed 16 June 2005. URL: <http://www.oecd.org/dataoecd/14/20/2386203.pdf>
- OECD (2002b) Finland: Phase 2. Report On Application Of The Convention On Combating Bribery Of Foreign Public Officials In International Business Transactions And The 1997 Recommendation On Combatting Bribery In International Business Transactions. OECD, Directorate For Financial, Fiscal And Enterprise Affairs. May 2002. Accessed 16 June 2005. URL: <http://www.oecd.org/dataoecd/52/0/2088239.pdf>
- OECD (2005) Principal elements of good governance. OECD, Directorate for Public Governance and Territorial Development. Paris: OECD. Accessed 16 June 2005. URL: [http://www.oecd.org/document/32/0,2340,en\\_2649\\_33735\\_1814560\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/32/0,2340,en_2649_33735_1814560_1_1_1_1,00.html)
- Palola, Jorma & Haapaniemi, Taru & Johansson, Viveka (2003) Kunnat ja kehitysyhteistyö / Tiedote [Local authorities and development co-operation / Newsletter]. *VIKKOTIEDOTE* 5, 2.2.2003. Suomen Kuntaliiton Brysselin toimisto. Finnish Association of Local and Regional Authorities. Accessed July 3, 2005. URL: [http://www.kunnat.net/k\\_perussivu.asp?path=1;29;346;31407;2548;40691;40862](http://www.kunnat.net/k_perussivu.asp?path=1;29;346;31407;2548;40691;40862)
- Santiso, Carlos (2001) Good Governance and Aid Effectiveness: The World Bank and Conditionality. *The Georgetown Public Policy Review*, Volume 7 Number 1 Fall 2001, pp.1–22. Accessed 7 July 2005. URL: <http://www.eldis.org/fulltext/conditionality.pdf>



- Suomen Kuvalehti (2004) Oikeusvaltio vientivaltiksi [Exporting the Rule of Law]. (An interview with Pekka Hallberg, the President of the Supreme Administrative Court, by Tapani Ruokanen). Suomen Kuvalehti 24/2004, 40–42.
- Rasi, Marjatta (1999) The cooperation between the United Nations and the Organization of African Unity. Statement by H.E. Ms. Marjatta Rasi, Permanent Representative of Finland on behalf of the European Union. 54<sup>th</sup> Session of the United Nations General Assembly, Agenda item 31: Cooperation between the United Nations and the Organization of African Unity, New York, 7 December 1999. Accessed 16 June 2005. URL: <http://www.un.int/finland/euspeechOAU.html>
- Tanzi, Vito (1998) Corruption Around the World: Causes, Consequences, Scope, and Cures. International Monetary Fund, IMF Working Paper, WP/98/63. May 1998. Accessed 16 June 2005. URL: <http://www.imf.org/external/pubs/ft/wp/wp9863.pdf>
- Tiihonen, Paula (2003) Good governance and corruption. Written for Virtual Finland. Published May 2003. Accessed 16 June 2005. URL: <http://virtual.finland.fi/netcomm/news/showarticle.asp?intNWSAID=25891>
- Transparency International (2004) Corruption Perceptions Index 2004. Document last modified: 10/22/2004. Berlin: Transparency International (TI). Accessed 16 June 2005. URL: <http://www.transparency.org/cpi/2004/cpi2004.en.html#cpi2004>
- Transparency International (2005) Global Corruption Report 2005. Special focus: Corruption in construction and post-conflict reconstruction. Berlin: Transparency International (TI). Accessed 16 June 2005. URL: <http://www.globalcorruptionreport.org/>
- UNDP (1997) Corruption and Good Governance. Discussion Paper 3. Management Development and Governance Division, Bureau for Policy and Programme Support. New York: United Nations Development Programme (UNDP). July 1997. Accessed 7 July 2005. URL: <http://magnet.undp.org/Docs/efa/corruption3/corruption3.htm>
- UNESCAP (2005) What is good governance? Bangkok: United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). Accessed 7 July 2005. URL: <http://www.unescap.org/huset/gg/governance.htm>
- World Bank Institute (2005) About Governance. World Bank Institute/The World Bank Group. Accessed 16 April 2005. URL: <http://www.worldbank.org/wbi/governance/about.html>

## *Security, Development and Regional Organizations in Africa*

*Liisa Laakso*

*Professor of Development & International Cooperation*

*University of Jyväskylä*

*Department of Social Sciences and Philosophy*

*E-mail: liisa.laakso@yfi.jyu.fi*

The relationship between security and development is a complex issue in international cooperation. Different governmental and non-governmental stakeholders have attempted to formulate new policies to address contemporary security threats and development challenges in a coherent manner. Security is widely seen as both a precondition and an outcome of development. As noted in one recent report issued by a development NGO there has been “a paradigm shift in the approach to the issue of security and development” (van Drimmelen, 2005).

The role of the African regional organizations in this field is particularly interesting. Security is a new thing for them. During the cold war security problems that spilled over the state borders were usually addressed either multilaterally by the United Nations or bilaterally between one of the superpowers or ex-colonial powers and the African governments. This situation has changed with the creation of the African Union (AU) and even before that with the activity of sub-continental organizations (like the Economic Community of West African States, ECOWAS). Today the world powers and the donor community look at peace and security as part of their dialogue with Africa as a region. The European Union for instance has provided 250 million euro of its development cooperation funds to the AU to promote peacekeeping in Africa.

This has raised concerns that the objectives of development policy, like alleviation of poverty can be compromised by security needs. Also the reputation of African regional organizations in the field of security is not unambiguous. The need for comprehensive dialogue and detailed scientific research is evident.

## Theoretical approach

Regional integration in Africa is a challenge to integration theories. The mainstream approaches to integration, both (neo)functional and inter-governmental, postulate that integration starts from economic co-operation and proceeds to political and security sectors only after there is confidence as well as shared values and material interests between the states creating a “security community”. However, in spite of a few exceptions, like the Southern African Customs Union (SACU), which is not active in the security sector at all, African regional economic integration is weak. Fundamental in the conventional theories of regional integration is also its conceptualisation as a process where states pool together or delegate their sovereignty to regional level bodies. Such transfer of sovereignty can occur only if there is recognised sovereignty at the state level in the first place. This, however, is contested in many African weak, failing or collapsed “quasi states” that nevertheless are full members of regional organisations. Related to this is the fact that the African states usually “gain” their membership of the regional organizations by their mere geographical location, instead of criteria related to their economic policies, good governance or human rights legislation as applied in the EU for instance.

Furthermore, for instance trade interdependence alone without institutional co-operation does not build up a security community (Hegre 2000). The mere fact that states depend on each others’ security in a given region does not mean that co-operation between them would automatically enhance security. The situation can be the contrary: authoritarian leaders might rely on the support of the governments of neighboring countries. Internal conflicts rather than peace can become essential for them to stay in power (Söderbaum 2003). Partly for that reason entire regions, like Western Africa for much of its post-colonial history, have been ruled by militaries supporting each other instead of democratically elected civilian leaders. In similar ways mafia-like non-state actors or rebel groups, can form regional networks for criminal or warfare activities.

It is apparent that at least minimal stability is a precondition for regional co-operation that can lead to a security community. According to Laurie Nathan domestic violence generates tension among states and can spill over the borders. Therefore he suggests that security community should apply not only between states but also within them, and therefore none of the African regional organizations, which include member states with acute domestic instability, can be regarded as security communities, even though many authors have argued the contrary (Nathan 2004). It is difficult to disagree with Nathan.

But what are the consequences of his remarks? If we follow Nathan's argumentation, domestic affairs cannot and need not be tackled by security communities, as domestic security problems by definition do not exist in such communities.

Whether we like it or not, states are the building blocks of security communities; and whether we like or not, concentrating on states makes little sense in order to grasp the political realities in Africa. This is not to claim that states are unimportant. On the contrary: in order to be able to build peace, African regional organizations need the mandate, capacity and political will to strengthen or replace the weak, failing and collapsed states. This is also why more attention needs to be paid to the multiple layers of political authority there.

Multi level governance (MLG) approach is one possibility to do that. MLG differs from traditional integration theories and the concept of security community in important ways. First of all it claims that there has been a shift from the domination of the state to the autonomy of other actors. While encompassing the emergence of supra-state levels of political authority, it also pays attention to decentralization and popular participation and, in particular, to the interaction between the sub-state and supra-state levels bypassing the state-level altogether. MLG thus enables different kinds of actors to participate in decision-making (Laakso 2005).

In principal the question is about a continuum of governance arrangements from the local level to the global level, the nation state being just one layer within the potentially infinite number of inclusive and mutually interactive levels. Therefore MLG can extend attention beyond states to regional organizations and to the global level, including the UN and the donor community, on the one hand, and to sub-state actors like NGO's, different militias and even private security companies, on the other.

Furthermore MLG enables analysis of pragmatic approaches and relationships that are more about partnerships and regulation than hierarchies and command usually connected to sovereign authority. It also means that the formulation of coherent policies requires coordination more than conformity. However, rather than developing from a rationalist model characteristic to intergovernmentalism and (neo)functionalism, MLG – with notions of blurred legitimate authorities and multiple non-exclusive political identities (Hooghe and Marks 2001, 45) – reminds us of “neo-medievalism” in the postmodernist approach (Jachtenfuchs 1997). MLG might translate into heterogeneous and even contradictory policies within and between states, regional organizations and their external

supporters. Thus there is a constant need to emphasise coherence not only between different levels but also between different policy sectors. The main asset of the MLG model with regard to security in Africa is precisely here. It is not deterministic and thus leaves room for uncertainties. Sensitivity to uncertainties in turn enables grasping both the possibilities and the constraints of regional organizations to bring security to Africa.

## **Multilevel security capabilities in Africa**

The AU, like its predecessor the Organisation of African Unity (OAU), has identified five regions as constituent components within the African continent: Southern, Western, Eastern, Northern and Central region. These regions form the basis for the selection of members of the AU Commission. As regional economic communities (RECs) representing these regions the AU lists ECOWAS, the Southern African Development Community (SADC), The Inter-Governmental Authority on Development (IGAD), the Arab Maghreb Union (UMA) and the Economic Community of Central African States (ECCAS) as well as the Common Market for Eastern and Southern Africa (COMESA), though the latter includes states from different regions, i.e. Southern, Eastern and Central Africa. The general rule has been only to recognise one sub-continental organisation per region.

### *Sub-continental organizations*

Of the RECs only SADC, ECOWAS and IGAD have been active in the security sector and are thus worth a brief overview here, particularly SADC, which has faced enormous difficulties to formulate a common security policy. On the one hand, there has been confusion on whether the member states should enter into a defence pact, i.e. military alliance, or develop a comprehensive security policy. On the other hand, there are deep political divisions that hamper the formulation of a common policy, not to speak about an ability to interfere in the internal affairs of any of the member states.

After the end of the apartheid rule in South Africa, the SADC approved the creation of an Organ for Politics, Defence and Security. The member states, however, were immediately divided on the relationship between the Organ and the SADC secretariat. According to South Africa the SADC Treaty did not provide for a separate Organ, while Zimbabwe argued that the Organ should operate independently on a flexible and informal basis. This

division extended to two interpretations of the purpose of the co-operation. South Africa's "camp", which included Botswana, Mozambique and Tanzania, viewed the Organ primarily as a political forum for confidence building within the region. Zimbabwe's "camp" including Angola and Namibia favoured military co-operation. Finally in 2001 the SADC Treaty was amended so that it stipulates the Organ as an institution of SADC.

These institutional vacillations have to be seen in the context of a number of violent conflicts in the SADC region. Action, however, was taken only in two cases. Zimbabwe, Namibia and Angola decided to send troops under SADC auspices to the DRC in 1998 to help the government of Laurent Kabila without even consulting South Africa, which had emphasized conflict resolution through mediation. The intervention did little to enhance stability in the DRC, contributing rather to the further fragmentation of the country and external exploitation of its resources. Neither was it an economic success for Zimbabwe although government officials there anticipated that the costs of the intervention could be covered by the revenues from the riches of the DRC. Quite the contrary, Zimbabwe's economic downturn and domestic political problems were only exacerbated (Addison and Laakso 2003). In the same year 1998 in consultation with Mozambique and Zimbabwe, South Africa and Botswana again "under SADC auspices" deployed troops in Lesotho. It was resisted by some sections of the Lesotho army, which then led to killings and public demonstrations. As a consequence, the operation was viewed by many observers as a military and political disaster (Nathan 2002).

In most cases of violent eruption in the region, SADC has refrained from any engagement, treating violence as a purely domestic affair. Zimbabwe is a case in point. SADC has not only remained silent but has expressed solidarity with the Zimbabwean government and condemned its international criticism.

Development within ECOWAS has been different, more *ad hoc* by nature. ECOWAS responded to the crises in Liberia in 1989 by establishing a Standing Mediation Committee (SMC). This then established the ECOWAS Ceasefire Monitoring Group (ECOMOG), which undertook peacekeeping in Liberia in 1990 and again in 1999 and 2003, in Sierra Leone in 1997–2000, in Guinea Bissau in 1999 and in Côte d'Ivoire in 2003. Through these actions, ECOWAS has gradually developed institutional capacity for crisis management.

However, in Liberia and in Sierra Leone, in particular, the ECOMOG performance was controversial. It did not enjoy unanimous support within ECOWAS and according to some observers rather exacerbated the crises (Cilliers 2001). The domination of Nigeria, particularly when under military rule, did not facilitate acceptance of the legitimacy of ECOMOG troops. Still a diplomatic norm has emerged emphasising the centrality of ECOWAS in conflict management in the region. In 1999 ECOWAS adopted the Protocol Relating to the Mechanism for Conflict Prevention, Management, Resolution, Peacekeeping and Security, as a way of strengthening its mandate and institutional capacity to manage conflicts further (Adibe 2002). ECOWAS has also put in place an observation and monitoring system and has institutionalised co-ordination with NGOs through Civil Society Forum (WACSOF) since 2003.

IGAD has no mandate to intervene in intra-state conflicts, and only a limited one with respect to interstate conflicts. Its 1996 Act stipulates the sovereignty of all member states, as well as the principle of non-interference in their internal affairs. However, it has established Conflict Early Warning and Response Mechanism (CEWARN) office. Although confining its role only to pastoral conflicts, it represents the first attempt to deal with conflicts through a common mechanism, involving non-governmental sources of information and sharing information among member states. Lack of trust between the member states and their willingness to control the mechanism including the information coming from non-governmental sources is a hindrance to its effective functioning. As noted by Kasaija Phillip Apuuli, CEWARN “is a good theoretical framework to react to the multifarious conflicts that are afflicting the IGAD region, however on the practical level it is so full of ambiguities and lacunae that it might not work” (Apuuli 2004, 174). IGAD has not been able to prevent or manage interstate conflict, like the one between Eritrea and Ethiopia, where the OAU finally played a major role.

The sub-continental organizations in Africa have not been able to mobilise their resources for common security policy very effectively even though there have been important institutional developments to strengthen their role in the field. One reason is that sub-continental organisations often operate under conditions that potentially impair their effectiveness. States involved in conflicts can have leading roles in sub-continental organisations, thereby impeding these groupings from acting as mediators or reducing their impartiality. Rivalry between neighbouring states also makes it less likely that sub-continental organisations would be given intrusive powers to deal with intra-state conflicts. Therefore the AU as a continental body might have more opportunities.

### *The African Union*

The distance between the AU and the actual disputes is greater than the distance between the sub-continental organizations and the disputes. Besides the AU can more easily represent African security interests globally and has a better ability to raise the long-standing international institutional support that Africa evidently needs.

In this the AU can build on the experience of its predecessor the OAU. Although the OAU was often criticised as having had only a token role in peace and security in Africa, already its 1993 Cairo Declaration set up the Mechanism for Conflict Prevention, Management and Resolution and its operational arm, the Conflict Management Centre (CMC). Also a special Peace Fund was established (OAU 1999). With the deployment of several fact-finding and military observer missions, the OAU assumed an active role in the search for political solutions to some conflicts. Examples of the OAU playing an important role include mediation, political pressure and employment of special envoys in Burundi and in the secessionist crisis in the Comoros, as well as close cooperation with the UN in the conflicts between Ethiopia and Eritrea and in the conflict in the DRC.

The formation of the AU represents a major step forward in this field. It has already moved beyond the mandate and record of its predecessor. While still acknowledging the principle of “non interference by any Member State in the internal affairs of another”, the *Protocol Relating to the Establishment of the Peace and Security Council of the African Union* gives the Council the power to “approve the modalities for intervention by the Union in a Member State, following a decision by the Assembly” (AU 2003). This mechanism has already been tested in Burundi, Darfur, DRC and Cote d’Ivoire. In each of these cases, the Commission of the AU was tasked with following the situation providing a good example of MLG arrangements. With such mandates and adequate recourses, where the international community can play a major role, the Commission can gradually assume autonomous powers in the security field.

Since 2003, steps toward setting up an African Stand-by Force and a Military Staff Committee under the aegis of the AU have created a special challenge for interaction between the continental and sub-continental levels. The AU Summit in Maputo in July 2003 decided on the framework to set up an African Stand-by Force (ASF), consisting of five brigades, each comprising contributions from states in a particular region. These troops are to be at full strength in 2010. In the coordination and management of this effort, sub-



continental organisations will play a major part. The effort to set up a Stand-by Brigade for the Eastern Africa region will be coordinated and managed by IGAD, for instance.

Taking into consideration the importance of coherence in MLG arrangements, there is a dual structural challenge posed by the ASF. First, while the principles of AU interaction with sub-continental organizations are still being tested, the latter have to assume a major role in an issue involving the credibility of AU institutions and mechanisms. This might end up putting a major strain on relations between the two levels. Second, there are discrepancies in the geometry of the regions providing Stand-by Brigades and the sub-continental organizations that will play a major role in administering them. For example, of the thirteen countries which form the Eastern Africa region – from which the Eastern Africa Stand-by Force is being formed – only seven belong to IGAD.

Further challenges relate to the comprehensiveness of African security problems. A framework agreement on a Common African Defence and Security Policy was adopted at the extra-ordinary AU Summit in Sirte in February 2004. It includes elements of human security, human rights, participatory governance, equal development, access to resources and the basic necessities of life, protection against poverty, good education and health, gender equality and environmental integrity. While agreeing about such policy is not difficult, operationalization of such wide policy and setting up priorities within is demanding (AU 2004).

In this task the AU can rely on partnership with civil society. When compared to the member states or even sub-continental organizations, the AU can have a good ability to engage with the civil society and to give it a voice, which is often silenced at the state or sub-continental levels as being the voice of the political opposition only.

### **Regional civil society**

The importance of civil society and regional action by civil society organizations in peace building is widely acknowledged. African regional civil society initiators in peace building include Nairobi Peace Initiative-Africa (NPI-Africa), Southern Africa Conflict Prevention Network (SACPN) and West Africa Network for Peacebuilding (WANEP). On the intergovernmental level there have also been important initiatives to engage with civil society. The most important of these is the Conference on Security, Stability, Devel-

opment and Cooperation in Africa (CSSDCA). In 1991, Nigerian president Olusegun Obasanjo and the then OAU Chairman, Ugandan president Yoweri Museveni invited African leaders to attend a meeting on Security, Stability, Development and Cooperation, which then proposed CSSDCA. However, it was not before the 36<sup>th</sup> OAU Summit in Lomé in 2000 that CSSDCA was officially endorsed. One of CSSDCA's main functions is to provide a mechanism for monitoring and facilitating the implementation of AU's decisions. To an extent CSSDCA and the simultaneously launched NEPAD can be seen as competing arrangements initiated by different coalitions of African leaders. With the MLG framework such multiplicity, however, is not a problem in case these bodies do not pursue contradictory policies.

Furthermore the OAU-Civil Society Conference on Developing Partnership in 2001 and its follow-up in 2002 explored practical modalities to the end of engaging with the civil society. The monitoring mechanism is planned as a comprehensive peer review process involving governments through inter-Ministerial Committees, RECs, civil society organizations and research agencies. As a good example of a multi-level arrangement, it would involve a process of interaction at national, sub-continental and regional level for cross-verification and mediation. In 2001 the OAU secretariat stated that it would work with civil society "to provide them with a legal framework on the basis of which they could claim their legitimacy at the national level". Civil society, in turn, was seen as having an important role in informing the African people about the continental level decisions (OAU 2002, 280). Besides the AU is actively utilising the expertise of independent African research institutes to support its security policy.

Inclusion of civil society forum to the peace processes is already a norm. The International Conference on the Great Lakes Region under the auspices of the AU and UN, for instance, has facilitated meetings for women, youth and NGOs from the region (AU 2005). When interpreted through the MLG model the existence of various platforms for dialogue between the public authorities and civil society and overlaps between these platforms do not necessarily make the interaction ineffective. Both conflict prevention and long-term peace-building are areas where exchange of information and views is valuable and should be kept flexible and to a certain extent informal, too. For example, civil society can promote useful informal approaches to conflict prevention and resolution, which is particularly relevant to conflicts involving parties like rebel groups that have not been recognized by governments.

Finally it is important to remember that the challenges of sustainable peace in many parts of Africa lay in promoting equal development with the wealth gained from the primary sector. Transparency in mineral revenues and payments is essential for African governments and publics to be able to utilize the revenues efficiently. Conditions for such transparency have to be created in partnership with the private sector, which along with the civil society needs to be engaged to the African security policy. The significant and sometimes contradictory role played by international private security companies in Africa is also relevant here. As their engagement is unlikely to work solely on voluntary or on unilateral basis, simply because companies compete with each other primarily in terms of the profit they can make, a regional or global approach is likely to be more pertinent.

### **Concluding notes**

The fact that governments of sovereign member states might themselves be part of security problems – also within their own territory – is an obvious challenge for African security integration. It has to move towards a model, which can address situations where the state monopoly over violence is already compromised. By the same token, supranational regional authority becomes a necessity. However, the emergence of a security community is not a necessity for regional organizations to play a role in security. By developing new intra-regional and cross-level relationships regional organization can exercise empirical power and make a difference to the realities in the ground. For this end they need external support. Existing gaps in funding arrangements of those donors that do not provide budget lines for regional or cross-border initiatives have to be addressed. For some purposes like conflict prevention development assistance is a suitable instrument. Others like peace keeping require specific assistance.

In order to evaluate the needs and performance of African regional organizations more research needs to be done. Furthermore, the roles and mandates of NGOs in relation to security and development are not clear. Development NGOs, humanitarian NGOs and peace NGOs can all play a meaningful role in the co-operation but should not lose their own objectives.

## References

- Addison, T and Laakso, L 2003. "The political economy of Zimbabwe's descent into conflict", *Journal of International Development*, 4(15), 457–470.
- Adibe, C 2002. "Muddling Through: An Analysis of the ECOWAS Experience in Conflict Management in West Africa" in Laakso, L (ed.) *Regional Integration for Conflict Prevention and Peace Building in Africa: Europe, SADC and ECOWAS*, Ministry for Foreign Affairs, Department of International Development Cooperation, Helsinki: 103–169.
- Apuuli, K 2004. "IGAD's Protocol on Conflict Early Warning and Response Mechanism (CEWARN): A Ray of Hope in Conflict Prevention" in Nhema A (ed.) *The Quest for Peace in Africa: Transformations, Democracy and Public Policy*, Addis Ababa, OSSREA:173–187.
- AU 2003. Protocol Relating to the Establishment of the Peace and Security Council of the African (adopted by AU Heads of State in Maputo, July 2003).
- AU 2004. Solemn Declaration on a Common Defence and Security Policy, adopted in Sirte, Libya, 28 February 2004.
- AU 2005. "Report of the Chairperson of the Commission on the Process of the International Conference on the Great Lakes Region", Peace and Security Council 32<sup>nd</sup> meeting, 17 June, Addis Ababa.
- Cilliers, J 2001. "Consolidating Africa's Regions", *African Security Review*, 10(1).
- van Drimmelen, R 2005. "Preface" in Robinson, C *Whose Security? Integration and integrity in EU policies for security and development*, Aprobev, Brussels.
- Hegre, H 2000. "Development and the Liberal Peace," *Journal of Peace Research* 37 (January).
- Hooghe, L and Marks, G 2001. *MLG and European Integration*, Lanham: Rowman & Littlefield.
- Jachtenfuchs, M 1997. 'Conceptualizing European Governance', in Jorgensen K (ed.) *Reflective Approaches to European Governance*, pp. 39–50. Basingstoke: Macmillan.
- Laakso, L 2005. "A capability-implementation gap in the making: multi-level governance and the emerging European crisis management policy" in Walzenbach G (ed.) *European Governance: Policy-making between politicisation and control*, Aldershot: Ashgate: 190–221.
- Nathan, L 2002. "'Organ Failure': A Review of the SADC Organ on Politics, Defence and Security" in Laakso, L (ed.) *Regional Integration for Conflict Prevention and Peace Building in Africa: Europe, SADC and ECOWAS*, Ministry for Foreign Affairs,

- Department of International Development Cooperation, Helsinki: 62 – 102.
- Nathan, L 2004. *Security Communities and the Problem of Domestic Instability*, Working Paper No.55, the Development Research Centre and LSE
- OAU 2002. *Building Partnership for Promoting Peace and Development in Africa*, Report and Main Conclusions of the First OAU-Civil Society Conference, 11–15 June, 2001, Addis Ababa, Ethiopia.
- OAU 1999. *Enhancing Peace and Security in Africa: The OAU's Programme for Strengthening the Conflict Management Centre*.
- Söderbaum, F 2003. "Modes of regional governance in Africa: By whom, for whom and for what purpose?" in Van Ginkel, H, J Court and L van Langenhove eds., *Integrating Africa: Perspectives on Regional Integration and Development*, UNU Press: 69–88.

## *New Ethical Tourism in Developing Countries*

*Pekka Mustonen*

*Economic Sociology*

*Turku School of Economics and Business Administration*

*Rehtorinpellonkatu 3, 20500 Turku, Finland*

*Phone: +35824814463*

*E-mail: pekka.mustonen@tukkk.fi*

### **Introduction – many faces of tourism**

Because of industrialization and development of modern means of transport, which helped tourism become what it is today, it is often thought that the whole phenomenon of travelling people is relatively new. Although tourism has surely changed remarkably during past decades, people have always travelled (see Harrison 2002). One good example is probably the oldest form of tourism, pilgrimage, which has remained somewhat similar as it was hundreds of years ago. And even though now the discussion on new forms of tourism has been extensive, the idea of travelling independently is not new (Butcher 2003, 16). It dates back at least to 1600–1700 to the era of “Grand Tours”.

Despite the fact that western consumption-based lifestyle has spread everywhere and tourism flows from for example some Asian countries have slightly increased, “typical” tourists still originate from western countries. In addition to this, tourists tend to travel more and more to poorer regions, especially to north and south-east Asia (See World Tourism Organization 2005). People in the “west” have generally more leisure time and resources and they are able to spend money on compulsory commodities, tourism being one of the most popular of these in contemporary world (see Harrison 2003, 28). First world tourists can in principle travel anywhere.

Nevertheless, some remarkable changes have happened. Contemporary tourists cannot be divided into categories as easily as tourists from the past. It has been said that we have entered into postmodern era in which older paradigms do not apply. For example travelling habits of the forerunners, the “allocentrics” (Plog 1974), has been adopted by all the social classes. The age of explorers and Grand Tours is over. In contemporary shrinking world it is almost impossible to think of a truly alternative form of tourism. For exam-

ple, backpackers or so called “ecotourists”, who are often considered alternative tourists and in a sense allocentrics of today, are actually representing just another dimension of mass tourism (Butcher 2003; Cohen 1995; Mustonen 2005; Ryan *et al.* 2003; Scheyvens 2002; Wearing *et al.* 2002).

Developing countries, especially in South America and Asia have been popular destinations for these new masses. Tourism has no doubt induced wealth to these areas but when total long scale impacts are concerned, the situation is complicated. There are numerous problems which concern particularly developing countries and there are many obstacles which must be overcome. Thus it is difficult to give exact advice of how, how much and what kind of tourism should be developed. Different authorities have always different interests.

Impacts of tourism are probably the most researched topic in the wide field of tourism research and not without a reason (see e.g. Brohman 1996; Mathieson & Wall 1982). In addition to economic impacts, the idea of “sustainable tourism” holds numerous other dimensions, ecological and socio-cultural being the most important of these. All the dimensions must be taken into account when tourism practices are developed and promoted. The question of responsibility comes easily into the centre of discussion. According to Global Code of Ethics of World Tourism Organization (2005) all stakeholders must act for the common goal which is the sustainable future (see Meadows *et al.* 1972). In addition to WTO’s “Code”, ethical issues have spread even into the hard core of the industry and all the major tour operators have their own programme of sustainable tourism. In addition to this, the growth of tourism is criticized even by them who are responsible of it (see Butcher 2003, 17). Tour operators, like any other enterprises, aim at increasing their profits. Thus when the codes are marketed and promoted, arguments and general credibility play major role.

In practice, obeying orders and suggestions is up to each and every actor in the market. When actual encounters with the Other occur, codes of conduct most probably are somewhere else than in hand. Instead, choices are made according to one’s own will and common sense (compare to Butcher 2003, 72). According to some postmodern theorists, consumers are acquainted with ethical issues involuntarily when they face the negative sides of modern society (e.g. Bauman 1996; Beck 1995a). Considering this in the case of tourism, postmodern tourists should notice the impacts of tourism and therefore this should create an ethical dimension into their behaviour. If, like some authors state, we now live in postmodern society, should not also tourists be all postmodern? Adopting

fully this opinion would be too exaggerated. Postmodern theories basically try to explain changes of (western) societies in general whilst postmodern theories of tourism are concentrated more on individual tourists and changes occurred in touristic behaviour.

## Postmodern tourism

One of the first and probably the most widely used “definition” of postmodern society is the one of Lyotard’s (1985). He claims that incredulity towards metanarratives, which refer to religious, political and scientific explanations of the world, is characteristic to postindustrial world. This has led to increasing insecurity due to legitimization crisis. Modernity has broken down the foundation of industrial society. In general, postmodern is something which does not fit easily into older paradigms of society (Best & Kellner, 1997, 21–23). Theories and discussions are connected to the fact that modern way of life have changed and this has created need for new general rules (e.g. Bauman 1996, 191–215; 1997). In the case of tourism, this means for example that new forms of tourism have been born and they might replace or at least change existing forms and even fundamental structures of tourism. The emergence of new motivation basis behind tourism is one part of this process.

Together with the assumed postmodern turn, social, cultural and ecological responsibility has been more and more in the centre of discussion, and sustainable tourism is now increasingly important topic (compare to Beck 1995a, 20–21; 1995b, 244). Uriely *et al.* (2003) talk about ‘other’ postmodern tourism which emphasizes the growing appeal of the concepts such as alternative, real, ecological and responsible. Tourism, when connected to these concepts is seen as the opposite to conventional tourism. (Barret 1989; Munt 1994; Poon 1993; Uriely *et al.* 2003; Urry 1990) Other side of postmodern tourism presented by Uriely *et al.* (2003) is simulational postmodernity. According to one view, “post-tourists” do not even have to travel to experience touristic attractions (Urry 1990). They can gaze touristic sites virtually or at least the actual sites are often simulated replicas of the reality which probably have never existed (see Baudrillard 1996; Featherstone 1991; Lash & Urry 1994).

In addition to the rise of individualism, which has lead to the birth of numerous new forms of tourism (sometimes occurring inside older conventional forms of tourism) also de-differentiation is considered one essential characteristic to postmodern society (Lash & Urry 1994; Uriely 1997; *et al.* 2003; Urry 1990 & 1995). Uriely *et al.* (2003, 58–59)



present two dimensions of de-differentiation, namely horizontal and vertical. By horizontal de-differentiation they mean processes where conventional distinctions between different fields of social activity are gradually decreasing in contemporary culture. In tourism this can simply mean that touristic practices can be found in various contexts of everyday life. Tourist has even been considered as a metaphor for *postmodern man* (Bauman 1993, Featherstone 1995, Jokinen – Veijola 1997) and like Lash and Urry (1994) state, people are actually tourists most of the time even when not taking vacation. Munt (1994) takes this even further by stating that “tourism is everything and everything is tourism”. Vertical de-differentiation according to Uriely *et al.* (2003) represents traditional distinctions between for example high and low culture which in postmodern are said to be breaking down (Featherstone 1991; Miles 1998; Settle *et al.* 1978; Toivonen 1992 & 1997; Urry 1995). De-differentiation can also be a reason why environmentally and socially conscious behaviour has spread to different fields of social life, tourism being a good example of this. Munt (1994) even places environmentalism in the centre of postmodern tourism.

### **The role of ethics in postmodern**

Aristotle in his *Nicomachean Ethics* (1989) considers that people aim at happiness which is the very basis of good life. All other urges aim at something else but finally always to happiness. People are members of societies and how they behave inside these groups is connected with the possible happy outcome. Despite new insights brought into the field for example by Thomas Aquinas, the legacy of Aristotle can be considered even as basis of contemporary discussions of sustainable development.

Postmodern individuality and consumption culture emphasize the freedom of choice. The problem especially in the case of tourism is a contradiction between this freedom and responsibility (compare to Ahponen 1998). The questions of responsibility become relevant especially when different actors meet each other. According to Bauman (1993; also Lévinas 1993, 124–125; 1996) all confrontation between people should base on the idea of being for the Other instead of being with the Other. Skiotis (2005) describes this by stating that the first is a relationship based on love whilst latter is based on power. In tourism these confrontations happen continuously when tourists meet the hosts, and *vice versa* (compare to Lash 1996). This relationship ought to be equal albeit by using westernized indicators, both parties would be in highly unequal situation. Tourist has had

opportunity to travel whilst especially in developing countries the other side, the hosts, most probably will never have.

When Bauman (1993; 1996) speaks about postmodern ethics he regards morality without ethical code. Moral codes are no more produced and given by authorities. Instead in postmodern world responsibility is personal and occurs in interpersonal communication. Individuals are the source of ethics and discussion. (Bauman 1996, 212.) Tourists who are guests in someone else's home, face ethical issues on Other's home ground. They are placed in the centre of ethical discussion, whether they want to be there or not. They are forced to make ethical choices in everyday practises (compare to Butcher 2003, 72). Where and how to live, where and how to travel, what to eat, what to wear? These among others are the questions to which proper universally applicable answers are difficult to find. Is the common sense which was discussed earlier in the case of the codes of conduct, like Aristotle thought, enough to maintain in the sustainable and ethical path?

Practically in the field of tourism, there is nothing fundamentally new under the sun. What is new is that without a doubt people in western countries now live in the consumer society, where consumption is the main factor behind lifestyles and culture (Miles 1998). Consumption choices depend on social environment, which is very consumption driven and especially in the case of tourism, almost demands people to travel (see Sharpley 2002, 307–311). In addition to social dimension, discussion on ethics creates pressures and for the consumers it is difficult to choose the right authority. The problem of multiple alternatives is connected to all types of consumption and thus also to tourism.

In general, ethical issues of tourism have become more important, which like stated earlier, can also be due to reflection process of the actors. This has led to the rise of totally new approaches to tourism and by interpreting for example Beck's (1995b: 239) visions on reflexive society, this postmodern change may endanger the whole modern structure of tourism. Actors of contemporary societies must encounter with the side-effects of modernity. This forces conscious individuals to reflect their own behaviour and thus face themselves. This according to Beck is an explanation to the increased knowledge of ecological issues. (Beck 1995a, 20–21; 1995b, 244; see also Bauman 1993 on postmodern ethics.)

Butcher (2003) presents provocative and probably the most extensive critique towards moralisation of tourism. This moralisation is essential to majority of writings of "new tourism". Butcher binds together travellers, ecotourists, "new tourists" (Poon 1993), and

postmodern tourists (Feifer 1985; Urry 1990) and claims that this New Moral Tourism [Butcher's own concept] is nothing else but an urge to escape personal guilt. According to him, key features of this "moralised conception of leisure travel are a search for enlightenment in other places, and a desire to preserve these places in the name of cultural diversity and environmental conservation". This critique nor the defence of conventional tourism cannot be fully rejected because unlike postmodernists claim, mass tourism has not disappeared and will not disappear, instead, it is still going strong and even growing (Honkanen 2004). Nevertheless, ideas of postmodernity occurring in tourism should be taken into account. It is for example possible to think postmodern as a melting pot where different types of tourism collide and transform into new types, and the result can be called for example postmodern (Mustonen 2005).

### **Some characteristic of tourism in developing countries**

Ethical rules presented above must be seen as guiding principles. As noticed above, the concept of the "Other" is in the centre of the discussion. When tourism is concerned, the confrontations with the other happen continuously. These confrontations are emphasized especially in the case of developing countries where the differences are greatest. Also conflicts between different parties are most likely to happen in developing countries. Thus in addition to ethical principles the actual practices of tourism development are problematic. Destinations are often very vulnerable and fragile and thus ecological impacts are often in the centre when sustainable tourism is discussed. Sometimes other, equally important, dimensions are forgotten. For example negative cultural impacts of tourism may occur even due to small influx of tourism (see Mowforth & Munt 1998, 109). Hosts adopt easily practices of tourists (i.e. demonstration effect), which is paradoxical because tourists' behaviour may differ remarkably between profane everyday life and sacred holiday (see Selänniemi 1996).

Economic impacts of tourism are the main reason why touristic activities are developed. They can be massive, but especially in developing countries there are numerous obstacles which must be taken into account (see e.g. Brohman 1996 and Mathieson & Wall 1982). First of all, there is a danger that positive impacts are allocated only to the well-to-do people whilst poorer must involuntarily face the negative impacts. Thus appropriate planning is essential when more sensitive and equal tourism is tried to be reached (Brohman 1996, 59). Secondly, too often revenues gained from tourism leak to tourism generating countries.

There are many stakeholders who want to get one part of the revenue, multinational travel agencies and hotel corporations not being the least influential of these. This might contribute to a loss of control over local resources. Thirdly, partly due to poor infrastructure and lack of cooperation, multiplier effect (i.e. circulation of revenues into the economy) is low. This is emphasized as there is often a lack of articulation with other domestic economic sectors. Fourthly, many countries or tourist destinations are also strongly dependent on revenues they gain from tourism. One of the most remarkable negative side effects of this dependency is vulnerability in front of unexpected shocks such as ecological crisis (e.g. tsunamis) or changes in tourism trends, i.e. economic fluctuations. Finally, especially in the case of small initiatives, the actual benefits may remain low. Thus the fundamental basis of the touristic activity may remain in shade.

One possible solution could be adopting a community based approach. Its principal idea is to enhance local participation and promote the economic, social and cultural well-being of the popular majority and to focus on broader development goals instead just on revenues or tourist numbers. Tourism should be seen as a local resource and local communities and their needs must be given priority over the other goals. It should focus on the strengths and uniqueness of the communities. Thus practices which are successful in one place will not necessarily succeed elsewhere. (Brohman 1996, 60–65) The ideal situation of active participation of communities can be reached for example by connecting tourists' altruistic motives and hosts' needs. One possible result could be volunteer tourism, few characteristics of which are presented next.

### **Example – volunteer tourism**

*Volunteer tourism* could be one part of the solution when locally sustainable tourism development is concerned. Volunteer tourist, using the most widely used definition (Wearing 2001, 1; see also Wearing 2003, 4) is someone, “who for various reasons, volunteer in an organized way to undertake holidays that might involve the aiding or alleviating the material poverty of some groups in society, the restoration of certain environments, or research into aspects of society or environment”. Volunteer tourism can be considered one of the most noble ways to tour and as a form of tourism, which most likely will meet the strict standards and numerous dimensions of sustainability (compare to Uriely *et al.* 2003; Wearing 2001) and will even be catalyst of peace (Brown & Morrison 2003, 74). Even though volunteer tourism would not have anything to do with peace or other

declamatory goals, it might be beneficial for the hosts, and in the same time, satisfactory touristic experience for the tourists. The latter is important to notice because tourists always seek satisfaction to their expectations.

Volunteer tourism has just recently gained interest amongst researchers. The most recent contributions on volunteer tourism are “Volunteer Tourism – Postmodern Pilgrimage?” by Mustonen (2005), “Social change, discourse and volunteer tourism” by McGehee and Santos (2005), “Volunteer Tourism: New Pilgrimages to the Himalayas” by Singh and Singh (2004), “Volunteering as Leisure/Leisure as Volunteering: An International Assessment”, an edited book by Stebbins, (2004) and “Volunteer Tourism: Experiences that Make a Difference” by Wearing (2001, see also Wearing & Neil, 1997). There are also various studies, which at least indirectly include discussion on volunteering as a part of tourism (e.g. Drumm 1998; McMillon 1993; Wall & Long 1996, DeKadt 1979).

According to Brown and Morrison (2003, 77), the increased recognition of the negative impacts of conventional tourism is behind the emergence of volunteer tourism. This view does not differ much from the general view behind the emergence of alternative tourism to which group also volunteer tourism has been linked (Lilach *et al.* 2003; Wearing 2001). Alternative tourism in general is regarded a protest to commoditization of tourism. However, this kind of generalization simplifies the reality too much. For example Mustonen (2005) states that volunteer tourists i.e. tourists who seriously want to volunteer when travelling, differ remarkably from other members of the group of alternative tourists especially when the motivation basis is concerned. In addition to recreational aspects which are always visible when leisure tourism is concerned, volunteers’ motives should ideally be based on altruistic values.

In general, the idea of volunteering lies in the direct interactive experience between hosts and guests. According to Wearing (2003, 3–4) this process should lead to value change and should also make influence on the lifestyles of both sides. In addition to value change, also self-actualization is in the centre of matrix. Mustonen (2005) claims that in the two example destinations in Indian Himalayas, volunteers want to be alternative and different tourists in a real sense (compare to Munt 1994). In the role of backpackers (in which most of the tourists visiting developing countries easily join) they try to get rid of the burden of mass tourists and in the role of volunteers they want to differentiate themselves from conventional backpackers, to which they will on the other hand transform after their volunteering session. Is this kind of tourism just a quest for something genuine

or authentic which has disappeared in the West (compare to MacCannell 1973&1999)? Or is it just nostalgia for the lost origins (Spivak 1996, 203–204)?

Nevertheless, whether tourists finally find what they are looking for or like MacCannell (1973&1999) suggests, fail in their task, and despite Butcher's (2003) critique, the experience has shown that small scale community tourism based for example on volunteerism could be well worth developing. The examples presented by Mustonen (2005) show that even the smallest grass-root level projects can survive and develop and induce significant benefits to the communities. It can be assumed that tourism based on altruism will continue growing and gaining more importance among mainstream tourists. For volunteer tourists the experience seems to be very impressive experience which in some cases may affect on individuals' life also back home. First tour may generate a need for new tours or similar behaviour even when travelling would not be involved. Taking a postmodern view, practices of volunteer tourism can also be conducted at home. Tourists may for example send useful goods like clothes to the projects or simply spread the word. Thus comparing to numerous other forms of "ecotourism", in the case of volunteer tourism, the interaction between the hosts and the guests is direct and close. Benefits go directly to those who need them most without additional intermediate authorities. Sometimes examples like "safari tourism" are connected with the prefix "eco". Money is said to go to the projects of environmental protection, but tourists can never be sure about the reality.

## Conclusion

Tourism is a multidimensional phenomenon which is connected to all the sectors of the economy. When developing countries are concerned, these connections or lack of them are emphasized. Also all the negative sides of multidimensionality are well visible. In this article after discussion on tourism in general and ethical issues connected to it, one possible alternative was presented. Volunteer tourism is not alternative in a sense that it would be alternative to conventional tourism. Instead it represents an idea which could be locally sustainable and beneficial to both, hosts and guests. By developing similar new initiatives it is possible to go further towards more equal world also in the field of tourism.

Ideally volunteer tourism should be small scale. By remaining small the negative social and cultural impacts most likely will remain minor to positive impacts. On the other hand, for example in the volunteer tourism destinations in Indian Himalayas presented

by Mustonen (2005) the uncontrolled growth is not a major problem. Tourism will remain small scale partly because of the projects' location and because lack of backpacker hubs. The projects are situated in remote Himalayas and travelling there is tiring and it takes a long time to get to the destinations. This can be beneficial for the projects because less wanted tourists most probably will remain absent.

It is commonly thought that some of the new forms of tourism might be the alternatives capable to meet the goals of sustainability in the third world (see Butcher 2003, 113). If tourism is kept relatively small scale this is possible, but only locally. Globally thinking, the only sustainable option would be to act for more responsible mass tourism and more environmental friendly ways to fly. People want to and keep on wanting to travel and all the tourists can not be volunteer tourists even if they wanted to (compare to Selänniemi 1996, 231–236). Instead, actors responsible of conventional tourism practices should be aware of practices from the other fields of tourism. It could be possible to adopt these and thus try to develop mainstream tourism. Codes of conduct are not the whole answer, although they might be good marketing weapons. In general, all the actors should be conscious of the changes and in addition to this, regularly seek deeper meanings by getting to know the essential cultural and historical facts of the subject especially in the case of developing countries (see e.g. Mohanty 1999: 40).

Developing countries are visible all over in Western countries. The picture which is created is often nostalgic; only beautiful and attractive characteristics like food, colour, clothes or mysticism are presented. This can be easily noticed by for example browsing through brochures of travel agencies. However, cliché or not, reality can often be found from the other side of the coin. Altruistic tourism to developing countries may enhance one's mind to meet also other dimensions and realize the values and structures behind them.

*Author of this article conducted field studies in Indian Himalayas in 2002 and 2004. His article, "Volunteer Tourism – Postmodern Pilgrimage?" (Mustonen 2005) deals with two small projects; Ananda project and Rural Organization for Social Elevation, both situated in remote Himalayas. Adopted methods consisted on unstructured interviews, discussions, participant observations and notes made during the field studies, and during the time spent by the author as a visiting researcher in Himachal Pradesh University. The aim of the study was to find new viewpoints to explain volunteer tourism, which is very close to modern backpacking tourism but when the motive basis is concerned, it can be considered*

*a clearly separate form of tourism. The new point of view was found by expanding the discussion towards premodern tourism and by utilizing postmodern theories. The differences between volunteer tourism and other forms of so called alternative tourism were connected with traditional pilgrimage, which in India has very deep roots. Whilst pilgrims are searching for enlightenment by conducting pilgrimages to particular sites, volunteer tourists follow their altruistic motives and reach their aspiration level in sacred liminoid. Volunteer tourism was finally considered a collision of premodern traditional pilgrimage and modern conventional leisure tourism which finally occurred in postmodernity. More information on the projects can be found from projects websites. Rural Organization for Social Elevation: <http://www.rosekanda.info> and Ananda project: <http://www.anandaproject.org>*

## References

- Ahponen, P. 1998. Läheisten suhteiden moraali ja globaalien vastuun etiikka. In: Saksala E. (ed.): Muutoksen Sosiologia. YLE Opetuspalvelut: Helsinki.
- Aristotle 1989. Nikomakhoksen etiikka. (Translated by Knuutila, S.). Gaudeamus: Helsinki.
- Barret, F. 1989. The Independent Guide to Real Holidays Abroad. The Independent: London.
- Baudrillard, J. 1996. Disneyworld Company. In Liberation-newspaper. Paris. 4.4.1996. <<http://www.uta.edu/english/apt/collab/texts/disneyworld.html>> 5.8.2005.
- Bauman, Z. 1993. Postmodern Ethics. Blackwell: Oxford.
- Bauman, Z. 1996. Postmodernin lumo. (Compilation of articles. Translated by Vainonen, J.). Vastapaino: Tampere.
- Beck, U. 1995a. Poliitiikan uudelleen keksiminen: kohti refleksiivisen modernisation teoriaa. In: Beck, U., Giddens, A. and Lash, S.: Nykyajan jäljillä. (Reflexive Modernization. Politics, Tradition and Aesthetics in the Modern Social Order. Translated by Lehto, L.). Vastapaino: Tampere. (pp. 11–82)
- Beck, U. 1995b. Mitä ymmärrämme teollisuusyhteiskunnan itsepurkautumisella ja –vaarannuksella? In Beck, U., Giddens, A. and Lash, S.: Nykyajan jäljillä (Reflexive Modernization. Politics, Tradition and Aesthetics in the Modern Social Order. Translation by Lehto, L.). Vastapaino: Tampere. (pp. 236–248)
- Best, S. and Kellner, D. 1997. The postmodern turn. The Guilford Press: New York and London.



- Brohman, J. 1996. New Directions in Tourism for Third World Development. *Annals of Tourism Research* 23(1): 48–70.
- Brown, S. and Morrison, A. M. 2003. Expanding volunteer vacation participation: an exploratory study on the Mini-Mission concept. *Tourism Recreation Research* 28 (3): 73–82.
- Butcher, J. 2003. *The Moralisation of Tourism. Sun, Sand ...and Saving the World?* Routledge: London and New York.
- Cohen, E. 1995. Contemporary tourism – trends and challenges. In: Butler, R. and Pearce, D. (eds.) *Change in tourism: people, places and processes*. Routledge: London. (pp. 12–29)
- DeKadt, E. 1979. *Tourism – passport to development: perspectives on the social and cultural effects of tourism in developing countries*. Oxford University Press: New York.
- Drumm A. 1998. New approaches to community-based ecotourism management. In: Lindberg, K., Wood, M. E. and Engeldrum, D. (eds) *Ecotourism: a guide for planners and managers*. The Ecotourism Society: Vermont. (pp. 197–213)
- Featherstone, M. 1991. *Consumer culture & postmodernism*. SAGE: London, Newbury Park & New Delhi.
- Feifer, M. 1985. *Tourism in history: from imperial Rome to the present*. Stein and Day: New York.
- Harrison, D. 2002. *Tourism and the Less Developed World: Issues and Case Studies*. CABI: London.
- Honkanen, A, 1994. *Menneisyyden tulevaisuus*. University Network for Tourism Studies. Discussion and Working Papers Series 5: Savonlinna.
- Lash, S. 1996. Postmodern Ethics. *The Missing Ground. Theory, Culture & Society* 13(2): 91–104.
- Lash, S. and Urry, J. 1994. *Economies of signs and space*. SAGE: London.
- Lévinas, E. 1993. *Outside the Subject*. The Athlone Press: London.
- Lévinas, E. 1996 *Eetiikka ja Äärettömyys*. Keskusteluja Philippe Nemon kanssa. Gaudeamus: Tampere.
- Lilach, L. A., Mansfeld, Y. and Mittelberg, D. (2003) Globalization and the role of educational travel to Israel in the ethnification of American Jews. *Tourism Recreation Research* 28(3): 15–24.
- Liotard, J.-F. 1985. *Tieto postmodernissa yhteiskunnassa (La condition postmoderne*. Translation by Lehto, L.). Vastapaino: Tampere.
- Mathieson, A. and Wall, G. 1982. *Tourism: economic, physical and social impacts*. Longman: Singapore.

- MacCannell, D. 1973. Staged Authenticity. *The American Journal of Sociology* 79(3): 589–603.
- MacCannell, D. 1999. (1976; 1989) *The Tourist: A New Theory of the Leisure Class*. University of California Press. Berkeley: Los Angeles and London.
- McGehee N. G. 2002. Alternative Tourism and Social Movements. *Annals of Tourism Research* 29 (1): 124–143.
- McMillon W. 1993. *Volunteer vacations: short term adventures that will benefit you and others*. Chicago Review Press: Chicago.
- Meadows, D. H., Meadows, D. L., Randers, J. and Behrens III, W. W. 1972. *The Limits to Growth*. University Books: New York.
- Miles, S. 1998. *Consumerism – As a Way of Life*. SAGE: London, Thousand Oaks & New Delhi.
- Mohanty, C. T. 1999. Lännen silmien alla. Feministinen tutkimus ja kolonialistiset diskurssit. (Under Western Eyes: Feminist Scholarship and Colonial Discourses. Translated by Vainonen, J.) In: Airaksinen, J. and Ripatti, T. (eds) *Rotunaisia ja Feministejä. Nais- ja kehitystutkimuksen risteyskohtia*. Vastapaino: Tampere. (pp. 229–273)
- Mowforth, M. and Munt I. 1998. *Tourism and sustainability. New tourism in the Third World*. Routledge: London and New York.
- Munt, I. 1994. The 'Other' postmodern tourism: culture, travel and the new middle classes. *Theory, Culture & Society* 11(3): 101–123.
- Mustonen, P. 2005. Volunteer Tourism – Postmodern Pilgrimage? *Journal of Tourism and Cultural Change* 3(3). (Forthcoming)
- Plog, S. 1974. Why Destination Areas Rise and Fall in Popularity? *Cornell Hotel and Restaurant Administration Quarterly* 14(4): 55–58.
- Poon, A. 1993. *Tourism, technology and competitive strategies*. CABI: Wallingford.
- Ryan, C., Trauer, B., Kave, J., Sharma, A. and Sharma, S. 2003. Backpackers – What is the Peak Experience. *Tourism Recreation Research* 28(3): 93–98.
- Scheyvens, R. 2002. Backpacker Tourism and 3<sup>rd</sup> World Development. *Annals of Tourism Research* 29(1): 144–164.
- Selänniemi, T. 1996. *Matka ikuiseen kesään. Kulttuuriantropologinen näkökulma suomalaisten etelänmatkailuun*. SKS: Helsinki.
- Settle, R., Alreck, P. and Belck, M. 1978. Social Class Determinants of Leisure Activity. *Advances in Consumer Research* 6: 139–145.
- Sharpley, R. 2002. The Consumption of Tourism. In: Sharpley, R. (ed.): *Tourism and Development: Concept and Issues*. Channel View Publications: Clevedon. (pp. 300–318)

- Singh, S. and Singh, T. V. 2004. Volunteer Tourism: New Pilgrimages to the Himalayas. In: Singh, T. V. (ed.) *New Horizons of Tourism: Strange Experiences and Stranger Practises*. CABI: Wallingford. (pp. 181–194)
- Skiotis, P. 2005. Postmodern Ethics: A Buddhist Response. *Western Buddhist Review* 4. <<http://www.westernbuddhistreview.com/vol4>> 1.8.2005.
- Spivak, G. C. 1996. Poststructuralism, Marginality, Postcoloniality and Value. In Mongia, P. (ed.) *Contemporary Postcolonial Theory. A Reader*. Arnold: London. (pp. 198–222)
- Stebbins, R. (ed.) 2004. *Volunteering as leisure/leisure as volunteering: an international assessment*. CABI: Wallingford.
- Toivonen, T. 1992. The melting away of class differences? Consumption differences between employee groups in Finland 1955–1985. *Social Indicators Research* 26: 277–302.
- Toivonen, T. 1997. Food and social class. *Journal of Consumer Studies and Home Economics* 21(4): 329–347.
- Uriely, N. 1997. Theories of modern and postmodern tourism. *Annals of Tourism Research* 24(4): 982–985.
- Uriely, N., Reichel, A. and Ron, A. 2003. Volunteering in tourism: additional thinking. *Tourism Recreation Research* 28(3): 57–62.
- Urry, J. 1990. *The tourist gaze: leisure and travels in contemporary societies*. SAGE: London, Thousand Oaks & New Delhi.
- Urry, J. 1995. Rethinking class. In: Maheu, L. (ed.) *Social movements and social classes: the future of collective action*. SAGE: London. (pp. 169–181)
- Wall G. and Long V. 1996. Balinese homestays. An indigenous response to tourism opportunities. In: Butler, R. and Hich T (eds.) *Tourism and indigenous peoples*. Thompson Business Press: London. (pp. 27–48)
- Wearing S. 2001. *Volunteer tourism: experiences that make a difference*. CABI: Wallingford.
- Wearing, S. 2003. Volunteer tourism. *Tourism Recreation Research* 28(3): 3–4.
- Wearing S. and Neil J. 1997. Tourism that counts: ecotourism, volunteerism and serious leisure. In: *Proceedings from Australian Tourism and Hospitality Research Conference*. Bureau of Tourism Research: Sydney.
- Wearing, S., Cynn, S., Ponting, J. and McDonald, M. (2002) Converting environmental concern into ecotourism purchases: a qualitative evaluation of international backpackers in Australia. *Journal of Ecotourism* 1(2/3), 133–148.
- World Tourism Organization 2005. A historical perspective of World Tourism. <<http://www.world-tourism.org/facts/menu.html>> 1.8.2005.
- World Tourism Organization 2005. Global Code of Ethics. <[http://www.world-tourism.org/code\\_ethics/eng.html](http://www.world-tourism.org/code_ethics/eng.html)> 1.8.2005.

## *Cultural Difference in Tourism – Lessons from Five Case Studies in Asia, Africa and South America*

*Petri Hottola*

*Senior Assistant Professor*

*University of Joensuu*

*Finnish University Network for Tourism Studies*

*E-mail: petri.hottola@joensuu.fi*

Intercultural communication may ideally be a source of mutual satisfaction and benefit, a chance to learn from other cultures. Unfortunately, dialogue between cultures is equally vulnerable to misunderstanding and conflict, especially in postcolonial intercultural situations. The risk of misinterpretation and the consequent mistrust and antipathy are the greatest when the values of the cultures of the actors are strongly dissimilar. Oftentimes, these relations include the use and abuse of power, as well. Also in international tourism, interaction between the hosts and the visitors, and the various subcategories within these basic categories, results in a variety of outcomes difficult to pre-estimate, and forms a specific challenge for the people involved. Cultural difference is an important tourism attraction but an overexposure to an Other culture is also a major source of stress both among the hosts and the visitors, even when everything goes well. A specific effort is required to learn new norms and practices. Sustainable tourism management therefore requires case-specific sensitivity to cultural difference to reduce and manage its negative consequences.

Tourism is an international and therefore inevitably also an intercultural phenomenon. Actually, it is in the forefront of both cultural and economic globalization which currently effects on every corner of the world, including the most peripheral regions of developing nations where tourism is often seen as the (only) way to economic prosperity. The Finnish University Network for Tourism Studies (FUNTS) has consequently built its functions, more than average among academic institutions, around international cooperation in tourism studies and research, including the topic of tourism and development. As an example, tourism as a form of intercultural communication and postcolonial relation has been studied in a number of transitional societies, with field studies in India and Sri Lanka (Hottola 1999, 2002, 2004, 2005a), South Africa (Hottola 2005b) and Brazil, and with well-prepared plans for a cooperative three-year research project in Namibia. In each of these projects, an important focus has been on the identification

and analysis of main situational pitfalls in intercultural communication. The dialogue between cultures is always a challenge, whether we speak about individuals, ethnic communities or larger social entities.

As already implied, the participants of intercultural dialogue are often mistreated during the process. Consequently, the ideally productive relationship may easily become an unfair and unproductive one. Interestingly, it is not predetermined that the poor and powerless would suffer as the rich and powerful prevail. Not infrequently, the outcome is dictated by the situational cultural and political dominance. In the case of Indian social space (Hottola 1999, 2002), the minority of Western travelers, especially women, experienced a combination of local gender relations and unrealistic expectations of Westernity in a negative way, therefore isolating themselves from the local people. In an interview sample of 80 Western travellers collected in Rajasthan, India, 97 % of women travellers and some men complained about unwanted sexual advances, the main reason for visitor dissatisfaction in the general sample. They also told about the local men who had been genuinely surprised because of the negative response by the women involved. It was not only about abuse of power but there was also a dimension of intercultural misunderstanding.

As host perceptions of the Western visitors appeared to be unrealistic, a further study on the information available and its 'glocalized' interpretations was concluded. An analysis of the media imagery in the nation which had just recently opened its markets to the global media and video entertainment revealed a dialogue of postcolonial collaboration and resistance and a consequent idealized and demeaned image of a Western woman. Indian men were discovered to travel to tourism destinations in order to see and meet Western women, perceived to 'free and available' unlike their Indian sisters who could not be approached before the (arranged) marriage. The eroticisation of the Occident in the media had made the tourists themselves a touristic attraction and created a conflict between the hosts and the visitors. This is one situation indicative of the current stage of the globalization in the peripheral tourism regions of the 'South', not only in India.

The situation was markedly more relaxed in Sri Lanka (Hottola 1999) where travelers did not group together and avoid the local people as much as they did in India. Foreign women were usually respected in the Sri Lankan public space. On the Indian subcontinent, there is a clear demarcation between two historical traditions of gender relations, patrilinear and matrilinear, and also a demarcation between two educational systems: one with the largest body of illiterate people on earth (e.g. Venkateswaran 1995), and another

er which empowers its citizens with a minimum of eleven years of compulsory education (Unesco 1995). Importantly, in Sri Lanka the primary-level education includes studies on other cultures and countries, whereas Indian students focus on their own nation. Furthermore, the Sri Lankan markets started to open already in 1977 whereas India did not follow suit until 1991. In Sri Lanka the early opening of markets did not only result in an initially more internationally competitive economy but also in an early growth in the flow of foreign cultural influences. Having watched Western television series such as *Baywatch* a decade longer than their northern neighbors, the Sri Lankans were more able to make distinction between reality and fiction, and to treat their guests accordingly. On the whole, tourism has historically been and still today remains geographically more present in Sri Lanka than in India.

Despite the recent advancement of globalization, adaptation to cultural difference remains a major problem for international tourists and also for their hosts. Even domestic tourists traveling between different parts of their nations experience confusion with local dialects, cultures and physical conditions. In general, people tend to seek ingroup membership, gathering together with those as close to their own values and behavior as possible, in order to avoid the discomfort of uncertainty. Oftentimes, we refer to culture shock, a concept and theoretical framework with its origin in the sojourner studies of the 1950s (Oberg 1960; Furnham 1984). Since then, several authors have noticed significant shortcomings in the culture shock approach in a number of case studies (e.g. Lundstedt 1963; P. S. Adler 1975; Ward and Kennedy 1993; Hottola 1999; Ward, Bochner and Furnham 2001). As often eventually happens to popular theories, also the culture shock approach has been declared inconclusive and outdated. A new framework – the dynamic model of culture confusion (Hottola 2004, 2005a) – has recently been introduced to overcome the current stagnation in the theoretical understanding of short-term transitions such as tourism.

The exposure to other culture is a chance for pleasure and self-discovery, but unavoidably also a confusing experience. People therefore manage the stress of learning by establishing physical and behavioral borders between them and the Other culture, and retreating from the potentially stressful public space to touristic ‘safe heavens’ as the adoption of new information becomes too much to bear. They seek to control their exposure to cultural difference in order to keep it on a comfortable level, thereby maintaining their psychological well-being. This search for control is an important structuring force behind the kind of tourism industry and tourism culture we today have. Service packages, accommodations, tourism enclaves such as holiday resorts, charter flights and guides are there to provide the

desired reassurance of control; for the purpose of limiting stress and uncertainty to a level which does not significantly interfere with the enjoyment of tourism. At the same time, also the hosts benefit from the regulation of visitor access to their everyday space, being able to maintain cultural authority on their home ground. Uncontrolled intrusions to their everyday space would create situations vulnerable to negative outcomes.

In another case from South Africa (Hottola 2005b), a nation in political and societal transition has undergone considerable changes during the last two decades. At the same time, the regional image which the governmental South African Tourism (Satour/Tourism SA) projects to the rest of the world in has been reconstructed as well, according to a content analysis of the 1985 and 2002 editions of its main tourism marketing brochure. A major change has occurred in the presentation of 'natives' and 'tourists', which today is clearly more balanced than it was in 1985. A 'paradise controlled' has become a 'paradise confused', with an increasingly blurred demarcation between visitors and hosts. There is, however, one major exception. The Zulus have become, albeit voluntarily, the underdog of postcolonial tourism trade as a consequence of a cultural demand for 'savage Africa', a place unchanged since the days of colonial conquest, among the Northern visitors.

The eastern part of the province of KwaZulu-Natal and the majority of its inhabitants, the Zulus, are portrayed as the wild, unchanging Africa, whereas the majority of the South African hosts, including the Xhosa majority in power, appear to share the culture, values and societal developments of the tourists. There is an emphasis on Zulu 'cultural villages', exhibitions of old (colonial time) traditions and lifestyles instead of today's modern culture. In this sense, SA Tourism continues to promote the stereotypic dualism of modern 'visitors' and primitive 'natives' – those who colonize and those who are colonized – thereby challenging the recent the promotional 'rebirth' of South African tourism; the goals of equality, social responsibility and sustainable tourism development set by the African National Congress (ANC 1994; Allen & Brennan 2004, 12). The cultural difference between the Zulus and the tourists, and between the Zulus and the rest of South African communities has been underlined in a way which makes the Zulus vulnerable to negative stereotyping.

The way local heritage is presented to visitors is usually not accidental but well selected, according to the goals of those who are in power, politically or economically (Ashworth 1994). The presentation of the Zulus as 'warrior nation' following old traditions instead of modern development may agree with goals of those who seek to diminish their importance in the national politics. At the same time, it also fits to the political agenda of conservative

Zulu separationists. Preference to old patriarchal order and rural culture instead of urban modernization has been high on the political agenda of Chief Mangosuthu Buthelezi and the Inkatha Freedom Party (IFP), which have been looking for an autonomous kingdom separate from the rest of South Africa (Allen & Brennan 2004: 55–58). Today, many Zulus not only accept but actively advocate their special role in South African tourism as a part of Zulu cultural revival and resurgence of chieftainship instead of democratization. At the same time, other minorities with an even weaker position, such as the !Kung and !Khwe of the Northern Cape, have declined the concept of static culture and refused to entertain tourists in 'cultural villages' (Koch & Massyn 2001).

In Namibia, the Finnish University Network for Tourism Studies and the University of Namibia have been working on a research project with a focus on a critical analysis of tourism development as a medium of regional and national modernization, with a special interest in networking, postcolonial restraints and the feasibility of information society. The nation with a relatively recent independency and oftentimes prevailing colonial culture, is looking for a new dialogue with the globalizing world. At the moment, tourism in Namibia is in many ways subservient to South African tourism, with a sizable German market. These well established visitor groups are an important resource for the local tourism sector, but also (a theoretically interesting) restraint, both on a sociocultural and operational level. In order to remain competitive in economically crucial sectors such as tourism, Namibia needs to establish alternative source markets, and a new culture of tourism with less segregation, based on genuinely Namibian initiative and involvement.

One of the several proposed subprojects concerns bird-tourism, a rapidly growing sector of international ecotourism. The economical significance of birdwatching as a form of leisure and tourism has only recently been acknowledged (e.g. Ceballos-Lascurain 1998). Some Internet sources state that the total global expenditure in bird-watching was more than € 60 billion in 1998, and growing. Being a peripheral destination with low human population and ample natural resources, Namibia can be described as a prime destination for specific-interest tourism, including birdwatching. Internationally, the most well-known and potentially attractive birdwatching region in Namibia is the 160 km long coastal strip between the southern Skeleton Coast (Cape Cross) and Sandwich Bay. During the northern hemisphere winter it attracts, in addition to the abundant resident birdlife, hundreds of thousands migratory birds. On the same strip lie several communities, notably Swakopmund, Walvis Bay and Hentiesbaai, with tourism services but unrealized tourism potential. A combination of increasing levels of unemployment and in-



creasing immigration from rural areas has led the local communities to a situation where new innovations in the tourism branch are urgently needed.

At the moment, there is a contradiction between the existing tourism potential and almost total lack of entrepreneurship. It is suspected that the prevailing inertia is to some degree a result of persisting colonial culture in the region. Birdwatching as leisure and business has traditionally been racially segregated in Namibia and the situation has not really changed since the independency (see also Mbuende 1986; Allen & Brennan 2004). Quite exceptionally, Namibia has no national birdwatching organization but a subsidiary of Birdlife South Africa, and apparently therefore both low local awareness of the potential of bird-tourism and smaller than average domestic birdwatching sector instead of two interlinked branches with shared knowledge and enthusiasm. The culture of segregation and lack of communication have excluded the indigenous communities from birdwatching as a form of leisure and business opportunity, and apparently prevented the cohesion required for successful tourism development. On the other hand, the South African connection has guaranteed the availability of high quality and low cost field guides for birdwatching, an important basic resource lacking in the neighboring Botswana, Angola and Zambia, which otherwise face very similar situation regarding bird-tourism.

A recently (June 2005) collected field material from Brazil provides another insight to cultural difference in tourism. In Penedo, Brazil, a former Finnish colony has become a successful tourism destination, with more than 100 tourism enterprises in a village of 2000 inhabitants. There is a replica Finnish village with wooden houses, the summer house of Santa Claus, saunas, Finnish cuisine and folk dances at Clube Finlandia, and a museum with an exhibition of Finnish culture. During the weekends, visitors from Rio de Janeiro, Sao Paulo, Volta Redondo and Belo Horizonte crowd the place, primarily seeking for cool climate, nature and mountain scenery, safety and tranquility in this exceptionally orderly Brazilian village. Mountain cottages with sauna and fireplace are favored by young couples looking for a romantic weekend. Finnish culture becomes an additional attraction on the spot, in a true postmodern fashion. Not only the genuinely Finnish culture in Penedo is marketed, sold and consumed as Finnish, but also products such as mango chutney, bratwurst and sauerkraut, and generic chocolate are labeled and accepted as something traditionally Finnish. Largely unaware of cultural differences in Europe, the majority of the Brazilian customers accept the reality as presented, buying the 'Scandinavian hamburger'. The entrepreneurs, on the other hand, sell according to demand, probing their customers with hybrid cultural products.

As Michael Featherstone (1995, 92) says: “drawing a boundary around a particular cultural space is a situational matter”. The travelers in South Asia gathered together in groups and touristic enclaves under the pressure of significantly different local culture, opening up for dialogue with their hosts when the situation allowed it; more so in the culturally open Sri Lanka than the more insular and overwhelming India. The cultural differences which keep people apart in Europe were put aside for the time being under the pressure of collective India, where Italian and Swedish travelers, for example, readily discovered their common nominators in the presence of a more contrasting Other. In South Africa, one region and its inhabitants have been set apart from the rest of the ‘rainbow nation’ in order to answer the demand of colonial nostalgia among the international tourists, with parallel political aspirations both among the minority concerned and the majority in power. In Namibia, the necessity of cultural transition and new vision of tourism have been acknowledged as the nation seeks to stand on its own, to cut out the middlemen and to remove the remaining colonial boundaries detrimental to economic and social development. At the same time, the entrepreneurs of Penedo, Brazil, play with the Finnish culture, expanding its boundaries according to situational needs in order to satisfy their customers. Cultural difference is effectively present on many different levels of the complex world of international tourism, with multifaceted consequences for local developments.

## References

- Allen, G., & Brennan, F. 2004. *Tourism in the New South Africa: Social Responsibility and the Tourist Experience*. I. B. Tauris, London.
- ANC [African National Congress] 1994. *The Reconstruction and Development Programme*. Unanyano, Johannesburg.
- Adler, P. S. 1975. The Transitional Experience: An Alternative View of Culture Shock. *Journal of Humanistic Psychology* 15 (4): 13–23.
- Allen, G., & Brennan, F. 2004. *Tourism in the New South Africa: Social Responsibility and the Tourist Experience*. I. B. Tauris, London.
- Ashworth, G. J. 1994. From History to Heritage – from Heritage to Identity. In G. J. Ashworth, & P. J. Larkham (Eds), *Building a New Heritage Tourism, Culture and Identity in the New Europe* (pp.13–30). Routledge, London.
- Ceballos-Lascurain, H. 1998. Bird-watching and Ecotourism. *Newsletter of the Ecotourism Society*, pp. 1–3.

- Featherstone, M. 1995. *Undoing Culture: Globalization, Postmodernism and Identity*. Sage, London.
- Furnham, A. 1984. Tourism and Culture Shock. *Annals of Tourism Research* 11 (1): 41–57.
- Hottola, P. 1999. The Intercultural Body: Western Woman, Culture Confusion and Control of Space in the South Asian Travel Scene. *Publications of the Department of Geography*, no. 7, University of Joensuu.
- Hottola, P. 2002. Touristic Encounters with the Exotic West: Blondes on the Screens and Streets of India. *Tourism Recreation Research* 27 (1): 83–90.
- Hottola, P. 2004. Culture Confusion – Intercultural Adaptation in Tourism. *Annals of Tourism Research* 31 (2): 447–466.
- Hottola, P. 2005a. The Metaspatialities of Control Management in Tourism: Backpacking in India. *Tourism Geographies* 7 (1): 1–22.
- Hottola, P. 2005b. Paradise Confused? Marketing South Africa for Tourism in 1985 and 2002. Unpublished manuscript.
- Koch, E., & Massyn, P. J. 2001. South Africa's Domestic Tourism Sector: Promises and Problems. In K. B. Ghimire (Ed), *The Native Tourist* (pp. 142–177). Earthscan, London.
- Lundstedt, S. 1963. An Introduction to Some Evolving Problems in Cross-Cultural Research. *The Journal of Social Issues* 19 (3): 1–9.
- Mbuende, K. 1986. *Namibia, the Broken Shield: Anatomy of Imperialism and Revolution*. Liber, Stockholm.
- Oberg, K. 1960. Culture Shock: Adjustment to New Cultural Environment. *Practical Anthropology* 7 (2): 177–182.
- Unesco 1995. *Unesco Statistical Yearbook – Annuaire Statistique – Anuario Estadístico 1995*. Unesco, Paris.
- Venkateswaran, S. 1995. *Environment, Development and the Gender Gap*. Sage, New Delhi.
- Ward, C. & A. Kennedy 1993. Where's the 'Culture' in Cross-cultural Transition? Comparative studies of Sojourner adjustment. *Journal of Cross-cultural Psychology* 24 (2): 221–249.
- Ward, C., Bochner, S. & Furnham A. 2001. *The Psychology of Culture Shock*. Second edition. Routledge, Hove.

## EARLIER FFRC-PUBLICATIONS

- 5/2005 Juha Heikkilä: Kansalainen Turun seudun tietoyhteiskunnassa..
- 4/2005 Mika Aaltonen with Theodor Barth, John L. Casti, Eve Mitleton Kelly & T. Irene Sanders: Complexity as a Sensemaking Framework.
- 3/2005 Niina Helander, Anna Kirveennummi, Maria Merikanto, Anita Rubin, Katriina Siivonen: Kulttuurin kulmakivet. Varsinaissuomalaisia kulttuuristrategioita.
- 2/2005 Jyrki Luukkanen, Jarmo Vehmas, Venla Kinnunen, Eeva Kuntsi-Reunanen, Jari Kaivo-oja: Converging CO<sub>2</sub> Emissions to Equal Per Capita Levels. Mission Possible?
- 1/2005 Markku Wilenius: Yhteiskunnallisen ennakkoinnin rooli tulevaisuuden haasteiden tunnistamisessa.
- 4/2004 Olli Hietanen, Anita Rubin: Oppimisympäristöjen tulevaisuus. Tutkimuksen ja yhteiskunnan haasteita.
- 3/2004 Anita Rubin, Hannu Linturi: Muutoksen tuulissa. Pienten lukioiden tulevaisuudenkuvat.
- 2/2004 Olli Hietanen, Sirkka Heinonen, Kati Kiiskilä, Jari Lyytimäki & Ulla Rosenström: Ekotietoyhteiskunta – kriteerit ja toimintamahdollisuudet.
- 1/2004 Olli Hietanen, Sirkka Heinonen, Kati Kiiskilä, Jari Lyytimäki & Ulla Rosenström: Kestävän tietoyhteiskunnan indikaattorit. Indicators of Sustainable Information Society.
- 8/2003 Jarmo Vehmas, Jyrki Luukkanen, Jari Kaivo-oja: Material Flows and Economic Growth. Linking analyses and environmental Kuznets curves for the EU-15 member countries in 1980–2000.
- 7/2003 Jarmo Vehmas, Jari Kaivo-oja, Jyrki Luukkanen: Global Trends of Linking Environmental Stress and Economic Growth. Total Primary Energy Supply and CO<sub>2</sub> Emissions in the European Union, Japan, USA, China, India and Brazil.
- 6/2003 Auli Keskinen, Mika Aaltonen, Eve Mitleton-Kelly: Organisational Complexity. Foreword by Stuart Kauffman.
- 5/2003 Petri Tapio: Decoupling has Begun in Finland. Economic growth, traffic volume growth and the CO<sub>2</sub> policy of EU and Finland 1970–2001.
- 4/2003 Sirkka Heinonen, Olli Hietanen, Ene Härkönen, Kati Kiiskilä, Laura Koskinen: Kestävän kehityksen tietoyhteiskunnan SWOT-analyysi.



# UNIVERSITY PARTNERSHIPS FOR INTERNATIONAL DEVELOPMENT

## Finnish Development Knowledge

The willingness and commitment of Finnish universities for promoting knowledge-based sustainable development cooperation was clearly expressed by the representatives of the eleven Finnish universities which assembled at the University of Jyväskylä on December 2002. The universities also supported suggestions for a closer, inter-institutional thematic co-operation in Finland leading to the establishment of University Partnership Network for International Development (UniPID). Sustainability, multidisciplinary, ethical concerns, institutional approaches, capacity-building and policy issues were considered to be the main challenges of the UniPID partnership network.

This publication is a mid term review and a state of the art analysis of the UniPID network. The first chapter of this publication tells about the history and futures visions of the UniPID network. The second chapter presents shortly all universities in Finland. The third chapter describes examples of Finnish development research knowledge and practices.

### RECENT FFRC-PUBLICATIONS

- 5/2005 Juha Heikkilä: Kansalainen Turun seudun tietoyhteiskunnassa.
- 4/2005 Mika Aaltonen with Theodor Barth, John L. Casti, Eve Mitleton Kelly & T. Irene Sanders: Complexity as a Sensemaking Framework.

ISBN 951-564-290-6



Turku School of Economics and Business Administration  
Finland Futures Research Centre

[www.tukkk.fi/tutu](http://www.tukkk.fi/tutu), [tutu-info@tukkk.fi](mailto:tutu-info@tukkk.fi)