8 Adaptation and cultural sustainability of the winter-seining community in the Southwest Finland Archipelago

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Introduction

Global change, including climate change, is affecting local communities everywhere. Today the world is a rapidly changing place. While these events occur at the global level, the outcomes are often experienced most strongly at a local level. For example, climate change leads to local flooding. These constant, rapid and sometimes unexpected changes have raised concerns for the future of local communities who are often faced with an urgent need to adapt. This places increasing emphasis on the importance of studying the local adaptation processes, capacity to adapt and community resilience at the local level in order to enhance the sustainability of communities in the face of global change.

To advance this task, adaptive capacity indicators have been developed by researchers (e.g. Smit and Pilifosova, 2001). With these indicators researchers are able to identify the vulnerabilities of a given community and, as a result, develop and apply better adaptation processes. However, identifying whether an adaptation has succeeded or not is a difficult task. One possible indicator of success could be that the adaptation promotes the overall sustainability of the community. For this task, it is argued here that in addition to economic, social and environmental sustainability (which have been well studied) we need to have a greater understanding of the nature and character of cultural sustainability – in order to develop indicators to identify whether outcomes are culturally sustainable.

This chapter examines the role of culture within adaptive capacity indicators in the context of a former winter-seining community in Rymättylä, southwestern Finland. The winter-seining community of Rymättylä is useful for examining this issue because

of the historical development of the industry, where adaptation and community resilience have played a critical role after the long-established winter-seining sector experienced a rapid decline in the 1990s. Winter-seining is a form of fishing which is conducted under ice cover with a large 'seine' and requires a large amount of man power. In Rymättylä, winter-seining was used to harvest Baltic Herring during freezing winter months when the Archipelago Sea was frozen. The adaptation process, adaptive capacity and resilience of the community is analyzed here in retrospect, and the identified indicators of adaptive capacity are examined in the context of cultural factors and cultural sustainability. The study is based on the author's ongoing research among the fishermen in the Southwest Finland Archipelago, and on fieldwork conducted in the area in 2006–2007 and 2015–2016.

Important concepts and theoretical framework

The key concept of this chapter is adaptation. In a cultural ecological sense, adaptation refers to adjustment that happens when a local community (however it is defined) reacts to changes in its environment, and, in order to overcome these obstacles, takes advantage of the resources available to ensure its own survival (Cohen, 1968; Bennett, 1976; Sonck, 2011). This concept is very useful for examining the effects of global changes on a specific community. Very often within this research context, local communities are treated as systems. This is also the case in this study. Each social system is connected to wider networks and does not function within itself, as if it were immune to external factors. Social systems are also connected to the physical environment and therefore the community and its environment are seen in this chapter as an open 'socio-ecological system' that is closely connected to global networks and subject to global changes, such as climate change. This approach is familiar to political ecologists but also to researchers studying adaptation to global changes and the social impacts of climate change (e.g. Noble *et al*., 2014).

One relevant concept is resilience, which was introduced to the field of ecology by ecologist Crawford Holling (1973) in his paper 'Resilience and stability of ecological systems'. The term describes the degree to which a system is able to rebound and recover from a stimulus or stimuli and still maintain its state variables (Holling, 1973).

Although originally an ecological term, resilience can also be applied in social sense. Adger (2000) tries to determine the parallels between social and ecological resilience and argues that a common ground can be found in social stability and resource dependency. He argues, as with Smit and Pilifosova (2001), that resource dependency – or in other words, specialization – increases the risks for communities (i.e. decreasing adaptive capacity). Social and ecological resilience are closely related, even integrated in the sense that together they are more than a sum of the social and ecological systems (Berkes and Ross, 2013). In this chapter it is contended that this close relationship also extends to culture, in the sense that there is a clear interdependency between nature and culture (also see Svane-Mikkelsen, this volume: p. 000). It problematizes the notion of resilience from the perspective of cultural sustainability and asks: how are they related and do resilient communities promote cultural sustainability or the other way around?

In order to assess both the possibilities and threats that a community faces and its capability to adapt successfully, the concept of 'adaptive capacity' is useful. Adaptive capacity is often regarded as a synonym for adaptability (Gallopín, 2006; Smit and Wandel, 2006). Those systems that have a high capacity to adapt are capable of responding to change easily and rapidly (Smit and Wandel, 2006) and by enhancing adaptive capacity can increase their potential to cope with changes and uncertainties related to global changes. For a researcher, adaptive capacity determinants can be used as a tool for analysis.

The adaptive capacity framework used in this study is that developed by Smit and Pilifosova (2001). These authors pointed out that the scholarship on adaptive capacity is very much limited in the climate change field, but in the fields of hazards, resource management and sustainable development, the indicators and determinants of adaptability of societies are seen in similar ways. From the literature and co-operation with the disciplines mentioned above, adaptive capacity determinants were identified as economic wealth, technology, information and skills, infrastructure, institutions and equity. Quite often high adaptive capacity and high resilience seem to indicate successful adaptation. But how does successful adaptation relate to sustainable development and specifically culturally sustainable development?

‘Sustainable development’ research has gone through several changes since the introduction of the notion in 1987 by the Brundtland Commission. Sustainable development is most often seen as standing on three pillars, which represent ecological, economic and social dimensions of development. Later on, the role of culture in sustainable development has been debated and the addition of culture as an aspect of sustainable development has been initiated by some institutions, for example, United Cities and Local Governments (Soini and Birkeland, 2014). However, defining cultural sustainability is not an easy task, since it is also connected to the question of how culture is defined. Quite often cultural sustainability is seen as embedded within the pillar of social sustainability. Dessein *et al*. (2015: p. 8) add two other ways of dealing with culture in the context of sustainable development. Culture can be seen as ‘framing contextualizing and mediating mode – one that can balance all three of the existing pillars and guide sustainable development between economic, social and ecological pressured and needs’. The third way of treating culture would be seeing culture as a fundamental coordinator of all sustainable actions (Dessein *et al.*, 2015: p. 8).

Social scientists Katriina Soini and Inger Birkeland (2014) analyze cultural sustainability in the context of scientific research and find seven different storylines that frame the discourse of cultural sustainability. These storylines are cultural heritage, cultural vitality, economic viability, cultural diversity, locality, eco-cultural resilience and eco-cultural civilization. This study fits best into the storyline of eco-cultural resilience, since it is described as a systemic way of thinking and emphasizes the need of both natural and social knowledge as well as the importance of indigenous knowledge and tradition.

Winter-seining and Rymättylä as a socio-ecological system

At the beginning of the twentieth century Rymättylä was a small municipality in the Southwest Finland Archipelago, with around 2000 inhabitants. It is surrounded by the Archipelago Sea which is part of the Baltic Sea. The community relied mainly on agriculture and fishing for its subsistence. Winter-seining was developed in order to catch fish (Baltic Herring) hiding underneath the ice cover and has been practiced in Rymättylä for at least five centuries (Anttila, 1968). This form of fishing requires a large

work force and ice that is thick enough to carry dozens of men and women, horses and later tractors. Rymättylä fishermen possessed extensive knowledge of not only the fish but of the weather conditions and the currents of the sea. Close to 100 holes would be dug on ice in a set pattern, covering an area as long as 1 kilometre and several hundred metres wide. Then a large seine (net) with a circumference of approximately 400 metres was laid under ice cover with the help of wooden sticks (or aluminum) 30 metres long. The seine was then moved through the patterned area up to the exit hole – a process that was repeated all the way from the entry hole to the exit hole. The seine would catch the herring on the way.

For decades winter-seining was crucial for the survival of the community. Between 1941–1950 winter-seining was the main subsistence method for 71 families in the area (Matinolli, 2000: p. 316; Sonck, 2011: p. 24). Up until the 1930s winter-seining also worked as an informal social security system for the less fortunate, since everyone who was willing to participate and get paid (with fish) was welcome on the ice (Sonck, 2011). Each co-operative had approximately eight shareholders, each of them owning their share of the net and other equipment. Between 1880 and 1930 co-operatives generally employed 50 to 100 people. This number decreased significantly after the 1960s due to demand for more effective forms of fishing and the motorization which followed. By the 1990s only five to ten people per co-operative were employed.

Anthropologist Jukka Pennanen (1986) conducted fieldwork in Rymättylä and noted that winter-seining was still a flourishing sector of the fishing industry, but voiced concern for the future of winter-seining with the ever-increasing forces on international markets. Pennanen was right to be worried, since it took only ten years for the livelihood to diminish to the point that it was merely a curiosity (Sonck, 2011).

This type of livelihood and social system required certain attributes from the environment. First of all, the Archipelago Sea and its ecosystem provided the community with the herring. Many factors, such as salinity, ice cover, appropriate algae and the occurrence of salt water copepods affect the amount and size of the herring, thus having a considerable influence on the local human system, while the people living close to the Archipelago Sea and using its resources had an effect on the conditions of the herring as well. Environmental factors are not the only ones affecting the local

system. Social change, such as urbanization has a major impact on the human community. Most of the changes, however, are the result of global changes, and not the actions of the local communities.

Gradual changes influenced the system in such a way that during the 1990s the Rymättylä socio-ecological system, which was based on the winter-seining livelihoods, transformed dramatically, as demonstrated in Table 8.1.

[Table 8.1 here]

External factors changed the functions of the system so profoundly, that it could not hold its original structure. The last straw for winter-seining was the mild winters from the mid-1990s onwards, which meant there was practically no ice to walk on. Winter–seining as a livelihood ceased to exist, although many of the local people would have been willing to continue practicing it.

The adaptive capacity, resilience and vulnerability of Rymättylä

Smit and Pilifosova (2001) determined the key adaptive capacity determinants to be economic resources, technology, information and skill, infrastructure, institutions and equity. As an adaptive capacity determinant, economic resources include capital resources, financial means, wealth and poverty or any economic condition of nations or specific groups. Since adaptive capacity research more often takes place in developing areas, poverty is usually a strong indicator of vulnerability. This, however, as Keskitalo *et al*. (2011) point out, is rarely the case in developed industrial regions. In Nordic regions access to economic resources seems to be closely connected with access to wage employment. Also, as Keskitalo *et al*. (2011) argue, Nordic industry scales are often large and very closely linked with global market-based systems. Small-scale entrepreneurs cannot compete with large-scale industry and are therefore subjected to the markets they have created. Still, a large-scale actor may employ the majority of the community and thereby ensure its ability to inhabit otherwise remote environments. The downside of this arrangement is, however, that markets fluctuate markedly, and being

dependent on one large-scale actor makes communities vulnerable. Smit and Pilifosova (2001) also note that economic resources often closely interact with access to resources, which in market-based systems is determined by economic assets.

This is certainly also true in Rymättylä. As long as the fisheries in Rymättylä were self-subsistent, the livelihood was fairly profitable. Once the fisheries adopted a wage labour system and started to work together with the fish dealers from the nearest city, Turku, they were unknowingly (supposedly) connected with the larger-scale industry and were vulnerable to increasing competition, as the arrival of the trawlers later in the 1960s would prove. The trawlers would also travel further out to the open sea and disturb the natural migration routes of Baltic Herring by harvesting the herring before it reached its spawning beds in the coastal areas, where the winter-seiners usually worked. Of course, trawlers were also accused of over fishing, but the validity of the allegation is hard to prove (Sonck, 2011).

Technological resources determine the ways societies can respond to stresses and harness their resources (Smit and Pilifosova, 2001). Keskitalo *et al*. (2011) highlight the importance of technology as an adaptive capacity determinant, since having access to technology means having a chance to compete within the market; '(T)echnological development and application in turn further increases the need for economic competitiveness and rationality within the sector' (p. 585). According to Keskitalo *et al*. (2011) this is especially true of the fishing industry; and so it was in Rymättylä as well. The increasing competition forces the fishermen to invest a lot of capital into motorized equipment, such as snow-mobiles and tractors. The whole system was subjected to the scheme of Western rationalization, where the efficiency of primary production increased the amount of income, but at the same time increased the capital the production demands, while also lowering the value of the product. Put simply, while the expenses were rising, the consumer prices were decreasing, thus adding to the pressure for more efficient productivity (Heikkinen *et al.*, 2007). Sometimes technological innovation also rises within the community and becomes part of professional identity and traditions. Innovation and diffusion are cultural phenomena, and should also be regarded as such. Innovations often arise within the community to meet the community's needs, whereas diffusion of innovations can be a voluntary and

practical adaptation of new ways of dealing with problems or to enhance productivity. One example of this type of adaptation was a particular kind of barrel, a sort of pulling device, which came to Rymättylä with immigrants from Karelia during the Second World War (Sonck, 2011). In Rymättylä, local innovations separated Rymättylä winter-seining culture from others in the area and made them special and unique. The nature of technology defines the ways it affects the community culturally and socially.

Information and skills are also important determinants of adaptive capacity, since 'successful adaptation requires a recognition of the necessity to adapt, knowledge about available options, the capacity to assess them and ability to implement the most suitable ones' (Fankhauser and Tol, 1997, quoted in Smit and Pilifosova, 2001: section 18.5.2.). This type of information could be regarded as Traditional Ecological Knowledge (TEK) or Local Ecological Knowledge (LEK). TEK has been defined as tacit knowledge learned by observing and by reproducing this knowledge in everyday life with behaviour and speech (Cruikshank, 2005). Anthropologist Conrad Kottak (2006) argues that one significant task of ecological anthropology – which also includes LEK – is to 'assess the extent and nature of ecological awareness and activity in various groups and to harness parts of native ethnoecological models to enhance environmental preservations and amelioration' (Kottak, 2006: p. 45).

Keskitalo *et al*. (2011) divide information and skills into two categories. First, scientific knowledge – which in Nordic societies is usually created in research institutes and higher research and education institutions. This type of scientific knowledge does not always agree or communicate with the other type of knowledge, which Keskitalo *et al*. (2011) consider to be technological/local knowledge. This is the knowledge I regard as TEK. Keskitalo *et al*. (2011) note that in peripheral regions the transfer of knowledge is usually disturbed when the population is starting to age and the new generation no longer has the experience-based traditional knowledge that is needed to practice the specific type of trade. Although Rymättylä is not so peripheral, this still applies. Most of the winter-seining fishermen were aging and could not practise winter-seining anymore. Younger generations moved off the island or just decided to take on something easier and more profitable for a living (Sonck, 2011). This indicator considers cultural factors, but does not really articulate them as cultural.

Good infrastructure is usually seen as an advantage to adaptive capacity. However, in some cases infrastructure also disturbs the natural state of the environment and/or prevents – for some – access to resources, or helps the competing actors to access the limited resources (Keskitalo *et al*., 2011). In these cases infrastructure may, indeed, enhance vulnerability. In Rymättylä's case the bridge that was built in 1972, which connected the island with the mainland, and provided the fish traders with easier access to trading spots, enabled the transition from a relatively self-subsistent community into a market-based one. On the other hand, decent roads and the bridge did increase the amount of commuting opportunities, as well as attracting tourists and other visitors. Good infrastructure also allows local people to interact with different communities in a more active and profound way, which of course has cultural and social consequences, positive and negative, depending on the point of view. It certainly enables economic diversification. Smit and Pilifosova (2001) write that an efficient way to enhance adaptive capacity is to diversify economically, if possible, and develop more diverse combinations of livelihood, which good infrastructure enables. From a cultural point of view, one can ask the question, if economic diversification is involuntary, is it still culturally sustainable? This was the direction of the development in Rymättylä as well, since many of the former fishermen started to specialize in crops like potatoes and cucumbers, or focused on aquaculture.

Well organized social institutions and management capacities, such as consistent policies and tenure arrangements enhance adaptive capacity (Smit and Pilifosova, 2001). Considering management, it is rather usual for ongoing legislation or reform to have a negative impact on adaptive capacity. This category may also include cultural factors, such as changing values within the community itself. In Rymättylä, the change of values could be seen most clearly in the attitudes of the new generation towards winter-seining, and its physical and economic difficulties. With this came a generation that also lacked the proper skills and equipment for winter-seining (Sonck, 2011). This indicator also does take cultural factors into consideration. Seeing legislation and reform having a negative impact to adaptive capacity does imply that while making decisions, local cultural factors – and therefore the perspective of cultural sustainability – has not been considered. Changing values, however, does not necessarily mean that

the cultural sustainability is endangered, since change is inevitable. Sustainability should not be confused with stability in the sense that nothing should change. Change can be culturally sustainable within certain circumstances, which most often include local empowerment and independency to make their own change.

The sixth determinant of the adaptive capacity, equity, is highly relevant to the fisheries in Rymättylä today. Equity refers to allocation of power and access to resources, whether the attention is on the community, nation or global actors. From the perspective of cultural sustainability being also about local communities' empowerment, and the possibility for them to influence their own surroundings, the notion of equity is crucial. From a Nordic perspective, unequal distribution is not present in an obvious way, but in the form of legislation and restrictions (see Daugstad and Fageraas, this volume: p. 000). These institutionalized rules ensure that some groups gain better access to certain resources and some are excluded from them. These rules also determine who gets to be part of the decision-making and 'create formalized interactions within which actors act under conditions of economic rationalization (Keskitalo *et al.,* 2011: p. 588). Rymättylä inhabitants did have equal access to resources, although being able to be one of the members of the co-operative required some capital (a horse or later a tractor or a snow mobile). But everyone willing to participate in winter-seining was allowed on ice, and each man or woman was appointed a task according to their physicality or skills. This was during the time when winter-seining was still a self-subsistent mode of livelihood. From the 1960s wages had to be paid with money instead of fish, the fishing quotas forced the co-operatives to take their seines further to the sea and increasing competition and motorization decreased the need for labour. By the 1980s the co-operatives employed only their members and those who could not afford to buy their share, had to seek work elsewhere. Cultural factors are also present here, since the allocation of power is a cultural character – a notion which is rarely recognized.

Reflections

Rymättylä today hardly resembles the community it was 50, or even 30 years ago. As many other communities around the world affected by globalization and global

environmental changes, Rymättylä has a new and more modern way of life. It is community that recognizes the value of traditions but that has little means to keep the traditions alive. Fortunately, Rymättylä has a very active local village association that aims to sustain, gather and exhibit old fishing traditions.

Rymättylä is now part of city of Naantali (due to a merger in 2009), and its demographics and vocational structure have changed drastically. Only a few fishermen still exist, and most inhabitants are now farmers, blue-collar or white-collar workers commuting to the nearest cities, artisans and/or entrepreneurs. Tourism employs a growing number of people, and Rymättylä has a status currently as one of the most popular summer-house locations. From an economic perspective the changes to the system were not negative in general; in 2000 the town of Rymättylä was practically debt free (Town of Rymättylä, 2002). But, when considering the winter-seining based socio-ecological system, the adaptation was not so successful – it ceased to exist, changing its structure so drastically that it is not the same socio-ecological system it was before. The dependency on the ecosystem has changed its form, thereby changing the function of the whole system. Every other change in the system had affected its functions so profoundly, it could no longer hold its ground once the milder winters came. This means that people had to give up something that was important to them and to their identity — an old traditional way of life. Many of the inhabitants gave up winter-seining involuntarily and even those not directly involved with it saw the decline of it as an unfortunate course of development. I would therefore argue that however economically and seemingly successful this adaptation of Rymättylä was, it was not culturally sustainable. This argument leads to a question with much wider relevance: if adaptation is not culturally or socially sustainable, can it be regarded as successful?

One could make the assumption that the liberalization and the invasion of the principles of economic rationalization in Rymättylä have reduced the ecosystems as well as the social resilience, therefore covering the whole of the socio-ecological system. Neil Adger (2000) writes that ‘This loss of resilience is associated with negative impacts on livelihoods and, in the context of the institutions of common property management, collective institutional resilience is also undermined (p. 348). This could be the case for Rymättylä as well, and quite certainly applies in similar conditions.

Social vulnerability refers to 'the exposure of groups of people or individuals to stress as a result of the impacts of environmental change. Stress, in the social sense, encompasses distribution to group's or individuals' livelihoods and forced adaptation to the changing physical environment' (Adger, 2000: p. 348). From this argument I can conclude that the social vulnerability of Rymättylä's winter-seining community in 1990s was high, and the system failed to rebound from the results of environmental change, i.e. the mild winters in the late 1990s. Since resilience as a concept describes the degree to which a system is able to recover from disturbance, I would be inclined to argue that the resilience of the socio-ecological system of winter-seining community of Rymättylä was low.

Quite often the concepts of adaptive capacity and adaptation seem to assume that adaptation is a positive thing. But how do we define successful adaptation and whose perspectives do we value? Who can define the difference between adaptation and maladaptation in local context? Kirsten Magis (2010) points out that socio-ecological systems may respond to disruption by maintaining, adapting or transforming. Resilience is perceived as absorbing disturbances in order to preserve their structures, to adapt and to change. Sometimes systems undergo major transformations. However, these transformations are considered to be necessary for the survival of the system. Transformability by definition refers to the capacity of the system to create a new system once the social, ecological and economic conditions have changed too much for the system to exist (Walker *et al*., 2004). In the case of Rymättylä's winter-seining, the transformation cannot be regarded as necessary for the survival of the socio-ecological system. On the contrary, from the perspective of the community, the development was heading in the wrong direction and the idea of cultural sustainability was endangered. Transformability of the Rymättylä winter-seining socio-ecological system was high, whereas the resilience in general was not. In seeking cultural and social resilience (and sustainability), it is easy to start seeking stability instead. In reality, cultural sustainability in this context is more related to the community's ability and opportunities to have agency and guide the direction of their development in a way that includes the cultural heritage important to them, and as ethnologist Katriina Siivonen put it: '(C)ommon cultural heritage should be selected, formulated, and used in co-

operation between those people who are in any way involved (2007: p. 17). Here traditional ecological knowledge and local ecological knowledge can play a very important role in binding together cultural, social, ecological and economic sustainability. Many studies have shown that analyzing the human-nature interface by facilitating socio-ecological system thinking has created more successful nature management plans. Also including local ecological knowledge in conservation and management planning has become more popular (see Huntington, 2000; Gadgil *et al.*, 2008; MacClanahan *et al*., 2009; Zykowski *et al.*, 2011).

Change is constant, so having a stable socio-ecological system does not mean it is prone to staying intact. Having a resilient socio-ecological system, on the other hand, means it is capable of reacting, creating new and making good of the changes it has to face. In her article, Kirsten Hagis (2010) explores the connection between social sustainability and community resilience and concludes that: 'Members of resilient communities intentionally develop personal and collective capacity that they engage to respond to and influence change, to sustain and renew the community, and to develop new trajectories for the communities' future' (Magis, 2010: p. 402). Community resilience might – in addition to social sustainability – also indicate cultural sustainability.

Most studies focusing on community-level adaption highlight the question of economic sustainability and adaptation. But since communities are also formed around lifestyles, traditions and identities, which are very often closely connected to the physical environment the community is living in, and which are extremely important to the wellbeing of the people in the community, these factors should be more included more often when examining adaptive capacity and resilience. But as shown with this analysis, the underlying assumption of cultural sustainability is embedded within the adaptive capacity indicators, but they are yet to be articulated and taken into more careful consideration. Since adaptive capacity research has influenced international and national adaptation strategies (it creates the knowledge that is applied when decision-makers set out legislation and regulations to promote adaptive capacity), these points of view should be taken into account.

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