

Cultural Sites, Traditional Knowledge and Participatory Mapping.

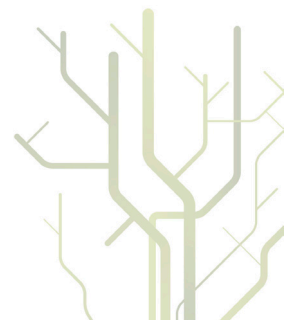
Long-Term Land Use in a Sámi Community in Coastal Norway



Stine Barlindhaug

Dissertation for the degree of
Philosophiae Doctor

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University of Tromsø

Faculty of Humanities, Social Sciences and Education

Department of Archaeology and Social Anthropology

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Til

Viggo

Nu gollet beaivvit, ijat mannet
Njähcun čuoiggadan màoheabis
duodariida
geahčan mot balvvat johtet almmi rastà
oainnàn duoddariid čuovgame
silban šealgume
oainnàn geainnu jàvkame čearu duohkài

Màoheabis čohkkedan čoru nala
attàn jurdagiid girdit
čalmmiid johtit
Duoddariin šuvvà njähcobieggà

Dagene går, og nettene
Jeg går på ski over viddene
i kram snø i måneskinn
ser skyene drive over himmelen
viddene lyser
skinner som sølv
veien blir borte bak åsen

I lyset fra månen
hviler jeg på fjellryggen
lar tankene fly
blikket gli
Over viddene suser vårvinden

Viggo Larsen

1952 - 2011

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Summary

The knowledge held by people who have been closely and directly involved with their land is valuable for our understanding of past land use. How can this knowledge be made more widely applicable, with greater relevance and value to scholars, authorities and local communities alike? In this thesis I explore how using an interdisciplinary approach based on participatory research, geographic information systems (GIS) and other digital media can facilitate such an approach, thus benefiting to local communities, cultural heritage management and the field of archaeology. The focus is on two areas in Finnmark County in North Norway, with one comparative study from the west coast of British Columbia, Canada.

Due to Norway's 'nation-building' project and its focus on a single Norwegian history and heritage, the Sámi past was of little interest to archaeology through much of the 20th century. It was not until around 1980 that research on Sámi culture and history became significant in academia. Parallel to this shift, several legal changes brought increasing demands for better understanding of Sámi land use and cultural history. My study is intended as a contribution towards meeting the challenges involved in the gap between today's deficient knowledge base and the data needed to meet Norway's expressed obligations and aims.

This thesis puts the use of Participatory GIS into practice within archaeological research, exploring ways of combining archaeology, participatory work and the flexibility inherent in GIS to increase spatial knowledge and facilitate ways of sharing it to the benefit of cultural heritage management, researchers and local communities. I show how an interdisciplinary approach can lead to more effective archaeological surveying and thereby more sustainable cultural heritage management. This approach has a potential to facilitate inter-thematic needs through the flexibility of the software involved. It can help bridge the increasing gap between a mature and ageing population with intimate knowledge of land use, and younger generations. Also, by combining documented visible features with the transcribed geo-referenced traditional knowledge into a GIS, the extent and intensity of land use emerges in a more complete and comprehensible form. The value of involving local knowledge is made clear,

showing how oral traditions and traditional knowledge can help archaeologists to contextualize and better understand their findings in a given landscape.

Oppsummering

Lokal kunnskap om landskapsbruk har vist seg verdifullt for vår forståelse av fortidens arealbruk. Denne studien har gjennom en tverrfaglig tilnærming utforsket bruk av lokal kunnskap, lokal deltakelse og muligheter innenfor digitale medier i en arkeologisk sammenheng. Studieområdene er to områder i Finnmark fylke i Nord-Norge og et komparativt studie fra vestkysten av British Columbia, Canada.

Grunnet Norges 'nasjonsbygging' utover 1900-tallet og myndighetenes fokus på én norsk historie og kulturarv, var samisk historie av liten interesse for arkeologien gjennom store deler av det tjuende århundre. Det var ikke før rundt 1980 forskning på samisk kultur og historie ble vektlagt i akademia. Parallelt med dette skiftet kom rettslige utredninger og lovendringer som medførte økt etterspørsel etter kunnskap om samisk arealbruk og kulturhistorie. Mitt arbeid er et bidrag til å møte utfordringene knytta til ubalansen mellom de eksisterende kunnskapshullene om samiske kulturminner og samisk landskapsbruk og den kunnskapen som trengs for å oppfylle Norges forpliktelser og målsettinger.

Denne studien har tatt i bruk deltagende GIS og utforsket alternative måter å kombinere arkeologi, lokal deltagelse og eksisterende fleksibilitet i GIS for å øke kunnskap om arkeologi og historisk landskapsbruk. Videre er det diskutert ulike måter å tilrettelegge for kunnskapsdeling både til fordel for kulturminneforvaltning, forskere og lokalsamfunn. Jeg har vist hvordan en tverrfaglig tilnærming kan bidra til mer effektive arkeologisk kartlegging og dermed en mer bærekraftig kulturminneforvaltning. Videre kan tilnærmingen som her er benyttet bidra til å fylle et økende kunnskaps gap mellom en generasjon med stor kunnskap om lokal arealbruk og de yngre generasjoner som ikke lenger har den samme nærhet til de tradisjonelle landskapene. Gjennom å kombinere synlige kulturminner med stedfestet tradisjonell kunnskap om landskapsbruk i et GIS, visualiseres omfanget og intensiteten av arealbruk på en helhetlig måte. Verdien av å integrere lokal kunnskap er eksemplifisert, og viser hvordan muntlige tradisjoner og tradisjonell kunnskap kan hjelpe arkeologene og kontekstualisere og forstå sine funn i et gitt landskap

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Part I Introduction

1 Introduction

Knowledge held by people who have been involved in intimate and direct engagement with their land is valuable for understanding of past land use. Through many years of fieldwork in North Norway I have seen how valuable such knowledge can be for archaeological investigations and landscape studies. A crucial issue is how this knowledge can be made more widely applicable, with greater relevance and value to scholars, authorities and local communities. In this thesis I explore how the use of an interdisciplinary approach based on participatory research, geographic information systems (GIS) and other digital media can facilitate such knowledge transfer, benefiting local communities, cultural heritage management and the field of archaeology. I discuss implications related to the use of local knowledge, participatory methodology and digital technology in the process of mapping sites and land use and in relation to communication of land-use knowledge to the broader community.

A Sámi community in Deanodat/Vestertana, Finnmark County in northern Norway is the main focus of my study. A smaller study in Porsáŋgu/Porsanger, also in Finnmark County, as well as a collaborative research project with the Tlowitsis First Nation on the west coast of British Columbia and the University of British Columbia, Canada, serves to provide additional and comparative material.

This chapter explores some issues regarding Norwegian policies in relation to the Sámi, how this has affected cultural heritage research and management, in turn leading to insufficient knowledge of Sámi cultural heritage. A short introduction to the Canadian context regarding indigenous politics is given in Chapter 2.

1.1 National political context

During the second half of the 19th century, Norwegian archaeological and culture historical research was strongly affected by a ‘nation-building’ project, with a focus on a unified Norwegian history and heritage. Both in political and historical terms the Sámi represented an anomaly and a disturbance in relation to the homogeneous aspirations of this project. In fact, throughout much of the 20th century the Sámi past was deemed of little interest to archaeology (Schanche & Olsen 1983, Hesjedal 2000, Hansen & Olsen 2004).

The 1970s and 1980s became an important turning point. Firm Sámi opposition to plans for damming a large part of a river valley in connection with hydroelectric development in Finnmark County (the Alta controversy) initiated an increasing recognition of Sámi rights. As a direct result of the controversy, the Sámi Rights Committee was appointed by Royal Decree in 1980, leading to the preparation of several White Papers¹ documenting Sámi history, resource use and rights. In 1987 Norway adopted its Sámi Act,² securing Sámi cultural and political rights through the establishment of an elected political body, the Sámi Parliament. The year after, an amendment to the Norwegian Constitution was passed, imposing responsibility on Norway concerning the future of the Sámi people³ (Grunnloven 1814, Sameloven, Gaukstad & Holme 2001:142). Norway’s ratification of ILO C-169⁴ in 1990 demonstrated to the international community its good political intentions concerning its own indigenous people (ILO 169).

These political developments in turn formed the basis for the ‘Finnmark Act’ (2005), according to which the Sámi people and other inhabitants, through protracted use of lands and waters in Finnmark County, have acquired ownership and/or user rights to land and waters. In the wake of this process, the Finnmark Commission was appointed

¹ See for example NOU 1984:18 , NOU 1993:34 , NOU 1994:21 , NOU 1997:4 , NOU 1997:5 , NOU 2001:34 , NOU 2007:13 , NOU 2007:14

² Lov om Sametinget og andre samiske rettsforhold (Sámi Act). The purpose of the Act is to enable the Sámi people in Norway to safeguard and develop their language, culture and way of life.

³ Article 110a of the Constitution of Norway reads as follows:

‘It is the responsibility of the authorities of the State to create the conditions enabling the Sámi people to preserve and develop its language, culture and way of life.’

⁴ ILO C-169: Convention Concerning Indigenous and Tribal Peoples in Independent Countries

in 2008, mandated to map existing user rights and ownership rights obtained on the basis of protracted use by the people of Finnmark County (Finnmarksloven). The Commission's work has begun but will take years to complete. These legal changes and a new legal framework have led to an increasing demand for knowledge of Sámi land use and cultural history.

1.2 National cultural heritage management

Today, the authorities' political aims and responsibility regarding Norway's cultural heritage are clearly expressed. The Cultural Heritage Act specifies that it is a national responsibility to safeguard cultural heritage as scientific source material and as an enduring basis for the experience of present and future generations and their self-awareness, enjoyment and activities (Kulturminneloven – Cultural Heritage Act). Further, the Directorate for Cultural Heritage (Riksantikvaren) has made it clear that the protection of cultural heritage and cultural environments is to be based on good source data and justifiable methods; the Directorate will contribute to the establishment and implementation of national and regional registration projects and further contribute to the development of predicative methods.⁵ In 1994, responsibility for regional management of Sámi cultural heritage was transferred to the Sámi Parliament (Samediggi), which emphasizes a sustainable and long-term perspective in all allocations of land and resources in traditional Sámi territories.⁶

Norwegian cultural heritage management practice has been dominated by a focus on classification, objectivity and description – a practice that researchers claim continued long after the general archaeological debate shifted away from the positivistic tradition during the 1980s (Schanche 1989, Hansen 2000, Brattli 2009, Barlindhaug & Pettersen 2011). Also representatives of Sámi society and organizations have criticized this emphasis in cultural heritage research and management. Moreover, the economic and developmental considerations that also provide the basis for policies and strategies have often had a negative effect on the knowledge and protection of Sámi heritage. For

⁵ The Directorate's strategy plan for management of cultural sites and environments 2010–2012.

http://www.riksantikvaren.no/Norsk/Om_Riksantikvaren/Strategisk_plan/

⁶ The Sámi Parliament's plan for environment and heritage. <http://www.sametinget.no/Miljoe-areal-og-kulturvern>

example, in a large national and state-funded survey project conducted between 1960 and 1991, only areas considered of national economic interest were surveyed and included in the production of Norwegian Public Land Use Maps (*Økonomisk kartverk*). These economic principles contributed to an insufficient surveying of Sámi settlement and use areas, particularly biased in the case of Finnmark County, where only 18% of Finnmark's 48,000 km² were covered by this map series. In addition, the map series in Finnmark County primarily covered developed areas along the main roads, concentrated along the coast. This left more than 80% of the county as *terra incognita* on the cultural heritage maps, and affected in particular the vast interior and outland areas. Further, archaeological presentations and interpretations of the past have had a discriminatory effect on the indigenous peoples' own conception of and narratives about the past, which are seen as secondary and biased compared to supposedly factually-based scientific accounts (Schanche & Olsen 1983, Olsen 1997:263–268, Schanche 1997, Falch & Skandfer 2004).

It was not until the Cultural Heritage Act was amended in 1978 that Sámi cultural heritage became specifically integrated and Sámi sites older than 100 years were automatically protected by law (Paule 1997, Holand 2002, Myrvoll et al. 2012). By around 1980, research on Sámi culture and history started in earnest (see *inter alia* Schanche & Olsen 1983, Hesjedal 2000, Hansen & Olsen 2004, Bergstøl 2009), coinciding with the growth of the Sámi ethno-political movement. In particular, Schanche and Olsen's (1983) criticisms of the ethno-politics of Norwegian archaeological practice marks this turn in the debate. After responsibility for Sámi cultural heritage management was transferred to the Sámi Parliament in 1994, there was a shift towards a more contextualized focus where local knowledge and traditions related to historical sites and land use was made relevant (Schanche 1999, Sametingsplanen 2001–2005, Holand 2002, Barlindhaug & Pettersen 2011, Myrvoll et al. 2012). This shift was partly based on the contextualizing aim of exploring existing local knowledge and tradition related to cultural sites. In addition, local knowledge and living traditions can be of direct relevance to the interpretation of Sámi cultural sites since they are automatically protected after 100 years (Schanche 1999). Since the shift was implemented after the nationwide state-funded survey was completed in 1991, this

has had little effect on the content of the Norwegian heritage management database.⁷ However, in the past two decades, the heritage register has been supplemented with data and information from research projects and surveys initiated as a result of archaeological surveys conducted in connection with industrial development projects in Sámi areas. In addition, institutions like the Sámi Ethnographic Department at Tromsø University Museum and the Sámi Cultural Centre at Snåsa (*Saemien Sijte*) have carried out archaeological surveys in connection with research projects. Unfortunately, these additions constitute only small contributions within the total area where overall documentation is lacking.

Nor have recent changes in the national heritage register necessarily been to the benefit of Sámi cultural heritage. For instance, writing on how cultural sites are categorized and classified in national archives and databases, Myrvoll (2010) notes how a revision of the national cultural heritage database in 2004 obstructed a more contextualized management approach. When the database was transferred to a new and revised system, 'Askeladden', it was initially decided not to include all data categories from the old version, such as information gathered under the headings of 'tradition' and 'comments'. Both of these categories contain a wide range of information, on local traditions, narratives, faith, ownership and age of dwellings. In addition, these were the sections used to record observations of Sámi cultural remains observed during surveys conducted prior to the amendment in 1978. This became a disputed issue and the section 'tradition' was later reinstated, but some of the information gathered has still not been included (Myrvoll 2010). Other international provisions providing guidance on the importance of local knowledge include the Convention on Biological Diversity (CDB), which gives directives on documentation and protection of traditional knowledge and obligations under the European Landscape Convention (ELC), and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (CBD, ELC, Henriksen 2002, Gaukstad & Sønstebø 2003, UNESCO 2003).

⁷ The Norwegian heritage management database (*Askeladden*) is a national register of protected archaeological and architectural monuments and sites and owned by the Directorate for Cultural Heritage. (<http://www.riksantikvaren.no/Norsk/Askeladden/>)

Thus we see that there is a knowledge gap in the existing baseline data, a clear mismatch between the existing data and the data needed to meet Norway's obligations and aims. This applies to general cultural heritage management in Sámi settlement areas,⁸ and to the work of the Finnmark Commission in mapping existing rights achieved through protracted use by the people in Finnmark County. It is a large and difficult undertaking to provide the knowledge and data needed to establish, in the foreseeable future, a sufficient basis for cultural heritage management in this vast area. More research on mapping methodology accommodating these needs and obligations is needed. There is potential for expanding and contextualizing archaeological and historical land-use knowledge for the benefit of research, and not least, for the benefit of local communities and people.

1.3 Objectives and research questions

The main objective of this thesis is to explore to what extent participatory GIS combined with archaeological survey can contribute to fill some of the knowledge gaps identified in the previous section.

The main research questions can be formulated as follows, each of them constituting the main focus of the individual papers:

- To what extent can the integration of a PGIS-based approach lead to more effective archaeological surveying and benefit cultural heritage management? (Paper 1)
- In what way can GIS and other digital media serve as 'memory banks' to support and stimulate the communication of land-related knowledge? (Paper 2)
- In what way can this approach contribute to a more contextual understanding of past land use? (Paper 3)

Hugh Brody's pioneer work in collaboration with a First Nation community in British Columbia (Brody 1982) was important in regard to participatory methods and how to represent the spatial knowledge of local communities. Since the late 1980s, the use of

⁸ What is recognized as the Sámi settlement area in Norway covers the three northernmost counties and 22 additional municipalities in three counties further south (NOU 2000:3, p.30, NOU 2007:13, bind B, p.887)

geographical information technologies and systems (GIT and GIS) has seen rapid development; these systems are increasingly being applied at various levels in society, also in research that incorporates local participation (Weiner et al. 2002:3). In this thesis, I combine traditional knowledge and archaeological data, thus utilizing the possibilities in exploring potential relations between historical sites and living community practices. Local knowledge of contemporary and historic land use as well as local knowledge of archaeological sites has been integrated in the archaeological survey methodology and in the interpretation of results. Participation and close collaboration with local communities, based on a transparent process and bilateral agreements on the use of the gathered data, have been fundamental to my approach. As a tool for storing and organizing the data, a core focus has been on integrating and organizing multiple land-use practices within a GIS. Implications and background regarding participatory research, mapping and GIS are discussed in Chapter 4.

In Chapter 1, I described the discrepancy between today's deficient knowledge base and the data needed to meet Norway's expressed obligations and aims. My study can be seen as a contribution towards meeting these challenges. It is especially important to contribute to the development of methods that can improve archaeological survey, so as to facilitate more effective and sustainable cultural heritage management in the vast traditional areas of Sámi settlement and use. This includes methods applicable to the areas that were left out of the comprehensive archaeological national survey programme in the period from 1960–1990.

Even though my main case study is set in a specific geographical, economic and cultural context – a mixed fjord and alpine landscape with sedentary coastal Sámi settlement and summer settlements for reindeer herders – the methodological approach has a wider and more general relevance, within Sámi settlement areas and in other regions as well. According to Mazzocchi (2006), approaching knowledge systems through a collaborative and dialogue-based process is a widely applicable tool for discovering and enhancing knowledge. The research has general relevance as a way of studying past and present land-use issues, and also in terms of the latter informing the former. Thus, existing local knowledge and living traditions can be of direct relevance

to the interpretation of earlier Sámi sites, especially since their legal protection after 100 years entails a relatively small time gap in a several cases (Schanche 1999). As this thesis seeks to explore the opportunities for a more contextualized comprehension of archaeological sites, additional information related to the geo-referenced data has been gathered, in order to contextualize knowledge about land-use practices with archaeological data. Many Sámi communities have members with valuable first-hand knowledge of land-use practices directly relevant to archaeological research. This is elaborated upon in section 5.4 and in Paper 3.

On the other hand, it should also be noted that many indigenous communities are at a crossroads as regards lived experience of traditional livelihoods and members with intimate knowledge of their traditional landscapes. In the course of the past century, indigenous societies have undergone profound social, economic and technological changes. In many places, the impact on traditional livelihoods has been dramatic and devastating, resulting in abrupt changes in living conditions and in traditional ways of transmitting land-use knowledge. Often, a community has lost access to its traditional lands, and the elders are the final generation who have lived experience from the land; or livelihoods have changed so that the elder generation is the last one to have used the land in the traditional ways. The two study areas in Norway and Canada are both examples of this, although to a very different degree. These issues are explored in Paper 2 with a discussion on how physical interaction with traditional landscapes is often seen as an important element for maintaining this knowledge. Many communities are finding that today's social and economic conditions make this difficult, and alternative approaches to support inter-generational communication of land-related knowledge are explored.

1.4 The concept of land-use knowledge

Over the last two decades, a range of related concepts employing the word 'knowledge' have become common, such as traditional knowledge, local knowledge, indigenous knowledge, local ecological knowledge and land-use knowledge (Nadasdy 1999, Usher 2000, Nakashima & Roué 2002, Mazzocchi 2006, Berkes 2008, Tobias

2009, Ween & Riseth 2011). Some of these are also to be found in this thesis. UNESCO defines the terms local and indigenous knowledge as:

Cumulative and complex bodies of knowledge, know-how, practices and representations that are maintained and developed by peoples with extended histories of interactions with the natural environment. These cognitive systems are part of a complex that also includes language, attachment to place, spirituality and worldview.

The list continues with various terms that are used to refer to this knowledge: *inter alia*, local knowledge, traditional ecological knowledge (TEK) and indigenous knowledge (IK). (UNESCO, ICSU 2002) The focus in my research is more directly on knowledge of patterns of land-use traditions such as habitation and movements in the landscape, and knowledge related to visible historic sites. Thus the term ‘land-use knowledge’ is used frequently here, but in a way that sidesteps the need for an excessively rigid and formal definition. Although the study is confined to land-use knowledge, there has been a deliberate focus on not extracting some elements and ignoring others, and thereby casting doubt on some parts while others are valorized (Nakashima & Roué 2002: 9–10). Regardless of what kind of information is involved, all knowledge offered by the local collaborators and informants has been stored in the database, as long as it was connected to a geographical area. I have not undertaken any rigid categorization of the various types of information. Also in chronological terms my approach has been inclusive, involving contemporary sites, historical sites and prehistoric sites, all mapped on an equal basis, with details about duration of occupation and age documented and stored in the database. The dating is based on information from local expertise, archaeological knowledge and discretionary evaluation of regrowth at given sites. For the purpose of this study, a rough dating level is regarded sufficient. Also mapped are sites that have become significant due to special events or that are accounted for in narratives.

Working with land-use issues in North Norway, the pronounced seasonal variations are a decisive factor to keep in mind. Archaeology in northern landscapes implies conducting fieldwork during a very short summer, at a time when the landscape looks

very different from what it does during the dark and snowy winter. I have worked as an archaeologist in North Norway since 1996, and have conducted extensive fieldwork in this region since I began my studies in the late 1980s. Besides being a researcher trained at the University of Tromsø, I grew up in this region and am thus familiar with the long, dark winters and the changing landscape throughout the year.

I personally find these contrasts fascinating. In addition to the knowledge and experience that follows from such familiarity, conducting research in these environments gives a positive dimension to my research. Olsen (2012a) has examined what it means to be a researcher in northern landscapes and at the same time having northern experience both related to the landscapes and all the varying weather conditions throughout the year. He discusses how this might add a special dimension of empathy and understanding to the research. I agree with Olsen's views here, but also wish to emphasize that such familiarity not is a prerequisite for good research. The 'outsider's' viewpoint can be advantageous and should be valued: moreover, it may help you to see things that have become too familiar to be noticed.

2 Study Areas

Data from fieldwork in Deanodat/Vestertana, North Norway, constitute the core empirical material. In addition, I have used data from a collaborative project in Porsáŋgu/Porsanger, North Norway and data gathered during my work with the Tlowitsis Nation in British Columbia, Canada (Figure 1).

Both Deanodat/Vestertana and Porsáŋgu/Porsanger were selected because they have populations with lived experience of both reindeer herding and coastal Sámi land-use traditions. The thesis has methodological focus, where the role of the case areas is primarily to be representative of land-use traditions in Finnmark County and suitable for testing the methodological approach. There are many other land-use traditions in the Sami lands, *Sápmi*, but as explained in section 1.2, the methodological approach employed here has broader and more general relevance as well.

Land-use mapping and participatory research have long traditions in Canada. During my one-year stay there, I was given the opportunity to take part in a process that included both land-use mapping and participatory research. Data and experiences from this work are used in a comparative study with the data from Finnmark. First Nation communities along the west coast of Canada have in many ways a comparable history with the case areas in Finnmark – the traditional economy based on hunting, gathering and fisheries, and similarities in climate, landscape and resources. Both have had a traditional semi-mobile lifestyle utilizing resources in several locations through the course of the year. Recently, both communities have come to share the fate of being a minority group within a majority society. However, the current situation regarding access to their traditional territories has taken different forms in the two study areas.

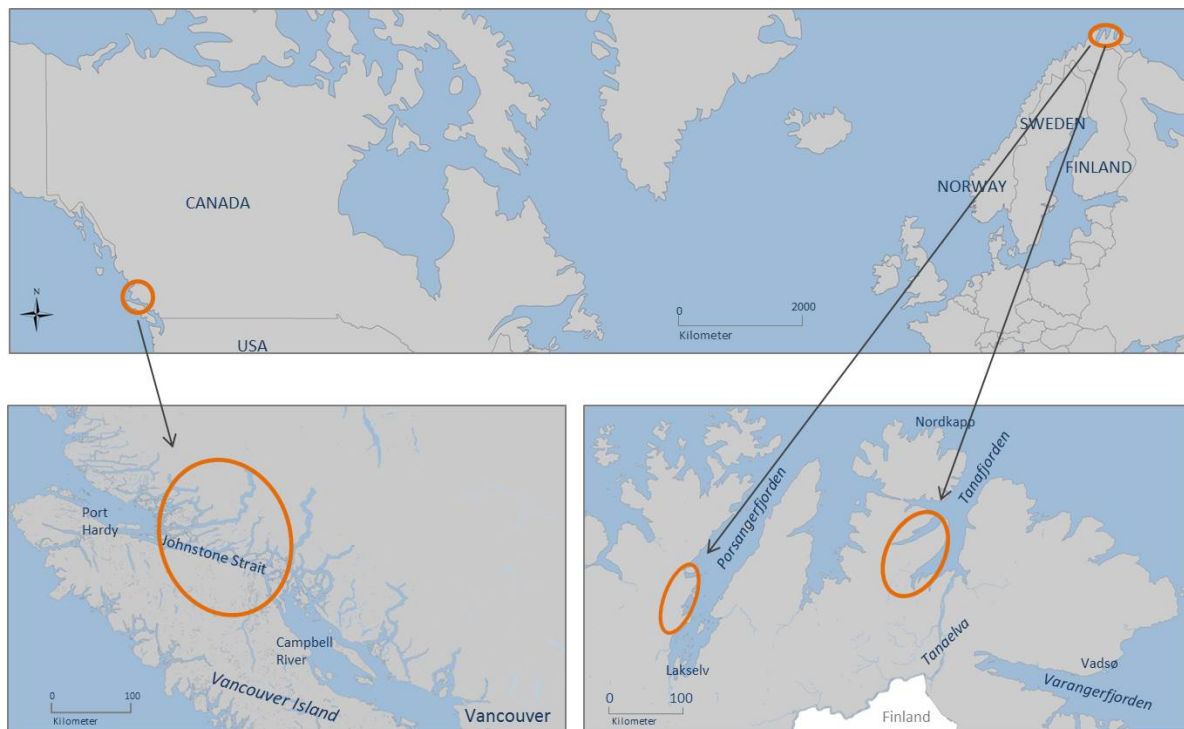


Figure 1. Location of study areas. Map source: Norwegian Mapping Authority.

2.1 *Deanodat/Vestertana*

The main geographical focus is Deanodat/Vestertana at the head of the Deanuvuotna/Tana fjord and the surrounding interior areas in Finnmark County. There are both migrating reindeer herder communities and a sedentary Coastal Sámi community. Represented here are a wide range of activities and land uses, ranging from reindeer herding, fisheries both in the fjord and in inland lakes, to hunting, berry picking and farming (Pedersen 1978, Pedersen 2001). The northern part of the study area is used as summer grazing land by Lágesduottar reindeer district 13, whereas the southern portions are used by Olggut Čorgaš reindeer district 9 in autumn and spring.

The study area, about 800 km² in all, extends from Geassajávri/Sommervann in the south, stretching northward via Deanodat/Vestertana to the headland of the Johkan/Digermulen peninsula. The area studied here does not cover the entirety of the local community's land use, as such a study would have been too time-consuming within the framework of this project. Even so, the selected area and the land-use practices herein can be seen as representative of annual land-use activities. Until the

beginning of the 18th century, the communities in the inner part of the Deanuvuotna/Tanafjorden maintained a semi-nomadic way of life, migrating between the inner and outer coast and the interior, with livelihoods based on domesticated reindeer, sheep and cattle husbandry, fishing, hunting and gathering. During the 18th century some Sámi adopted a more sedentary livelihood and gradually established a more permanent settlement on their old summer sites at the head of the fjord. According to Pedersen (2001), Deanodat/Vestertana had no Norwegian settlements until around AD 1850, and traditional livelihoods dominated until the mid-20th century. The domesticated reindeer economy, with lengthy migrations between inland and coast, started to evolve during the 18th century, but prior to and alongside this development, people have kept domesticated reindeer in the area throughout the year from at least the 16th century. (See Pedersen 1994:52–71, Hansen & Olsen 2004.)

Members of the sedentary community in Deanodat/Vestertana practise many elements of a traditional coastal Sámi economy based on combinations of fishery, farming and some hunting and gathering. Earlier, activities like berry picking, hunting and fishing in lakes and also small-scale reindeer husbandry were of greater importance. Today, reindeer herders use these areas as grazing land for reindeer during the spring, summer and autumn. There is also less mobility compared to some decades ago, when there was movement between two or three settlements during the year. People stay mainly in Kárášjoga/Karasjok during the winter, with smaller settlements (cabins) closer to the reindeer summer grazing areas near the coast.



Figure 2. Landscape around Geassajávri/Sommervann. Photo: Stine Barlindhaug.

The extensive reorganization of Norwegian economic, welfare, and regional policy in the 1960s made it difficult for Sámi to continue to live from traditional means based on a mixed economy (Brox 1966, Eythorsson 1993). The number of residents has continuously decreased in the sedentary coastal Sámi settlements around Deanodat/Vestertana in recent decades. In addition comes the movement of young people away from the village, to continue their further education or for jobs. Thus, first-hand knowledge concerning traditional land use is in danger of being lost with the passing of the older generation (aged 50+). However, reindeer herders were to a lesser degree affected by official policies, thanks to protective legislation towards their economy, making their situation somewhat different, and also today, members of the younger generation take up reindeer herding. On the other hand, with radical changes in the management of reindeer herding, and especially the greater dependence on motorized equipment, knowledge related to land perceptions and use from the pre-motorized era is becoming fragmented.



Figure 3. Marking reindeer calves at Idjavuonduottar/Ifjordfjellet. The children are valuable help during the calf marking in the summer. Photo: Stine Barlindhaug

2.2 Porsáŋgu/Porsanger

In Paper 1, we use data derived from a short-term collaboration with Mearrasámi diehtoguovddáš/Sjøsamisk kompetansesenter (Coastal Sámi Resource Centre) and Skáidaduottar reindeer district 16D on the west side of the Porsáŋgguvuotna/Porsangerfjorden. As with Deanodat/Vestertana, this area has been inhabited by both coastal Sámi and reindeer herders for many centuries, and the course of history has been similar. Along the coast there have been small villages with a traditional coastal Sámi economy based on combined fishing, farming and some hunting and gathering. During the summer, reindeer herders stayed in the area as well, grazing their stock here from early spring until late autumn. Apart from a few officials and tradesmen, Norwegians did not establish a presence in this area until the late 19th century, and then only a few households. In addition there was immigration of farmers from northern Finland around the beginning of the 20th century. They settled mainly on the eastern shore of the fjord, on the opposite side from the study area (Hanssen

1986, Bull et al. 2001, Hansen & Olsen 2004), and are thus not included in this research. The study area extends from Rávttošnjárga/Stabbursnes in the south to Leaibeavutna/Olderfjorden in the north. Today Skáidaduottar reindeer district 16D uses this area as summer grazing land. Mearrasámi diehtogovddáš/Sjøsamisk kompetansesenter, located in the village of Billávuotna/Indre Billefjord within the study area, has undertaken a thorough mapping of, *inter alia*, traditions among the Coastal Sámi.

2.3 *Tlowitsis First Nation, Canada*

As Chapter 1 focused on the main study area in Norway, a brief overview of the British Columbia political context will be given here. British Columbia and the west coast of Canada were colonized relatively late by Europeans. It was not until around the 1770s that Europeans began to settle here, and it was not until after the gold rush of 1849 that the central Canadian government incorporated British Columbia as a province. Many died as a result of the European colonization and especially smallpox ravaged the indigenous populations. It is estimated that 90% of the indigenous population along the west coast died during the period from initial European contact until the mid-1900s, and it was widely held that the First Nations were doomed to extinction. This mentality, together with a policy from the colonist leaders on Vancouver Island who ignored the existence of any First Nation title, led to little or no interest in making agreements related to land-use rights (Duff 1997, Muckle 2007). Thus, during the period 1850–1923, when most other parts of Canada went through land-use agreement processes (treaties), British Columbia never did, except for a small area in the northern part of the province (Duff 1997:92–93). For a long time it was forbidden by law for First Nations to organize themselves or hire legal assistance to work with their rights. Only in the early 1980s did the province permit such negotiations (Muckle 2007:80). At present there are several treaty agreement processes underway in the province, where the Tlowitsis First Nation is one of the groups involved.

The traditional territory of the Tlowitsis Nation covers the coastal area of northern Vancouver Island; it has been occupied and used by Tlowitsis families and community members since time immemorial. In the past, the land use of the Tlowitsis Nation was intrinsically woven into the mosaic of islands, inlets and valleys. Locally adapted ecological knowledge and responsive harvesting techniques supported a rich livelihood based on a broad range of resources (Galois 1994, Turner & Loewen 1998). Ocean resources included salmon, halibut, sea lion, seals, crabs, clams, abalone and seaweed. Land-based harvesting included cedar bark, roots, pitch, berries and other seasonal plant foods and medicines, while ungulates, black bear, smaller trapped game and migratory birds were harvested according to the reproductive cycles of individual species (Kennedy & Bouchard 2008:19). Harvesting practices supported the acquisition of a diverse range of locally available resources, while extensive trade and social ties with neighbouring groups allowed the Tlowitsis to expand their resource base by obtaining resources located outside their local territories (Webster 2001).

Family residences were scattered throughout the territory, linked to seasonal resource availability and management. During the post-contact period, the winter village of Karlukwees on Turner Island became a small trade hub for the area, with a store and school, and a hospital ship visited regularly. In the early 1960s, the provincial government halted essential services; with few prospects of schooling or access to health care, the Tlowitsis community began to leave the area, family by family. They moved to more accessible areas and to towns on Vancouver Island and on the mainland. In the ensuing diaspora, community members stopped living on and using their traditional territories (Kennedy & Bouchard 2008).



Figure 4. The former settlement of Karlukwees, Turner Island, 50 years after the last Tlowitsis left the village. Photo: Jon Corbett

An important requirement for being a member of the Tlowitsis Nation is kinship, based on matrilineal lineage (Kennedy & Bouchard 2008). People with clearly identifiable kinship are readily granted recognition as Tlowitsis members. This is a shared defining characteristic among the British Columbia northwest coast First Nations, because kinship ties regulated both rank and access to specific resource locations for fishing, hunting and gathering, and served as an important element in institutionalizing identity among the Tlowitsis. Kinship was probably the most important social feature among the First Nations in the pre-contact period, and knowledge about kinship relations has survived better than many other cultural aspects (Duff 1997, Muckle 2007). The emphasis on kinship has thus been of vital importance for Tlowitsis identity during the past 50 years of diaspora.

Urbanization and a rapidly growing population with little attachment to traditional settlement areas have dramatically reduced the possibilities, as well as ability for members of the community to take an active and informed role in the governance and

development of the Tlowitsis Nation. The Tlowitsis Nation is attending treaty negotiations with British Columbia authorities, with the goal of becoming a self-governing and self-determining First Nation. However, their traditional territory remains remote and has no infrastructure, so the negotiations for a new territory must in all probability include an alternative location.

It is important in relation to this study to emphasize that the Tlowitsis members that have contributed to this study by sharing their land-use knowledge have lived experience from the Tlowitsis territory. They grew up in the village of Karlukwee and as adults practised a traditional life in their traditional territory for 10 to 20 years, before the village was abandoned in the 1960s. They represent the final generation with lived experience from the Tlowitsis lands.

2.4 Case area summary

Figure 5 provides a summary of the main characteristics of the situation regarding land use and knowledge transference in the case areas. In Paper 2, the focus is on the difference between the situation of the Sámi communities and that of the Tlowitsis First Nations, not the differences between the Sámi communities in Norway.

Characteristics	Coastal Sámi communities in Deanodat/Vestertana and Porsáŋggu/Porsanger	Reindeer herding communities in Deanodat/Vestertana and Porsáŋggu/Porsanger	Tlowitsis First Nation
<i>Historic land-use traditions</i>	A combination of fishing, husbandry and various uses of outlying fields for hunting-gathering activity.	The main economic base is reindeer herding supplemented by some fishing and gathering for household supplements.	A combination of fishing and a variety of hunting-gathering activities, including collection of clams and seaweed.
<i>Current habitation</i>	The older generation still lives on the land, but many younger people move to more centralized areas when they reach adulthood.	Communities live on their traditional lands and many of the younger generation take up reindeer herding and remain as adults.	The Nation were forced to leave their traditional lands during the 1960s. They do not live in a common community: individuals are spread throughout Vancouver Island and adjacent mainland.
<i>Lived experience from traditional land use</i>	The older generation has lived experience from a traditional life form when a mixed economy was still practised.	On-going traditional life with reindeer herding as main economic base.	The older generation has lived experience from a traditional life form when a mixed economy was still practised.
<i>Access to traditional lands</i>	Full access	Full access	Access is limited and difficult. All villages are abandoned and overgrown, no official/regular means of transport exists, and the area is remote from present-day settlements.
<i>Prospects for future land use in traditional landscapes</i>	Uncertain/limited in relation to the traditional mixed economy. Some will continue fishing and farming, but most will live elsewhere and use their traditional lands for recreational purposes.	Good	Uncertain/limited
<i>Prospects for transfer of traditional land-use knowledge</i>	Possible, but it demands focused awareness; deliberate steps must be taken to facilitate such knowledge transfer.	Good, but new (motorized) ways of using the land may interrupt the transfer of historic land-use traditions and knowledge.	Difficult, due to lack of a common community and meeting places. Action needs to be taken to facilitate knowledge transference adapted to their complicated life-situation.

Figure 5. Main characteristics of land use and knowledge transfer in the case areas.

3 Summary of papers

Paper 1. *'Kartfesting av lokal kunnskap – en tverrfaglig tilnærming til kulturminneregistrering'* ['Mapping local knowledge – an interdisciplinary approach to archaeological surveying']

Stine Barlindhaug & Bjørg Pettersen

This article explains how an interdisciplinary approach can lead to more effective archaeological survey and thereby more sustainable cultural heritage management. The focus is on Sámi cultural sites in Finnmark County, northern Norway. The background for the geographical focus is the fundamental imbalance in knowledge about cultural history and sites in Norway. Due to the systematic Norwegianization of the Sámi during the 19th and 20th centuries, knowledge about Sámi cultural history and archaeology is poor. This knowledge gap is especially problematic for Sámi cultural heritage management. The methodology explored here is particularly well-suited in relation to Sámi cultural sites, as all such sites dating back more than 100 are automatically protected by law; moreover, some orally transferred knowledge still exists in the local community.

We worked with holders of Sámi knowledge in two study areas to map cultural heritage sites by means of interviews and literature studies. The study shows that the Participatory GIS methodology (PGIS) is a useful supplementary tool to traditional archaeological surveys, and can be helpful in the process aimed at sustainable cultural heritage management.

Paper 2. *‘Living a long way from home: Communicating land-related knowledge in dispersed indigenous communities, an alternative approach’*

Stine Barlindhaug & Jon Corbett

Despite histories of displacement or disruption, land-use knowledge anchors people to place. This paper presents the application of GIS tools and other geographic multimedia in community-integrated projects to document landscape-related knowledge. The study involves a First Nation community in British Columbia, Canada, and a Sámi community in Finnmark County, Norway. We discuss how land-use traditions and related knowledge are fundamental to people’s identity, and explore alternative ways of transferring this knowledge to support the continuing transfer of cultural knowledge among geographically dispersed community members, as well as to future generations.

In today’s globalized world with increased use of digital media and software technologies, we need to reconsider the role of these new technologies in documenting, sharing and preserving indigenous land-related knowledge. In the future, memories of the past will invariably be mixed with experiences and memories from new places; perceptions and expressions of individual and collective identity will experience pronounced changes, precisely because identity is shaped in an on-going process.

Globally there is an on-going loss of land related knowledge among many indigenous peoples: still, traditional landscapes often remain significant as places of origin. With the use of GIS and other geographic digital multimedia tools, communities can strive to establish a ‘memory bank’ that directly supports and stimulates the communication of land-related knowledge. A wider perspective on archaeological surveying and mapping can contribute to a more contextual understanding of past land use.

Paper 3. *'Mapping complexity. Archaeological sites and historic land-use extent in a Sámi community in Arctic Norway'*

Stine Barlindhaug

This paper focuses on the extent and complexity of land use, drawing on fieldwork in Deanodat/Vestertana, Finnmark County in northern Norway. Through a collaborative process with the community, knowledge of land use and its material manifestations in the landscape has been mapped. By combining people's knowledge about present and past land use and archaeological data, I explore the extent and complexity of historic land use, and discuss how a wider perspective on archaeological surveying and mapping can contribute to a more contextual understanding of past land use.

During the interviews, the topographic maps acted as a stimulus and helped people with lived experience of traditional lifestyles to remember 'lost' knowledge. Maps visualizing the familiar landscape became a mnemonic device during the mapping process. Databases and visualizations of land use can offer a new layer of memory, facilitating new experiences and interactions between people and the (past) material. The GIS and other media can extend this network of interaction, helping also people with less intimate knowledge tools to experience material that, despite its considerable age, has proven durable. Both the local community and researchers, management authorities and the general public can benefit from this.

Extensive land use does not necessarily result in a landscape rich in cultural sites. Despite detailed data on these communities' extensive, varied and seasonal activities, there are also activities that do not leave many conspicuous man-made traces in the landscape. However, by combining documented visible features with the transcribed geo-referenced land-use knowledge into a GIS, the extent and intensity of land use emerges as both more complete and more comprehensible. This paper explains the value of involving local knowledge, and describes how this contextualizes cultural sites within oral traditions.

4 Methodological approach and discussion of implications

The spatial dimension in archaeology makes GIS, with its capability to process and visualize large volumes of spatial data, a well-suited tool. Within the field of human geography there has been a parallel march of high technology that has led to the development of a methodology based on local participation and the use of GIS which I have drawn on in this study. Implicit in this interdisciplinary approach is mapping. In the following, I indicate some main features of map history in the Western world and discuss some implications. The mapping in this study is combined with GIS and participatory research, also presented and discussed. At the end of this chapter, I explain how mapping, GIS, participation and archaeology are implemented in the study.

4.1 Maps – a powerful tool

The oldest known maps date back to 1400 BC in Egypt. By 200 BC, the Greeks produced maps based on a right-angled system with longitude and latitude (Bernhardsen 2006:35). People have made sketch-maps long before that: human beings have probably made some kinds of maps as long as we have existed. We have used sketches to communicate when talk became insufficient; when explaining a track or where to find a resource, maps have been drawn in the sand, on bones or wood, etc. (Wood et al. 2010:19). There has not been one single historical line in map history: around the world, maps have been made through several parallel processes serving various private, local and national interests (Wood et al. 2010:19–22). Wood (2010:23) argues that there is a clear difference between maps prior to AD 1500 that communicate some kind of spatial information and those produced afterwards. In Europe, maps as we know them today emerged during the 16th century, and were put to systematic use by newly self-aware states, seeking to map their properties and territories. Technical inventions of decisive importance to the accuracy of maps, such as the chronometer, the sextant, barometer and ways of solving projection problems, were developed during the 17th and 18th centuries (Harley 1989, Schneider 2007:65–

77, Wood et al. 2010:22–26). During the 19th century there was an explosion in map-making: many countries inaugurated topographic mapping programmes, and colonial powers realized the need for accurate maps of their territories (Crampton 2010:22–30, Wood et al. 2010:19–25).

Maps gained their authoritative status and powerful usefulness through representing scientific and objective knowledge (Harley 1989, Wood et al. 2010). Up until the 1980s, mapping was in the hands of state authorities and other institutions like the Church. Maps were used as a powerful political force – amongst other things, the existence of indigenous peoples was erased from official maps (Brody 1982, Harris & Weiner 1998, Fox et al. 2005, Crampton 2010:26). In the beginning of European colonialism, maps contained information on indigenous peoples, but by the end of the 16th century, influenced by the prevailing Euro-centrism, indigenous people ‘disappeared’ from the maps (Schneider 2007:102–119). Maps provide a mask for seemingly neutral science that both denies their social dimension and legitimates the European worldview (Harley 1989). During the colonization of America, cartographers made maps showing the frontier between civilization and the ‘empty wilderness’ moving west across the continent (Schneider 2007:102–103).

Also in Norway, the national authorities had control of map making. Throughout most of the 20th century, local Sámi place names, rich in cultural information, were replaced by Norwegianized, often meaningless, names on official maps (Helander 2008:96–108). This practice has gradually changed, and in the course of the past two decades Sámi place names have increasingly been put back on to official maps. Unfortunately, many names were ‘lost’ during the Norwegianization period.

As described in Chapter 1, inadequate management of the Sámi cultural heritage up to 1978 led to under-representation of registered Sámi cultural sites in the official cultural heritage maps, although much of this has since been rectified. From 1994, the Sámi Parliament has had responsibility for Sámi cultural heritage and the mapping of Sámi cultural sites. It has also made agreements with other Sámi institutions that held cultural heritage data on integrating their data with ‘Askeladden’. However, the Sámi

Parliament has also continued the factual under-representation, by not allowing Sámi sacred sites to be included on public heritage maps.

4.2 Mapping, knowledge and GIS

Mapping of people's knowledge is a key feature of this project, where an important issue is flexibility in land-use related to different users, seasonal activities and changes over time. Today there is general agreement that maps both represent and create realities; they are an active medium in constructing knowledge; they exercise power, and are never value-free images (Harley 1988, Crampton & Krygier 2006:15, Crampton 2010:18). Maps have lost their neutrality: we are becoming more aware of the underlying intentions and social consequences that need to be defined. In the following, the discussion is limited to map issues that involve GIS.

GIS is a computerized data management system used to capture, store, manage, retrieve, analyse and display spatial information. It describes the world in terms of locations through precise placement of features on the earth's surface and assigned characteristics or attributes to features linked through relational databases (see Figure 6) (Bernhardsen 2006, Conolly & Lake 2006).



Figure 6. Main characteristics of GIS. Hardware is the computer, printer, network etc.; the software provides the tools needed for storing, visualizing, analysing etc.; the data consist of both geo-referenced data and related attribute data, methods are available tools like guidelines, standards, applications and procedures for handling the data; and people are needed to manage the system and develop plans for applying the technology (after Bernhardsen 2006).

In 1995, when GIS technology was still in its infancy, Robert Rundstrom expressed a critical standpoint, seeing: ‘... GIS as potentially toxic to human diversity, notably the diversity of systems for knowing about the world’ (1995:45). He was concerned that this was another European-derived method that would help Western society to destroy indigenous cultures. His starting point is that GIS is a ‘techno-science’, where the outputs of GIS are meant to represent realities. Rundstrom has not been alone in criticizing mapping and its traditions as a powerful tool used by dominant powers to colonize and render indigenous people invisible. Some of the main elements in this criticism have been the blindness to non-Western worldviews such as non-binary thinking in relation to humans and non-humans, ubiquity, a cyclical concept of time, and also the contradiction between fixed boundaries on maps and flexible land-use practices. Rundstrom (1995:47) asserts that by using GIS technology one disassembles the world and then rebuilds it, possibly indicating relations that do not exist. This can

be seen for instance in relation to a place with long tradition of overlapping use and where land-use maps with fixed boundaries can create conflicts that did not exist before (Fox et al. 2005). Thus we must ask: is it possible to employ these new technologies to preserve traditional knowledge? or do they serve to disfigure it with Western patterns of thought, thus leading to loss of indigenous conceptions of space? (See Rundstrom 1995, Agrawal 2002, Fox et al. 2005, Srinivasan 2006, Turnbull 2007, Tobias 2009, Crampton 2010.) Also among archaeological GIS practitioners, similar concerns emerged around the mid-1990s, and it was discussed whether the GIS represented a re-introduction of a positivistic approach (Conolly & Lake 2006).

However, the new technology has also been seen as representing opportunities. There exist many worldviews and adaptations to land-use, within indigenous communities and elsewhere. The key question must therefore be how to handle this multiplicity without seeking to impose one unifying ontology on the rich diversity (Craig et al. 2002, Turnbull 2007). Handling different levels of knowledge by the use of information and communication technology (ICT), GIS and databases is still in an early stage of development. The importance of dealing with complexity and multiplicity in general is being taken more and more into account, and alternative ways of mapping local knowledge are also likely to emerge (Turnbull 2007:146). For instance, technology can offer new opportunities as various relations can be shown on digital and interactive maps, making the map a new type of meeting place for dialogue and negotiations. Landscapes have different meanings to people and groups, and GIS can express many types of relations (Crawhall 2003). In 1987 Harley and Woodward offered a definition of maps that facilitated a broader spatial understanding: 'Maps are graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes, or events in the human world' (Harley & Woodward 1987: xvi). This also emphasized the role of maps in human experience (Crampton & Krygier 2006). GIS has a built-in capability to combine layers of information in various ways. By reading the outputs as cartographic texts and not fixed images, one can make use of the technology (see Tripathi & Bhattarya 2004, Elwood 2009, Pettersen 2011). As Conolly & Lake (2006:10) conclude:

...we will surely learn even more as a result of the integration of GIS with virtual reality, agent-based simulation and on-going developments in artificial intelligence. Ultimately, the key to success is to use GIS appropriately, which means remaining cognizant of the theoretical encumbrances inherent within it and having adequate technical command of the powerful and diverse possibilities it offers.

Having discussed maps and principles related to GIS, I now move on to introduce the participatory approach.

4.3 ‘Participatory GIS’ – The new mantra

The mapping of indigenous lands and land use has, since Hugu Brody published ‘maps and dreams’ in 1981, developed into a methodology often referred to as *participatory GIS (PGIS)*. PGIS is a merger of several methods, inspired in particular by Participatory Learning and Action methods (PLA) and Geographical Information Systems – GIS (Rambaldi et al. 2006). Participatory Learning and Action is an umbrella term for a wide range of methods where the common theme is a process entailing the participation of the people concerned. Methods like interviews, group work and various kinds of visualizations are common. This approach usually challenges both biases and preconceptions about people’s knowledge, and offers opportunities for mobilizing local people for joint actions. The merger of these ideas with GIS technology for registering, analysing and presenting geo-referenced data has led to the methodology called PGIS (Rambaldi et al. 2004, Rambaldi et al. 2005).

PGIS combines a whole range of geo-spatial information management tools and methods to represent people’s spatial knowledge, such as sketch maps, 3D models, aerial photographs, satellite imagery and GIS. Around the mid-1990s, PGIS methods moved into the digital realm. Thanks to the rapidly decreasing costs and the greater availability of spatial data and user-friendly software, the methods could more easily be used by local communities and organizations (Weiner et al. 2002, Rambaldi et al. 2004, Chapin et al. 2005, Rambaldi et al. 2006).

The basic idea is a mapping process where the communities themselves participate in gathering information about the way they think of their land, and then make maps for the ‘outsiders’. Fundamental to PGIS is that control of access and use of culturally spatial data is to remain in the hands of those who generate it. In this way, PGIS practice can protect traditional knowledge from external exploitation (Abbot et al. 1998, Weiner et al. 2002, Chapin et al. 2005, Rambaldi et al. 2005, Dunn 2007).

In recent decades, there has been an increasing recognition of indigenous people and their knowledge as pivotal for achieving sustainable development. This has led to a growing number of projects where local knowledge is geo-referenced in a GIS system. Approaches like cultural mapping, counter-mapping, community-based mapping and participatory mapping are all practices that have directed attention to indigenous and local perspectives for those who hold power and usually control what appears on official maps. Today we find a whole range of networks and organizations working with these issues (Abbot et al. 1998, Nadasdy 1999, Usher 2000, Agrawal 2002, Weiner et al. 2002, Dunn 2007, Berkes 2008, Crampton 2010:25–38). Globally these new approaches have been employed to enable communities to manage and communicate their spatial knowledge, while also serving as an impetus for spatial learning, discussions, information exchange, analyses, decision-making and advocacy (Corbett & Keller 2005, Fox et al. 2005, Rambaldi et al. 2005). This is a use of GIS where social awareness is an important element and which gives legitimacy to local or indigenous spatial knowledge (Dunn 2007). The participatory approach has various areas of use and also various labels, among others Participatory GIS (PGIS) Public Participatory GIS (PPGIS) and Community Integrated GIS (Dunn 2007, Kyem 2010) Here the term PGIS will be used.

Since the 1980s there has been a gradual shift away from the assumption that ‘maps were essentially devices that communicated information that had been gathered and processed by the expert cartographer’ (Crampton 2010:37). To a large extent, these new mapping practices have been a reaction to the kind of mapping conducted during the age of exploration and colonization (Chapin et al. 2005). In recent years there has been a shift within the scope and focus of participatory work. Earlier it was mainly

smaller and local projects that implemented the participatory approach, but today participatory aspects feature increasingly in regional, national and international projects. For instance, both UNESCO and the European Landscape Convention have heightened their focus on local participation (Crawhall 2007).

Through these changes, more and more mapping activities that operate bottom–up and outside the control of the experts have emerged. Mapping or cartography has become increasingly freed from the constraints of academic discourse and opened up to the public (Craig et al. 2002, Crampton & Krygier 2006:12, Wood et al. 2010). With the expanding range of accessible and free mapping tools, the use and development of geo-referencing affects all aspects of our world and makes the amount of accessible information appear unlimited. This development affects management and other official areas. The dissemination of geo-spatial information technologies and information systems is set to continue, among practitioners, researchers and the authorities – making it especially important to have a deliberate and critical assessment of the impact of these methods. It also gives rise to challenges and ethical issues for those involved in geo-referencing people’s knowledge.

PGIS methodologies are, as described here, full of good intentions. Kyem (2010) has summarized in table form the general characteristics of the transformation in GIS from what he terms ‘techno-centric’ applications to ‘socio-technical’ employment of the technology in PGIS (Figure 7).

Traditional GIS	Characteristic	Participatory GIS
Technology, data and people	Focus	People, process and technology
Facilitate official decision making. Improve software programs	Motivation/Goal	Empower communities and facilitate public participation.
Public officials, decision makers and GIS experts	Participants	Local communities and underprivileged groups in society
Supply driven, technological push	Implementation	Demand and need driven
Because the GIS technology makes it possible	Why adopt?	Because the GIS technology is needed
Rigid, hierarchical & bureaucratic	Organization Type	Flexible, open and participatory
Decided by GIS experts	Details of Applications	Decided by Users/Focus groups
GIS experts lead and control applications and GIS development	Role of GIS Experts	GIS experts act as facilitators
Multipurpose applications	Project Type	Specific and simple projects
Public organizations & large private enterprises	Project Location	Local, rural and indigenous communities
Top down, hierarchically structured.	Information Flow	Bottom up, grassroots and citizen participation.
Capital intensive projects	Expenditure	Low cost projects
State and corporate funding	Sponsorship	Donations, NGO support.
Big, complex and long-term projects	Size of Projects	Small, simple & short-term projects

Figure 7. Characteristics of GIS and PGIS (from Kyem 2010).

However, despite all good intentions and concerns, PGIS has not remained uncontested. In his *Rethinking the Power of Maps*, Wood (2010:160) writes:

In fact, the feeling I got was that in the hands of PPGIS, GIS was merely replacing cartography, not liberating mapmaking [...] I'd have to say, despite the high idealism and great goodwill of perhaps all its practitioners, that PPGIS is scarcely GIS, intensely hegemonic, hardly public, and anything but participatory.

In my view, these are very uncompromising statements about an approach that is being used at many different levels and for a wide range of purposes. Still, Wood is making a pertinent point, because 'participation' has become a buzzword within management,

research and non-governmental organizations that might be tempted to use the term to legitimize their projects (see also Weiner et al. 2002:248). A critical discourse among PGIS practitioners has been underway since the 1990s. Questions have been raised about how space is conceived and represented in GIS, if differing kinds of knowledge can be presented, as well as of the hegemonic power relations inherent in the technology (Lock & Harris 2000). This has brought greater awareness of internal differences and power relations within communities participating in PGIS projects, as well as a heightened focus on the internal impacts of participation, and not only on promoting participation itself. Maps do not necessarily manage to include the worldviews of various indigenous peoples. How, then, can maps succeed in expressing the relationships between people and their landscape – for instance, flexibility represented by overlapping uses, seasonal activities and changes over time?

Moreover, maps that indicate fixed boundaries can trigger latent conflicts, or even create conflicts that did not exist before. There might be internal existing conflicts or competition related to differing spatial perceptions and values of landscape as well as competition related to knowledge and claims to resources (Fox et al. 2005). In Finnmark, for instance, there are long traditions of extensive overlapping land use. A map presentation that accentuates the boundaries between the land-use of different groups can provoke conflicts or provide grounds for conflict. Consideration must be given to the flexibility in how such overlapping uses are being managed, and how to present this in the GIS. Also changes through time must be taken into account. A long tradition does not mean that practices are static: changes are inherent in any tradition.

As a response to the challenges regarding overlapping use and fixed boundaries, Tobias (2009:32–35) draws a distinction between *use* and *occupancy*. ‘Use’ refers to activities involving the harvesting of traditional resources – hunting, fishing, gathering etc. – and the travel routes involved. Such use can overlap with use by other communities. By contrast, ‘occupancy’ refers to the area a group regards as its own, and where the use is more continuous due to habitation, burials and places related to stories, legends, specific ecological knowledge, etc. Occupancy will often refer to fixed sites, whereas use is more often related to various practices in the landscape.

Tobias's suggestion is aimed at reducing conflicts related to boundaries between groups with overlapping land use.

It can be a challenge to express characteristics like 'ubiquity', 'cyclical time-concept', 'non-binary thinking', etc., on 'Western' maps. Translating indigenous views onto maps requires close collaboration with those who have the knowledge, throughout the entire process. Still, we must ask: is it possible to employ these new technologies to preserve traditional knowledge – or do they serve to disfigure it with Western patterns of thought, leading to the loss of indigenous people's conceptions of space and possibly greater regulation from the state? The effects of mapping technology can be both empowering and disadvantaging for a community and its relationship to the past.⁹

Still, the mapping processes and the use of GIS will continue, and the technology is spreading to even the most remote corners of the world. Thus it is important to keep exploring various approaches and seek to improve the weak points in the methodology. The answer is not to avoid using the technology, but to continue developing and better adapting it. The progress and rapid changes in new technologies create their own internal dynamic: they are not a tool with an ON/OFF switch. Once this technology is deployed, the effects can be hard to reverse. Maps may continue to have an influence even if the technology should be turned off (Fox et al. 2005, Johnson et al. 2006).

I believe that indigenous peoples, minorities and local communities can benefit from the possibilities offered by the rapidly-developing GIS technology – but a critical issue is participation and equality between academia and the local people involved (Robiglio et al. 2003). The power of definition and development of the methodology must not be left solely to computer engineers, or to researchers for that matter. In order to find ways to make the tools adapt, we must keep carrying out small-scale projects as well as larger projects on a more general level, in close collaboration with local communities and with institutions on all levels. Since the early 1990s, there has been a clear shift towards a more context- and issue-driven approach emphasizing local

⁹ For further reading, see Rundstrom 1995, Shrader-Frechette & Westra 1997, Sterritt et al. 1998, Hershock 1999, Fox 2002, Kyem 2004, Corbett & Keller 2005, Fox et al. 2005, Crampton 2010, Wood et al. 2010.

participation, as well as pronounced improvements in the functionality embedded in GIS (Dunn 2007). There are examples where GIS outputs have been used to communicate varying characterizations of one place or overlapping land use (Elwood 2009:60–66). In this thesis what I explore is not an alteration in any methodology, but a systematic and documented approach combining conventional GIS, archaeological fieldwork and local participation. In transferring people's views and recollections into a GIS or onto a map, a basic premise has been close collaboration with those who have the knowledge, to reduce the flattening and fragmentation of the data.

Some of the worries and critical issues that have been raised are more relevant for those working in less democratic societies, where the gap in financial, educational and power relations between the indigenous and the majority population may be wide indeed. In such cases, there is a greater danger that the effects will exclude and not include, because members of the minority groups may not be able to control either the tools or the further use of their own knowledge. The implementation of local control and participation in this study is further elaborated on in section 5.4.

4.4 Software, database and multimedia

The data for this study have been stored, analysed and viewed in a GIS using ESRI's ArcGis and Microsoft Access database software. The GIS software was used to view spatial relationships between natural and human phenomena – more specifically in this study, between landscape and land-use systems (see Tripathi & Bhattacharya 2004:3, Bernhardsen 2006, Conolly & Lake 2006:11, McCoy 2009). The data have been used to create maps and other media products which were then distributed back to the collaborators. In the GIS, the attribute data in the database are linked to a geographical location (lines, points or polygons) on maps. There is a direct link from the symbol on the digital map to the attribute table (database) where all the information related to the symbol on the map is stored (see Figure 8 and 9).

In Paper 2, issues relating to the application of GIS and other geographic multimedia tools are explored as ways of transferring land-use knowledge between generations, as

well as between members of the local community. This involved, for instance, distributing an interactive DVD to Tlowitsis band members containing videotaped interviews with knowledgeable elders, audio recordings of how to pronounce place names in the Kwakwala language, photos of their original villages and territory and interactive maps with land-use information.

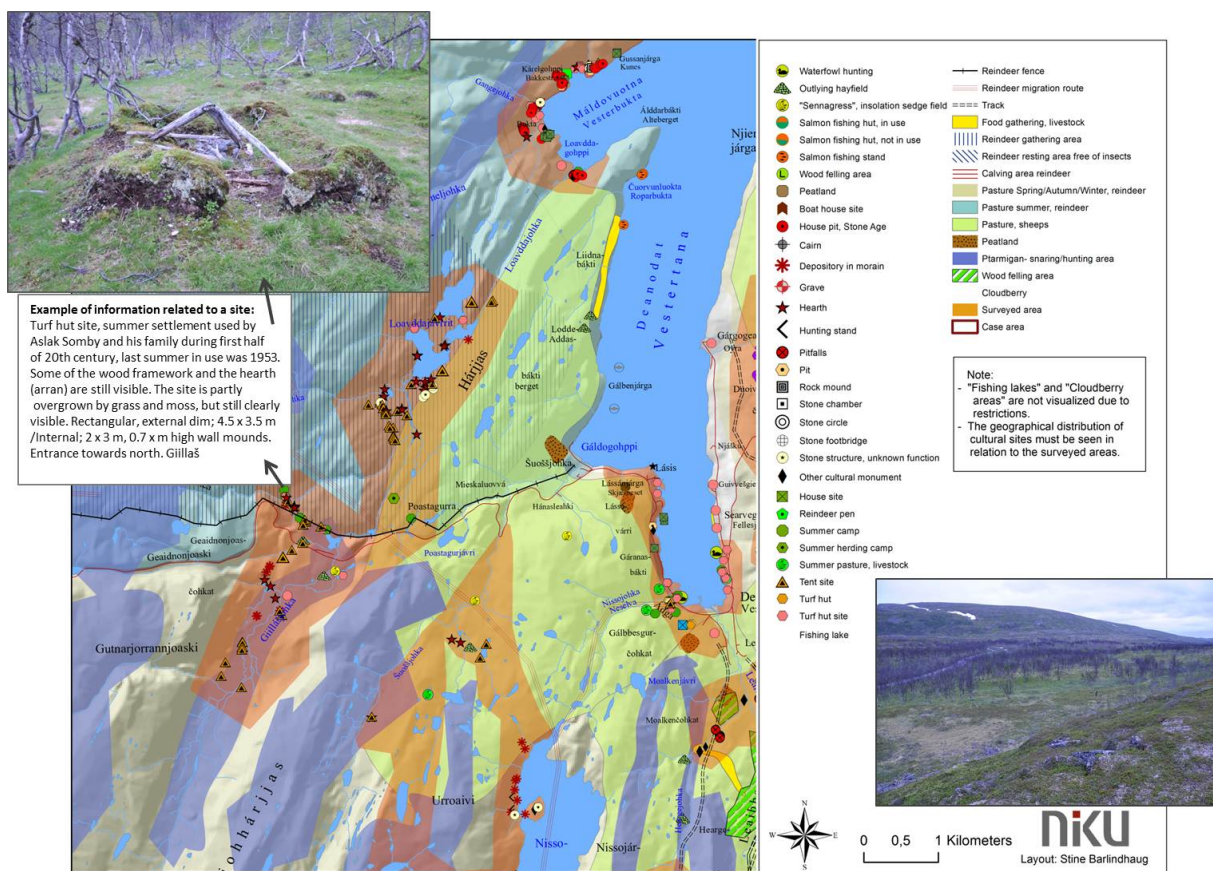


Figure 8. Map showing a part of the study area with individual symbols linked to a database with information from interviews and survey. Graphics: Stine Barlinthaug, Base map: Norwegian Mapping Authority.

Attribute	Content
Type of site	Tent site, turf hut, trapping area, fishing lake, cloudberry picking area, event/story, etc..
Activity	Related activity if known: reindeer herding, reindeer gathering, salmon fishing, habitation, haying, ptarmigan hunting, etc..
Use information	More in-depth knowledge of who, how, why precisely here, etc.
Season	Which season of the year, if relevant.
Age	How old is the activity/site or time-span of use.
Visibility	The site/feature's visibility in the terrain.
Measures	Detailed measures of various aspects of the feature: width, breadth, depth, height, diameter.
Distinctive feature	Details about structure/form, e.g. a round or rectangular turf hut, or distinctions related to the ground plan within a tent site
Entrance direction	Compass orientation of the entrance, when relevant.
Terrain/vegetation	Local vegetation/terrain observations
Date	
Photo no.	
Source	Type of source: informant, literature.
Accuracy	Type of positioning: GPS, mapped during interview, old field reports, etc.
Who	Who did the documentation / interview
Code	Code number of informant.
X-coordinates	
Y-coordinates	

Figure 9. Attributes used in the access database to systematize the data. There is full access to add columns and divide the data into a more detailed matrix if required.

In addition to conventional GIS (section 4.2), the participatory approach (section 4.3) has been an important part of the research design in my study. It is in the research design and the focus on local participation related to decision-making, data collection, map editing, and the focus toward the community as users of the final products that this study differs from conventional GIS. The additional information offered through the participatory approach is mainly to be found in the first five rows in the table in Figure 9. Within these attributes there is a system with even more detailed categorization, such as the map legend list in Figure 8 that shows the details of the attribute 'Type of site' in Figure 9. These detailed categories were not fully structured

prior to the work process, but were deduced from the information gathered and findings that emerged during the surveying.

4.5 Interviews and archaeological surveying – structure and implementation of participation

Details about how the participatory aspect has been employed during the various parts of the project are provided in each of the papers, here I will here give a short and general overview of the participatory work and how it was initiated. In Norway, contact was made through the local associations Vestertana kapell og bygdelag in the village of Deanodat/Vestertana, Mearrasámi diehtoguovddáš/Sjøsamisk kompetansesenter (Coastal Sámi Resource Centre) in Porsáŋggu/Porsanger, and the boards of the three local reindeer herding districts – Lágesduottar, Olggut Čorgaš and Skáidaduottar – that use the study areas during parts of the year. They were given information about the project and the methodological approach and asked whether they would like to take part in the project. Except for Olggut Čorgaš reindeer herding district (one of the two relevant districts in Deanodat/Vestertana), where there was no response, all confirmed that they wanted to participate. Community members who wished to share their knowledge were interviewed and their local knowledge was entered onto land-use maps in terms of resource areas, sites, routes, etc. In all, fifteen people, all with lived experience of traditional land use, were interviewed. The mapping includes oral information about traditional land use, stories and incidents connected to places in their landscape as well as contemporary, historical and prehistoric sites. Older interview records from the 1970s (Pedersen 1978, Pedersen 1994) and data held by the Mearrasámi diehtoguovddáš/Sjøsamisk kompetansesenter have also been included in the material. On the basis of the land-use maps made from interviews and group meetings, archaeological surveys in the community's traditional lands were conducted in collaboration with knowledge-holders from the community.

Not all elements within the participatory methodology are relevant in a project that focuses so specifically on cultural heritage and historic land use. Important here has been to have a methodological and theoretical framework for local participation and

control of data. Through years of fieldwork in North Norway, I have learnt how the knowledge held by local people can benefit archaeologists, and have recognized the necessity of a more systematic approach. Figure 10 gives an overview of the participatory work process during the land-use mapping.

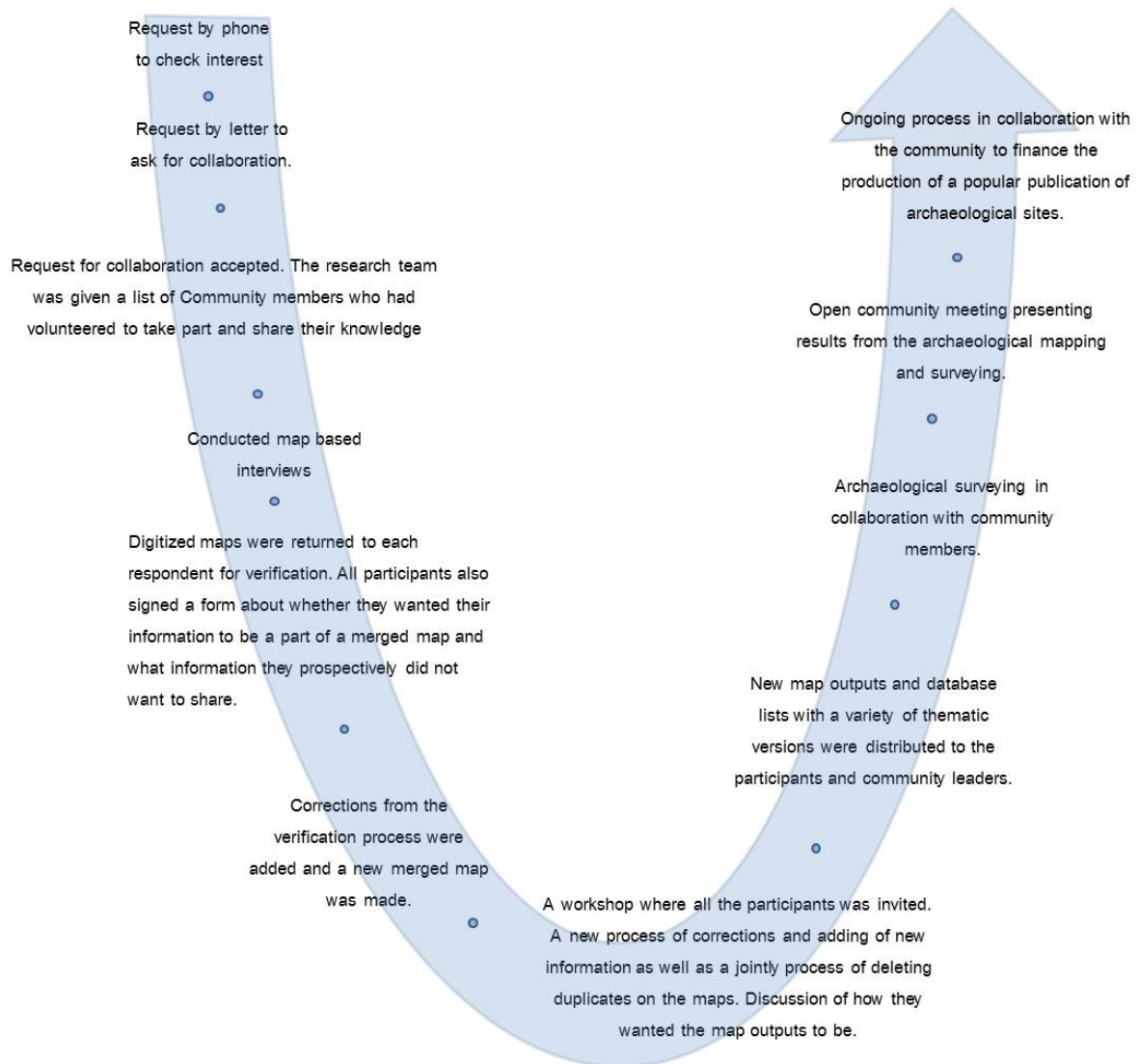


Figure 10. How the mapping process was organized in Deanodat/Vestertana

The interviews were organized in a semi-structured way where the setting was relaxed and conversational, but with a structured focus on knowledge of archaeological sites and historical land use. There was no pre-set time limit or fixed questionnaire, but a list of themes had been prepared in advance. The participants were guided in the discussions, but could also follow their own train of thought: the discussions were kept

open, to draw on informants' experiences and perspectives. (See Huntington 2000, Holstein & Gubrium 2001.) The interviews were conducted mainly at the individual level, except for three instances where two close relatives wanted to do the interview together. The basic principle underlying the study in both case areas in Finnmark has been that representatives from the local communities have participated in gathering information concerning knowledge about their traditional landscapes and how they use or traditionally used these areas. Participation has entailed transferring this knowledge onto topographic maps, done both individually and in groups. The land-use maps made from the interviews have been checked and approved by each individual interviewee and in group meetings. In Deanodat/Vestertana, in response to a request from the community, the mapping process continued in group meetings, where supplements were added and some locational details were corrected. Prior to this meeting, all respondents in Deanodat/Vestertana had been asked to sign an agreement form for merging the individual maps into one map. Only one person was reluctant to merge the personal map onto the common map, and another wanted to keep one 'secret' cloudberry site off the common map. Five of the seven informants came for a joint focus group discussion of the data. The joint discussion was based on the information from eight of the individual interviews that prior to this meeting had been merged and visualized on several thematic paper maps. I also had an individual meeting after the interviews with one of the reindeer herders who had not been able to attend the group meeting. In the maps from the coastal Sámi inhabitants in Deanodat/Vestertana where several people had mapped their knowledge related to the same area, the issue of duplicates and redundancy had to be dealt with. This was done in the joint focus group meeting where members of the community went through the maps together and agreed on which versions were the most correct and how the merged polygons and lines should appear. The field survey was carried out after all the interviews, subsequent corrections, and focus group meeting had been done and all additional data and corrections had been digitized into the GIS.

The work in Porsánnggu/Porsanger was more limited, serving as a comparative case to the data from Deanodat/Vestertana. The survey was organized to verify archaeological interview data at selected sites during one week of fieldwork. Here I worked with both

Nils Jovvna Eira Meløy, representing the reindeer herders, and Hartvik Birkely from the Mearrasámi diehtogovddáš/Sjøsamisk kompetansesenter. The Centre has received the complete digital datasets with the data derived from them. I have also transformed the data so that they can incorporate them in their own homepage.

In Deanodat/Vestertana the fieldwork was conducted in greater detail. Through the interviews both historical and contemporary sites were recorded. The survey was conducted in close collaboration with members of the local community. Both Viggo Larsen and Lasse Andre Anti had been asked by their fellow villagers to work with me, and both agreed. Fortunately, Viggo Larsen had the opportunity to work all six weeks in the field, as Lasse Andre Anti had to leave the survey to work with his reindeer herd after two weeks, as it was time to earmark the new-born calves.

Due to the extent of the area (see small map in Figure 11), it was necessary to focus on a few selected areas. The areas were selected on a discretionary basis, the criterion being that they were representative land-use areas for the livelihoods of both the reindeer herders and the coastal Sámi. The decisions were taken on the basis of Viggo's and Lasse's knowledge, my archaeological knowledge, and the digitized land-use maps based on interviews, community meetings and literature. Historical and contemporary sites were recorded; and areas both with and without reported land use and known sites were surveyed.

The survey was carried out without the use of off-road vehicles, which also limited the extent of the area we could cover. However, the surveyed areas are representative of the variety of land-use practices and the dominant geographical zones: forested valleys, alpine mountain and areas along the coast. We covered everything we had decided to, with the exception of one alpine area in the northernmost section due to weather conditions. Approximately 70 km² were systematically surveyed during six weeks of fieldwork. One benefit of not using motorized vehicles is the opportunity to experience the landscapes and talk about knowledge related to places and traces while moving through it. This can be advantageous, but is not feasible on a larger scale, given the total size of the area.

After six weeks of archaeological fieldwork, our database contained 721 cultural sites, ranging from 6000-year-old house sites to contemporary turf huts still in use. Most of the sites are related to Sámi land use over the last centuries, such as hunting, reindeer herding, fishing, husbandry and berry picking. Included here are also many of the sites which were mapped through the interviews and which have now been verified and their positions fixed by GPS. I wrote down additional information about the documented sites in diaries and later entered it in the GIS database. With a large-scale survey, documentation should be done directly onto a digital data collector with a built-in GPS, to minimize the need for extensive follow-up work.

The archaeological survey was followed up with a public presentation of the findings in cooperation with Deanu historjásearvi/Tana historielag (Deanu/Tana Historical Society). The collaborators have full access to the data and map outputs from the interviews and the archaeological survey, and further publications based on their land-use knowledge must be approved by those who shared it. This has been communicated clearly in meetings and during all interviews: all access to, and publication of, their land-use data will be subject to their permission. Documented archaeological sites that fall within the responsibility area of the cultural heritage management authorities can be made accessible to the authorities, except in cases where the local community explicitly expresses otherwise.

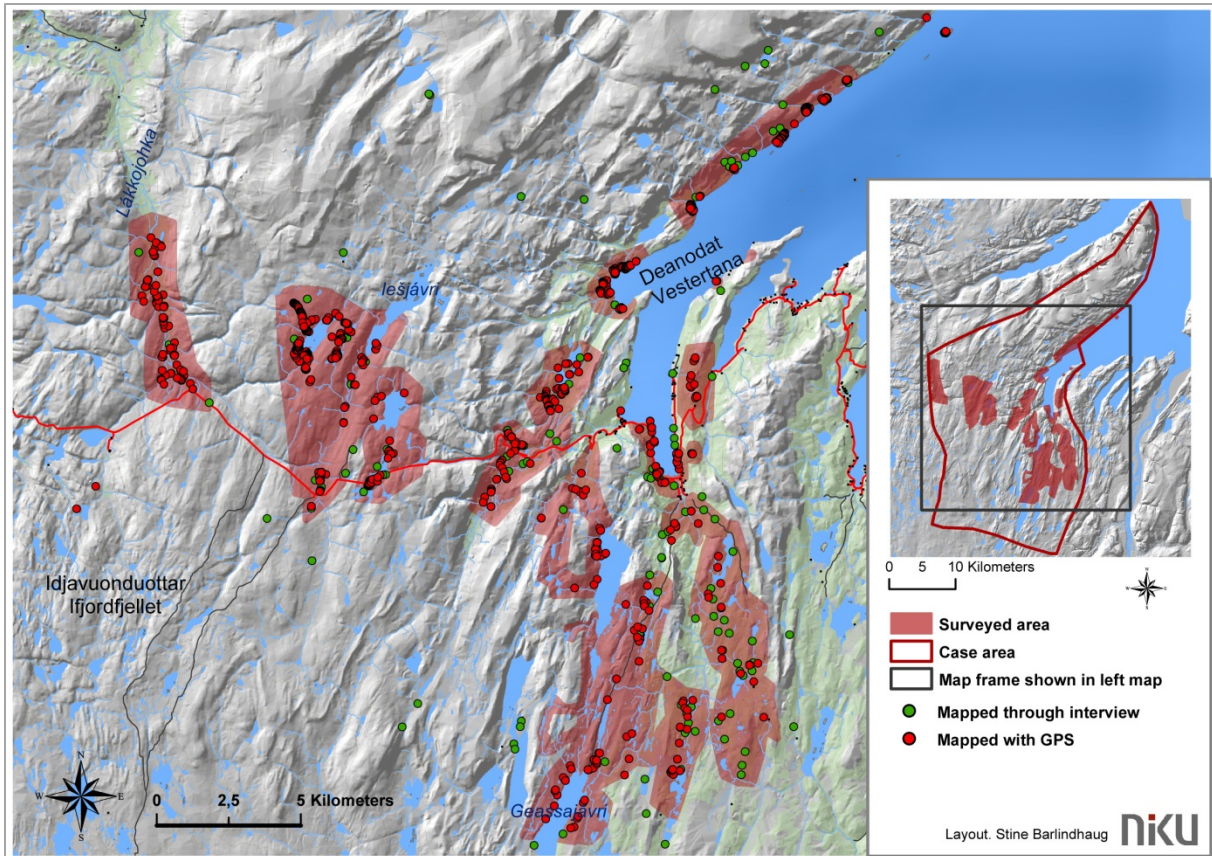


Figure 11. Survey area with sites mapped on the basis of interviews and those mapped with GPS.
 Graphics: Stine Barlindhaug. Base map: Norwegian Mapping Authority

To date it is only the Mearrasámi diehtoguovddáš/Sjøsamisk kompetansesenter that has adequate data software to utilize the digitized data; the other groups have received several maps and print-outs of the database. We have started the process of making the data from Deanodat/Vestertana more easily accessible to the broader community through a popular science publication. The publication will facilitate easy access for individual members of the community to explore sites in their landscapes. The digital data is also to be transformed so that it can be accessed through open source software and transferred to the local community.

My one-year stay at the University of British Columbia (UBC), Canada, was originally intended as a study-year where I could learn about participatory processes and PGIS in particular. The Centre for Social, Spatial and Economic Justice (CSSCJ) at UBC offered a research milieu with long experience in participatory work from around the world. I was fortunate to be invited to participate in an on-going project the centre had

in cooperation with the Tlowitsis First Nation and their chief negotiator Ken Smith. The aim of their project is to engage a representative group of Tlowitsis citizens in building capacity that can support decision-making activities for the nation. The intention is to develop a collaborative working group that will learn, discuss and make relevant decisions collectively (Corbett & Romano 2010).

The initiative to this project came from the community, as the chief negotiator had invited the researchers to assist with re-acquainting the dispersed members with their traditional lands. Most important in this study is the role the working group plays in the community's engagement process that explicitly and directly promotes nation building and re-introduces coherently articulated Tlowitsis cultural knowledge within the broader community. I was given the opportunity to participate and learn from this on-going project, where the participatory framework was established before I arrived. In addition to having access to literature and discussions, I gained valuable experience of participatory work in practice. The archaeological focus was subordinated, as my role during this stay was to learn practical skills in participatory work. Core elements in the participatory work were intense group work and decision-making in a Treaty Support Team group – composed of six First Nation representatives, consultants and academics. We also facilitated training in interview techniques so that younger members of the community could interview elders about traditional land use and other knowledge. The UBC support team followed this up and participated in an 'Elders Engagement Project' where Tlowitsis knowledge-holders were interviewed by younger members. (For further details see Paper 2.)



Figure 12. Marshall Wadhams interviewing Medrick Wadhams, Cecile Wadhams and Watah Joseph in Alert Bay, British Columbia. Photo: Jon Corbett

4.6 An interdisciplinary approach

A characteristic hallmark of the focus in the interdisciplinary PGIS literature, as elaborated in section 4.3, is well expressed by Elwood (2009:59): ‘The predominant focus in the published literature on PGIS has been upon its social and political processes, illustrating how GIS, spatial data, and maps produce and negotiate politics and power relations, or how they can be used to foster participatory decision making processes’. My focus is more specific: exploring alternative approaches to documenting and communicating land-related knowledge. The interdisciplinary elements in this research comprise the merging of the core elements from the PGIS methodology with archaeological surveying methods and acquired archaeological knowledge about the location of, and type of, cultural sites. Using unconventional spatial data such as narratives and interview data creates analytical representations of people’s experiences and movements, and includes the respondents as co-creators based on their experiences (Pavlovskaya 2009: 25–28). Thus implemented in this study, besides extensive archaeological field surveying, is a mapping process based on the principles of the PGIS methodology (see section 4.3), an approach commonly used

within human geography. Research outputs have been stored and visualized in a GIS but also made accessible through printouts of databases and maps, DVDs and a published book, and another forthcoming book. The interdisciplinary base is thus the combination of archaeological and local knowledge systems within the methodological framework of archaeological survey and the PGIS approach.

The intention is to achieve a more efficient documentation process, adding contextualized data to the understanding of sites and landscape as well as alternative ways of communicating this knowledge.

I am aware that recognizing the value of local knowledge is not a totally new idea within the archaeological discipline in Norway, especially not among archaeologists working with Sámi issues. Both in North Norway and in Sámi settlement areas further south, projects have been and are currently being carried out where elements of participation and local knowledge are implemented. As mentioned in the introduction, the Sámi Parliament emphasizes local knowledge in their cultural heritage management practices. In 2008 they initiated a pilot project, *Árbediehtu*, focusing on traditional knowledge in Sámi areas, with Sámi Allaskuvla/Sámi University College as project manager (*Árbediehtu*). The aims of that project seem to some degree to overlap with the issues of this study, although focusing more broadly on Sámi traditional knowledge in general. Porsanger and Guttorm presented the work of the *Árbediehtu* in *Dieđut* (2011/1), with papers from several authors: '[...]the articles examine practical and theoretical aspects of documenting traditional knowledge, [...] This collection of articles is a step towards building up a field of knowledge called *árbediehtu* (Sámi traditional knowledge)' (Porsanger & Guttorm 2011:13–14). The project is still in the process of discussing and testing several approaches for building up knowledge and the capacity to develop an all-Sámi programme for safeguarding Sámi traditional knowledge. A similar process has been started in Sweden initiated by the Swedish Sámi Parliament, and a policy document on traditional knowledge has been published (Jonsson 2010). The Swedish Biodiversity Centre also has a national programme on local and traditional knowledge concerning the conservation and sustainable use of

biological diversity (NAPTEK), focusing on similar issues (Tunón et al. 2009, Westman & Tunón 2009).

Survey and research projects where local knowledge about land-use practices and cultural sites has been implemented in some form include Vorren (1962), Fjellheim (1999), Barlindhaug (2007b), Skandfer (2009), Sommerseth (2009), Barlindhaug and Pettersen (2011), and the Norwegian/Swedish documentation project Saemieh saepmesne/Samiske rommet (Saemieh Saepmesne, Norberg & Fossum 2011). Local initiatives for documenting and sharing local history using GIS have also been undertaken in some communities, for instance by an NGO in Gáivuona suohkan/Kåfjord municipality and Porsáŋggu gielda/Porsanger municipality (Gáisi.no, Mearrasapmi.no).

There are also examples where local knowledge has been used to contextualize archaeological knowledge outside the Sámi context. Lillehammer (2004:140–153) has examined how local knowledge has contextualized the understanding of sites consisting of the bases of hay stacks, common in the rural landscapes of Jæren in southwest Norway. In an on-going interdisciplinary project focusing on cultural heritage in marginalized coastal communities in Nordland County, researchers have found local knowledge to be crucial to understanding some ‘unknown’ cultural monuments that were revealed during the fieldwork (Bertelsen, pers. comm.). In Paper 3, I refer to archaeological fieldwork published by Burström et al. (2006) where gathering people’s recollections of an incident during the Second World War was part of their project. There are also examples of interdisciplinary research elsewhere in Scandinavia where archaeology is combined with local knowledge: see Feldt 2004, Burström 2007, Welinder 2007 (ed.), Karlsson 2008, Persson 2011 and Burström 2012.

There seems to be a distinction in how the use of local knowledge is implemented within Scandinavia, also reflected in the literature mentioned above. In the Sámi context, implementation of local knowledge is to a larger degree part of an overall approach related to an overall identity project. By contrast, in archaeology in general, knowledge is usually put to use to answer specific questions. This might be due to a

more deliberate focus on collaboration and local knowledge within Sámi archaeological research than in archaeology in general. The Sámi Parliament has specific guidelines on the matter; Norway has obligations through ILO Convention 169; and the Swedish Archaeological Society has agreed on guidelines aimed at ensuring respect and collaboration with Sámi communities in their work (see ILO 169, Samediggi – Sámi Parliament, Broadbent 2004). It should also be noted that the focus on younger cultural sites as in historical and contemporary archaeology, and the 100-year-rule regarding Sámi cultural sites, has made use of local knowledge more imperative than in other archaeological contexts. Still there is a need for more methodological literature focusing directly on experiences of how it is implemented and how it works.

5 Representativeness, time aspect, benefits

As presented in Chapter 1 the research questions in this thesis are threefold, a structure reflected in the three articles.

- How can an increased focus on local participation related to archaeological surveys lead to more effective surveying and be beneficial to cultural heritage management?
- How can GIS and other digital media serve as a ‘memory bank’ that supports and stimulates the communication of land-related knowledge?
- How can a systematic participatory approach lead to a more contextual understanding of past land use?

The methodological approach is a common denominator, so there are correlations in the possibilities and challenges discussed in the papers. In the following section, overall aspects and results of the research are discussed.

5.1 Representativeness

A fundamental question in research based on local participation will always be how to ensure that ‘all’ participants are involved in the mapping: ‘..., even the most homogeneous community contains individuals whose goals differ from those of the group, and who may be marginalized by this process’ (Weiner et al. 2002:6). There is no way to have full control, and there might always be people who feel they have not been heard. The researcher can never be sure, so it is important to be aware of this issue. Even if the consequences not are of fundamental importance to people’s livelihood or rights as is the case in this study, it is still important to strive for equality in participation-based research – otherwise, it will be without legitimacy (Rambaldi 2005). In regard to this study, conducted in an area with a well-established and democratically organized Sámi Parliament, access and control related to existing Sámi land-use data is not the main issue. My focus is on the knowledge gap regarding land-

use data and knowledge caused by earlier neglect of Sámi history, as discussed in Chapter 1. It is a case study aimed at developing and adapting the technology to facilitate further archaeological and land-use mapping. I am fully aware that the situation of the Sámi people in Norway often differs considerably from realities in most other indigenous communities around the globe. Even though the mapping process and research design may have transfer value outside the areas of Scandinavian Sámi settlement, the focus on owner rights and data access could require a far more deliberate position if similar projects were to be conducted elsewhere. Still, the principles of local ownership and control are central when working with these issues. In all communities, different power relations can affect whose voices are heard; and there will often be some who are more eager to share than others, although they may not necessarily be the most knowledgeable. Also in this project there are circumstances that need attention in connection with these issues.

5.1.1 Reaching out to people

My contact with the reindeer husbandry communities in Deanodat/Vestertana and Porsáŋgu/Porsanger was by letter and phone to the involved reindeer district boards. They referred me to people with knowledge relevant to the research; I then contacted these people, and they agreed to participate and share their knowledge. From the Porsáŋgu/Porsanger case area two people were interviewed; and four people with close knowledge of the Deanodat/Vestertana area were interviewed. Ideally more people should have been involved, even though those who participated had in-depth knowledge of the areas and had spent both their childhood and adult lives there. There is a clear challenge in finding time for meetings within the framework of the project, a limited field season, and the reindeer herders' livelihood where they have to act on short notice due to the needs of their reindeer. The situation would have been better if I had had the possibility to show up at short notice over a longer period of time. That would have made it possible to talk with more people. Unfortunately, this was difficult to organize due to the long distances involved. Nor can I disregard the possibility that

some individuals may have had other reasons for not participating, or that I failed to communicate adequately that I would like to have contact with more people.

In the coastal Sámi village in Deanodat/Vestertana, I know that my enquiries reached a broader segment of the population – that is easy in a village with only 18 inhabitants. Seven people volunteered to take part in the mapping, five men and two women. The almost total concurrence in land-use knowledge gathered through these interviews leads to a general consensus in the data. I might also have the same consensus in the data related to reindeer herders' land use, but I do not have full control of this. With a higher number of participants from the reindeer herders, the amount of data would have been larger and more balanced, but not necessarily: my participants had probably been recommended because of their broad knowledge. They were also open to sharing the map outputs with a broader public, and felt confident that their information was representative.

More experience is needed on how to establish a framework that enjoys local legitimacy. Ween and Riseth (2011) have analysed their own unsuccessful attempt to use indigenous knowledge in a participatory process in a South Sámi area to provide authority to Sámi demands. The background was the reindeer herders' problems in being heard during a process where the government wanted to establish a national park in their traditional use areas. Ween and Riseth initiated a project to gather land-use knowledge based on participatory principles and through public meetings where reindeer owners and other knowledge holders were encouraged to attend (2011:234–236). After two unsuccessful attempts to gather people, they were informed that people were uncomfortable with the framework and felt that they were being asked to take part in a competition about knowledge and that they had to prove that their knowledge was real. Ween and Riseth concluded that, despite their good intentions and arrangements for local ownership and storing of knowledge, there was uneasiness as to how this knowledge would be used in further negotiations related to the national park issue, and that this was out of their control (2011:236–239).

During the project work in Deanodat/Vestertana I did not have this experience – but the primary focus of the project was also different. Ween and Riseth aimed at using the

knowledge directly in an already sensitive case related to land-use rights, but that was not the situation in Deanodat/Vestertana. In addition, gathered knowledge about land use related to cultural heritage sites in the landscape will result in a range of documented visible data. Much of the knowledge is thus verified by being materialized in the landscape. In Paper 2, the uses of orally knowledge transferred via digital media are discussed, but, unlike the case described by Ween and Riseth, we focus on internal use. If the knowledge is to be used in other connections, it will be by the communities themselves.

5.1.2 Men, women and a female researcher

The feminist movement over the past three decades has criticized the dominance of Western white males throughout research history. There has been a focus on how this androcentric practice has excluded, marginalized and silenced women and their history and place in societies (Morgan 1981, Harding 1986). It has been claimed that the male bias in research would be reduced if the number of female researchers were increased and more female researchers held leading positions (Engelstad et al. 1994). In this study, the researcher is a woman, but twelve men and only three women participated actively in the mapping. What place has the gender focus had in this study?

First, let me point out that the proportion of men/women participating reflects the gender distribution in the Deanodat/Vestertana village and in many small communities in Finnmark. During the years of depopulation, a greater share of girls than boys have left their homes and moved to cities and towns: in the village, there were hardly more women to interview. Still, there are a few other factors worth mentioning.

The background for the dominance of men can also be based on the phrasing of our questions about land-use tradition in a vast area and where this knowledge actually exists. Traditionally, the men in Deanodat/Vestertana generally spent more time outdoors, in their extensive landscapes, than the women. As described in section 2.1, most family livelihood was traditionally based on coastal fisheries and animal husbandry, supplemented by hunting, inland fishing and berry picking. When

discussing the gender balance with the volunteers involved in this research, I was told that the women usually had the daily responsibility for animal husbandry and the household, and therefore did not have the same opportunity to spend days wandering far away. Often the only times available were the hours between the dairy work in the morning and in the evening, so their radius of land use and intimate knowledge of the extended area was naturally less extensive than among most men. This land-use practice was also reflected in the material gathered. As noted in Paper 3, fishing lakes and good cloudberry areas within the reach of daytrips were often referred to as the women's domain. Still, I did experience that, unlike the men, the women in Deanodat/Vestertana were somewhat reluctant to share their knowledge. This was partly because they felt that the men had more thorough knowledge about these matters, and they sometimes doubted whether their knowledge was valuable. It may also be partly due to scepticism towards how secure the information would be. That was, however, specifically expressed on only one occasion.

5.1.3 Varying participatory approaches

Drawing on local knowledge has been a key factor in this study. Still, there are various ways to approach land-use mapping and archaeological surveying, depending on the purpose of the research and the varying local realities.

In Porsáŋgu/Porsanger, one of the main activities of the Coastal Sámi Resource Centre, since it was established in 2002, has been to document traditional practices. Being able to draw on an existing locally-based centre of knowledge provides both greater legitimacy and better data than could be achieved by a short-term research study in the same area. Contact was therefore made with an institution and not directly with local holders of knowledge. In the village of Deanodat/Vestertana and in the case of the reindeer districts of Porsáŋgu/Porsanger and Deanodat/Vestertana, contact was made through the district boards, but the interviews were conducted directly with individuals. The participatory work with the Tlowitsis was a combination, drawing partly on the locally-based institution, the Tlowitsis Citizen Advisory Group (TCAG), and partly on direct contact with knowledgeable elders.

The local variations in the three case areas illustrate well the varying realities encountered when conducting research in close collaboration with local communities. There has been a deliberate assessment of how the information gathered in the case areas has been used in this study. For instance, I do not see it as problematic that there are differences in the participatory processes in the cases in Paper 2, Deanodat/Vestertana and Tlowitsis. I feel this can provide an impetus for implementing different realities and discussing how the communication of local knowledge through digital media works. In Paper 3, where details relating to archaeological material and the participatory work are discussed in greater detail, only material from Deanodat/Vestertana (where there was an explicit focus on this issue) has been used.

The interview data from Porsángu/Porsanger, presented in Paper 1, were validated through only one week of archaeological survey at selected sites, but the results were convincing in terms of the specific focus on the accuracy of local knowledge of archaeological sites.

There can be no doubt that the research work benefits from community meetings where people can discuss and remember together. At such meetings, the maps and associated discussions activated further memories and stimulated communication and knowledge transfer. Through discussing their spatial knowledge and collectively remembering by using the maps, the people of Deanodat/Vestertana contributed substantial additional information to the GIS database.

When the aim is to document cultural sites on a large scale over vast areas, a comprehensive and time-consuming field strategy is unrealistic. The participatory level needs to be scaled in accordance with the type of project in question, and must be based on a project design that inspires confidence among the involved communities/region. Adapting to local situations and opportunities is crucial. There is not one participatory approach that works for all – but participatory approaches that follow certain core ethical principles do work in many cases.

5.1.4 Differing and competing spatial perceptions

Another important issue emphasized by Fox et al. (2005) concerns conflicts related to differing and competing spatial perceptions and values of landscape. Disagreements between the sedentary coastal inhabitants and the reindeer-herding communities have been, and still are, common in Finnmark.

In Deanodat/Vestertana, people felt confident in sharing their knowledge with each other, also between the coastal Sámi and the reindeer herders. They agreed on a few restrictions regarding publishing to the broader public, because of resources that are important to the community.

In Porsáŋgu/Porsanger, there was some dissimilarity between the data of the reindeer herders' land use and the coastal Sámi community's land use, and these two databases were kept apart. The reason for the difference in the desire to merge the databases might be explained by the differences in interrelationship and intercourse between the reindeer herders and the coastal Sámi in Porsáŋgu/Porsanger and in Deanodat/Vestertana. As explained in Paper 3, several coastal Sámi families in Deanodat/Vestertana have close kinship ties to the reindeer-herding families, and thus share history, identity and knowledge. For long periods during the past century, the reindeer herders also stayed in the village during the summer, and their children attended school in the village. That has not been the case in Porsáŋgu/Porsanger, and sharing intimate land-use knowledge is thus probably somewhat more complicated. As described, the participatory approach in Porsáŋgu/Porsanger was also less thorough than in Deanodat/Vestertana, so it might be that the necessary insight and confidence as to further use of the data were not established.

5.2 Indigenous communities are multifaceted

The discourse connected to the use of mapping and PGIS in relation to indigenous communities and multiplicity focuses on relations and principles that are not always directly relevant to an archaeological project in Norway. For instance, there has been a strong focus on the developing countries or communities where illiteracy, poverty and

oppression are major problems, and the aim has often been to bolster legitimate land-use claims or ownership of land and resources (Chapin et al. 2005, Fox et al. 2005). Often, conditions and historical realities not commensurable with those of most Sámi are described and it can be difficult to place the challenges within Sámi archaeology and land-use management into this discourse. ‘Compared to other indigenous peoples, [...] the case of the Sámi in Norway appears to be a story of success’ (Stordahl 2008:249). Still, the principles in the methodology can be transferred to a wide range of cases, and from North America there is relevant experience to draw on even though the backdrop also there is often land claims (see Andrews & Zoe 1997, Greer 1997, Aporto 2004, Aporto 2005, Chapin et al. 2005, Tobias 2009).

Indigenous peoples, like everyone else, differ when it comes to representing and advocating potentially conflicting interests. The concept of ‘ethnically pure’ areas is also contentious, due not only to recent processes of globalization and mixing but as a more general historical phenomenon. Sámi areas are today also inhabited by Norwegians and Kvens (early Finnish immigrants) who can claim long land-use traditions. Neither *Finnmarksloven* nor the Finnmark Commission operates with ethnic distinctions: they apply to all those living in Finnmark County, albeit with special responsibility for securing a basis for recognition of the Sámi culture (*Finnmarksloven*).

The data gathered for this project also have value in discussions of land-use and ownership claims. Neither archaeology nor research on indigenous issues or research in general can remain disconnected from society in general or from political debates. The heightened interest in Northern regions has actualized issues related to Norway's obligations to the local populations. Although the increased demand for knowledge of Sámi land use and history has had an impact on my engagement, the main reason, independent of other external factors, has been the general lack of basic data on cultural sites and traditional land-use knowledge. My wish to contribute to a better knowledge base for political discussion and decision-making has also been important. Against this backdrop, my focus has been on helping to develop relevant methods for mapping archaeological sites and land-use practices at a high professional level.

5.3 Different aims, but not much time to differentiate

In the three articles, different relevant uses and aims for combining archaeological surveys and PGIS are discussed, with different points of departure. Which approach to choose will depend on the aim, desired level of detail, and local conditions.

As discussed in Paper 1, what is needed is an official regional mapping of archaeological sites and land-use practices aimed at meeting the requirements of a satisfactory knowledge base. This study has shown that open meetings work well at a higher level, for instance in revealing and enabling realistic predications of the potential for historical and archaeological sites. A prerequisite is that the work enjoys legitimacy in the local community or region (Ween & Riseth 2011). The organizational and technical framework must be established with the necessary safeguards and agreements concerning access, control ownership, etc. (Dunn 2007, Turnbull 2007, Barlindhaug & Pettersen 2011). A large-scale survey narrowly focused on cultural sites will be at the expense of detailed local knowledge and related land-use knowledge. However, it is technically possible to emphasize adaptive solutions with applications that can handle data at several levels of detail for both qualitative and quantitative data, as well as the implementation of other digital media like videos, photo and audio recordings (McCall 2003, Kyem 2004, Tripathi & Bhattarya 2004, Srinivasan 2006, Dunn 2007). This does not mean that GIS is fully suitable for handling all kinds of knowledge, but developments in the last few decades have improved this ability considerably (Crampton 2010:98–111). Originally, GIS was normally used internally and data were rarely shared, so metadata (data that describe the data) were not as necessary. When metadata started to be used this was initially purely of a spatial character – the projections, scale and geographical accuracy necessary for mapping and analysis (Schuurman 2009). With the democratization and widespread use of GIS through the 1990s has come greater use of non-spatial metadata to facilitate sharing and broadening of the analysis (Dunn 2007, Schuurman 2009). Regardless of technical innovation and possibilities, one fact will not change:

ontological metadata are a product of context and are always socially produced (Schuurman 2009).

A better knowledge base related to archaeological remains in the traditional Sámi landscapes is necessary if cultural heritage management is to be able to meet the increasing interest from various sectors – for instance, mining, wind power and tourism. Developing a GIS framework for gathering and handling land-use knowledge and cultural heritage as a tool for more sustainable cultural management will definitely help. A fundamental principle must be not to use such material as the sole eternal truth, but to establish a common understanding that such data are both contextual and contingent, and can, through GIS, be optimized (Schuurman 2009:53–54).

Both the Deanodat/Vestertana case and the work in collaboration with the Tlowitsis First Nation, Canada, served as a background for the discussions in Paper 2. The concept of ‘digital knowledge bank’ was used to describe the use of videos, audio recordings, maps, photos and text visualized in a GIS and on interactive DVDs. Ingold’s somewhat strict standpoint about the necessity of living in the land as a fundamental component of the process of knowledge production and knowledge transfer (Ingold 2000:132–151, Ingold 2011) is being challenged. Will GIS succeed in expressing the relationship between people and their landscape? That is a legitimate question. Undoubtedly, the use of information and communication technologies has limitations when compared to the transfer and memorizing of local spatial knowledge gained from actually living on the land. However, I would still argue that these tools can play a role in safeguarding and transferring land-use knowledge. We are dealing with a limited time frame because many of the remaining knowledge-holders are elderly people; there is little time available for a step-by-step approach to the collection of data over the next few decades.

No less important is the fact that both the people in the Deanodat/Vestertana and Tlowitsis First Nation case areas expressed a desire to safeguard this knowledge (explained and exemplified in Papers 2 and 3). The realities described in the papers are also valid for many today, and not only indigenous peoples. A growing number of groups and cultures are experiencing increased mobility, diaspora or new livelihoods

quite unlike those of earlier generations (Olsen 2001), so changes in knowledge-transfer practices should be a natural consequence. Basso (1996:107–111) writes about how we, through actively sensing a place, establish a connection between the physical landscape and our memoryscape, and how layers of significance become anchored to features in the landscape throughout people's lives. Basso probably did not take into account sensing through information technologies as explored in this thesis, but I find his statement valid and we can add new realities to it. Adaption and change have been key factors in human livelihood and cultures throughout history: traditional systems of knowledge transfer have always undergone change, and will continue to do so. Even if people experience major changes in their relation and access to traditional landscapes, these will often remain significant as places of origin (Kellman 1998, Olsen 2001, Peil 2004). Exploring alternative ways for safeguarding and transferring knowledge is thus highly relevant. My research has shown it to be very welcome as well.

As we have seen, there exist potentials and possibilities for establishing a better knowledge base to meet the needs within heritage management and to safeguard existing knowledge. The conflicting factor is the time frame, and the decreasing number of holders of knowledge alive today. Another important factor is the growing outside interest in the northern regions. Paper 3 opens with the following statement: 'Finnmark is the largest and northernmost county in Norway. Being sparsely populated and with relatively little of the land affected by modern infrastructure it may appear to many people as pure nature and wilderness.' The area is sparsely populated and large areas still do not have roads, buildings or other infrastructure – but pressure from, *inter alia*, wind-power and mining companies is already substantial, and there is a growing interest in tourism and recreational facilities.

A third factor not mentioned earlier is climate change. Climate changes are already noticeable in this region (ACIA 2005, Tømmervik et al. 2005, St. meld. 7, 2011). In saying this I do not mean to imply that the climate has been stable from prehistory and straight on through until recently, as there have indeed been major climate changes throughout history (Solli 2011). However, in relation to many visible cultural sites in the landscapes, rapid re-growth can be problematic. Re-growth is now perceptible

within a short time-frame. I have personally observed it over the last decade when re-visiting archaeological sites, and it is also documented through research (Riseth 2003, Barlindhaug & Holm-Olsen 2006, Barlindhaug et al. 2007a, Tømmervik et al. 2009). In Paper 3, I discuss how well the northern landscape ‘remembers’ and how visible even archaeological sites several thousand years old can be. In some areas this is likely to change: the tree line will shift, and shrub willow will gradually cover up sites that have been visible for centuries. Visible cultural sites and narratives embedded in the landscape have, through a traditional livelihood with extensive land-use practices over the centuries, become an intrinsic part of people’s consciousness. The link between the archaeological landscape, local land-use knowledge and the present landscape can become blurred with future changes in the vegetation.

A common denominator is in any case the limited time frame. Developing a framework that can handle several levels of detail to facilitate the incorporation of different documentation projects parallel with each other will be an advantage.

5.4 Reciprocal benefits

In Paper 3, I discuss the benefits of a multidisciplinary approach for a more contextualized understanding of cultural sites. This discussion is also relevant to Paper 2, in that establishing some sort of ‘knowledge bank’ will have an impact on how the local communities understand their land-use traditions and cultural landscape. Archaeological sites in the landscape are, with a few exceptions, visible in some way. They represent physical elements of what once was part of common memory (Aporto 2004:15) or memoryscape (Nergård 2006:29). Ingold (2011:81) reminds us: ‘The lines of the meshwork are the trails along which life is lived.’ (See Paper 3 for further discussion.) Combining land-use knowledge and visualizing it in a GIS can offer a glimpse into elements of the memoryscapes of communities of today and earlier times.

5.4.1 Contextualized knowledge

In the section ‘Land use and visible sites’ in Paper 3, the focus is on activities and movements that have gone on between mapped sites. This is exemplified with data from historic land use and related sites that show how extensive and intense ptarmigan trapping might leave only one visible site in the landscape. Being aware of the intense wayfaring (Ingold 2007:75) that can be behind archaeological sites is a very useful reminder of how dynamic and mobile lives in these areas used to be; it helps to detach the viewer from a still picture of site distribution, and gives life to the map.

This insight can help in comprehending archaeological data in new ways. This is shown in Paper 3, with the morphological variation among the tent sites and the location of turf huts and their concurrence with ptarmigan-trapping areas. The participatory approach tested out in this project has shown how local knowledge can contribute to an expanded framework for understanding archaeological sites in other, similar landscapes. In relation to Sámi cultural heritage, local knowledge is of special value due to the legal protection that applies after 100 years. Another valuable reminder is the awareness to the fundamental seasonal landscape formations, also discussed in relation to turf hut locations. Working as an archaeologist in a northern landscape means conducting fieldwork during the brief summer, but the researcher must bear in mind that life here unfolds in a winter landscape for most of the year, so lived experiences and knowledge of land use can be relevant for understanding archaeological sites.

It is useful to have such contextualized knowledge systematically documented in a case area with regionally representative land-use traditions and sites – useful not only locally but also as a reference case to other areas in relation to archaeological material and more recent data on land use. The archaeological discipline benefits when references and contexts from such data are merged into one system. This does not mean that present land-use knowledge explains prehistoric sites, but it can provide a contextual knowledge base for understanding the spatial and temporal distribution of sites from far back in time (Andrews & Zoe 1997, Stewart et al. 2004). Indeed, as

noted, such transfer value decreases for sites from the distant past, where social, cultural and environmental conditions may have been very different.

The local knowledge-holders did not find more sites or other types of sites than I did, as an archaeologist. The benefit lies more in their knowledge of the affordances of the landscape and traditional land-use practices, which makes the surveying much more effective. In addition, their knowledge enriches interpretations and discussions around a site. For instance, around one lake we might find no sites, while there were several sites around another one. Viggo could explain that the fish from this lake taste far better than fish from the other lake, due to the different kinds of nutrition available; or that there were no fish in the one lake.

5.4.2 Value assessment

As stated in the Norwegian Cultural Heritage Act: ‘It is a national responsibility to safeguard these resources as scientific source material and as an enduring basis for the experience of present and future generations and for their self-awareness, enjoyment and activities’ (Kulturminneloven/Cultural Heritage Act, Chapter One, Purpose and Scope).

The same wording is found in the Samediggi/Sámi Parliament’s reasoning for Sámi cultural heritage management. Cultural heritage is recognized as a non-renewable resource for the needs of present and coming generation related to such issues as identity, enjoyment, activities and scientific research. This locates Norway’s cultural heritage regime within a common Western practice based on universal human needs (Brattli 2009, Myrvoll 2012).

In recent years, criticism has been voiced of the constructivist and post-processual emphasis on underlying explanations of culture, as these see culture as basically detached from the material world. This critical view has been expressed by Bjørnar Olsen, who has introduced the concept of ‘symmetrical archaeology’ (Olsen 2003, Olsen 2006, Olsen 2010, Olsen 2012b). He explains symmetrical archaeology in a brief proposition: ‘[...] humans have always been cyborgs and that the human

condition is characterized by its inextricable enmeshment with things and other non-human entities' (Olsen 2012b:209). Other researchers have followed up this critique (Shanks 2007, Witmore 2007, Webmoor & Witmore 2008, Solli 2011, Myrvoll 2012). Implicit in this view is an argument for cultural sites as assets independent of their current condition, authenticity or value for humans (Myrvoll 2012, Olsen 2012b: 219).

This approach was not emphasized during my fieldwork or discussed with the local collaborators in Deanodat/Vestertana. However, in the course of our six weeks of fieldwork Viggo showed me cultural sites representing all stages of decay, from barely visible overgrown house sites, partly overgrown turf huts with visible traces of a framework and a woodstove, to dirty abandoned salmon cottages and turf huts with broken coffee mugs, rusty old cans, and mattresses teeming with mice. The appearance of these sites ranged from 'beautiful and appreciated' cultural sites that have almost returned to nature, to 'disgusting' ramshackle huts infested with vermin (Figure 13).

Viggo never expressed any views on the interest or value of these sites during fieldwork or in discussions with others afterwards. My first reaction on entering an abandoned hut could be that this was a filthy site full of old rubbish. In contrast, Viggo seemed quite at ease, and might remark what a good turf hut this had been, or say something about the excellent qualities of the dilapidated woodstove in the corner and reminisce about hunting trips in the surrounding area. His familiarity and closeness to the cultural sites served to contextualize and ascribe value to sites that might otherwise seem without value. Their physical presence, their form, materiality and location evoked memories – sometimes memories from his lived experience, sometimes recognized from stories, or their familiar form, materiality and location.



Figure 13. Sites in the study area appeared in a variety of stages of decay. Photo: Stine Barlindhaug

The sites in these landscapes represent long-term land use, and their presence places the close and distant past in Viggo’s present. Without the material manifestations of these sites in the landscape and their physical persistence over the years, they would not be part of the community’s common memory today. The sites are there, independent of today’s humans; they offer experiences to those who see them, but their existence is not dependent on human presence today. Sites can be valued despite their varying condition; their inherent materiality is an independent quality.

5.4.3 *Facilitating continuing interaction with landscapes and archaeological sites*

To a local community, a ‘knowledge bank’ also represents a way of facilitating different and increased attention to land-use knowledge and probably a longer-lasting awareness than otherwise would be the case. A circulating and coherent transfer of knowledge (Latour 1999:69–74) is established, a transference system that certainly differs from ‘living on the land’ but is an alternative that can work on several levels. A

knowledgeable elder will have different experiences and understandings from those of the 30-year-old who commutes to work at the municipal centre, or the 20-year-old who visits the village only at weekends and during holidays. Still, the cultural heritage knowledge is traceable and its truth value can be established, for instance through re-finding a described reindeer herder summer camp in the landscape (see concluding discussion in Paper 3). Moving across different steps of transformation, one both gains and loses something. The information and concrete knowledge related, for instance, to ptarmigan hunting that is held by a knowledgeable hunter like Viggo will suffer reduction when written in the transcribed interview, and then further transferred to the database and on to the map, and finally put into words in a thesis like this. On the other hand, there will also be gains: data that have been standardized and distributed can more readily be compared with information from other areas, enriched and informed by the research conducted there, as well as maintaining and transferring local knowledge about land use that otherwise would be lost (Latour 1999:78).

The visualization of the number and extent of sites and land use was surprising, even to local people with intimate knowledge of land-use traditions. Seeing this manifested both unified and thematically on maps gave a new dimension for comprehending the variation, extent and complexity of their own and their ancestors' land use. Being able to visualize sites from far back in time together with sites and land-use knowledge that people are familiar with (to a varying degrees) helps the understanding of the correlation and the totality in time depth, variety and continuity. Until recently, lived, habitual memory – explained by (Olsen 2010:116) as ‘... a bodily memory preserved by repetitious practice, and where the past continues by being relieved in our routines and ways of dealing with things...’ – has been maintained through land-use practices (see also Paper 3, p. 20). Of course, archaeological sites as such are not ‘lost’ simply because people forget about them – but the knowledge and memory of them can be lost. In the case areas examined in this thesis, as well as many other places, land-use practices have changed, very often towards greater urbanization. Visual and virtual information, something that can be seen, talked about and discussed, can be productive and also help to counter the loss.

This is not about making glossy maps and fancy videos that can replace traditional knowledge transfer and interaction between people – no tool can do that. However, I will argue that, given the realities of diaspora facing many minority and indigenous communities, GIS-stored information has the potential ‘tangibility’ and durability to safeguard and communicate knowledge that would otherwise disappear in the near future. Through a participatory approach and with the resultant data stored in a GIS, we have the chance to keep parts of the past still present, thereby facilitating possibilities for future interaction with these ‘new’ layers of memory (see Papers 2 and 3 for further discussion). Even if people’s knowledge of their community’s land use, places and stories is decreasing, the importance of this knowledge and the sense of home remains (Kellman 1998, Peil 2004, Solli 2011). Different forms of interaction with the land and additional communication forms can facilitate new practices that keep alive both historic landscape knowledge and elements of the past.

At an open community meeting where I presented archaeological and historic sites documented during the fieldwork, it became clear that people had strong feelings about these places. Worried about boring the audience, at one point I explained that I would soon stop talking and showing the endless series of maps and pictures. A young man, the father of two small children, exclaimed: ‘Oh no, don’t stop, this is so interesting, and imagine, taking these maps along on hikes, and showing these places to my children and telling them about their history...’ In the discussion that followed, it became evident that there was a general wish to have some of this material made accessible to the general public to make it easier for people to visit some of the sites themselves. In order to accommodate these wishes, a local guidebook to cultural sites in Deanodat/Vestertana is to be written during the winter of 2013/2014. This work will be done in collaboration with the local community association, *Vestertana bygdslag*, and the municipal local history association, *Tana historielag*.

From 1905, when the first national cultural act was established and throughout the 20th century, Norwegian cultural heritage governance was based on the assumption that heritage is best protected through top–down preservation. Cultural heritage governance was professionalized, and less effort was put into information and awareness-raising

(Bertelsen et al. 2001, Holme 2001:28). In the 1990s came a shift toward more local co-determination and a greater focus on the importance of engaging local communities in their own local history (NOU 2002, St.meld. 16, 2004–2005). There has been increasing awareness of how knowledge of one's own history and land use anchors people to place (Paper 2) by helping them identify with their cultural heritage, which in turn strengthens the local safeguarding of cultural heritage (Burström 1997:104–105, NOU 2002). The Norwegian Directorate for Cultural Heritage has also emphasized openness and local engagement in recent years. In 2009 the directorate launched a publically available version of the 'Askeladden' database under the name 'Kulturminnesok.no' (Kulturminnesøk). This is an open access site, with only a few exceptions where sites such as Sámi burial grounds and other sacred sites are exempt from public disclosure. 'Kulturminnesok.no' encourages the public to add information and knowledge to the database. People in Deanodat/Vestertana were very interested and engaged in the mapping; and the results made visual through presentations and map printouts increased their awareness of, and pride in, their own history. I think this increased knowledge and awareness of their heritage sites will prove to be a positive force. The common pride and interest will strengthen the awareness and caring for these places. In the Deanodat/Vestertana community there was common agreement to make the cultural heritage sites known to the public.

6 Conclusions

This study has, from an archaeological viewpoint, explored the benefits of emphasizing local knowledge, local participation and the growing possibilities offered by digital media. There is an on-going debate on the importance and possibilities of PGIS, and many projects around the world have contributed to this topic. However, further development and research are still needed. By applying PGIS methodologies in a Sámi and archaeological context in Finnmark, this study offers experiences and results from case studies that can inspire and benefit further research and development.

The approach based on a PGIS methodology and digital media outputs has shown a potential for facilitating inter-thematic work. The research is directly relevant to the cultural heritage management authorities' aim of sustainable management based on good source data and justifiable methods. They are today unable to perform their obligations satisfactorily in most of Finnmark County (see Paper 1). The approach described in this thesis can also help narrow the widening knowledge gap between elders with intimate knowledge of land use, and the younger generations. It can help maintain their roots and sense of belonging, and be constitutive and reinforce people's identification with their own history (Paper 2). People who share the same landscape and land-use knowledge can communicate effortlessly without maps and implicitly understand each other. However, if such knowledge is to be transferred outside this frame of reference, to people like researchers and authorities who lack this implicit understanding, we need tools to help us translate, store and distribute. In this study I have argued that topographic maps and GIS can serve as such a tool and be a good medium to facilitate the communication of knowledge, bridging some of the gaps in differing types of knowledge. I also saw how maps showing a landscape that people had known well served as mnemonics, triggering their memories.

The approach offers contextual knowledge relevant to understanding archaeological sites and landscape connections, with special relevance to Sámi cultural heritage due to the 100-year rule for automatic legal protection (see Paper 3).

As this study has shown, these initiatives need not entail complicated GIS analysis; but, through the software's flexibility, it is possible, within one interactive system, to visualize and combine various aspects of land-use knowledge. The focus here has been on using the basic elements of PGIS methodology to visualize and share knowledge through the familiar and widely understood language of cartography. 'In today's globalized world with increased use of digital media and software technologies, we might need to reconsider our understanding of the role of these new technologies in documenting, sharing and preserving indigenous land-related knowledge' (from the conclusion to Paper 3). In many parts of the world, the use of GIS is becoming part of everyday life, and we must not underestimate people's ability to take deliberate advantage of the technology in these fields.

Scientists have called for more research that not only theorizes about integrating local knowledge, but actually does it (Nadasdy 1999, Elwood 2009:59). The work presented in this thesis has shown that cultural heritage management can benefit from establishing standards and procedures for a deliberate approach where local knowledge is incorporated to a greater extent than today. This is especially important due to the 100-year rule for the protection of Sámi sites. There is also a need to expand the possibilities for including qualitative data in the national cultural heritage database 'Askeladden'. The Sámi Parliament has begun work on establishing a database for Sámi traditional knowledge which will also include land-use knowledge and historical sites, thus partly overlapping the Sámi sites in 'Askeladden'. A link between these databases is technologically possible, but first there will have to be a thorough process to clarify various levels of access and ownership. If realized, it would be an improvement of great value to local communities, heritage management and future research.

In this study I have put the use of PGIS into practice. I have not sought to replace local knowledge with glossy maps and fancy technology: rather, I have explored alternative ways of combining archaeology, participatory work and the flexibility inherent in GIS to increase spatial knowledge and facilitate ways of sharing it, to the benefit of cultural heritage management, researchers and local communities.

7 Literature

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