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THATCHED ROOFS AND OPEN-AIR MUSEUMS

A comparative study of Sweden and Japan.

Serusa Katabami

Degree project for Master of Science with a major in Conservation
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UNIVERSITY OF GOTHENBURG
Department of Conservation
P.O. Box 130
SE-405 30 Göteborg, Sweden

http://www.conservation.gu.se
Fax +46 31 7864703
Tel +46 31 7864700

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By: Serusa Katabami
Supervisor: Kristina Linscott

THATCHED ROOFS AND OPEN-AIR MUSEUMS. A comparative study of Sweden and Japan.

ABSTRACT
The purpose of this thesis is to study how thatched roofs in Sweden and Japan have changed their characters over the time from a roof for residence to a museum object and how they are represented at open-air museums today while the craftsmanship is still alive and struggling for its survival.

The methods for this research are literature studies, interviews, and observations. Theories of Architecture mainly by Pallasmaa Juhani and UNESCO Intangible Cultural Heritage are applied to analyze the subjects from another aspect.

This thesis highlights the tendency in open-air museums that lacks attention to thatched roof and its craftsmanship. By rethinking the history of thatching and open-air museums and by introducing the concept of Architecture and Intangible Cultural Heritage this thesis concludes that thatched roofs and its craftsmanship should be narrated and shown to the visitors as it is a part of their collection. It would promote thatching and strengthen the role of open-air museums in the current society.

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Preface

Foremost, I would like to express my gratitude to my supervisor Kristina Linscott for the useful comments, remarks, and engagement through the learning process of this master thesis. Furthermore, I would like to thank Mr. Hiroyama, Mr. Nishio and Mr. Nilsson for inviting me to their work sites and supporting my study of thatched roofs. Also, I would like to thank the participants in my survey, the 10 museums and 13 craftsmen, for willingly sharing their precious time. I owe special thanks to Ms. Ueno and Mr. Shiozawa for their great help with correcting and spreading my questionnaire. Finally, I would like to thank my grandparents and parents in Japan and the beloved ones in Sweden, who have supported me throughout the entire process.

The two pictures on the front page are taken by the author at Jidayuuborikoen Minkaen and Fredriksdal Museums and Gardens.

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1. INTRODUCTION

This thesis studies how thatched roofs in Sweden and Japan have changed their characters over the time from a common roof to a historical object at open-air museums, and examines how its tangible and intangible characters are represented at the museums today.

1.1 Disposition

Chapter 1 introduces the structure of the paper, definition of thatching and open-air museums, problem description, research purpose, methods, previous research, and limitation.

Chapter 2 describes thatched roofs and the craftsmanship in Japan and Sweden in detail. Some typical roof shapes, techniques, and customs are studied and the current situations in the two countries are reported.

Chapter 3 examines the history of the open-air museum (OAM) which adapted numbers of the decreasing thatched buildings. OAM first emerged in Scandinavian countries in the late 19th century and in Japan in the 1950s. In this chapter, the ideology behind OAM and its relation to modernization are examined. Also, current OAM topics are discussed.

Chapter 4 invites theories on Architecture and Intangible Cultural Heritage are introduced to reconsider thatched roof houses in OAM.

After looking at the history and theories, the fifth and sixth chapters report the current situation of OAM and thatcher in Sweden and Japan by conducting interviews and fieldworks.

Chapter 7 draws a conclusion of the research.

Acronyms:
The following acronyms are used in this thesis.
Open-Air Museum- OAM
UNESCO- United Nation Educational, Scientific, and Cultural Organization
ICH- Intangible Cultural Heritage

1.2 Definition of the main subject terms: Thatching and open-air museums.

As there are varieties of thatching and open-air museums in the world, it is necessary to define these terms in my research context.

1.2.1 Definition of thatching

This paper uses the term thatch-ing when dealing of the craftsmanship itself and uses thatched- when indicating the thatched object.
It is difficult to define what is thatching because materials, techniques, and shapes differ from region to region and even craftsman to craftsman. Still, there are some common aspects. Here is my summary of what thatching is from the literature mentioned in section 1.6 the previous research, which would give readers some general ideas.
Thatching is one of the oldest ways of covering roofs and walls, found all over the world.

The material and roof shape are influenced by the climate of the area, for example, water reed around the lake, wheat straw in the farming area, a steep roof in the heavy snow region and a large attic for silk industry. The straws are placed on the roof structure, fixed by ropes and rods, piled up and smoothened at around 45 degrees. The rain drops are carried by the end of the straw to the next end of the straw which the rest of the roof remains dry that isolates against warmth and coldness. The straw would decay after a while of being exposed to sun, rain, and wind and finally turns to soil that sometimes used as fertilizer. The roof is therefore rethatched every several decades, around 20-40 years. The craftsmanship has been passed down from generation to generation (Ando, 2004; Hedin, 2001; Sugimoto, 2011).

1.2.2 Definition of OAM.

Open-air museum is first and foremost, a museum. International Council of Museums (ICOM) defines a museum as below.

> A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment. (ICOM, n.d, *Museum Definition*)

Association of European Open Air Museums (AEOM), a platform for about 90 European OAMs, defines OAM as "scientific collections in the open air of various types of structures, which as constructional and functional entities, illustrate settlement patterns, dwellings, economy and technology" (Association of European Open Air Museums, n.d, *Definition*).

Svenska friluftsmuseerna (FRI), an organization consists of 29 OAMs in Sweden, defines OAM as below.

> § 2
> Ett friluftsmuseum är ett utomhusmuseum, som i helt eller delvis rekonstruerade miljöer avser att i folkbildande syfte ge upplevelser och kunskaper om historia och om samspelet mellan människan och naturen.
>
> Friluftsmuseerna är offentligägda permanenta institutioner (tillhör stiftelse, förening, stat eller kommun), som leds av vetenskapligt utbildad personal och arbetar genom insamling, dokumentation, bevarande och levandegörande av byggnader, föremål och andra historiska vittnesbörd om kultur och miljö. Ett friluftsmuseum kan vara en självständig institution eller ingå som en del i en större museiorganisation.

(Svenska friluftsmuseerna, Oct 3, 2013, *1997-FRI-STADGAR-ANTAGIT-PÅ-SKANSEN*.)

> OAM is an outside museum in completely or partly reconstructed environment which in educating purpose intends to give experience and knowledge about history and interaction between human and nature.
> OAMs are public owned permanent institutions (belongs to foundation, organization, nation or municipality), which are led by scientific educated staffs and work through collection, documentation, conservation and vitalization of

> buildings, objects and other historic testimonies about culture and environment. An OAM can be an independent institution or be part of a bigger museum organization.
> (Translated by the author).

In Japan, there is no OAM titled association. There is 全国文化財集落施設協議会 (Council of Japan Cultural Heritage Villages and Facilities, translated by the author) that is a platform for the 12 member OAMs to communicate. They do not define OAM clearly but one can see their concept of OAM here.

> 日本には全国各地に建造物をその収集対象とする野外博物館が点在しており、それぞれに建造物という地域の特徴ある文化遺産を後生に伝えることを存在意義としています。
>
> There are open-air museums in every region of the country, which collect buildings as their main subjects and aim to succeed buildings as a regional cultural heritage to the future generation. (Edo-Tokyo Open-air Architectural Museum, n.d, *Council of Japan Cultural Heritage Village Facility*. Translated by the author)

To sum up the general ideas of the three different definitions OAM would be an outside museum that gives knowledge and experience about history and nature to visitors.

1.3 Problem description

Today, thatching is not familiar to many people as it used to be. In some European countries, thatching is applied to modern architecture, by applying fire protection methods, as an architecture magazine CONTEMPORIST reports 12 examples (Nov 6, 2016) but it is often expensive and restricted by Building Act.

Open-air museum is, therefore one of the few places where thatching, especially the traditional method, exists today. How are the thatched buildings exhibited in OAMs today? They have probably changed its meanings and functions after being moved to OAMs where they are a part of the representation of an image such as a nationalistic ideology or an otherworld atmosphere. It is therefore important to research what aspects of thatching are narrated and not at OAMs today.

1.4 Reason for choosing this subject and purpose of the research

I have been interested in the historical relationship between the decline of a craftsmanship which was deeply rooted in local communities and the rise of nationalism and conservation movement, as well as the roles of open-air museums today in the safeguarding of ICH. As I had a chance to visit thatcher and OAM in Sweden and Japan which both countries have long and diverse histories on the subjects, I decided to do comparative studies of the two countries. The purpose of this research is to study how thatching and OAMs in Sweden and Japan have changed their characters over the time and to analyze how OAMs represent thatched roofs today. This thesis aims to give both OAM and thatcher some insights to make use of OAM.

1.5 Methods

This thesis consists of two parts. The first part, from chapter 1 to 4, is about the history and theory of thatching, OAM, architecture, and ICH. For this part mainly literature study is used to describe the subjects. The second part, the chapter 5 and 6, is an analysis of interview and observation that sheds light on today's thatching and OAM situations.

This section explains the research methods for the second part and their advantage and disadvantage. The methods I took are of Anthropology and used for "Nonprobability samples". It is a way of collecting data from few cases, in other words, in-depth study. Most studies of this category focus on fewer than 50 cases which are chosen on purpose (Bernard, 2011, p.158). The purposive sampling is a method when the researcher has a specific topic he/she wants to know from the informants. 10-20 knowledgeable informants can help studying of a focused cultural topic (p.169).

1.5.1. Interview.

"Every sample represents something" (Bernard, p.170).

An interview is done in order to collect data from a group of people, in an informal way as having an ordinary conversation, or in a structured way with a list of questions, by meeting the informants or by sending out questions via email or the Internet (p.171). Face to face interview can be both structured and unstructured. The major advantage of face to face interview is that the researcher and informants can ask each other directly when they have questions which leads to the accuracy of answers. Disadvantage is that researcher's presence might affect the informant and that it takes time and costs (p.207-209).
Questionnaire belongs to the structured interview which answers would be compared to each other. It can be sent out many informants and is easy to answer if it is designed well (p.203-204). The advantage of such self-administered interview is that all the informants receive the same questions and answer without someone's presence that makes informants comfortable to answer certain private topics. The disadvantage is the difficulty of having communication with the informants when there are unclear questions or answers. The response rate is not often high, from 20-30% for questionnaire via mail and even worse when sent via the Internet (p.208-210).

Questions are asked in fixed choice or in open ended ways. Closed ended is easy to analyze but it limits other possible answers informants might have (p.216). Bernard suggests 15 pieces of advice for questionnaire making: Choose clear words that prevent misinterpretation, use vocabulary that informants understand, make sure that the content of the questions is applicable to the informants, make the purpose of asking clear so the informants will not wonder about the question, have a good flow, make a clear scale, make several related questions into one, include "don't know option", keep questions short, provide alternative option if applicable, avoid loaded questions, avoid double-barreled questions, avoid emotional wording, explain contexts when asking controversial topic, and avoid false premise. Pretesting is important to make a good questionnaire (p.217-223).

To obtain information about the current situation of OAM and thatching in Sweden and Japan I set 4 groups for my questionnaire: OAM and Thatcher in each Sweden and Japan. As I did not have much time and money to conduct many face-to face interviews I carried out an online questionnaire which can be sent anywhere and be replied quickly. I looked for

informants through organizations I listed below. The reason for getting contacts through the organizations was because otherwise, it would be difficult to find each individual, and as I assumed that members of those organizations would not have much difficulty to take part in my research since it was one of the organizations' aims to promote their activities.

<OAM>

Council of Japan Cultural Heritage Villages and Facilities (CJCHVF)
(全国文化財集落施設協議会, Translated by the author)
The council is voluntary run by 12 OAMs which have architecture as their main collection. Their purpose is to discuss problems they have and to improve their conservation, exhibition and management skills in order to contribute to the development of culture. (Edo-Tokyo Open-air Architectural Museum, n.d, *Council of Japan Cultural Heritage Village Facility*.)

Svenska Friluftsmuseerna (FRI)
("The Swedish open-air Museums" Translated by the author)
It is an organization for the Swedish OAM, consists of 29 museums. It promotes communication and cooperation between museums (Svenska friluftsmuseerna, Oct 3, 2013, *1997-FRI-STADGAR-ANTAGIT-PÅ-SKANSEN*.)

On CJCHVF, there was no information on each museum's email address. Therefore I looked up each museum's website and checked if they had thatched building or not and their email addresses. It seemed that 8 museums had thatched buildings. Besides those museums, I added three museums I knew having thatched buildings to my research focus, by considering geographic balance. To the 11 OAMs, I sent the online survey URL and asked for participating in my research via email and facsimile.
On FRI website there were email addresses of all the museums. 15 museums out of the 29 replied to my email that turned out 7 of them had thatched buildings. To them, I sent the online survey URL.
In the end, 5 museums from each country participated in the questionnaire which became 10 replies in total.

<Thatcher>

Japan Thatching Association (JTCA)
The association aims at preserving and promoting the Japanese thatching craftsmanship and culture. They research reed bed, train craftsmen, publish books and host reed harvesting workshops for the public. (Japan Thatching Association, Jun 24, 2013, *About*)

Svenska stråtaktäckarföreningen
("The Society of the Swedish straw roof thatchers" Translated by the author)
It is a platform of the Swedish thatching, which aims at making straw roof as an alternative material in the modern building industry. (Svensk Stråtaktäckarföreningen, n.d, *Om Föreningen*)

On JTCA's website, thatcher's member list and contact information was not available. Therefore I received help from the board Mrs. Ueno for sending my letter and the questionnaire link to the 25 individuals who work with thatching.
On Svenska stråtaktäckarföreningen's website, thatcher's contact address was open to the public. There were 17 companies' addresses and I sent them emails about myself and the research.
In the end, 13 thatchers (6 from Japan and 7 from Sweden) answered to the questionnaire.

Reply (total sent)	OAM	Thatcher
Sweden	5 (7)	7 (17)
Japan	5 (11)	6 (25)
Total	10 (18)	13 (42)

The amount is not much to draw a generalization of the situation of OAM and thatcher in Japan and Sweden. There would be more museums and thatcher which are not covered by the associations I used for this study. Thus the data I obtained here should be treated as a qualitative data of a purposive sampling. These answers will be analyzed in Chapter V.

1.5.2. Participant Observation

"Immersing yourself in a culture" (Bernard, p.277)

Participant observation is also an important method in cultural anthropology. It is a way of observation by getting close to the subject and even by experiencing the life with them (p.277). There are three levels in participant observation: becoming a complete participant in the activity, being a participant who observes/ being an observer who participates, and complete observer who concentrate on recording the scene (p.279). The advantage of taking this method is that researcher can observe all kinds of firsthand data by accompanying the informants (p.284-285). Objectivity and documentation would be difficult in participant observation which could be managed by being aware of own experience and bias (p.298) and by documenting soon after the observation has been done (p.312).

I tried to observe thatching and OAM as close as I could by spending some time with thatchers and being a museum visitor by myself. I visited thatcher's work site at in Miyama, Kyoto on July 25-Aug22 2016 and in Perstorp, Skåne on September 18 – 20, 2016. There I observed how people thatch and I also tried out thatching for 1sqm. I also worked at a thatched cottage Miyama Futon &Breakfast, Miyama Kyoto for about a month (July 25-Aug22 2016) and experienced what it is like to live in a thatched roof house through cleaning the whole property every morning. Unfortunately, I did not manage to document them in every detail when I did participant observation at the thatchers, therefore I will use these data limitedly as my experiences in Chapter 2 and 4. When visiting museums I was mostly a participant who observes, being both a visitor filled with curiosity at the same time a researcher with a critical mind. The museum observation will be reported in Chapter 6.
These are the museums I visited:
<Sweden>
Kulturen, Lund.
Fredriksdal' Museums and Gardens. Hellsingborg,
Skansen, Stockholm.
Vallby Open-air museum,Västerås.
<Japan>
Open-Air Museum of Old Japanese Farmhouses, Toyonaka City, Osaka
Edo-Tokyo Open-air Architectural Museum, Koganei City, Tokyo.
Jidayuuborikoen Minka-en, Setagaya Ward, Tokyo.
The Japan Open-Air Folk House Museum, Kawasaki City, Tokyo.
Michinoku Folklore Village, Kitakami City, Iwate.
Tono Furusato Village, Tono City, Iwate.

1.6. Previous Research

I did not find any previous study covering all thatching, open-air museum and Intangible Cultural Heritage so referred to each field's previous studies. My standing point is most close to the discussions in open-air museums that critically look at what they collect and show for what.

About Thatching:
For the Swedish thatching, Sigurd Erixon and Anders Nyman's *HALMTAKSTYPER I SVERIGE* (1948-49) reports types and distribution of thatched roof in Sweden with rich pictures and sketches. Mikael Hedin's report on thatched buildings documentation project in Skara also tells the history and roof structure (2001). Ove Torgny's *Skåne's Long House* (1975) (*Skånelängor*) describes Skåne region's thatching. Dervishi and El-Zoubi analyses straw roof from the engineering perspective for its use on modern architecture (2012).
For the Japanese thatching, Kunihiro Ando's *Ethnology of Thatching- Minka as Living Technology-* (2004) (茅葺きの民俗学 - 生活技術としての民家) describes thatching in social and cultural perspectives. Different roof types in Japan were reported in depth by Edward S. Morse in the late 19th century and today by Naoji Sugimoto in *The Japanese Minka Regional Study* (2011) (日本民家の研究　その地理学的考察).

About OAM:
There are numbers of research about the history of OAM. The history of Scandinavian and Japanese OAM is researched by Tomoko Ochiai in *The research of Open-air museum* (2009) (野外博物館の研究). Mattias Bäckström discusses the origin and ideology of Skansen in *Loading Guns with Patriotic Love: Artur Hazelius's Attempts at Skansen to Remake Swedish Society* (2011). Criticism to OAM is made by many such Kevin Walsh (1992) and Mills Stephen F (2000) to name few. Roles of OAM for today and future are discussed by museum practitioners, which can be read at for example an anthology *On the Future of Open Air Museums* (2008).

About ICH:
Intangible Heritage (2009), an anthology edited by Smith Laurajane and Akagawa Natsuko introduces the concept, history, various aspects of ICH. The relation of ICH to museums is considered by Yoshida Kenji (2004), Musinguzi and Kibirige (2009), du Cros Hilary (2012) and Alivizatou (2016).

1.7. Limitation

This research has some limitations.

While there are many countries where thatching and OAM exist, I chose to research the situation of Sweden and Japan. I focused on the two countries because I have gotten a chance to live in both countries and knew some craftsmen as well as museums which I thought it would be interesting to compare. It could have been a better research if I could include the situation of England which is famous for their thatched country houses and OAMs as well as The Netherlands which has many modern thatched buildings.

OAM in this research is the one which focuses on the country life that is related to thatching, not industrial OAM.

The fieldworks were conducted by considering to cover various OAMs in sizes and regions but it was affected by the cost and time limitation.

The interviewees were found through websites of thatching and OAM organizations in both countries. I am very aware of that the obtained data is too small to represent the current situation as there would be more museums and thatcher which I could not find.

This research deals with the representation of craftsmanship but it will not describe the craftsmanship itself in detail, for instance, the roof structure and process of thatching. I have tried thatching in total three times in Japan and Sweden but that was not enough experience to describe the craftsmanship. Instead, this research analyzes the representation of thatching at OAMs.

When describing each country's situation I used their original sources. My limitation in Swedish was a hinder and it perhaps resulted in the amount of information and length of description. Regarding the accuracy of the translation from Swedish to English, I asked native Swedes to check my translation.

2. THATCHING IN JAPAN AND SWEDEN

This chapter introduces history, material, types, techniques, life around the roof and the current situations of thatching in the two countries.

2.1 Japan

2.1.1 History, names, and materials

Thatching has been carried out since probably Jomon period about 10,000 years ago. Excavation suggests that straw, bark, and mud were used to roof the pit dwellings (Kanagawa Prefectural Museum of Cultural History, 2015).

In Japanese thatched roof is often called “Kaya-buki-yane 茅葺き屋根”, sometimes “Kusa-buki-yane 草葺き屋根” or “Wara-buki-yane 藁葺き屋根”. “Kusa 草” means grass in general, “Kaya 茅” means reed that refers to “Ashi” or “Yoshi” (Phragmites australis) grows in seaside and “Susuki” (Miscanthus) or “Karisyasu” (Miscanthus tinctorias) grows in mountainous area, and “Wara 藁” means rice straw or wheat/ barley straw which were available from rice and wheat farming (Ando 2004, p.17-18).

2.1.2 Documentation of thatched roofs

Thatched roof on people’s house, often called Kayabuki Minka (min refers to people and ka means house), was documented and studied especially during the end of the 18th century to the 20th century when Japan experienced a drastic change in lifestyle. Here I would like to introduce three people with their documentation of thatched house.

The fig one was drawn by an American zoologist Edward Sylvester Morse (1838-1925) when he was staying in Japan in 1877 to 1883. He made thorough documentation of the Japanese houses which were published as *Japanese Homes and Their Surroundings*. He described the Japanese residence as simple and colorless (Morse, 1961, p-6-7) but roofs were picturesque that differed from one province to another (p.91). He documented various thatched roofs in the country sides and suburbs, wealthy house’s thick roof with an elaborated ridge and poor hat in city made of “chip, paper and straw” (p.49). His observation was made when the Western systems of education, military, economy, and architecture were rapidly introduced to the country. Facing the tempestuous period, he forecasted the future of the folk houses as “may be difficult, if not impossible, to obtain” where “profound changes have already taken place and other changes are still in progress.” (p. Introduction 9-10).

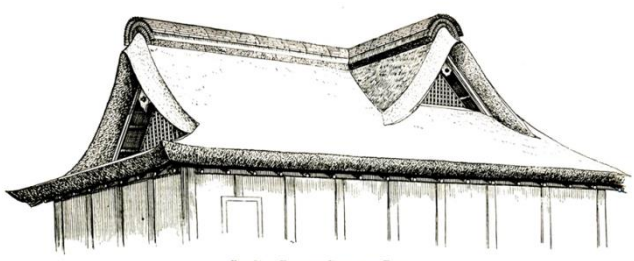


Fig. 83. — Thatched Roof, near Tokio.

Fig 1. Irimoya roof in Musashi region.

The second image (fig 2) was drawn by Kon Wajiro (1888-1973), who was an architect and a member of a folklore study group called Hakubou-Kai. In this period, more and more westernization spread to common people's fashion, food and living and urbanization started. Kon and other scholars researched country sides living situation and folklore in the 1920s which his sketches became a book, *The Japanese Minka*. When the book was re-published in 1954, he wrote that what he had observed in 1920s is disappearing day by day and someday the houses would totally disappear and his report would be of great value (Kon, 1989, p.15).

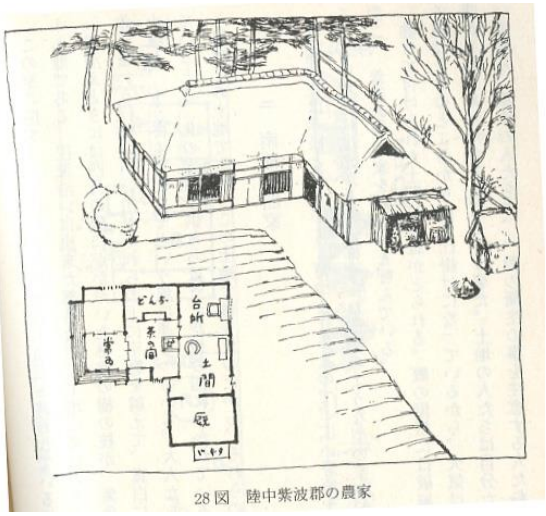


Fig 2. Magariya house in Iwate prefecture.

The third image (fig 3) was photographed by Yukio Futagawa (1932-2013), an architecture photographer. Together with architecture historian Teji Ito (1922-2010), he traveled all over Japan and documented vernacular houses in the 1950s which were published as *Nihon no Minka* (*The Essential Japanese House* in English) of 10 volumes divided into regions. He perceived Minka as truly beautiful and wanted to record them (Zimmerman 2015, p.734). His photograph is artistic than scientific documentation as it cuts out a part of a building and shows it in contrast to nature. Such artistically flamed images of old houses were no longer the common houses of people in the 1950s but they were regarded as beautiful.

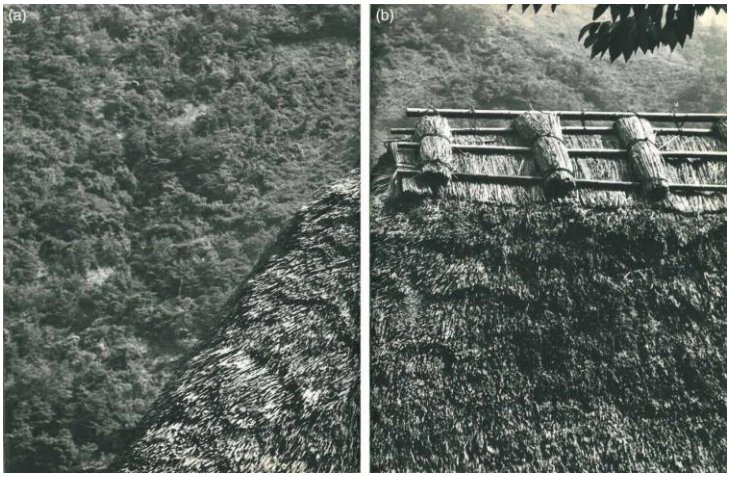


Fig 3. Nihon no minka (1957–59): Volume 8, Shikoku, Plate 29.

These three people were one of the people who shared somewhat like a mission for documenting the vernacular houses which were disappearing in the modernization. They documented such houses in words, sketches and images by traveling all over the country.

Some people collected artifacts and buildings and tried to reconstruct the folk life itself which will be discussed in the next chapter.

2.1.3 Types

The major roofs in Japan are classified into three shapes; “Yosemune 寄棟”, “Irimoya 入母屋” and “Kirizuma 切妻” (fig.4). Yosemune type is a hipped roof, consists of four sides. This roof type is largely seen in the country. Having four sides of low roofs, it is said to be wind resistant. Irimoya type is having small windows under the front and back gables, which is said good for taking lights in and smoke out for sericulture or showing the status of the owner, which is popular in the Kinki region, the western Japan. Kirizuma type is a gabled roof. This type of roof is seen where were famous for the silk industry and having large families. The big attic was used for raising silkworms and as living space for some generations of family members (Sugimoto, 2011, p.75-81). Large Kirizuma style roof is called “Gassho-zukuri 合掌造り” which means “hands folded in prayer”, exists in Shirakawa-go 白川郷 in Gifu prefecture and Gokayama 五箇山 in Toyama prefecture which was famous for the silk industry in Edo-Meiji period. The roof is steep, around 60 degrees, which can bear the heavy snow in the regions (Young, 2004, p.84-85). Besides the major three types, there is “Magariya 曲り屋” style that is a L-shaped house. The style is a famous in Iwate prefecture in the northern Japan, which a stable is attached to the main house to keep animals warm in the cold winter. In Saga prefecture in the southern Japan, U-shaped roof known as “Kudo” style is seen which the structure may have developed to bear the strong wind of typhoon which often hits the region (Sugimoto, p.86-87). The uniqueness of roofs reflects the climates and lifestyles in each region.

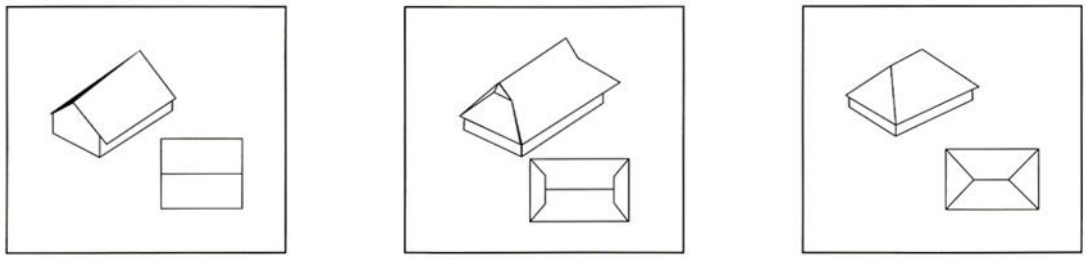


Fig 4. Three roof types.

2.1.4 Thatching

Thatching a roof has been a big event in a community since it often requires a huge labor in the process of growing, gathering the grass and thatching. These processes were generally carried out by a laboring sharing system in each village called “yui 結” (literally means “to tie”), which was also seen in farming, maintaining of roads, water system and so on (Young, p.86).

“kaya” (yoshi, ashi and susuki) grows naturally, but in order to gain high quality (hard and strong) and a large amount of kaya, people maintained a field which was called “kaya-ba 茅場”. The size of a field to harvest enough amount of kaya for one roof is said about 5-10 times as large as the roof so it was common to have a shared field in a village that people worked together when harvesting and maintaining the field. It required a complete eradication of

weeds to grow kaya so mowing and burning of the field in spring to summer was done by villagers. In the shared field system, the right of harvested kaya was distributed to each house every year and sometimes people borrowed and lent kaya between houses (Ando, 2004, p.30-39).

In some villages, thatching was made by themselves by assembling workers from the neighbors or relatives (p.49-53). It took one day to replace a whole roof involving many people which was a village event usually accompanied with a banquet after the completion (p.138).

Those who were good at leading workers, planning the whole thatching procedure and skilled in thatching of difficult parts were admired and gradually became artisans who gained rewards and helped thatching in other villages. They made the roof more lasting and decorative, and worked efficiently, which made thatching less dependent on the village labor sharing system. The skilled techniques of the artisans were passed down from a master to a pupil which created special groups in Aizu (会津, current Fukushima region), Echigo (越後, current Niigata region), Tsukuba (筑波, current Ibaraki), Kishu (紀州, current Wakayama and Mie), Geisyu (芸州, current Hiroshima) (p.69-74). Covering the roof ridge with special ways of finishing called “munejimai 棟仕舞” was developed by artisans, which is beautiful as well as functional to prevent rain drops go through the roof (p.103) (fig 5).

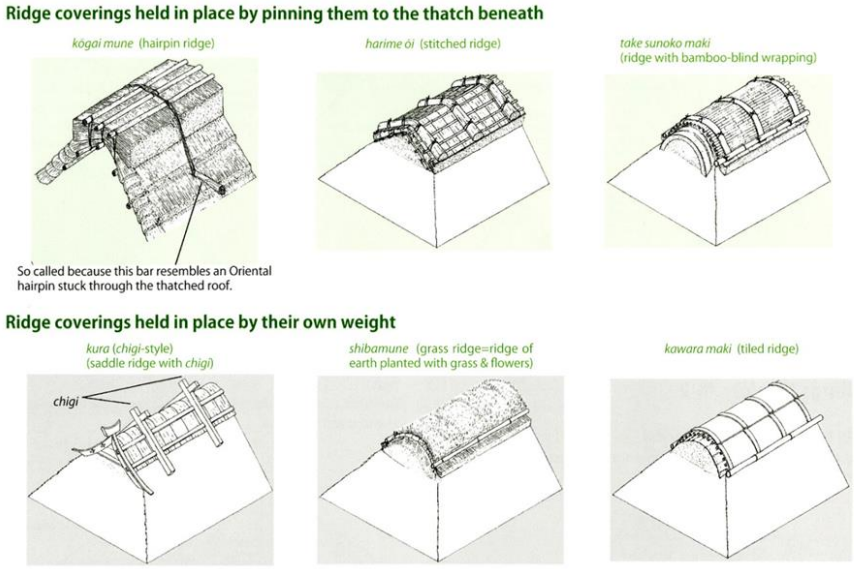


Fig 5. Ridge types.

The roof is re-thatched before it became leaky. The durability of a roof is decided by material, the environment around the roof, and the skill of thatching. Generally, kaya lasts for 20 to 30 years, wheat straw lasts for around 10 years and rice straw lasts for 3 years. Under certain conditions where gets less sunshine, locates far from the fireplace and under a tree branch, a roof easily gets mossy and rotten. The part which is damaged faster than the other part can be reinforced with additional straw. In order to prolong the durability of a roof, it was important to keep roof dried and let rain drops flow by thatching the whole roof evenly in the right angle (p.133-136).

The old straws which got decayed and soot-covered were used as fertilizer for farming. There was a saying “Thatching makes a rice field” (p.143). The Japanese thatched roof is famous for its thickness compared to the European one, and the reason might be explained by its relation to farming (Ando, 2000, p.71). The process of thatching shows the way of living which was deeply related to farming and village community.

Here is how one thatches in Tsukuba style, narrated by Mr. Misao Hiroyama, then 77 years old thatcher in 2009.

The process of thatching begins with an estimation of a number of straws. About 24 bundles of 1.5m rope are used for 3.3m^2 (1 Tsubo). Then one prepares for actual thatching by constructing scaffolds and making the straws into the right length bundles. One thatches from the bottom of the roof truss by placing the straw bundles on the roof truss, putting a bamboo branch on the straw and fixes the straw by sewing in between the bamboo branch and the truss with the straw ropes. With the Tsukuba style, the bottom part can be decorated with a layer of the different color of straws (fig 6). The bottom and corners are important as they decide the grade of the roof. After fixing the bottom and corners next levels can be placed by placing the straws and tying them in between the bamboo branches. Then one hits the straws upwards and makes the surface even with a bumped wooden hitting tool. To keep the ideal grade around 38˚ (8 寸勾配) even is important for drainage and to make a long life roof. To do that, good team work of thatchers while the work is important. The difficult part is the top and valley (a conjunction of buildings) where water constantly comes. On valley one places cedar bark between straws and on the ridge one places extra straws covered by bamboo and weighted with wood. In Tsukuba style Chinese characters (fig 7) of water, a dragon to prevent the roof from a fire as well as luck related characters to invite good lucks are inscribed with scissors on the both sides of the ridge (Katabami and Hiroyama, 2009, p.104).


Fig 6. Decoration of the eave.


Fig 7. Inscription of a character.

Fig 8 to 11 shows making the first layer of a thatched roof in Miyama, Kyoto which I observed in 2016.

Fig 8. Making the first layer.

Fig 9.

Fig 10. Smoothening the surface.

Fig 11. Making the corner and the next layer.

Being thatcher was not easy, Mr. Hiroyama said. One became dirty after working on the sooty old roof smoked for decades by the hearth, and no one taught a young thatcher how to thatch so he learned by himself by finishing lunch faster than his master and studied how his master did secretly. The work required patience. After having sleepless nights reflecting the day's work and working together with strict masters he became a skilled thatcher. Such experience is not common anymore. For today's thatcher, learning by doing is difficult as there are not many works as people stopped maintaining their thatched roofs, and today's young people are used to being taught than learning by themselves. He thinks the utilization of the existing roofs such as at open-air museums is needed for teaching and learning of thatching for the future (p.105).

2.1.5 Today

Nitto Kazuhiko reports that there were 140,000 houses with thatched roof in Japan in 2002 which is the thirtieth of the 1960s number and 99% of them were covered with metal sheeting (Nitto, 2006, p.199).

There are several reasons for this decrease. Sugimoto suggests the improvement of rural life standard by introducing of machinery and daily farming after WWII that enabled people to replace thatched roofs with tile. Depopulation of rural communities also caused the decrease of thatched houses (Sugimoto, p.206).

Nowadays it is hard to find a lot of reeds required for thatching as the many shared reed fields are now developed into plantations (p.61). It is also said that skilled craftsmen are decreasing, and the 93% of them are aged over 70 (Nitto, p.200). Under such situation thatched roof became expensive.

Also, the fire regulations make it difficult to keep and make a thatched roof. Article 22 and 23 of the Building Standards Act 建築基準法 requires house owners and architects to use noncombustible materials and fire proof structure for building in the area which is designated by each local government (Building Standards Act).

However, there are some exemptions for the regulation when the local governments confirm the safety (MLIT 2012) and in the area designated as the "Important Preservation Districts for Groups of Historic Buildings 重要伝統的建造物群保存地区 (IPDGHB)" which is a standard created in 1975 under the "Law for the Protection of Cultural Properties 文化財保護法" to preserve old buildings with their surrounding environments. The districts which are designated as IPDGHB can receive financial supports for the repair and disaster prevention program and are excluded from the taxation (Architecture and Other Structure Division 2014, p.2-8).

There are several regions where keep thatched roof as a whole village and being designated as IPDGHB, for example, Miyama-Kita Village in Kyoto, Ouchi-Yado in Fukushima and Shiraraka village in Gifu prefecture. Shirakawago is probably the most known among them as it was designated as the "World Heritage Site" by UNESCO in 1995. The village of 1,710 residents is visited by 1.4 million tourists every year (Shirakawa Village, 2013 &2015). These regions succeed in preserving the thatched roof houses by attracting tourism.

However, Ando points out that the recognition of the site has changed the way the village originally was, as their main business became tourism (Ando, 2000, p.69). Also, conservation of such scenery is not easy as it requires residents' consent for keeping the traditional scenery, accepting tourism and new residents from a city which might cause conflict in the community. As the scenery and tradition belong to the current residents they are always at risk of alteration or loss, not like the one in a museum. Sustenance of community is the most important for the preservation of thatched heritage in those districts.

The diverse roof styles created by the climate and people which have been existed for ten thousands of years through maintenance and succession of skills are today decreasing its role as actual roofs for residence. They have been documented and preserved in books, cameras, museums, and in situ by transforming into a touristic site. The situation today is polarized into being preserved by museums or authorities, or barely being stayed on private's house. New use of thatching is hardly recognized as there is a high limitation by the Building Act.

2.2 Sweden

2.2.1 History, names, and materials.

It is difficult to say when people began thatching in Scandinavia as there is seldom a remnant left. In Ginderup in Denmark, some fragments of straw were found from the excavated ground from BC which might be used for roofing (Hedin, 2001, p.14).

In Swedish, thatched roof is called “Stråtak” (straw roof) which covers all kinds of grass namely “Vass” (Phragmites communis or reed) “Halm” (Rye - Secale cereal, Wheat - Triticum aestivum), “Ag” (Cladium mariscus), “Säv” (Scirpus lacustris) and “Elefantgräs” (Miscanthus). Among all, reed is the most common today (Svensk Stråtaktäckarföreningen, Teknisk information).

2.2.2 Documentation of thatched roofs

Sigurd Erixon (1888-1968), a Swedish ethnologist, studied thatched roofs in Sweden thoroughly which is published in *Halmtakstyper I Sverige (1948)*. He recorded types and structure of thatched roofs topologically with drawings and pictures (fig 12-17). According to him, documentations of the straw roof in the 18th century were mostly about practical instructions of how one thatched. It was after the 19th century when straw roofs became the subjects of study, especially of history and ethnology.
According to Erixon’s observation, generally, houses, sheds, and shops were thatched in southern Sweden (Skåne, Halland and west Brekinge) where good straw was available and also in Västergötland, Östergötland, Västmanland, and Uppland. In the east part of Svealand, Gästrikland Hälsingland and over Norrbotten, hay barn, sauna, and boat houses were thatched in simple ways (Erixon, 1948, p.53).

2.2.3 Types

Erixon and Hedin classify the Swedish straw roofs into three by its way of placing the straws namely “bundet” (bound), “obundet” (unbound) and “virat” (wound).

Bound roof (fig 12) used to be major in the southern Sweden: Skåne and Västergötland (Hedin, 15). Reed or wheat straw bundles are bound tight between battens and a parallel placed stick. Wicker or straw ropes had been used for binding but gradually it was replaced to galvanized steel threads in the end of 19th century. One began thatching from the lowest part and ended on the ridge which was tightened by extra straw bundles and covered by peat and cray because it was a vulnerable part to wind and rain (Erixon, p.71-76). The method of binding straw roof came to Sweden from Denmark and spread the southern part of Sweden. The advantages of the bounded roof are that it lasts longer than the unbound one. It usually keeps 40-50 years if it is placed right and taken care regularly (Hedin, p.17).


Fig 12. Uthus (out house), Skåne in 1925. Fig 13. Svinhus (pig shed), Södermanland in 1903.

In the northern, central and western Sweden unbound roofs used to be seen. The bundles are kept on the roof by heavy rods which were placed in various ways.
In the central Sweden: Dalsland, Västergötland, Östergötland, Södermanland and especially in Västmanland and Uppland, rods are placed vertically on the straw along the slope from the ridge to the eave. The rods are assembled at the ridge with wooden nails. Moreover, a rod is placed at the eave horizontally to bind the whole rods and to add the weight (fig 13). In the northern Sweden, primary Norduppland but also along Dalälven as well as Hälsinglands and Norbottens coasts, rods are placed horizontally with additional vertical rods on to put weight (fig 14).
Agtaket is also unbound roof which exists only in Gotland. Ag (sedge) is 0.6-1.2m height with bread leaves with needles. The roof is supported by the long rods. The Ag is placed up and packed on the twiggy foundation (p.15-16) (fig 15).

The third type, “virat tak” (wound roof), the bundles are simply wound around the battens. It was found in Värmland, Dalsland, Bohuslän and north-west Västergötland. The straws were gathered into relatively thin bundles that were twisted together at the top of the bundle and then wrapped once around the batten and then connected to the next bundle (p.17) (fig, 16, 17).


Fig 14. Sjöbodar (lake shed), Uppland in 1926.


Fig 15. Uthus, Gotland in 1911.


Fig.16. Västergötland in 1931.

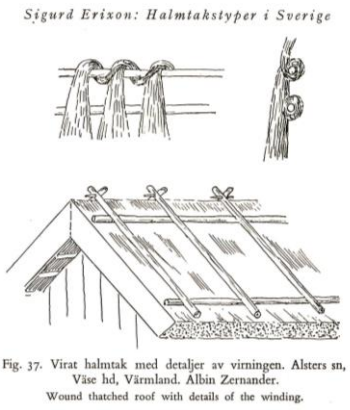


Fig. 37. Virat halmtak med detaljer av virningen. Alsters sn, Väse hd, Värmland. Albin Zernander.
Wound thatched roof with details of the winding.
Fig 17. Sketch of winding. Värmland shed.

2.2.4 Thatching

Among the different ways of thatching, I would like to introduce thatching in Skåne here as it is the major thatching in Sweden that I had a chance to observe the work.

The Skåne region's characteristic long farm houses used to be almost always thatched. The straw was available from rye field but also other kinds of cereals could be used. Straw roof used to be cheap roofing in Skåne as the straw cost nothing but labor. Under the winter the seeds were threshed and cleaned from the rest by a spike. When one could not get enough bundles for a roof repair one bought or begged straw from others (Torgny, 1975, p.91-92).

Here is how one thatches in Skåne, with some pictures I observed on the 18-20th September 2016 in Hembygdsgården in Perstorp, Skåne.
First, the straw bundles are placed on the furthest down of the roof truss (fig 18). Rafters or Hazel rods are placed across over the straw and knotted with wicker in battens. The method is especially good when there is a ceiling under the roof truss and one cannot stick a needle to sew. After the 19th century, it became popular to bind straws with galvanized steel thread with a round needle that goes around the batten (fig 19). After fixing the straw bundles on the roof one evens out the straws with hands. One thatches from bottom to upwards, layer by layer (fig 20). The straw is even out with "täckevragan", the ribbed plank (fig 21).
Sealing of the ridge is always problematic and there are many ways to solve this. Loose long straw (reed) could be placed and anchored with crossed wood or with wire net under the roof tiles with steel wire between. One can also use seaweeds and moss.
When the roof is placed one trims the roof so its surface layer becomes even. One could make a pattern on the roof (fig 22) by laying "täckevragan" on askew and cutting the surface with a sharp knife along the board (fig 23) which was a luxury to do. Lastly, the roof's beard, the lowest edge of the roof, was made straight and beautiful with a long and sharp knife (p.93-95).


Fig 18. Placing the bundles on the truss.


Fig 19. Fixing with galvanized steel thread.


Fig 20. Making the layors.


Fig 21. Täckevragan.

Fig 22. The cut roof surface.

Fig 23. How to cut the roof surface.

2.2.5 Today

By the turn of the 20th century, straw roof was still common in Sweden. But one after another thatched roof has been demolished or replaced to other materials.

There are many reasons to this. The difficulty of getting the material caused by the change of agriculture method is one reason. When hand threshing was replaced to a machine, straw stem became broken and could not be used for roofing (Hedin, p.9). The straw roof was replaced often to shingle roof in the end of 1800 and later to the pasteboard. They cost as much as the straw roof but it keeps longer than straw (Torgny, p.99).

Another main reason for the decrease is its risk of getting fire. The Swedish building code (BBR) which every house has to be checked and meet its strict requirements does not approve reed as a safe building material (Dervishi, El-Zoubi 2002, abstract). It is prohibited to thatch in a highly inhabited area and insurance is expensive because of the risk of fire (p.8).

Yet fire can be prevented by placing fire preventing sheet inside the roof structure. In the Holland method, a wind protection sheet is placed in between the straw layer and the plywood. There is no air space in between the layers which prevents fire's origin (oxygen) and it is good for keeping warmth. The Danish method applies roof sheet made of flame retardant polyester which produces non-combustible gas. It can be placed on the rafters and battens which keep the flow of air that is good for straws. Moreover one can put a sprinkler on top of the roof (p.11-12). If one shuts out oxygen circulation and prevents the roof from fire, the roof seldom catches fire. By applying these modern methods thatching is seen in today's architecture as in Holland (p.8).

Many thatching companies in Sweden have these methods and they explain them on their websites so combustibility will not hinder customer's decision.

Besides houses, thatching is applied to the Swedish nature visitor centers, Naturum, for example in Hornborgasjön, and Tåkern where are the habitats for hundreds of species birds and other creatures. There are two thatched buildings at Hornborgasjön. One is a birdwatching tower, completed in 1986, is octagonal and one can have 360 degree view over the lake (fig 24, 25). The architect Gunilla Hagberg of White arkitekter AB reflects that the building has one of the recurrent themes of Naturum that is to "establishing direct contact with nature, making a single entity of indoors and out" (Lauri, Caldenby and Isitt, 2013, p.43).

The other is a café and auditorium designed by Sten Torsén at Arkitektrum and opened in 2015 (fig 26, 27). The architect explains that he was inspired by the older building technique and a barn (fig 28). The purpose of the building is that it would harmonize with the surrounding and well blend in the sensible environment (Arkitektrum, n.d). In Tåken, there are one birdwatching tower and an information center (fig 29) designed by Wingårdhs. These buildings are completely covered with reeds even walls and are cut smoothly into geometric crystal shape (Lauri, Caldenby and Isitt, p.131).

Fig 24. A bird watching tower.

Fig 25. Inside the tower.

Fig 26. Information center and cafe.

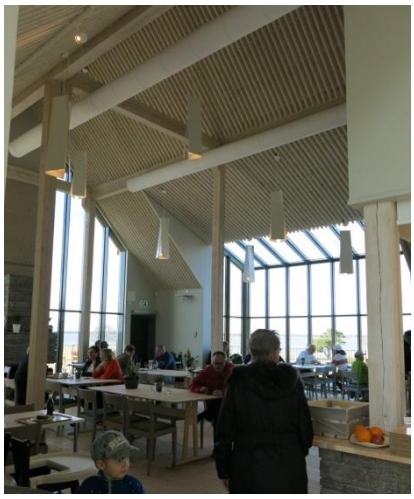


Fig 27. Inside the building.

Fig 28. A house nearby the Naturm.

Fig 29. Naturum Tåken.

The Environmental Protection Agency explains the design of nature visitor centers to be means of environmental education. “Architecture is a part of this experience, and so it is vital that the architecture of the Naturum centers should be of good quality, environmentally appropriate and accessible to all. Good architecture furthers our culture and develops our heritage.” (p.5).

As seen in some of the Naturum architecture thatching can be applied to modern architecture. It is formable to any shape and coexists with surrounding environment. Tradition is seen in new looks.

2.3 Summary

This chapter introduced thatching history, types and methods as well as today’s situation in Japan and Sweden. Their diversity in materials and structure shows how people have lived by adapting to each environment and by cultivating it in a society.

In both countries, decline of such traditional thatching started to be documented during the 19th century to 20th century in the both countries by mainly ethnologists. In both countries the decline was caused by industrialization that brought change in agriculture and lifestyle that efficient machines, cheap and strong materials became available to people. It happened in the end of the 19-20th century in Sweden but after the WWII in Japan.

Today, Building Standards Act regulates thatched roof for safety reason but it is getting possible to thatch modern architecture with fire prevention methods. In some European countries such as the Netherlands, thatched roof is getting popular for modern houses. This current seems affecting Sweden. Many companies work with the modern techniques. The value of thatching is found today in its formable shape and harmony with the environment as seen in Naturum architecture. In Japan, modern thatched architecture is not much heard. Thatching is strongly seen as cultural heritage in Japan as the cases of Important Preservation Districts for Groups of Historic Buildings that attracts tourism.

The next chapter will focus on the preservation and representation of folk life (thatched buildings) at open-air museums and discusses some of the problems and future possibilities. Then chapter 5 will report fieldworks and interviews and discuss situations of thatcher and OAM today.

3. OPEN-AIR MUSEUM: HERE AND THERE, NOW AND THEN

Some thatched roof buildings have been saved from demolition by open-air museums. This chapter sheds light on history, ideology and some arguments on OAM in order to think about the relationship between thatching and OAM which will be discussed in the later chapters.

3.1 Creation of a nation by collecting life of countryside

OAM first emerged in the Scandinavian countries in the late 19th century and spread the world which realized in Japan about half a century after the world first OAM, Skansen.

Skansen was conceived by Artur Hazelius (1833-1901) and opened in 1891. Having huge interests in Scandinavian languages and folklore he traveled around Sweden and noticed that the traditional lifestyle was disappearing in response to the rapid urbanization and modernization. He felt such lifestyle must be preserved before it would disappear and started collecting clothes, artifacts, and furniture of the area. His collection grew and in 1873 he opened the Museum of Scandinavian Folklore, today's Nordic Museum. It is said that he conceived the idea of exhibiting objects with its context at the Paris Great Exhibition in 1878, which he got the gold prize on the Swedish exhibition he designed. He wanted to establish a new style museum where visitors could experience the whole environment. In 1891, he acquired land and reconstructed houses and farms, Sami camps and workshops and mills from over the country. Folk dances and custom-related events attracted many people (Ochiai, 2009, p.112-116).

Mattias Bäckström sees Skansen as "a socially reforming institution." (2010, p.69). According to him, the original Skansen reflected Hazelius ideal society. Hazelius was influenced by the Romanticism, Darwinism and the role of women in society. Objects, houses, and clothes were studied scientifically and represented as a lively environment that romanticized the image of the past and countryside. Women who involved in the activities represented themselves as care takers of pedigree, moral and homestead tradition. Skansen was planned to mitigate the social change by modernization and to unite people with the idea of loving, social moral and tradition. Their activity was, however, mostly of and for the bourgeois (p.76-84).

It gave people a united image of the nation by representing folklore from all over the country and an amusement feeling similar to the one of traveling. It rapidly spread to Scandinavian countries as following: Frilandsmuseet of Denmark in 1901, Norsk Folkemuseum of Norway in 1902 and Seurasaari of Finland in 1909 (Okazaki, 1978, p.9).

There were rising of nationalism in the Scandinavian countries then. Until 1905, Norway was a possession of Sweden so Hazelius who supported the Scandinavism collected a storehouse from Norway in the museum to show the unity of Scandinavia (fig 30). On the other hand, there was a rise of an independence movement in Norway. Hans Aall (1869-1946) opened Norsk Folkemuseum in opposition to the Hazelius' idea for uniting Scandinavia. In Denmark, Frilandsmuseet started from four buildings which all of them were from the former Danish provinces of southern Sweden and northern Germany which is said the founder intended to teach the sense of Danish belongings to the young people (Maruyama, 2013, p.40-43).

As their history shows, the first open-air museums emerged in response to the formation of the modern nation which accompanied with the urbanization, the disappearing country life, and the rising nationalism. Collecting materials from all over the country and showing them to the public were the acts of defining the nation which played a role in fostering national identity among people.

Fig 30. A storehouse form Norway.

3.2 Spreading open-air museum

OAM was perceived as a new museum in the museum history because of their experience-based exhibition about ordinary people that was differed from the conventional museums.

The early Scandinavian OAMs were reported by some Japanese scholars such as Kuroita Katumi, Tanahashi Gentaro, Shibusawa Keizo and Kon Wajiro.

Kuroita Katsumi (1874-1946), who was a historian and a leading figure of the conservation movements of historical sites and national treasure in Japan, visited Scandinavian museums while studying abroad in Europe in 1908-1910. He described Norsk Folkemuseum as “a park in museum taste” and Skansen as “a museum accompanied by a zoo” to explain the new way of exhibiting materials. He was impressed by the OAM atmosphere as he could learn the fashion, custom, arts, work, and hobby of the people of the countries while having a feeling of traveling. He suggested the needs of such museums in Japan (Ochiai, p.29-35).

Tanahashi Gentaro (1869-1961), who contributed to the development of the Japanese museums such as the establishment of the National Museum of Nature and Science and the enactment of the Museum Law made a report on Skansen when he studied in Europe at the beginning of the 20th century. He introduced outside exhibition as it enables exhibition of buildings and visitors to learn through their senses (p.43, 50).

Kurosaka and Tanahashi reported the new experiments in the Scandinavian countries but they did not create one in Japan. It was Shibusawa Keizo (1896-1963) and Kon Wajiro (1888-1973), who planned its establishment in Japan.

Shibusawa was on a business trip to Europe and visited Scandinavian countries in the end of August 1924 for a month (Shibusawa, 1993, p.164).

Shibusawa's article to *Asahi-Shinbun* (1959. 11.29):

> Museums in Japan could be dated back to the one opened at the Yushima temple in Meiji 5 (1872) and now there are various types of museums in Ueno area, but mostly they are indoor museums. Skansen in Stockholm, a small one in Oslo, and Friland Museum in Copenhagen, preserve rural houses of the countries in large parks. Staffs wearing traditional clothing, animals, and farms consist of a life in the countryside. The museum in Detroit also preserves houses and factory around the industrial period. Japan needs such a grand open-air museum too. There are the incipient developments of such open-air museums in Hoya at Tokyo, Toyonaka in Osaka, Toro, and other regions. (Shibusawa, 1992, p.521-523).

Here, he introduced the open-air museums abroad briefly to the newspaper readers who knew only indoor museums and suggested establishing one in Japan.
His lecture in 1955s:

> Nowadays, statues of Buddha, old architectures, and historical documents are registered as the cultural heritage but I would like to mention that things which common people made are also important. Rice is very important for the Japanese which its straw is also interesting to note. It is used as compost, roof, wrapping, rope, sandals, rain coats and so on which is deeply related to our life. Sandals made of straw, therefore, can be a cultural heritage. Such things, including a country house to small tools, are preserved in museums in overseas, as seen in Sweden, Denmark and the U.S. I think we can have more museums of common people in Japan. (Shibusawa, 1993, p.256-258).

He problematized the limited concept of cultural heritage and suggested people to look at their daily life which is as important as the Buddha statue. He introduced OAM abroad to preserve common people's lifestyles.

Overall, Shibusawa seemed to have a good impression on OAM as a mean of preserving and exhibiting the folk life and he wished to open such museum in Japan.

Kon Wajiro traveled Europe and the U.S in 1930 and dropped by Oslo and Stockholm in July (Ogiwara, 1990, p.158). He reported his impressions on the open-air museums in letters to his family.

Impression on Skansen (Stockholm, Sweden):

> Honestly, I was disappointed by seeing Skansen. It was too urbanized. Compared to that, the one in Oslo (Norsk Folkemuseum) had more atmosphere of the country life even it was not completed yet as a museum. In Skansen there were too many visitors in urban fashion, the streets were planned in a city manner, and the bench was as the one in a park and the

> theatre was too simply made. The museum has a long history, but I felt it was commercialized and popularized that lost their original purpose of a museum as an educational place. (p.76-77)

Kon studied architecture and collected Minka all over Japan in his sketchbook in the 1920s. Shibusawa was a business man who had a great interest in folklore that he opened his house as a salon for the researchers, named as Attic Museum, to conduct folklore studies. They collected over 2,000 objects and studied them in relation to society and environment (Maruyama, p.75). It had been Attic Museum members' dream to establish a national museum of ethnography by using their collection and documents to promote the Japanese culture including the common people's life as well as the high-class culture (p.204). They made an OAM plan designed by Kon for the memorial project of 2600 years of Imperial reign in 1940. It was designed in an open-air style, having various types of buildings from several regions such as working huts, farmhouses and religious objects (p.101-103) (fig 31). However, the national museum of ethnography did not realize because of the WWII circumstance. When it realized in 1974 it became an indoor museum (fig 32).

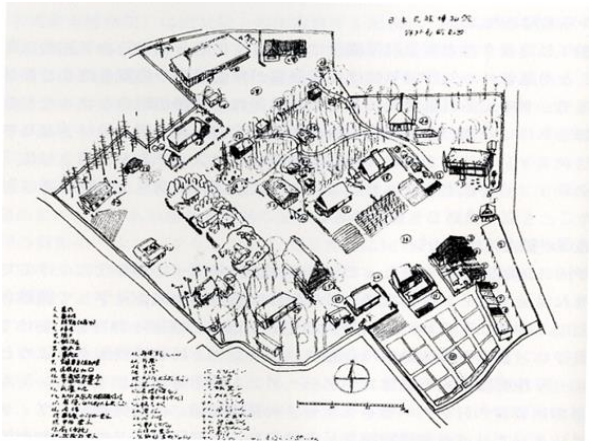


Fig 31. The National Museum of Ethnology.

Fig 32. National Museum of Ethnology.

It was during the economic growth when OAM began to be established in Japan. There were increasing concerns on the disappearing old buildings and traditions as well as urbanization. There were needs for preserving the historical buildings and creating relaxing space in the highly urbanized and individualized cities (Ochiai, p.159). The first OAM in Japan, Open-Air Museum of Old Japanese Farm Houses which was established in 1956, was launched by taking a gassho-style house in Shirakawa village that was about to be submerged by the dam construction. The house was purchased by the Kansai region electric company and donated to Osaka government. Toyonaka City got the house and made it as a museum, supported by donations from citizens. The opening mission was to become a cultural center of the western Japan, to serve as an educational institution for the young people, and to attract adults and foreign tourists (p.105-107). Similarly, The Japan Open-Air Folk House Museum opened in 1967 started with a restoration project of a house in the region. The original plan was to create an OAM that represents Japan to serve as common *Furusato* (home) for the Kawasaki city citizens (p.109-110).

What drove the early OAMs was a mission to preserve the disappearing country life and to arouse a sense of identity by activating the traditions. Japanese scholars were inspired by Scandinavian OAMs but it was during the 1960s when the OAM spread in the country.

3.3 Between academic institution and amusement park

Kon's disappointment on Skansen as being urbanized and commercialized can be explained by the fact that Skansen was made for the city people. Its purpose was not just to document and preserve the artifacts but to create and represent what Sweden is by recreating the whole environment, having first person interpretation (staffs wear folk clothes and play the role) and events.

It was not only Kon who wondered the character of OAM. Kevin Walsh points out that OAM and heritage sites are similar to Disneyland, which opened in 1955, where the history flavored townscape gives "the trip back in time" feeling which makes the site successful in attracting people. Similar to Disneyland, OAM gives an experience of time travel often without detailed explanation and by representing only beautiful images and not dark and harsh side of the past. The younger generation who does not know the life back then will believe the representation as it is. Yet it is impossible to make a perfect reconstruction and representation of the past at OAM. One cannot experience the poverty and hardworking of the past at OAM. Still, museums can control their representation not to be only entertainment but academic one by explaining about the difficult topics and relate them to the present. The past is not an otherworld but contingency to today. Without narrating the past objectively people would get lost in the constructed image which fosters "a sense of historical amnesia" (Walsh, 1992, p.97-103).

First person interpretation, a method of representation which museum staffs wear clothes and talk as people in the past did, is a good example of the ambiguity in the OAM exhibition. It helps visitors leaning when they interact but it can also give a fixed, often beautified image of a past that becomes like an entertaining show (p.104).

Walsh summarizes heritage representation as a structure that makes the past as "another country". In this structure, history is represented as something of the past and not a process (p.115). This contributed to modernization that was about urbanization, industrialization, and nationalization, which was all about distancing people from their village and tradition. By collecting and representing once ordinary life as something past the progress of modernity became apparent. At the same time, the recreated tradition and country sides gave reassurance for people in the rapidly changing life and an image of a united nation (p.178).

OAM has played roles in the modernizing society and attracted people by being both academic and entertaining place. Struggles might be OAM's deem as it locates here but deals with there, exists now but shows then.

3.4 Future of open-air museum

The world's most creative museum has changed its character since its emergence. In 2007, leading OAM members discussed the future of OAM at Skansen. Here I will introduce some of the topics which were discussed there.

Jan Vaessen, the director of Netherlands Openluchtmuseum, argues that OAM should change as the society changes just as it emerged by responding to the big social change in the 19th century. Today OAM should accept many identities of the public and be a place for them (Vaessen, 2008, p.22-31).

Thomas Hylland Eriksen also calls a need to redefine the mission of OAM. The experience and scenes people would enjoy at OAMs in the 19-20th century do not mean the same thing today. People are surrounded by many entertainments such as travel, TV, and games today which they don't have to go to OAM for that. Instead, Eriksen finds OAM's strength in offering sensual experiences in the historical and natural environment which is difficult to experience in the city life (2008, p.41-43).

Hannah Mellemsether claims that "OAM can change" in her article (2015). She describes that current OAM has become static, material focused and getting a history flavored touristic site/ amusement park. In order for collections from the past to become relevant to today's society, the museum collections should be placed in dialogues by involving local groups. For example, OAM can be a perfect place for environmental education by collaborating with NGOs and community and by using its collection and space that narrate the history of human and nature (p.272-280).

Some OAMs update their exhibitions by including current aspects. For example, Norsk Folk Museum which was established in 1894 is today trying to show the diverse and changing Norwegian society. Since the 1990s they have started to include 20th century's buildings and youth and immigrants stories in their collection (Vaessen, p.90). Den Gamle By which recreates Danish life from Renaissance had an exhibition on homeless for 2 months in 2012 by setting a homeless man's dwelling at the museum and there he actually dwelled until he found a place. It was enabled by the collaboration between the person, museum, and association (Laursen, 2015, p.195). As the project was about contemporary life and a real person, the reaction from the public was big and controversial. The museum explains that the exhibition would fit in their mission on telling how people live in different periods and social situations. The exhibition became a place for people to meet others who they usually pass by on the street. Laursen believes that besides museum's conventional roles in studying and preserving the past, they have a role in taking care of the present aspects which are undermined and documenting them as it will be a part of the history in the future. "We can extend the limits of what we can do as a museum." (p.199-201).

These points are important for OAM to keep being an unconventional museum and not to become the storage of old objects or an amusement park which does not tell any history. OAM emerged by responding to the society's needs for example unity of people, secured feeling and a new role of women. These ideologies are no longer so much relevant to today's society. As our society is changing OAM does not have to stick on the original ideologies and representation of them. It is important to tell the history but it can be narrated in different ways to fit for today's visitors.

My question here is if OAM makes thatching frozen in the past or not. As Norsk Folk museum decided to show modern apartment and as Den Gamle By had an exhibition about the contemporary aspect of poverty perhaps more things could be narrated with thatching. How about cultivating straws or building modern thatched houses in OAM, for example? How much and to what extent can visitors experience thatching at OAM? Are aspects besides the roof itself narrated and shown?

Before asking these questions to OAMs I will reflect on some concepts related to thatched building and craftsmanship in next chapter. These concepts are important when thinking what kinds of aspect of thatching can be represented OAMs.

4. CONCEPTS OF ARCHITECTURE AND INTANGIBLE CULTURAL HERITAGE

This chapter discusses thatched roof from aspects of architecture and Intangible Cultural Heritage and suggests OAM to take these concepts in its exhibition.

4.1 Nature of architecture

As a thatched roof is a part of a building, it is also an architectural element. Thus, ideas about architecture are important when discussing what thatched roofs represent. In this section, I apply Simon Unwin, Juhani Pallasmaa, and Anke Gröppel Wegner's arguments about the nature of architecture.

4.1.1 Basic elements of architecture

Simon Unwin analyzes basic elements of architecture (2009). He defines architecture as a combination of elements for the use of a space. A roof is one of the basic elements of architecture among ground, wall, path, and windows (p.37-39).
Under a thatched roof, there was most often a hearth. The hearth has been the most important focus in a house which provided warmth, cooking source, and light where gathered people (p.83). It was therefore located in the center of the house but when gas and electricity became available hearth disappeared from houses.
In Sweden, open hearth was probably used since the Iron Age but the iron oven was introduced in country people's houses in the 18th century (Togny, p.11-14). In Japan hearth was used until recently especially under the thatched roof because the smoke from the hearth was regarded good for keeping the roof dry and away from insects.

4.1.2 Vernacular architecture

Thatched roof building is vernacular architecture, influenced by geological and cultural conditions. Architecture critic Juhani Pallasmaa states that "A culturally adapted architecture is not merely a matter of visual style, but of the integration of culture, behavior, and environment." (Pallasmaa & MacKeith, 2012, p.267). Thatched roof building is exactly an example of such architectures, as it has deep connections to the local nature and culture that I introduced in chapter II.

4.1.3 Decay and fear to death

Vernacular architecture is made of organic materials such as wood, mud, and grass. They age, decay and decompose to the soil. Contrary human has built grand stone architecture to leave their mark on the earth. Pallasmaa analyzes that such eternal architecture shows human's aspiration to immortalize life (p.310). Vernacular architecture, on the other hand, let people experience fragility of life and acceptance of death (p.314-315).

Thatched roof is vulnerable that needs to be rethatched in every 20-40 years. After exposed to wind, rain, and sun for decades, it gets thinner and rotten. Then people would thatch again with newly harvested grass and succeeded methods. With regular maintenance a roof can live

for hundreds of years, said a Japanese thatcher (Katabami, 2009, p.107). Life and death in the thatched roof are cyclical. If there are materials and skills the roof would be immortal.

Pallasmaa observes a paradigm shift in modern architecture. Architects' attention is shifting from eternity to the sustenance of nature (p.316). The tendency is visible in thatching too especially in Netherlands, Denmark and Great Britain where modern thatched architecture is getting popular as it is regarded as fashionable and sustainable.

4.1.4 Experience, senses, and identity

Pallasmaa thinks that the essence of architecture is not in its appearance but in how its structure and material are experienced by people (McCarter & Pallasmaa, 2012, p.5). In his essay, *The Eyes of the Skin: Architecture and the Senses*, Pallasmaa critiques today's architecture as vision centered that is eye appealing with use of advanced technologies but lacks a sense of home that could be experienced by involving all other senses (Pallasmaa, 2005, p.19). Architecture gets standardized and people lose their identity. Pallasmaa calls for architecture to activate senses which are not only eyes but ears, nose, skin, tongue, and muscles (p.34). Through those senses, people identify place and the moment which is also about recognition of self (Pallasmaa & MacKeith, p.75). Therefore he says "the task of architecture is to make visible how the world touches us" (Pallasmaa, 2005, p.46).

Anke Gröppel Wegner continues thinking about experiencing architecture in the museum context. She argues that museum architecture's performative nature is often underestimated. Visitors experience the building by walking around inside and outside and feeling sounds, lights and smells that are created by the building (2011, p.39-40). She suggests museums to be more aware of the experience in architecture itself that "can be the beginning of new, original learning experiences that are fully grounded in the powers of the real" (p.51).

How are thatched buildings experienced? And how about when they are in OAM?

4.1.5 Experienced thatched roof buildings

Here I would like to talk about the experience of myself and people I met.
In summer 2016, I worked at a 150-year-old thatched house inn for one month. I cleaned the house of 200m^2 every day which took three hours by three people. Every morning we had to wipe off dust, dead flies and reed stem because it had a bare roof that one could see straw bundles directly from the inside (fig 33). After this job, I realized that it would be a quite labor to live in such a traditional thatched house. One 40 years old part time worker who used to live in such thatched roof house told me that she did not like her house when she was young as it was so dark because of the thick low roof (A staff, personal conversation, Aug 5, 2016). On the other hand, I thought it was cozy about the darkness and the smell of the grass which I had never experienced. Many guests leave comments after staying at the inn that they felt as "time had stopped" or "authentic culture of Japan" (Miyama FUTON&Breakfast, n.d).

The inn provides an experience of staying in thatched roof house. People come to the inn from cities or even overseas, stay there for few nights, experience the darkness and smell of organic materials, and go back to their home. Countryside and thatched roof house which once was abandoned in the course of modernization attract tourism today. The experience in nature, accumulation of culture and time seem to attract people. When I interviewed the CEO and also himself a thatcher, Mr. Nishio, he said that this kind of business helps thatching as it

enables the daily care of the abandoned thatched houses (Mr. Nishio, personal conversation, Aug 8, 2016).

Fig 33. The inn's inner roof.

Fig 34. Scattering the old bundles over the field.

I also experienced thatching. In Japan, I helped to take off the old thatched roof and in Sweden, I placed, tied bundles, and hit them into a smooth surface for 1km^2. I got thirsty, muscle ache, tanned and got dusty in a lot of reeds. It was then I learned a bit more about what thatching really was through all of my senses. I even tasted it through the dust when I scattered the old straws over a field (fig 34).

Thatched roof can be "seen" on a picture and at OAM, and then can "be sensed" more by staying over a night, and then can "be part of" muscle, knowledge, and memory of oneself by actual thatching. The experience of architecture will be deepened from sight to more complexed senses as Pallasmaa said.

Pallasmaa's main argument, "Architecture must be experienced", applies to the houses in museums too. A museum is not an inn or a residence. However, their architecture can still provide sensual experiences as Wagner stressed. The point here is if OAM considers those thatched roof buildings as something to be experienced or only to be looked at. It will be analyzed at observation section in the next chapter.

4.2. Intangible Cultural Heritage

Thatched roof is not only a part of house or barn but is a way of life, attitudes towards nature and craftsmanship. It is not enough to preserve the roof itself but safeguarding the context too.

The concept of such intangible aspects of heritage grew in the 20th century as a response to the Western material focused heritage discourse. Many heritage sites were created during the 1970s to 1980s and the World Heritage Convention (WHC) was established in 1972.

WHC's purpose is to recognize and safeguard both cultural and natural heritage in the world which is under the threats of destruction and disappearance. Its international structure provides conservation knowledge and funds to achieve the purpose. It defines "cultural heritage" as monuments, groups of buildings and sites, and "natural heritage" as natural features, geological and physiological formations which are outstanding from the points of art, history, science, ethnology, and anthropology. Every state party in this convention is supposed to make its own inventory of heritage in its territory and the one which has outstanding value is nominated to the committee's "World Heritage List" and the one which

is threatened by serious and specific dangers is registered as "List of World Heritage in Danger" to receive immediate help from the fund (UNESCO World Heritage Centre).

Following the idea and system of WHC but to cover wider culture, the Safeguarding of the Intangible Cultural Heritage was adopted by the 32nd session of UNESCO in 2003. It defines ICH as:

> The practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.

ICH is categorized further into five aspects:

> (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
> (b) performing arts;
> (c) social practices, rituals and festive events;
> (d) knowledge and practices concerning nature and the universe;
> (e) traditional craftsmanship.
> (UNESCO Culture Sector, Intangible Heritage, 2003, *Text*.)

In its text, ICH is mentioned as an important concept which works together with Human Rights and Sustainable Development, which needs to be safeguarded as it is under threats of disappearance caused by globalization and social transformation. The purpose of the convention is to safeguard and raise awareness of ICH at local, national and international level by providing knowledge and funds. The important point of this concept is that it respects the meaning of the ICH to the people who express it first and foremost. ICH has its existence only through enactment by practitioners. Therefore involvement of practitioners and local communities in the decision-making and management processes is important.

Thatching has aspects of ICH in sense of domain (c) social practices, rituals and festive events; (d) knowledge and practices concerning nature and the universe; and (e) traditional craftsmanship. As the chapter II described, thatching has been an activity produced in relation to environment and society. Not only the roof itself but how people made it needs to be recognized and safeguarded because otherwise, it will disappear.

Ise Jingu, the Shinto shrine in Mie prefecture in Japan would be the "oldest" thatched building in the world that sometimes appears at WHC and ICH discourses. The shrine is famous for Shiki-nen Sengu that is a ritual of renewing every part of shrines every 20 years since the year 685. There were some opinions in the country to designate the shrines as WHC which Japan signed in 1992. However, the different view on authenticity between Japan and

WHC became apparent and it did not realize. The regular renewing ritual did not fit with the WHC's view that put a value on the conservation of the original materials (Ise City, n.d,).

The concept of authenticity was affirmed in Charter of Venice in 1964 that forbid moving of any part as the historical layer should be preserved in the original state (Sand, 2015, p.143). It caused conflicts between countries which have wooden building tradition that requires dismantling and partial repair. It was updated in 1995 by Nara document of Authenticity that authenticity should be judged based on various source information such as "form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling, and other internal and external factors" rooted in each cultural context (ICOMOS, 2012). This argument process from materiality to intangible aspects resulted in the enactment of ICH (Sand, p.148).

Kenji Yoshida argues that WHC discourse that considers the shrine "new" is a material based and lineal way of thinking. The ritual, spiritual connection to gods and nature are expressed by renewing the architecture for every 20 years, has been passed down for centuries. It is a sincere tradition and therefore he regards the shrine ICH (2004, 108) On the other hand, Jordan Sand critically looks at Ise shrines as a metaphor to promote nationalism and opposes to accept them as 'the common heritage of humanity' (Sand, p.151).

I do not think that the shrines should be designated as WHC or ICH because they do not have to be preserved or promoted by such international systems.
The important point about ICH is not about enlistment but recognition and safeguarding of the intangible aspects.

Museum, which has been a cabinet of materials, started to recognize the importance of ICH too. ICOM includes ICH in its definition of a museum in 2007 and UNESCO suggests museums to play role in safeguarding of ICH (Du Cros, 2012, p.4).

The concept of ICH enables museums contextualization of objects and cooperation with the community (Alivizatou, 2016, p.51-52). For instance, objects that were taken to Europe under the colonization are gaining their context back at exhibitions or are repatriated to original holder (Yoshida, 2004, p.110).

There are some ways of introducing ICH in museums such as recording of practices, performances, and oral histories and organizing events that involve tradition bearers, artists, and performers. However, there are some difficulties here. It is costly to use video recordings and it materializes the living performance to one expression in one record. Furthermore, events and performance at museums might distort its original significance (Alivizatou, p.51-53). The way of inviting practitioners should be careful not to impose their privacy and human rights and should be today's figure, not the retrospective one (Du Cros, p.4).

Even though there are some difficulties, the inclusion of contexts and people will make the museum collection and activity much richer and meaningful. The museum is no longer repository of artifacts when it deals with ICH.

Enactment of ICH could be done in many ways. OAM has already deep contexts to objects as it recreates households, village, and scenery (Mills, 2000, p.82). It is also active on making interactive exhibitions. Musinguzi and Kibirige (2009) report activities at Bakoni Malapa OAM in South Africa that they demonstrate traditional dance performance and crafts

techniques of the region which are at stake in the changing society. The OAM plays important role in succeeding craftsmanship and local identity.

As mentioned before, thatching's attitudes towards nature, relationships in community and craftsmanship are considered as ICH. How can these be safeguarded at OAM where the life is gone from the houses but simulated by decorating according to the documents, where the relationship among the villagers is replaced to one of visitors and performers, and where the craftsmanship is outsourced from somewhere else?
Much of the original ICH lost when the life changes and relocated.
However, it is early to say that there is no ICH at museums. As ICH convention recognizes changeability of ICH (Yoshida, p.108-109) intangible aspects of thatching can be found in OAM too. The museum setting can be a meeting place for people, a living storage for knowledge and nature, and a place for succeeding skills.

5. QUESTIONNAIRE RESULT

This chapter analyzes the online questionnaire I made to the Japanese and Swedish OAM and thatcher. The methods are explained in detail in the *Chapter I.5 Methods*. 10 museums (5 from each country) and13 thatcher (7 from Sweden, 6 from Japan) answered to the questionnaire. The questions are in appendix 1 and 2 and the answers are summarized in appendix 3 to 5.

5.1 Open-air museum

The museums were established during 1873-1997 (Sweden) and 1967-1990 (Japan), mostly municipality founded. Every museum has a similar mission that is mainly about preservation and promotion of cultural heritage such as houses, artefacts, and animals for the benefit of the local society, tourists and the future generations. These missions have generally been maintained since they were established, however, their focus has expanded and their role has changed to meet the needs of modern visitors.

There are total 80 thatched buildings in the Japanese museums and 30 in the Swedish museums. These were moved from the local region or from all over the country and most often reconstructed when they were placed in the museum sites. The oldest buildings date back to the 17th century.

In the Japanese museums, many of the thatched buildings are enlisted as Cultural Properties, designated or registered by the nation or local municipalities. In Swedish museums, by contrast, only a few buildings are protected or listed in authorized systems.

In the Japanese museums, these thatched buildings' original uses are 60% residence, 36% other living related buildings, 3% barn and 1% shop. In the Swedish museums, the original uses are 70% barn and 30% other living related buildings. The high percentage of residence and the low percentage of barn in the Japanese result and no residence and the high percentage of barn in the Swedish museum perhaps reflect how people thatched when those museums were established. There was still a large number of thatched residences in Japan which were getting to be demolished and moved to the OAM in the 1950s onwards. In Sweden, the situation was different. Ove Torgny writes "Towards in the end of 1800s the straw roof was replaced with shingle roof, pasteboard and tiles" (Torgny, 1975, p.97-98) which probably many residence roofs had already been replaced to tiles when the five Swedish open-air museums were established. Barn and other buildings had kept straw roofs as they did not require a high quality and expensive roof.

Reconstruction of the life around the building seems to be done in various ways but more variety is found in Swedish museums, such as role playing, keeping livestock and staffs wear costumes, which was not popular in the Japanese museums. It might be reflected by the each country's different development of OAM that the Swedish ones were oriented towards a recreation of folk life and the Japanese ones towards a conservation of architecture itself.

In all museums, re-thatching is generally performed 0-2 cases every year according to the 20-40 years cycle. It takes museum's expense from 6-25% and half of the museums have ever canceled the maintenance because of the cost.

Most of the museums hire thatcher when thatching their buildings. Museums ask them to thatch in traditional ways but when it comes to detail, such as which material and tools to use, they tend to rely on thatcher's choice. No museum takes the lowest cost choice over the succession of the tradition. However, cost is still a big aspect as some museums actually ever canceled thatching due to the cost.

Many museums commented that they have responsibility for their roof to be thatched in traditional method as they regard old methods and knowledge as cultural heritage and to keep the original state which has the value.

Most of the museums open the working site to the public as they want to show the process of making a roof and some museums ask thatcher to talk about the roof structure to the visitors. Otherwise not so much about thatching is narrated at the museums. Out of 10 museums, two have explanation panel about thatching, one exhibits straw bundles, two shows thatching video, five shows tools and two have reed/straw fields nearby the buildings. These numbers could be increased.

Then I set two experimental questions on possible exhibitions which would broaden the image of thatching to its intangible aspects. One was about straw cultivation at the museum in order to make the process local as it used to be and to show the whole cycle of thatching. Responses from the Japanese museums were not promising as they do not have space, cost and people to work on. The Swedish museums were relatively positive to do that in a small size.

The next question was about building a modern thatched house at the museum to show that the craftsmanship is used for the today's needs. It was controversial. In the Japanese museums, two answered that it is out of their role and they have no plan for that. The other two were positive but perhaps in a different way or setting. In the Swedish museums two refused as they do not build new buildings, one had no opinion to say and two were positive with external supports to show how thatching can be used today.

It seems that building a modern thatched building at their site is out of focus for many museums. On the other hand some interested in the idea. Here one could see OAM's ambiguities. They represent the past with historical houses and objects so if they introduce a modern building it might break the atmosphere of the past. However, every house and object are taken care today by both traditional and modern knowledge and techniques. Such knowledge and craftsmanship are intangible cultural heritages that should be narrated to the public. The reluctant but also interested responses from the museums perhaps show the dual character of OAM which deals tangible and intangible heritage and past and present.

Museums have replied that their roles in the future of thatching would be a promotion of thatching to the public and preservation of the traditional thatching by letting craftsmen work in old methods.

However, many OAMs struggle with utilization and preservation of the buildings in the limited money and human resources. It is very important to reconsider their roles in today's society and hold their existence as without them it would be more difficult for people to meet thatching and then the tradition will be seriously at stake.

5.2 Thatcher

The thatchers who replied to the questionnaire are still working and average 20 years' experience in the field. The Japanese thatchers are from different parts of Japan whereas the Swedish thatcher seems to situate themselves mostly in southern Sweden. Some of their working places are famous for the traditional and local thatched buildings such as Miyama village in Kyoto prefecture and Ouchi-yado village in Fukushima prefecture which both are designated as Important Preservation Districts for Groups of Historic Buildings, as well as Skåne region of southern Sweden. Although they work mostly within their region many of them travel widely.

Thatching takes a large portion of their income but many of them work with something else related to mostly buildings. Every informant had around 5-20 thatching cases in the year 2016. In the total Swedish 77 cases, 63% was of private, 23% of museums and 13% of other customers and in the total 57 Japanese cases, 83% were of private clients, 14% of museums, and 3% of another category. The demand for new thatching is described as big in Sweden whereas not many or almost none in Japan. The demand for rethatching is big in Sweden and relatively big in Japan. This means that the Japanese situation is at stake because a new need is almost none and it depends on whether the owners of the 86% cases and museums would continue rethatching or not. There seem to be some tens of young successors with them, but without new and stable customers it will be difficult to guarantee their future. A thatcher wrote in the questionnaire that "Without more needs for new buildings, the business will be severe in 20 years which is going to be high competition in the small share of Cultural Properties". Whereas in Sweden, new need is increasing and some replied they need more thatcher to work, but it was only 2 thatchers who had successors. Because my focus is on OAM I did not study further about the new thatched roof demands which should be studied in another time.

The straw material was mainly Miscanthus in Japan and reed or rye straw in Sweden. None of the Japanese thatchers answered that they use rice or wheat straw. According to a thatcher in Miyama, Kyoto, rice straw is only used when decorating the eaves. Since it is weak to water it has been used as decoration or a covering over the reed roof in certain regions where do not get much rain (Mr. Nishio, email, May 22, 2017).

Majority of the Japanese thatchers involve in material cultivation which is supplied in Japan whereas majority buy the materials from various countries in Sweden. The reason for growing straws by oneself was for one can manage quality and the reason for buying was lack of place, time and people for the cultivation. Where the tradition of growing the material at local is lost one must buy it from distance and most often it is cheaper and high quality than doing it by thatcher oneself. Still, they say the cost for materials and for thatching a roof has become higher than 10 years ago.

OAM seems to be not their main client as its 14-23% occupancy in the total client share shows and only 8 of 13 have ever worked with OAM. However, it is certainly a special client to the thatchers in terms of historicity and promotion. To the question, if there is any difference between when rethatching an old roof at OAM and when thatching a new roof for modern use regarding their choice of roof materials, thatching methods and the use of tools, the most Swedish thatchers said Yes while the most Japanese thatchers said No. The Swedish thatchers mentioned that there were demands from museums to thatch in traditional methods. They use willow twig to bind and do not use screw drivers at OAM for example. Japanese

thatchers mentioned that material, method, and design would differ according to locality and history of each roof but there are no big differences between OAM buildings and the others. The clear difference between the Swedish and Japanese thatchers might be affected by the different situations of both countries that in Japan modern thatching is not big while it is so in Sweden. Probably in Sweden it is getting common that private houses are thatched in modern ways while it is still traditional houses in Japan. Probably that is why answers clearly differed between the two countries, but a further study on current thatched roofs is needed to reason this.

Thatcher's impressions on working at OAM are generally positive that they found it interesting to talk to museum visitors about the structure and cycle of thatching that makes visitors get interested in their work. They enjoy mingling with visitors and think it is important for them as it can promote their works and bring them further works.

For many of the thatchers OAM is an opportunity to promote thatching, a place for keeping the traditional methods, and a source of income. They think OAM could provide thatching workshops for visitors, collaborate with creative ideas, support thatching activity broadly, and have a discussion on the future of thatching.

Their descriptions of the attractiveness of thatched roof had something in common. 8 people mentioned "renewability" 7 mentioned "age beauty", 4 "formability" and one each "strengthening community tie" and its good work environment.
How much of these are narrated to visitors at OAMs will be analyzed in the next chapter.

The data I collected is not big to draw a conclusion for the OAM and thatching situations in the both countries but these answers could hint their relationships.
For OAMs, thatched roof is one of their collections which they take care of its traditional skills even it costs. They do not have much creative and deep explanation on thatching which could be improved. For thatchers, OAM is mainly a place where the regional and traditional methods are kept. On the other hand they think that working at OAM is to meet general public that might promote their work.
More collaboration with thatcher and museums will make OAMs livelier that might also help thatching industry.

6. OBSERVATION OF THATCHED BUILDINGS AT OPEN-AIR MUSEUM.

This chapter will report the observation of thatched buildings at some OAMs in Sweden and Japan. The museums I visited are:

<Sweden>

Name	*Official English name*	*Location*	*Visited date*
Kulturen	---	Lund	October 20, 2016
Fredriksdal Museer och Trädgårdar	Fredriksdal Museums and Gardens	Hellsingborg	October 28, 2016 August 8, 2017
Skansen	---	Stockholm	Mar18, 2017
Vallby Friluftsmuseum	Vallby Open Air Museum	Västerås	Mar 19, 2017

<Japan>

Name	*Official English name*	*Location*	*Visited date*
Nihon Minka Shyuraku Hakubutukann	Open-Air Museum of Old Japanese Farmhouses	Toyonaka City, Osaka	April 28, 2015
Edo Tokyo Tatemonoen	Edo-Tokyo Open-air Architectural Museum	Koganei City, Tokyo	June 14, 2017
Jidayuuborikoen Minka-en	---	Setagaya Ward, Tokyo	May 20, 2015, June 23, 2017
Nihon Minka-en	The Japan Open-Air Folk House Museum	Kawasaki City, Tokyo	June 15, 2017
Michinoku Minzoku Mura	Michinoku Folklore Village	Kitakami City, Iwate	18 June, 2017
Tono Furusato Mura	Tono Furusato Village	Tono City, Iwate	18 June, 2017

The main purpose of my visits was to see how the houses and thatching are shown and experienced by the visitors.

Each observation shows what the museums had when I visited there. They might have different activities and exhibitions another period. The visits were planned to include various regions and both major and local museums but were still affected by cost and time limitations. Considering this I would like to clarify that these observations do not describe the situation of the whole OAMs in the two countries. Still, they will shed light on some tendencies in the representation of the thatched houses.

Each observation is described by following the four observing points, a summary and pictures I took.

Observation points:

1-Brochure and Website: General information about the museum. How they represent themselves.
2-Thatched house and its surrounding environment: What are represented there, how they are used today and taken care.
3-Explanation panels: If there are information about the history of the house as well as thatching.
4-Staffs at the house: What they do and who they are.
*-Short summary of my observation and overall impression.

6.1 Kulturen

1. Kulturen's main open-air museum opened in 1892 and locates in the city center of Lund. The museum site is divided into southern and northern area which consists of about 37 buildings. The museum encourages visitors to "step into our houses and experience life in the city and the countryside" (Kulturen, n.d, *Kulturen in Lund*).

2. There were two thatched roof houses: a priest house (Fig 35) and a smithy (Fig 36). They looked as they were thatched a few years ago. A man who used to work at the museum and now helps out the citizen activity at smithy took me inside of the smithy's storage which I could see the roof was made of rye straw (Fig 37). The inside of the priest house was furnished as if the house owners had left just a few minutes ago. Some rooms were separated from visitors by ropes and glass walls but one could still see the inside (Fig 38). Around the houses, there were an herb garden and a small garden which was maintained by local schools.

3. In front of each building, there was a panel explaining the history, structure, the previous owner, and reconstruction of the building in Swedish and in English (Fig 39). In the priest house, there were panels about interpretive stories of the life of the original residents.

4. There were no staffs stayed in the houses at the time of visiting. In the smithy there were some citizens making crafts (fig 40).

* There was no mentioning on the thatched roof or its craftsmanship at the museum. The life at the priest house in the 18th century was recreated and narrated through the interior and the interpretive stories. The museum seemed to be actively used by the local people for educational and recreational uses that gave a lively atmosphere to the smithy and gardens.


Fig 35. Västra Vrams prästgård.


Fig 36. Hylla smedja.

Fig 37. The smithy roof from inside.

Fig 38. Inside the priest house.

Fig 39. Outside explanation panel.

Fig 40. People making crafts at the smithy.

6.2 Fredriksdal Museums and Gardens

1. Fredriksdal museums and gardens is a 36ha land locate in the middle of Helsingborg town. The estate was originally a manor house built in 1787 and was donated to Helsingborg city with the will of the last owner Gisela Trapp to make it an open air museum. Since it was decided to be an OAM in 1923 they have collected and maintained about 50 historic buildings from Skåne, Halland and Småland and variety of species of plants and livestock. The museum recommends visitors to come in the houses and see how people lived and worked before (Fredriksdal Museums and Gardens, n.d, *Hus och gårdar*).

2. There were some thatched buildings at Fredriksdal: a farmstead (Fig 41), a cottage, two watermills and a saw mill which had been moved from Skåne in the middle of the 20th century after being abandoned. All of them located in an area called “woodland” in the museum together with meadows, fields, and woods which represent a landscape of Skåne in 1840 (Explanation panel at the site, “Skåne in 1840 and in the future” visited on August 8, 2017). They were closed when I visited there in October 2016 but were open in August 2017. The farmstead and cottage were furnished with furniture, utensils, and some flowers (Fig 42). Around the farmsteads some domestic animals such as Väne cow (Fig 43) Linderöd pig, and North Swedish work horse were kept free and traditional wheats: Spelt, Enkorn and Emmer were cultivated (Fig 44). When I asked the staff if they use the wheat straw for the thatched roofs at the museum, he said not yet but it would be an idea for future (A staff, personal conversation, October 28, 2016).

3. In front of the each building, there was a panel explaining the structure of the building, the previous owner and reconstruction history in Swedish and shortly in English with some pictures and a map which show their original sites (Fig 45).

4. There was a staff at the farmstead when I visited on August 8 2017. He was sitting on a bench outside and sometimes explained about the house and its environment to the visitors. He had some pictures of the buildings from the 1920s when the farmstead moved to the museum which his grandfather accompanied with. He said that Fredriksdal is a living museum and knowledgeable people could give more lively experience and information to the visitors than an explanation panel could do (A staff, personal conversation, August 8, 2017).

* There was no mentioning on the thatched roof or its craftsmanship at the museum. The area was large and the thatched roof houses match with the whole landscape as if they were standing in the countryside. Having straw fields, the museum could show thatched roofs as a byproduct of farming. The conversation with the staff was impressive that helped me understand the place and its history.

Fig 41. Lillaryd farm

Fig 42. Kitchen of the farmstead.

Fig 43. traditional wheats.

Fig 44. Väne cow.

Fig 45. Explanation panel.


Fig 46. A guide at the farmstead.

6.3 Skansen

1. Skansen is 75-acre area locates on the island Djurgården in Stockholm. It was opened in 1891 by Artur Hazelius. According to the website "Skansen is a unique place where history meets the present day, where Swedish traditions and craftsmanship live on, and where people of all ages come together." (Skansen, n.d, *This is Skansen*).

2. There were some thatched buildings in Skansen which had been used in different ways and from different region: market shops from Småland (Fig 45), a cottage from Västergötland (Fig 46), farmsteads from Halland (Fig 47) and Skåne (Fig 48), Halland's mill (Fig 49) and sheep shelter of Gotland (Fig 50). The situation of the roofs was diverse that some looked like newly thatched while some were heavily damaged that even knots and supportive rods were exposed (Fig 51). When I visited I could not enter the houses which I could during summer 2014.

3. There were explanation panels in Swedish and in English in front of each building about its original owners, the building structure and plan as well as about the animals (Fig 53, 52). There was a small mentioning on thatching on the explanation panel about the native breed and farmstead that state "The houses are built with half timbers and bricks and the roofs are covered with straw. The building traditions reflect on a time when there was a shortage of wood but plenty of mud and straw." (Fig 54).

4. In a house (non-thatched) I met a first person interpreter who wore the 17th century peasant clothes and explained the life back then. There were also some staffs taking care of the animals.

* There was almost no mentioning on the thatched roof or its craftsmanship at the museum. I asked one of the staffs if there was any exhibition about thatched roof but she said they did not have one. They had a rich variety of roof types in different decaying states which one could learn a lot but most of the visitors' attention was drawn to animals.

Fig 45. Marknadsgatan.

Fig 46. Hornborgastugan.

Fig 47. Oktorpsgården.

Fig 48. Skånegården.

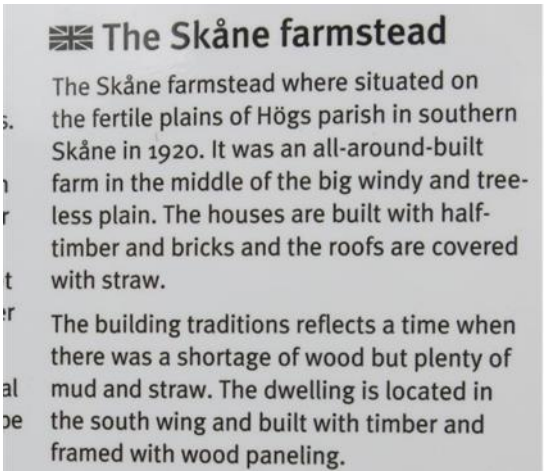
Fig 49. Skvartkvarnen.

Fig 50. Lamm och russgiften.

Fig 51. Exposed tied part.

Fig 52. Explanation panel about the animals.

Fig 53. Explanation panel about the farmstead.



The Skåne farmstead

The Skåne farmstead where situated on the fertile plains of Högs parish in southern Skåne in 1920. It was an all-around-built farm in the middle of the big windy and tree-less plain. The houses are built with half-timber and bricks and the roofs are covered with straw.

The building traditions reflects a time when there was a shortage of wood but plenty of mud and straw. The dwelling is located in the south wing and built with timber and framed with wood paneling.

Fig 54.

6.4 Vallby Open Air Museum

1. Vallby Open Air Museum locates in Västerås. It was established in 1921 to show the historical life and environment of Västmanland County. Besides buildings of a school, a missionary hall and farmsteads, the museum preserves biological heritage such as Linderöd pig (Fig 59), grains and fruits in the region. The museum is open all year round but most of the buildings are open only during the summer. The theme for the summer opening calls "Res i tiden!" ("Trip in the time!") (Vallby Friluftsmuseum Västerås, n.d, *About*).

2. There were two thatched buildings: Farmstead (Fig 55) and Soldier's homestead (Fig 56). They had rods on the roof which would be classified as the unbound roof according to Erixon's classification (chapter II). The Roof of the Farmstead looked like thatched a few years ago while the Soldier's homestead was decaying and bumpy. When I visited I could not enter the houses which might be open during the summer according to the website.

3. There were explanation panels in Swedish and in English in front of each building about the life of the houses, the use, origin, structure of the building (Fig 57), as well as about the animals (Fig 58).

4. There were no staffs regularly stayed in the houses when I visited but they seem to have costumed staffs who wear costumes of farmers, teachers, and workers and play some roles during the summer (n.d, *Levande museum*).

* There was no mentioning on the thatched roof or its craftsmanship at the museum. As one could only look at the houses from outside mostly animal attracted visitors' attention.


Pic 55. The farmstead.


Fig 56. The Soldier's homestead.

Fig 57. The explanation panel.

Fig 58. The explanation panel for the animals.


Fig 59. Linderödsvin.

6.5 Edo-Tokyo Open-air Architectural Museum

1. The museum was established by the Tokyo Metropolitan government in 1993 as part of the Edo-Tokyo Museum. There are 30 buildings from the end of the 17th century to the 20th century which were relocated from all over Tokyo and reconstructed at the 7 ha site in Koganei Park. The museum area is divided into three zones which houses of various architectural styles, farm houses and shops are exhibited in clusters (Edo-Tokyo Open Air Architectural Museum, 2016).

2. There were 6 thatched buildings: 4 farm houses (Fig 60), a granary and a gate. All the roofs except one under construction were in good condition. Houses were open to the public and decorated with some utensils that would tell the life at the house (Fig 61). Toys were available for a try. At most of the houses, fire was kept by the hearth (Fig 62).

3. There were explanation panels on the house plan, original owner and built year at the entrance of houses in both Japanese and English (Fig 63). Inside houses, there was some information about the utensils such as stoves and Tatami mat printed on papers. There was one bundle lied by the wall without no mentioning of it (Fig 64).

4. There were one to two volunteer staffs wearing staff coat at every house. They sat by the hearth and took care of the fire as well as explained the history and structure of the house to visitors.
The volunteer activity began in 1996 to help museum activities. Above all, they keep the fire at hearth to dry roof, and conduct guided tours and crafts workshops. One has to be over 18 years old and can attend 2 days volunteer lecture and come to the activity once in a week. (Edo-Tokyo Open-air Architectural Museum, n.d, *About Volunteer activities*).

* There was no mentioning on the thatched roof or its craftsmanship at the museum. The houses where the fire was kept were lively as people were interacting around the fire. On the other hand, it was dark and felt live-less when there was no activity. The rooms, especially of the farm houses, did not have much recreated scenes of lifestyles where one could feel the architecture itself.


Fig 60. Farm House of Yoshino Family.


Fig 61. Interior was set at 1950s.

Fig 62. Volunteer staffs are keeping fire.

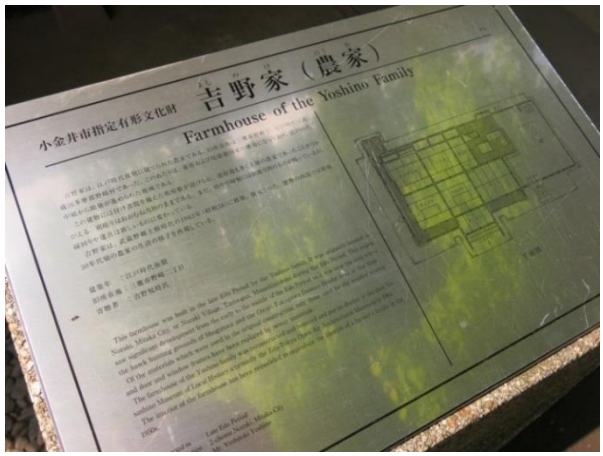


Fig 63. An explanation panel.

Fig 64. A reed bundle.

6.6 Open-Air Museum of Old Japanese Farm House

1. The museum was established in 1956 in Toyonaka-city in Osaka prefecture which is the first open air museum in Japan. Within 36,000 square meters land in Hattori Ryokuchi Park, the museum features 12 old houses which were built between the 17th and the 19th centuries and were moved from all over the country. The museum says “The clever use of the natural surroundings and wisdom applied by people at the time to live in harmony are in display throughout these structures. Each style of living transcends the depths of time to convey to us quietly important messages.” (Open-Air Museum of Old Japanese Houses, n.d).

2. There were 9 thatched buildings: 6 farm houses (Fig 65, 66), a theater, a store house and a tea house. One roof was exposing the rods but otherwise, they were in good condition. Inside there were some furniture and objects which were placed with signs in order (Fig 67, 68). At three houses fire was kept by the hearth (Fig 70, 71).

Fig 65. A farmhouse from Gifu prefecture.

Fig 66. A farmhouse from Miyazaki prefecture.

Fig 67. Inside Iwate's farmhouse.

Fig 68. Name tags on the roof structure.

Fig 69. At each house's entrance.

Fig 70. Keeping fire at cooking stove.



Fig 71. Volunteers keeping fire at some houses. Fig 72. Volunteers cleaning around the house.

3. There were explanation panels on the house plan, style, reconstructed year, original owner and place at the entrance of houses in Japanese (Fig 69).

4. There were some volunteer staffs wearing some sort of farm-worker costumes. They sat by the hearth and took care of the fire as well as explained the history and structure of the house to visitors.
The museum always recruits new volunteer members for maintaining and using the buildings. Volunteers clean the houses (Fig 72), keep fire, have storytelling and help out the museum activities which once a week contribution is required (Open-Air Museum of Old Japanese Houses, n.d, *Volunteer Recruitment*).

* There was no mentioning on thatched roof or its craftsmanship at the museum. The houses where the fire was kept by the volunteers were lively as people were interacting around the fire. On the other hand, it was dark and felt live-less when there was no fire keeping activity. With explanation panels and captions placed by objects, it felt like being in an old fashioned exhibition hall.

6.7 The Japan Open-Air Folk House Museum

1. The museum was established in 1967 in Ikuta Park in Kawasaki city to preserve the disappearing vernacular houses. There are 25 buildings from mostly eastern Japan which were reconstructed to the original plan after had been carefully studied modifications. The houses are assembled in 5 areas according to each original location. “Visiting Minkaen, you may find yourself standing in the middle of old Japanese folk village of 17th to 19th Century, and will get the insight into rich heritage of living and traditional culture of Japan.” says the museum (Nihon Minkaen, n.d, Brochure).

2. There were about 18 thatched buildings: 15 houses (Fig 73, 74), one water mill, one store house and one shrine. Most of the roofs were in good condition but some were damaged and showed rods. Inside houses farming tools and kitchen utensils were displayed orderly (Fig 75, 76). The fire was kept almost every house (Fig 77, 78).

3. Every house had an explanation panel on the house plan, form, original location, built year, and use of the house (Fig 79). There were some exhibitions on thatching. On a street, there was a model of a thatched roof on a street which showed the roof structure from sides and top followed by name tags on each rod and a panel explaining on repair (Fig 80). And in the

exhibition hall, there was one section dedicated to the material, process, and tools of thatching as well as village labor sharing system (Fig 81).

4. There were two volunteer staffs wearing staff coat at some houses. They sat by the hearth and took care of the fire as well as explained the history and the structure of house to visitors. These volunteers are of Robata-no-kai, The Fire-place Society, which developed in 1994. One has to be over 15 years old, able to attend the 4 times volunteer lecture and come to the open house at least twice a month and monthly meeting. Besides the fire keeping, they do maintenance of the house, objects, and environment, and conduct some craft activities. There are over 200 members who take care of the maintenance of the fire at 2-5 houses every day (Japan Open-Air Folk House Museum, n.d, *About Robata-no-kai*).

* The houses where the fire was kept by were lively as people were interacting around the fire. On the other hand, it was dark and felt live-less when there was no fire keeping activity. With explanation panels and captions placed by objects, it felt like an academic exhibition than a recreation of the past life. They had a detailed exhibition on structure, craftsmanship, and life at the houses including thatching which would be a good support for learning at the site.

Fig 73. The Suzuki House from Fukushima.

Fig 74. Houses from Toyama prefecture.

Fig 75 Utensils for kitchen.

Fig 76. A bamboo made horse at a stable.

Fig 77. Keeping fire.

Fig 78. Keeping fire.

Fig 79. An explanation panel about the house.

Fig 80. Thatched roof structure model.

Fig 81. An exhibition on thatching.

6.8 Jidayuuborikoen Minkaen

1. The museum was established in 1988 in Kitami town which is run by Setagaya Ward. It consists of a wealthy man's house, two store houses, a farm house, a house of a merchant, a gate and a firemen's cottage in the 8251 square meters area which as a whole reconstructs a farm village of Setagaya in the late Edo to Meiji period. The museum motto is "Old houses in life" (Setagaya Board of Education, 2004).

2. Their three houses (Fig 82), a storage, and a gate were thatched. Their roof condition was good except one house which was under repair from May until November 2017 (Fig 83). Inside the houses, some utensils and farming tools were displayed and some of them were touchable (Fig 84). There was a reception where staffs sold rice crackers and traditional soft drink. Tea was served for free that one should rinse off the used cups with water from a jar as people did so before (Fig 85). The fire was kept at a house (Fig 86).

3. There was no explanation panel at each building but a general introduction on the buildings stood by the park entrance (Fig 87) and detailed information was printed out as articles at the reception. There was a periodical exhibition at the storage which displayed the tools of thatching (Fig 88). Those tools were donated to the museum from the thatchers in the area. Also, they had a small model of a thatched roof which showed the structure thatched in both reed and straw (Fig 89) which was sometimes used for workshops for citizens (Fig 90).

4. There were some staffs at some houses. Some of them took care of the fire at hearth and stood at the reception. Also at the field volunteers were working with wood craft activities.
There are different volunteer groups at the museum which practice traditional indigo dying, cotton spinning, smithy, soba making (buckwheat), wood work, paper making, bamboo and grass crafts, farming, and thatching to reactivate the traditional skills. Their sounds and smells are a part of the museum exhibition and therefore essential to the museum. The editor's note of the museum's volunteer reports says "Minkaen is like a small village which is succeeded by every volunteer group." (Setagaya Board of Education, 2017).

*It is a local museum where local people come by and participate in activities. Thatching craftsmanship was in their focus especially when I visited there a roof's repair was undergoing. There were three workshops about the roof structure, thatching and a celebration custom together with the thatcher for the public during the repair period.


Fig 82. Shirota's House.


Fig 83. Ando's House.

Fig 84. Playing with old toys.

Fig 85. The sink.

Fig 86. Fire at the hearth.

Fig 87. Explanation on the buildings.

Fig 88. Exhibition on thatching.

Fig 89. Thatching on a low roof model.


Fig 90. Thatching workshop for small children.

6.9 Michinoku Minzoku Mura (Michinoku Folklore Village)

1. It started in 1973 by reconstructing the first house and developed as a museum in 1992. In the 7ha area, 29 buildings were moved from the area along River Kitakami and reconstructed. The museum is a place where one can learn the life of the past in somewhat nostalgic environment and meet seasonal flowers (Kitakami City, Sep 1, 2016).

2. 10 thatched Minka from around the end of the 17th century to the 19th century spread over the area and made farm village scenery together with the rice fields and forests (Fig 91). There were even some reconstructed pit dwellings of Jomon to Heian era (Fig 92). Most of the roofs were in good condition but some were wavy by rain and got grass and tree on the roof (Fig 93). Inside houses daily life was reconstructed naturally by displaying farming tools, kitchen utensils and clothes (Fig 94). There was a goat kept at Hoshikawa's house (Fig 95).

3. There were explanation panels (screen) in Japanese on the house plan, style, reconstructed year, original place and some characters at every entrance of houses (Fig 93). There were almost no caption and explanation panel inside the house but there was audio guide fixed at the houses probably narrated by the locals in Iwate dialect.

4. At Kanno's house, a woman was weaving the traditional Nambu Sakiori which her product was sold there (Fig 96). She said she has been weaving since she was young and she sometimes weaves at the museum which is her joy to interact with visitors. According to the museum, the maintenance of the houses (cleaning floor) and weeding are done by people who have intellectual disabilities as a part of their rehabilitation works. A staff from the facility is in charge of keeping the fire at hearth once a month to dry the roofs. Besides them, there are volunteer guides but they are decreasing its members as the average age is getting high (Mr.Waga, email, July 31, 2017).

* There was no mentioning on thatched roof or its craftsmanship at the museum. The museum succeeds in showing the history and the scenery of the region in a lively way by reconstructing the houses with the landscape and letting the local people perform their skills. However how long the live performance can continue is uncertain. Because there were no explanation panels inside the houses but the warm local voices I felt as if I am visiting someone's house, not a museum.

Fig 91. The village scenery.

Fig 92. Pit dwelling of Heian era (Around 900c).

Fig 93. Roof on its process of decay.

Fig 94. Inside a house.

Fig 95. Goat used to provide milk and protein.

Fig 96. A local woman.

6.10 Tono Furusato Mura (Tono Furusato Village)

1. It opened in 1996. In the 8.8 ha area, 7 Magariya-style Minka from mid-Edo to mid-Meiji period are reconstructed and make village scenery together with rice fields (Fig 97, 98). “Enjoy the country life in Tono” says the museum (Tono Furusato Village, Apr 5, 2017 *Tono Furusato Village*).

2. All Minka and a water mill (Fig 99) were thatched. All the roofs were in a good condition. The Magariya-style's L shape structure was for having the domestic animal inside the house as the winter is cold in the region. At a house, a horse was kept which however was not of the region's breed (Fig 100). Inside the houses, farming tools and kitchen utensils were displayed naturally (Fig 101). The houses were open to visitors (Fig 102). At the storage, tools for charcoal making, cutting woods and thatching were displayed (Fig 103).

3. Every house had a name which represents the original owner such as "The Carpenter's House". The built year, area and character of the house were described shortly on a board around each house (Fig 104). The tools had name tags but not much explanation for their use.

4. At one house, a volunteer woman was presenting her handmade product such as woven sandals and toys which were for sale (Fig 105).
There are local people named as "Maburitto", which means "care takers" in the region's language, who regularly participate in the museum activities. They do farming at the site and help to conduct of museum activities for visitors such as bamboo and straw craft making, soba noodle and rice cake making, storytelling and so on (Tono Furusato Village, Apr 5, 2017, *Program*).
* There was no mentioning on the thatched roof or its craftsmanship at the museum. The museum felt like a real village in its reconstructed farm and forest scenery and with the existence of the local people. There was on the other hand not much explanation on the house and objects' history, structure, and use. It was more like a touristic site where visitors relax and experience the various program as well as where local people get together and meet outsiders.



Fig 97. The rice fields taken care by school children. Fig 98. Magariya style house.



Fig 99. A water mill in use. Fig 100. A stable at a Magariya style house.

Fig 101. Farming tools.

Fig 102. People at the house.

Fig 103. Thatching tools at the storage.

Fig 104. Explanation panel by a house.

Fig 105. A volunteer woman and a visitor.

6.11 Overall analysis

The museums I visited were established during 1891 to 1923 in Sweden and 1956 to 1996 in Japan, both major and local museums located in various regions. All the museums had thatched buildings which almost all had been moved from all over the countries and reconstructed at the museum sites to make a scenery of farm/townscapes.

My primary interests for visits were: how thatching is shown to the visitors, how they exist in the whole museum representation, and how the site is used. I observed if they have an exhibition on thatched roof and its craftsmanship, how the life at the houses are recreated, and how people participate in the museum activities by looking at their website and brochure, roofs and interiors, explanation panels and staff/volunteer.

The thatched buildings were from different regions and were thatched differently with different materials. Wheat straw was seen at many museums in Sweden while not at all in Japan.
Some roofs were damaged that had holes and exposed the inside layers and rods. It would be incidentally good for telling how straws were placed and tied, as well as its cyclical process of thatching. However, without any explanation on this point, it would just give an obsolute image on the houses. Only The Japan Open-Air Folk House Museum and Jidayuuborikoen Minkaen had dedicated explanation panels and roof models which explained the structure, material and craftsmanship. At other museums, thatched roof stood as a cover of a house and no more than that. Cultivation of materials, tools, structures, and craftsmanship were not mentioned or shown there. Their panels mostly focused on explaining the life when the house was in use and the structure of the building.

The living exhibition was underlined at every museum. Most of the museums stated “experience how people lived in the past/ countryside” on their websites and brochures. In the Swedish museums, all except Kulturen in Lund had a landscape with animals. Keeping the local breeds and plants seemed to be one of their missions. It was not so popular in Japan and only two museums kept some animals as an addition to the buildings. This result is corresponding to the questionnaire answers too.

In the Swedish museums except for Kulturen in Lund, many houses were closed when I visited in October and March. They seem to be more active in Summer then more buildings are open. Rooms were furnished in lively ways by placing objects randomly as if the owner had left just before the visitor came, and sometimes, especially during summer, by placing interpretators who wear folk costumes and do some activities of the life in the past which were not seen in the Japanese museums.
In the Japanese museums, on the contrary, the furnishing of rooms was kept in minimum and it was local volunteer people who would meet visitors. There was more room in the architecture where many visitors sat down on the floors and relaxed. Most of the Japanese museums kept the fire at the hearth for drying the roof where often became a mingle place. It seemed like the interactions of educated staffs/volunteers and visitors were popular in both Swedish and Japanese museums, but more by museum staffs (sometimes wear costumes) during summer in Sweden and more as volunteer activities all year round in Japan. Both Swedish and Japanese museums had seasonal events and activities for trying out the life of the past. The Swedish museums seemed not having volunteers while it was an important mean in the Japanese museums to get the museums maintained and get citizens involved in the museums.

From these observations, one generalization about the 4 Swedish and the 6 Japanese OAMs could be drawn. The Swedish museums are more oriented to the recreation of the past in theatrical and holistic ways by decorating the houses, keeping animals and setting role-players that show a day of the past lively to the visitors. Visitors experience what the museum offers as a visitor and as a tourist. The Japanese museums are more oriented to focus on architecture and in academic ways which they have not many furnishments and display objects orderly with name tags. It might give visitors sometimes the dusty and dark impression of the past but some rooms especially around hearth function as social space for today where people mingled. If people want to involve more, they could become volunteers. The roles of OAM in community making or life long learning could be studied more from this finding.

In both countries except two museums, almost nothing was narrated on thatched roofs and its craftsmanship. It should be considered as they are one of museums collections that the museums should take care of.

7. CONCLUSION

In both countries, thatching has been practiced countrywide but its use is decreasing since the industrialization. Many historic buildings with thatched roofs are saved from demolition and today seen at OAM which emerged in response to the modernization in both countries. The current situation of thatching and OAMs is analyzed by interviewing 10 museums and 13 thatchers, and by visiting 10 museums. Most of the museums answered that they regard thatched roof as a part of their historic properties so they ask thatchers to work in traditional ways. Thatcher also answered that OAM is a place where traditional craftsmanship is succeeded and where they show their work to the public. In spite of their recognition of thatching as a tradition and OAM's promotional roles, not much was narrated or shown to the public when I visited some OAMs.

Only The Japan Open-Air Folk House Museum and Jidayuuborikoen Minkaen had information on materials, tools, and ways of thatching by placing explanation panels, objects and models. Jidayuuborikoen Minkaen had even a volunteer activity which studies thatching and thatching workshops for the public. At the other museums, thatched roofs remained to be a cover of the buildings and people would not learn anything but just recognize the looks of the roofs. The interior, the story about the owner, house plan, and animals attracted visitors' attention as they received more means to appeal, such as explanation panels.

This is a serious problem because a roof is a part of architecture which should be used and experienced as Pallasmaa argues. Also, craftsmanship is an Intangible Cultural Heritage which ICOM defines museums to take care of (ICOM, n.d, *Museum Definition*).

Thatched roof represents a regional culture in its material and style that should be mentioned if the museum is dealing with "how people used to live". The cyclical character of thatched roof which grows, decays, and being rethatched should be narrated at explanation panels and at the fields if the museum has wheat fields/ reed bushes. Also, it can be experienced by holding a workshop on a smaller roof model.

The history of OAM in Sweden and Japan showed that OAM is good at recreating a past life and inviting visitors to the otherworld atmosphere, as well as at saving historical buildings and serving as a home for industrialized cities. However, if they keep their mission there, they might fail at showing the history which is living today. Museums should not just show the surface of the thatched roof as a part of the historical house but thatching activity holistically and if possible by letting visitors experience thatching through their senses.

Safeguarding of ICH is also important especially when thatching industry struggles to survive by adapting modern design and techniques. It would be a primary mission for OAMs to preserve their historic properties as intact as possible and it is important to succeed the traditional thatching techniques. However, the craftsmanship is developing to adapt new demands for sustainability and modern design by using newer tools and methods. How thatching exists today and in future could be mentioned and discussed at OAM parallel to the historical buildings which can promote today's thatching and support more study for modern thatching practice.

Lastly, I would like to close this thesis with a message from a 26 years old thatcher.

> It is a pity that the museums don’t provide a better insight into the world and history of thatching. Although I think I understand why this might be the case. While the museums have access to the history and knowledge that alone won’t get them far, what they need at a minimum would be a small mock-up structure of a roof, indoors and at ground level with a cross section of the thatched roof that gives the visitors an eyes-on experience, along with written explanations. Unfortunately such a display requires a lot or space and resources which might deter museums. I think that the museums should be more tactful and exploit thatching events when they occur, at the very least. Some museums already do this but I'd say it is quite rare. Most of the time there were no announcements to alert the curious locals and the whole thatching process was almost viewed as an inconvenience that needed to be dealt with quickly and discreetly. Personally I appreciate the silence and privacy of working like this, but at the same time it feels like a great loss to our craft and heritage. (Mr. Olovsson, email. September 11, 2017)

8. SUMMARY

This thesis studied exhibitions of thatched roof buildings in the Swedish and Japanese open-air museums. It introduced different thatched roofs in Sweden and Japan, history of OAMs, the theory of Architecture and Intangible Cultural Heritage to analyze the thatched roofs at OAMs, and then made interviews and observations.

It contributes to highlight the tendency of OAMs that lacks attention on thatching craftsmanship. This thesis argues that thatched roofs and its craftsmanship should be narrated and experienced that would promote thatching today as well as increase the role of OAM in the current society. Here are the main arguments discussed in the thesis.

Thatched roofs represent a culture.
Chapter 2 introduced thatching in Sweden and Japan. In both countries, thatching has been used for protecting the life of human and animals from rain and wind.
There are various materials and roof shapes which are influenced by the available plants in the area, the climate, the use of the house and its social status and so on. Such details would differ among regions but the structure is basically the same in terms of keeping the roof smooth around at 45 degrees for rain drops to flow. The straw would decay after a while of being exposed to sun, rain, and wind and finally turns to soil that sometimes used as fertilizer for the field. The roof is rethatched every several decades, around 20-40 years. The roof represents the regional culture and nature which has been maintained generation to generation that its craftsmanship can be regarded as an Intangible Cultural Heritage as chapter 4 discussed.

The decrease of thatched houses and Increase of OAM.
When other roof materials became available, machinery was introduced for harvesting, and people started to leave the countryside and moved into cities, thatched roof was gradually replaced with noncombustible materials. The disappearance of the regional character from the households during the industrialization was documented by scholars. OAM emerged then, in order to save the disappearing objects and to represent them in a unified and living way for the enjoyment of the newly emerged citizens, which was discussed in Chapter 3.

Current Problems in thatching industries and OAM.
Chapter 5 reported interview result of thatchers and OAMs. In the both countries thatchers replied that OAM is a place where they would thatch in traditional ways and where they could introduce their work to people. OAM regards thatched houses as their historical properties, therefore, they ask thatchers to perform in the traditional ways. However, many museums struggle with the maintenance cost and how to make use of them for today's society.
Thatching is no longer common and cheap but still, the craftsmanship is alive. In Sweden, the modern need is increasing by introducing techniques for fire protection of the Netherlands and Denmark. In Japan, on the other hand, a new need is almost none and most of their works are for the old houses. The future of thatching is at stake.

Time Travels hinders Ongoing?
Chapter 6 observed the thatched buildings at OAMs which found out that not much attention is made when it comes to the exhibition on thatching craftsmanship. The reconstruction of a past was done in all of the OAMs by furnishing rooms, holding events that involve in role

players and so on which are nice to show a picture of how it would probably look like in the past. It is however, not enough and more things can be done to show a history at their institutions. For example, thatching can narrate how people lived by using nature in its materials and structure, how people helped each other, and that the knowledge and skills are still carried on by craftsmen. The actual state of the past in today is the continued thatching which is still developing and used creatively. OAMs should show visitors not only the the tangible but intangible heritage too which creates the thatched roof and which is alive today, by giving more information and inviting thatchers in their activities. OAMs can be better by collaborating with thatcher and being creative about what they can create together. They should be a place where people get to know about the old and gain new ideas in order to pass down the essence of tradition.

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Fig 33-34. Taken by the author on the 21th August 2015.

Personal Conversation.

A staff at Fredriksdal Museums and Gardens, a short conversation, October 28, 2016.

A staff at Fredriksdal Museums and Gardens, a short conversation, August 8, 2017.

A staff at Miyama Futon & Breakfast, a short conversation, Aug 5, 2016.

Mr. Nishio (Miyama Futon & Breakfast), 30 minutes face to face interview, Aug 8, 2016.

Mr. Olovsson, email. September 11, 2017

Mr. Waga (Michinoku Folklore Village), email, July 31, 2017.

Appendix 1. Questions to OAMs.

1. Your name
2. Museum's name
3. Museum's establishment year.
4. Who governs the museum? Circle one.
    - Nation
    - Municipality
    - a public interest incorporated foundation
    - a private company
    - something else ( )
5. What does your museum mainly collect, preserve and exhibit?
6. What is the mission of the museum?
7. How have the collection, mission and roles of the museum in the society changed since its establishment?
8. How many buildings in the museum are thatched?
9. Where were the buildings' origins? Check in the bracket.
    They were originally standing at the current Museum's location. ( )
    The region of the museum. ( )
    From all over the country. ( )
10. Among the thatched buildings, how old is the oldest and the newest building? Fill out their original construction year.
    The oldest thatched building was built in ( ).
    The newest thatched building was built in ( ).
11. How were the buildings used before being moved to the museum? Fill out numbers in the bracket.
    House ( ), shop( ), barn ( ), smithy ( ), Storage ( ),
    Other: _____( )
12. How do you reconstruct the life back then at the museum? Check in the bracket.
    a.Staffs play roles of the people back then ( ) / b. Staffs wear costumes back then ( ) / c. Raising livestock ( ) / d. Exhibiting gardens and fields related to the houses ( ) / e. Keeping fire at hearth or stove ( ) / f. providing events about traditional or seasonal customs at inside and outside the houses ( ) / g. reconstruction of the lifestyle by placing related objects ( ) / h. reconstruction of the lifestyle by introducing sounds and lights ( ) / i. Explanation panels about the lifestyle ( )
13. Is there any thatched building which is registered as a cultural heritage?
    What are the reasons for the registration?
14. How many rethatching do you have every year?
15. How much does it cost for 1square meter rethatching?
16. How big is the rethatching cost in the museum's total expenses? Describe in %.
17. Have you ever canceled rethatching because of the cost?
18. Do you get any subsidy for the roof maintenance from the government or relevant organization? What kind of subsidy is it?
19. Who thatches the roofs? Check in the bracket.
    <a.Thatching companies> 1.Mostly ( ), 2.Sometimes ( ), 3.Never ( )
    <b.Museum staffs> 1.Mostly ( ), 2.Sometimes ( ), 3.Never ( )
    <c.Volunteers > 1.Mostly ( ), 2.Sometimes ( ), 3.Never ( )

20. Which companies are they? Name/ Region.
21. What are the reasons for choosing the thatching company?
22. Check one for each aspect that is the closest to your decision.

    A.The way of thatching: 1.Leave decision to thatcher ( )/ 2.Ask them to thatch in traditional way ( )/ 3.Take the lowest cost ( )/

    B.Material: 1.Leave decision to thatcher ( )/ 2.Ask them to thatch in traditional way ( )/ 3.Take the lowest cost ( )

    C.Tools: 1.Leave decision to thatcher ( )/ 2.Ask them to thatch in traditional way ( )/ 3.Take the lowest cost ( )
23. Do you think that museums should ask thatcher to take as traditional methods as possible? Why?
24. Do you make rethatching scene seen by visitors as a part of the exhibition? Why?
25. Does thatcher engage in activities below? If yes, check in the bracket.

    a.-Explain the structure of thatched roof to visitors. ( )

    b.-Show how they thatch to visitors. ( )

    c.-Conduct a workshop for visitors. ( )
26. Check if you have those exhibitions on thatching.

    a.3D model of thatched roof ( )/ b.Exhibiting straw bundle ( )/

    c.Explanation panel for thatching ( )/ d.Film screening of thatching

    ( )/ e.Exhibiting tools ( )/ f.Reed bed or Straw field nearby houses ( )
27. Do you have any volunteer activity for thatching and thatched roof houses?

    What do they do? How is it meaningful regarding to conservation and use of the buildings?
28. The amount of thatching is getting less and less. Less needs of thatching bring difficult situations for craftsmen, which leads to the disappearance of thatching as a craft. What can the museum do to keep thatching active?
29. Should museum do something in order to keep thatching being used for modern architecture?
30. Does it sound appealing, meaningful, and realistic to supply straw/reed for thatching the roofs at your museum? Why?
31. Does it sound appealing, meaningful, and realistic to build a thatched house designed for today's living and is thatched in modern technology at your museum? Why?
32. Open-air museum is often described as living history museum and both academic and amusement park-like institution. How is this description applicable in your exhibitions about thatched buildings?
33. Do you have any challenge regarding to maintaining and exhibiting thatched buildings today and for the future?

Appendix 2. Questions to thatcher.

1. Your name:
2. Company's name:
3. Your age:
4. How long have you been working with thatched roofs?
5. Where do you work mostly?
6. Do you have extra job besides thatching? If so, what are they?
7. How big deal does thatching related work occupy your income? Describe in percentage.
8. How many cases did you thatch last year?
9. Who were the customers? Fill each number in the blanket ().
   Private house owner ( )/ museum ( )/ Other ( ) Specify which:
10. Where are your straws from? Do you buy or grow the straws by yourself?
11. Why do you buy/ grow the straws?
12. If you buy straws, how much does it cost per kilo?
13. Do you have any successor? If yes, how many are they? How old are they?
14. Is there any difference between when you rethatch an old roof and when you thatch a new roof for modern use regarding to your choice of roof materials, thatching methods and the use of tools? If so, why is that?
15. Have you ever been told to consider the way of thatching, material's origin and use of tools when you work at historical houses at open air museums? How and whom were they?
16. Which open air museums have you worked with?
17. Did you mingle with visitors when you were working at the museum? If so please explain more.
18. Have you ever done thatching workshop for visitors at the museums? If so please explain about it.
19. Has the thatching situation changed since when you started working as a thatcher? Have the amount of job at (Private house's new roofing / Private house's rethatching / and Museums), and the cost of material changed?
20. How is the demand for thatched roof today?
21. What is challenging for thatching industry today?
22. What is the thatching attractiveness in your opinion?
23. How can open air museums help thatching to spread its attractiveness and increase the demands?
24. What do thatched roof houses in open-air museum mean for you?

Appendix 3. The answers from the Japanese OAMs.

Museums

*(): Official English name.

四国民家博物館 四国村 Shikoku Minka Museum Shikoku Mura.

Takamatsu, Kagawa. Est 1976. Owned by a public interest incorporated foundation.
http://www.shikokumura.or.jp/

日本民家園 (Japan Open-air Folk House Museum).

Kawasaki, Kanagawa. Est 1967. Owned by municipality.
http://english.nihonminkaen.jp/

白川郷　合掌造り民家園 (Gasshozukuri Minkaen Outdoor Museum).

Shirakawago, Gifu. Est 1972. Owned by municipality.
http://www.shirakawago-minkaen.jp/english/admin/

常陸風土記の丘 Hitachi Fudokinooka.

Ishioka, Ibaraki. Est 1990. Owned by municipality.
http://business2.plala.or.jp/fudoki/

飛騨の里(Hida Folk Village).

Takayama, Gifu. Est 1971. Owned by municipality.
http://www.hidanosato-tpo.jp/english12.htm

Mission

-Relocation and reconstruction of characteristic old houses in the region and exhibit them to contribute to the society.
-Preservation of old houses.
-Relocation and reconstruction of houses in the village and exhibit them to people.
-To introduce city's history, succeed traditional skills, and promote tourism.
-To tell the disappearing old Minka and the living to the future generations.

Change of collection, mission and roles of the museum in the society since establishment

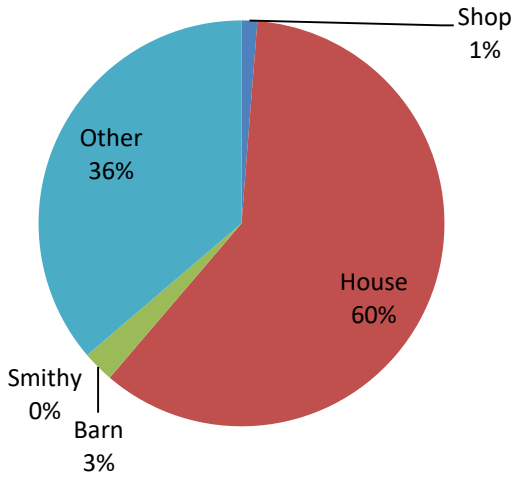
Changed	2 From conservation to utilization by inviting artists. Increase in foreign visitors.
Unchanged	2
NA	1

Number of thatched buildings, their origin and age

Museum	A	B	C	D	E
Number of thatched buildings	12	20	26	16	6
Original location	The region	The whole country	The region	The whole country	The region
Oldest built	The end of Edo period	1687	Mid 18th c	Around 1850	1750s
Latest built	Taisho period	1863	NA	1990	Around 1800
Cultural Heritage Marked Property (CP)	Nation, Region and City designated CP, Registered CP, Important Tangible Folk CP	Nation, Region and City designated CP, Important Tangible Folk CP	Region designated CP	None	Nation, Region and City designated CP

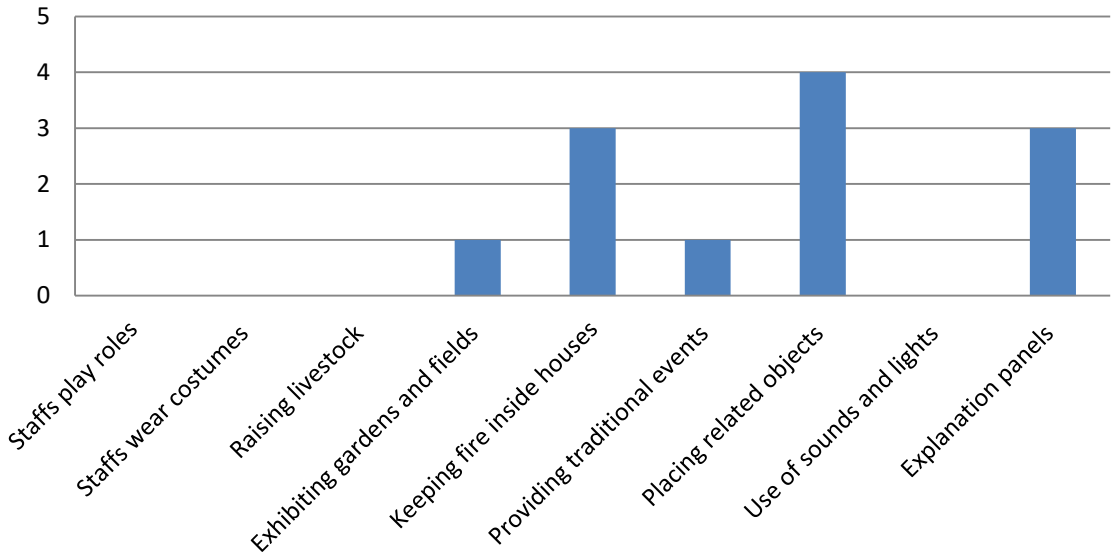
Their original use

*total 80 buildings



*Other: sugar factory, paper factory, storage, theatre, mill, shrine, toilets.

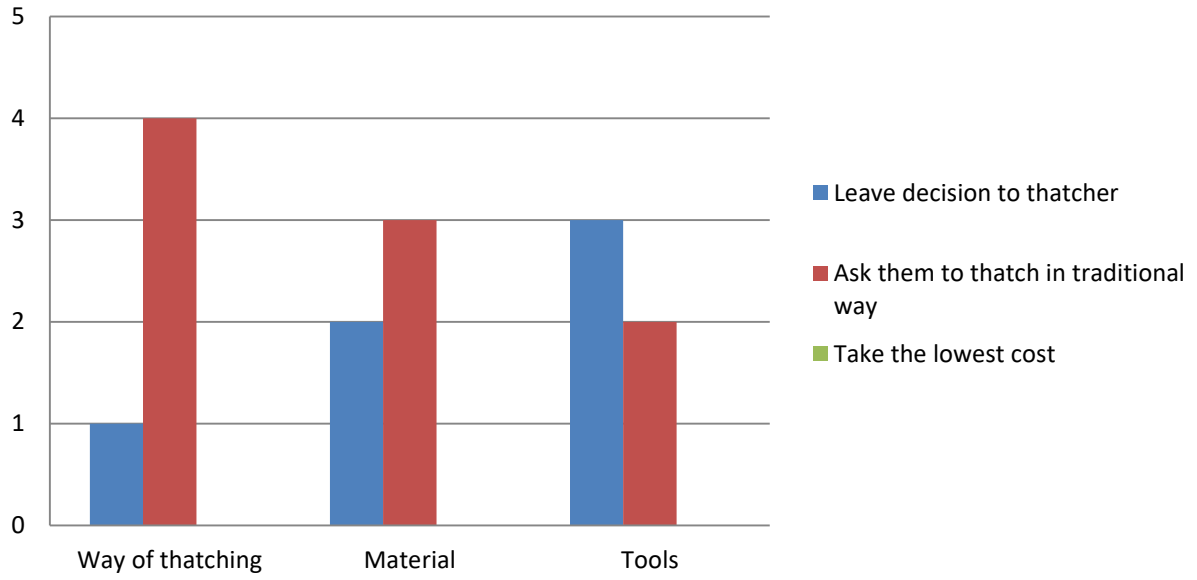
Ways of Reconstruction



Expense on Thatching

Museum	A	B	C	D	E
Thatcher	Company	Company	Company	Company	Museum staff
Number of rethatching/year	0-1	0-1	1-2	1	1-2
Cost for 1km^2	NA	NA	130,000yen	NA	100,000yen
The cost in the museum's total expenses	NA	25%	NA	7%	10%
Ever canceled rethatching due to the cost	NA	Yes	Yes	Yes	No
Subsidies	NA	Nation	Nation, Prefecture	Village	NA

Decision making on thatching



Should museum ask thatcher to take as traditional methods as possible?

-It depends on part to part. Some parts are followed in the traditional ways while other parts are repaired in modern manners to keep the roof longer.
-Yes for the registered CP for not to lose its value.
-Museums should support succession of traditional craftsmanship if possible.
-It is the original that has value so it is precondition to keep the original state if possible.
-Museums should preserve the current state.

Thatcher's activities at museum

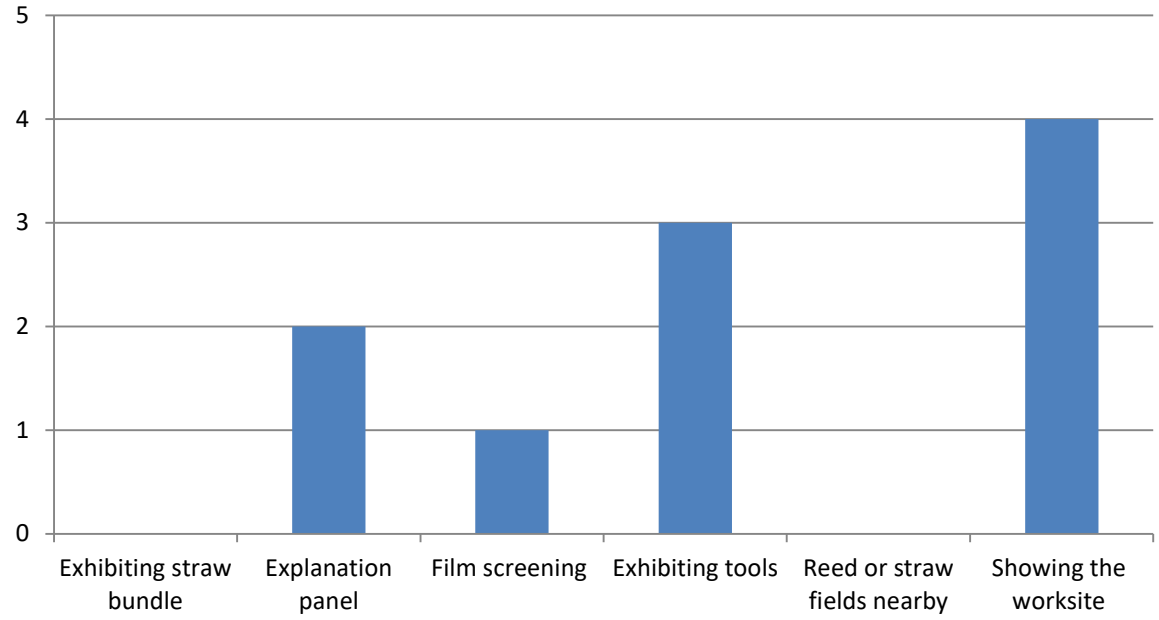
	Number of museum having the activity
Explain the structure of thatched roof to visitors	3
Show how they thatch to visitors*	4
Conduct a workshop for visitors	0
Volunteer's involvement in thatching activity	1 Keeping fire and guiding of the roof at the houses.

About showing thatcher's work to visitors:

Showing:
-An important chance to explain the roof structure.
-Visitors want to see the process.
-We want people to know the regional culture of Gassho style.
-It is a rare opportunity so we open it to the public.

Not showing:
-Because of safety reason.

Exhibiting thatching



What can the museum do to keep thatching active?

-To tell children about thatched roof house which was once common and still found in the town.
-To rethatch regularly in the traditional ways.
-To use the local thatcher to succeed the craftsmanship.
-The one who maintains thatched roofs except the roofs in museum institutions is neither nation or museum but the public people who owns the house. It is every individual of each time who decides what type of house to live, what clothes to wear and what plates to eat. Thinking of that, if not showing practical attractiveness of thatching, such as its high adjustment to environment, this current (of not choosing thatch among other choices) will continue. Therefore what museum can do is probably to promote this character of thatching to explore new needs.
*NA 1.

-To show the real straw and tell the merit of straw.
-To keep exhibiting the traditional roofs.
-Conservation of Gassho style roof.
-There is a limitation by law. According to Building Standard Act it is almost impossible to build new thatched roof in the city development area. To change this law is not a museum responsibility.
*NA 1.

Straw Cultivation for the roofs at museum

-It is difficult in our museum because of space, location, cost and people problem but it might be possible to grow straw at the local mountains.
-Not realistic. No space and people.
-Not realistic. No space and people.
-It sounds attractive to cut down the cost.
*NA 1.

About building a modern thatched house at the museum

-It is attractive. However it should look clearly that it is a modern building in order not to create false image of history and culture. I think it is easier to do this at for example housing company. Proposing new ideas is one of the museum's roles but I feel the idea oversteps the museum's first mission and cannot agree with it. However, making of small building as a workshop might give inspiration to a modern thatching. In what way, the first and foremost mission of museum is to show the property. The research for its utilization can be outsourced to the third party (eg. university research).
-It is out of the museum's role.
-We have no plan for that.
-It is effective to some extent to promote thatching attractiveness to people and let them choose and understand thatching but it does not have to be a modern architecture.
*NA 1.

Open-air museum as both academic and amusement park-like institution

-We have endless dilemma between conservation and utilization. Without utilizing the collection the museum cannot attract visitors which lead management crisis. Some says sleep over experience at the museum but it is too much for the staffs which won't work out.
-That people can see the traditional Japanese folk houses in real.
-We try to keep both characters.
-It has a great aspect as a touristic site but for the local people it is used as a life learning institution.
*NA 1.

Challenge for today and future

-Preparing for earthquake, attracting visitors, welcoming the increasing foreign tourists, holding workshops for elementary schools. We have shortage in budget and museum curators.
-Lack of money. It is getting difficult to succeed traditional craftsmanship.
-Supplying straw and other materials, succession of techniques and making money.
-Training of craftsmen and provision of material. In our institution we have had training program for craftsmen for 10 years that produced 3 independent craftsmen. We are still doing this now as succession of skill will be important task in the future too.
*NA 1.

Appendix 4. The answers from the Swedish OAMs.

Museums

*() Official English name.

Nordiska museet (The Nordic Museum).
Stockholm. Est 1873. Owned by a foundation.
https://www.nordiskamuseet.se/

Öland's Museum Himmelsberga.
Borgholm, karmar. Est 1959. Owned by Hembygdsförbund (organization for the local cultural heritage societies)
http://www.olandsmuseum.com/

Vikingagården Gunnes gård.
Upplands, Väsby. Est 1988. Owned by municipality.
http://www.upplandsvasby.se/2/uppleva-och-gora/turism-och-sevardheter/vikingagarden-gunnes-gard.html

Vallby Friluftsmuseum. (Vallby Open Air Museum).
Västerås, Est 1921. Owned by municipality.
http://www.vallbyfriluftsmuseum.se/index-eng.shtml

Äskhults by (Äskhult hamlet).
Kungsbacka, Halland. Est 1997. Owned by municipality.
http://www.askhultsby.se/sv/

Mission

-To preserve and bring alive the memories of life and work in Sweden. The museums motto is "know yourself".
-To preserve a unique cultural heritage, and to find ways to make this interesting and important today. To be cultural meeting place by holding events such as art exhibitions.
-To show a Viking farmstead.
-To show the cultural history of Västmanland county with living history of houses, artefacts, animals and plants. Cultural history, biodiversity, sustainable development, and lifelong learning for all our visitors are our focus.
-To look back and understand why we live as we do today. Also to learn how to take care of the nature in the future.

Change of collection, mission and roles of the museum in the society since establishment

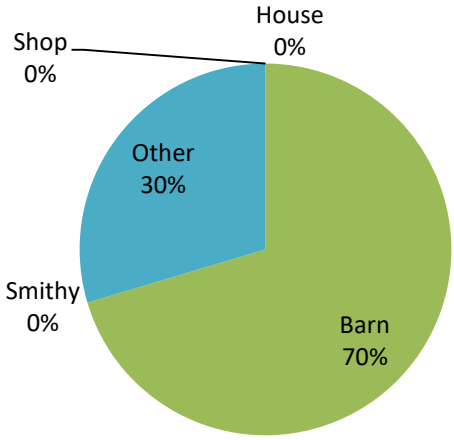
Changed	4 Collection's expansion (number and content), focus on diversity, comparison of history to today, museum became an important transmitter of older information and skills, opened to the public.
Unchanged	3 Mission, essence, role have been the same.

Number of thatched buildings, their origin and age

Museum	A	B	C	D	E
Thatched buildings	10	9	3	3	5
Original location	The current location	The current location	The region.	The region	The current location
Oldest built	late 17th century	18th century	1988	1812	1660
Latest built	Second half 19th century	19th century	2015	late 19th century	don't know
Cultural Heritage Marked Property (CP)	Protected or listed but not by any heritage laws.	Much is considered as an important cultural heritage.	No	NA	The whole village is registered as a cultural heritage.

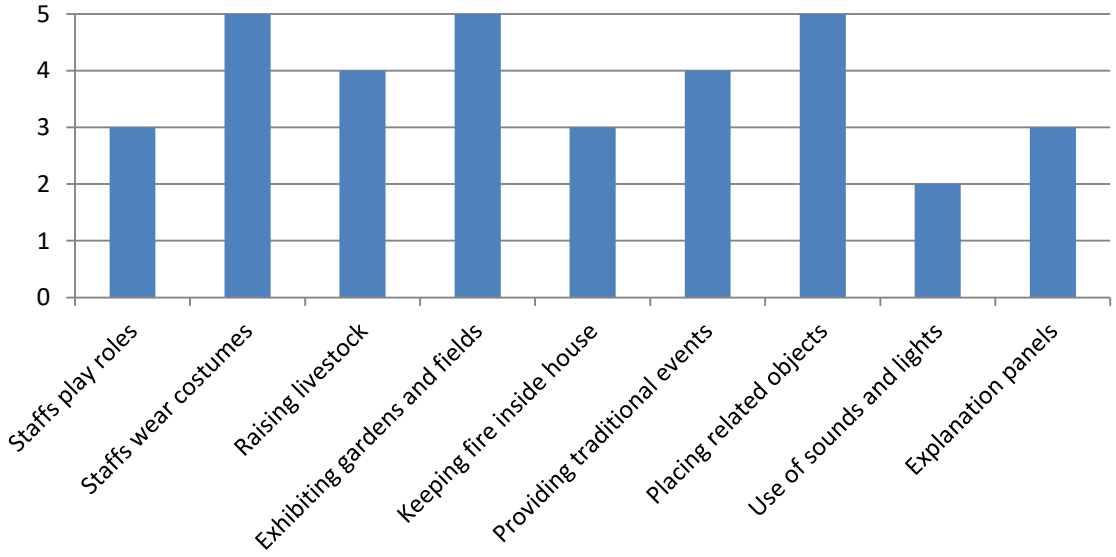
Their original use

*total 27 buildings



*Other: Storehouses, sheds, workshop/woodshed, and loft building.
*NA 1. (All building is a reconstruction).

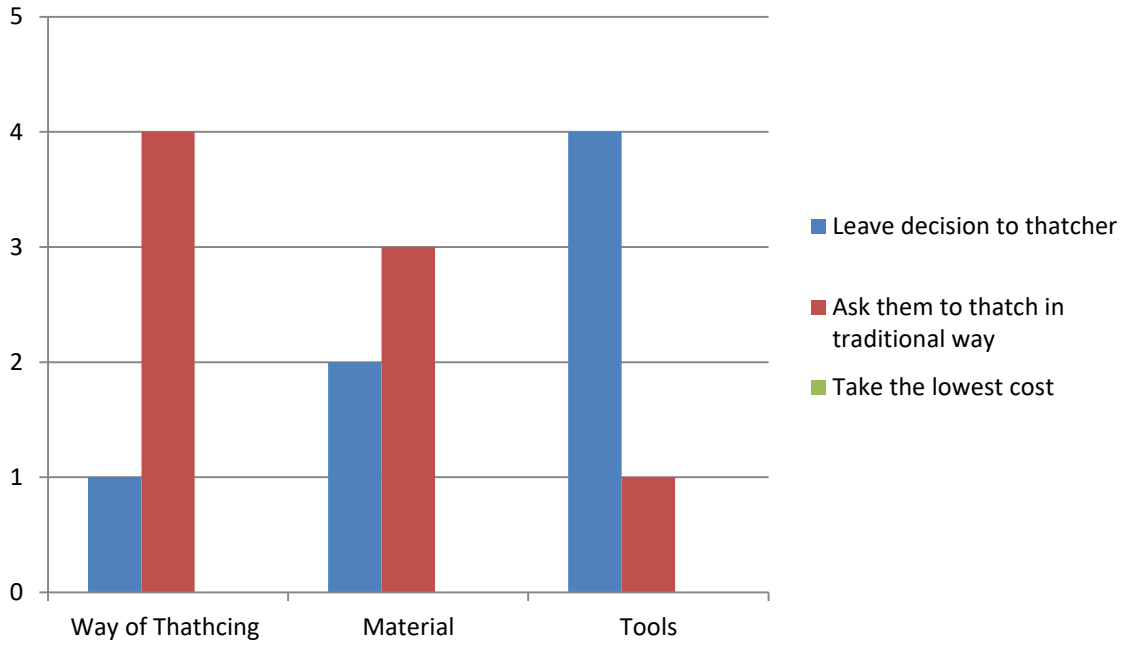
Ways of Reconstruction



Expense on Thatching

Museum	A	B	C	D	E
Thatcher	Company	Company	Museum staff	Company	Company
Number of rethatching/year	0-1 Every 5-10 years	1-2	0-1	0-1	0-1 Every 20 years
Cost for 1km^2	1150sek/m^2 For complete restoration	250-300,000sek for 70m^2 barn	Do by ourselves	NA	Don't know
The cost in the museum's total expenses	NA	6-7%	NA	NA	NA
Ever canceled rethatching due to the cost	Yes	Yes	No	Yes	No
Subsidies	Yes, for each project.	Yes, for each project.	No	No	NA

Decision making on thatching



Should museum ask thatcher to take as traditional methods as possible?

-Yes. If you want to preserve the buildings cultural value, you should choose traditional methods linked to the current building. The craftsmanship should also be seen as part of the cultural heritage/values.
-Yes. To preserve the ways in a time is important when more and more interests in it exist.
-We want to show how it was made!
-Yes.
-Yes. It is a matter of the whole idea at the museum to preserve the knowledge of the old methods.

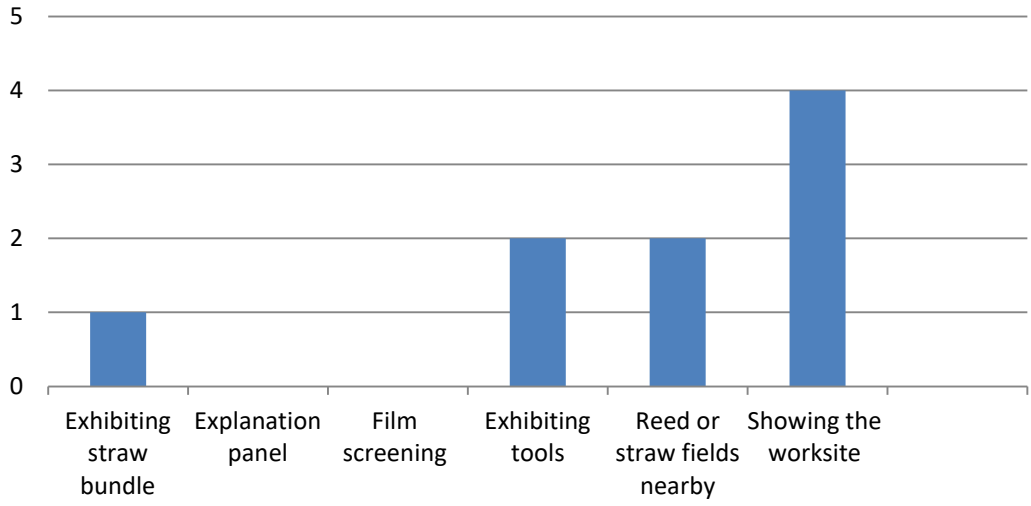
Thatcher's activities at museum

	Number of museum having the activity
Explain the structure of thatched roof to visitors	3
Show how they thatch to visitors*	4
Conduct a workshop for visitors.	0
Volunteer's involvement in thatching activity	2 "Rethatching of the ridge is often done by volunteers. It is meaningful in the essence that more people get involved and knowledge is transferred to other people in the area."

About showing thatcher's work to visitors:

Showing:
-We try to but it can be hard to manage depending on seasonal openings of the museum and of course the weather.
-We try to make rethatching part of what's shown at the museum, and thereby create an interest for it.
-We show it because that is one of our aims.
-It is a part of our mission on lifelong learning.
Not showing:
-No. It has not been a priority.

Exhibiting thatching



What can the museum do to keep thatching active?

-By putting demands on craftsmen to use traditional methods on our buildings.
-Get people involved in thatching activities and if possible give courses.
-Use the Craftsmen
-To hold Courses. Unfortunately we don't have the expertise in our museum.
-Have workshops in thatching

Should museum do something in order to keep thatching being used for modern architecture?

-To spread the knowledge about thatching to focus on the matter. But to be used in modern architecture, it is more up to other institutions like municipality, county board or maybe county museum.
-Together with others to highlight the benefits and be a resource for knowledge about it

-We can provide and advocate public with information regarding the subject.
*NA 2.

Straw Cultivation for the roofs at museum

-It would be meaningful to supply straw from our museum, at least for our own buildings.
-We already do. We use our reed for smaller work with the roofs.
-Yes, as it is very difficult to find good quality straw and also to show how to cultivate the material.
-No we haven't got the space for growing or storing the straw or reed.
*NA 1.

About building a modern thatched house at the museum

-Yes, to show how old techniques and material can be used today.
-No, not in our museum mostly because we don´t build any new buildings.
-It's an interesting idea, and with external support it would not be unrealistic.
-No we are a reconstruction from one excavation.
-No opinion for this matter

Open-air museum as both academic and amusement park-like institution

-The thatched buildings are not part of the main exhibitions but part of the guided tour. More about how and why there are thatched roof and not so much about the craftsmanship.
-We are a living history museum.
-We haven´t got an exhibition or a sign that tells about thatched houses but of course the houses are there and you can watch them in their environment.
-We want the museum to be more of an excursion site. But we have also a lot of visitors (such as schools University etc) that are interested in the museum.
*NA 1.

Challenge for today and future

-Thatching is quite expensive. So I think we should hire craftsmen only when whole rethatching is needed.
-Finance for rethatching
-Access to craftsmen with the right skills.
-Not having a visitor center where we can have bigger groups inside to teach them about all the old techniques etc. We want to teach people how to preserve the old manor of maintaining building, gardens etc. Finance, climate and contamination are also problems to keep thatched buildings.
-Nothing to think of.

Appendix 5. Answers from thatcher (both countries).

Question	**Japan** **: 6 answers**	**Sweden** **: 7 answers**
Average age.	46 years old	49 years old
Average working years.	18 years	24 years
Where do you work mostly? (Free writing)	-Miyama, Kyoto. -Nagano Prefecture . -All over the country, mostly west from Tokyo. -Mainly Kyoto. -Hiroshima. -Ouchiyado Village, Fukushima Prefecture and Kanto region -Around Kobe.	-Mostly Southern Sweden. -Mostly Skåne but sometimes even northern Sweden. -Götaland, Svealand -Österlen, Skåne -Southern Sweden, mostly Skåne. -Halland. -Mostly Southern Sweden.
Engagement in a side job. (Yes/No)	Yes: 3 (tourism, metal, farming and restaurant), No: 3	Yes: 7 (Building works, archaeological works)
Average engagement in thatching in the total income.	97% (/5)	76.7% (/6)
Average work case in the last year.	12.8 per year	9 per year
Who the customers were. (Multiple choice).	Private house: 37, Museum: 6, Other: 14 (regional, CH, shrines)	Private house: 49, Museum: 18, Other: 10
The size of demand for new thatched roof today. (Multiple choice).	Big: 0, Some: 1, Almost none: 4, Never: 1	Big 6, Some 1
The size of the demand for rethatching today. (Multiple choice).	Big: 3, Some: 3, Almost none: 0, Never: 0	Big 6, Some 1
Having successors or not. (Yes/No).	Yes: 5(25ppl, age 20-30), No: 1	Yes 2 (some, age 20-50), No 5
Type of straw. (Free Writing).	Susuki (Miscanthus), Kariyasu (Miscanthus tinctorius), Yoshi (Phragmites australis)	Reed, Miscanthus, Rye straw
The way of supplying straws. (Multiple choice).	Grow: 2, Buy: 1, Both: 3	Buy 5, Grow 1, Both 1
The straws' origin. (Free writing).	Japan (Gotenba 2, Aso 3, Shikoku, Kumamoto, Hyogo, Yamagata, Fukushima, Iwate	Polland 4, Estonia 4, Sweden Skåne 1, Denmark 1, China 1
Average cost of the straws. (Free writing).	Reed bundle about 60cm circumstance: 700-1200yen (About 40-70kr).	Reed bundle of 60cm circumstance: 20-30kr, Straw, 30kr. (About 250-350 yen).

Reasons for buying. (Free writing).	No reed field nearby, no people, and no time to grow. The tradition of growing the material in the local community was lost.	No time and place, Cost efficiency.
Reasons for growing. (Free writing).	It is the village tradition. For high quality.	For high quality.
Number of newly thatching in the latest 10 years. (Multiple choice).	**Private house**: Up 1, Unchanged 3, Down 1, Don't know 1. **Museum**: Up1, Unchanged 1, Down 1, Don't know 3. **Other**: Up 1, Unchanged 1, Down. 2., Don't know. 2	**Private House**: Up 4, Unchanged 3, Down 0. **Museum**: Up 0, Unchanged 5, Down 2. **Other**: 0.
Number of rethatching in the latest 10 years. (Multiple choice).	**Private house**: Up 1, Unchanged 1, Down 3, Don't know 1 **Museum**: Up 1, Unchanged 1, Down 1, Don't know 3. **Other**: Up 1, Unchanged 1, Down 2, Don't know 2.	**Private house**: Up 2, Unchanged 3, Down 2. **Museum**: Up 1, Unchanged 5, Down 1. **Other**: 0.
Cost of the material. (Multiple choice).	Up 5, Down 1.	Up 5, Unchanged 1, Down 1.
Cost of thatching 1km^2. (Multiple choice).	Up 5, Down 1.	Up 5, Unchanged, 2 Down 0.
Working experience in OAM. (Yes/No)	Yes: 3, No 2, NA: 1.	Yes:5, No: 2.
Difference between a historical and new roof when thatching. (Yes/No)	Yes: 0, No: 6. Three people mentioned material, method and design differences according to locality, history and material cost.	Yes: 6 No: 1.
Ever holding workshop at OAM. (Yes/No)	Yes: 1, No: 3, NA 2	Yes: 4 (Talk 6, Show thatching 4, Holding workshop 2) NA: 3.
Impression about having workshop at OAM. (Free writing).	-Visitors are interested in roof structure and the material. I talk about the cycle of thatching and the connection of thatching to farming and visitors get fascinated about that the roofs are made of natural materials. -I feel public interest in thatching is increasing.	- Amusing, always pleasing with interested visitors. One may show and explain, hopefully spread little about thatching knowledge. -Interesting. It is often that people ask, watch and wonder. I think it is cool.

		-Interesting but very complicated to work with authorities. -Pleasant -Cool, but bad paid.
What is OAM for you. (Multiple choice).	A source of income: 2, An opportunity to spread thatching: 6, A place for keeping the traditional methods: 4	A source of income: 3, An opportunity to spread thatching: 5, A place for keeping the traditional methods: 5
Is there any problem in the thatching industry? (Free writing, the numbers show how many people mentioned on the word).	Quality of straw: 3 Lack of craftsmen: 2 Decreasing job: 3 Low quality of workmanship: 2 Limitation by the law: 1 Communication with the administration: 1	Quality of straw: 3, Lack of craftsmen: 3, New needs: 1
What are attractions of thatching? (Free writing, the numbers show how many people mentioned on the word).	Age beauty: 1, Renewability: 3, Formability: 1, Community tie: 1	Age beauty: 6, Renewability :5, Formability: 3, Work environment: 1
What can museums do to spread thatching attractions? (Free writing).	Preservation of the style and the activity as whole, providing experience, collaboration with new ideas.	Promotion of thatched roof, to support thatching activity broadly, to have discussion on the future of thatching.