

The Transformation of Tradition: Restoring original Estonian Vernacular Architecture in a Situation where Traditional Materials are no Longer Available

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Abstract

The focus of this article is on Estonian vernacular farm architecture and its primary traditional roofing materials. These include thatching materials such as straw and reed, certain wooden materials, and, to some extent, concrete roof tiles. The aim of the study was to map the changes in the use and technologies of traditional roofing materials in Estonian vernacular architecture over the past 150 years and to address the question of to what extent the requirement to use authentic materials—no longer produced or accessible today—is even feasible for heritage buildings and those in museum collections, and what measures should be taken to ensure that knowledge of these traditions is not lost. To achieve this, earlier studies and surveys from the 1930s and 1960s were reviewed, along with handbooks and a database compiled by the museum in recent years containing information on culturally valuable rural architecture still preserved in Estonia. In addition, interviews were conducted with craftsmen who are actively working in this field today. The preservation of cultural heritage and heritage skills cannot be left solely to the efforts of a few homeowners. In today's rapidly changing world, with increasing emphasis on sustainable technologies and reducing carbon footprints, now is the ideal time to rediscover and adopt these traditional techniques.

Keywords: straw roof; wooden roof; concrete roof tile; traditional material; traditional techniques

1. Introduction

The focus of this article is on Estonian vernacular farm architecture and its primary traditional roofing materials. These include thatching materials such as straw and reed, certain wooden materials, and, to some extent, concrete roof tiles.

Fired clay roof tiles were primarily used for manor houses, churches, and town buildings, appearing on farmhouses only incidentally or as recycled materials.

Metal roofing also found its place in rural architecture, but only to a limited extent. Unlike thatch and wooden roofs, metal roofs have a significantly longer lifespan, and their restoration does not pose a problem due to the availability of materials.

Yet, by focusing on the first mentioned materials, the aim is to highlight a key issue – the short lifespan of historical roofing materials, their increasing scarcity, and the loss of traditional craftsmanship.

2. Methodology

The aim of the study was to map the changes in the use and technologies of traditional roofing materials in Estonian vernacular architecture over the past 150 years and to address the question of to what extent the requirement to use authentic materials—no longer produced or accessible today—is even feasible for heritage buildings and those in museum collections, and what measures should be taken to ensure that knowledge of these traditions is not lost. To achieve this, earlier studies and surveys from the 1930s and 1960s were reviewed, along with handbooks and a database compiled by the museum in recent years containing information on culturally valuable rural architecture still preserved in Estonia. In addition, interviews were conducted with craftsmen who are actively working in this field today.

3. Traditional roofing materials of Estonian farm architecture

Between 2021 and 2024, Estonia allocated state-funded grants to preserve the uniqueness of traditional rural architecture and landscapes by restoring farmhouse roofs with original materials. This initiative led to the successful restoration of nearly 100 farmhouse roofs. A key requirement for eligibility was that the building had to be constructed before 1940. When discussing historically preserved farm buildings in Estonia, it is important to note that most surviving structures date back to 1850 or later, with only a few exceptions. Members of the grant allocation committee often encountered questions about the original roofing materials of these buildings and how to ensure that houses – some up to 140 years old – retain as authentic an appearance as possible or at least the look they had after renovations completed before 1940.

Numerous archaeological evidences indicate that split wooden boards were the primary roofing material in present-day Estonia from prehistoric times onward. However, sod, straw, and reed roofs were also used. With the advancement of agriculture and the expansion of winter rye cultivation, rye straw gradually replaced split wooden boards as the dominant roofing material during the medieval period. As traditional smoke huts disappeared, high-pitched barn dwellings,¹ with straw-thatched roofs – characteristic of Estonian architecture – became increasingly common. In southern Estonia, however, split wooden boards remained in use to some extent until the mid-19th century (Metslang, 2016, p. 21).

The 1881 Baltic census provides valuable insight into the roofing materials used in Estonian farmhouses. The census gathered statistical data on farm dwellings in the Governorates of Estonia and Livonia (parts of which are now in southern Estonia). It recorded details on wall and roof materials and the presence of chimneys, providing a comprehensive overview of rural construction practices at the time (Viires, 1962, p. 100). Comparing these figures with data from the 1922 and 1934 censuses, and the 1929 agricultural survey, reveals significant changes in construction techniques and material usage over time. In 1881, straw remained the dominant roofing material for rural dwellings in Estonia. In northern Estonia and the islands (the Governorate of Estonia), 86.8% of farmhouses had straw roofs, while 9.8% had wooden roofs. In the Governorate of Livonia (covering parts of present-day southern Estonia), the figures were 72.9% for straw roofs and 19.5% for wooden roofs (Viires, 196, p. 109). It's important to note that the census at the time did not distinguish between straw and reed roofs.

¹ The roof pitch of a traditional Estonian farmhouse ranges from 40 to 45 degrees.

Straw for roofing was primarily harvested from winter rye, with smaller amounts obtained from winter wheat. In the 19th century, Estonian vernacular included terms like *suured rukkid* (large/great rye), *rootsi rukkid* (Swedish rye), *võsu rukkid* (bushy rye), and *jaanirukis* (St. John's Day rye or Midsummer rye) to differentiate bushy rye from the usual one (Kihno, Jääts, Laane, 2015, pp. 217, 218.). These types of bushy rye were known for their high productivity and yields, though their stalks were shorter and more fragile than modern varieties. A single seed could produce a large cluster, sometimes with 70–80 stems.



Fig. 1 – Farmhouse with straw-thatched roof from Halliste parish, southern Estonia (Estonian National Museum, 1925).

From the early 19th century, the Estonian manors began cultivating foreign landraces introduced from abroad, and by the mid-19th century, they had started using formally bred rye varieties. Rye breeding in Estonia began in the late 1860s under Count Fr. G. M. von Berg at Sangaste Manor. In the 1920s, a local variety named ‘Sangaste’ began to spread and gain popularity.

3.1. Thatched roofs

In the 1881 census, straw and reed were grouped and not differentiated as separate materials. However, by the 1922 census, special attention was given to distinguishing between these materials. At that time, 44.8% of farmhouse roofs were thatched with straw, 2.75% with reed, and 46.7% were covered with wood (Viires, 1962, p. 112).

It was only in the late 19th century that Estonia developed a long-stemmed winter rye variety known as ‘Sangaste.’. The aim was to produce larger quantities of high-quality thatching straw and bedding for livestock. Before this, various bushy rye varieties were mainly used, which had significantly shorter, thinner, and more fragile stalks. (<https://metk.agri.ee/sangaste>)

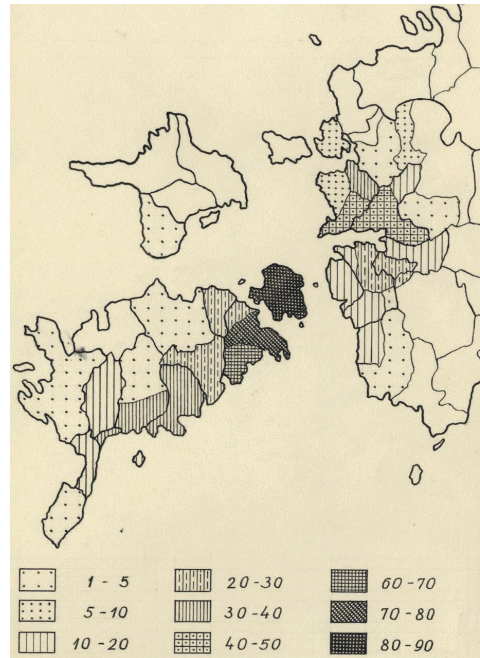


Fig. 2 – The percentage of reed roofs on rural dwellings in western Estonia in 1922 (Estonian National Museum).

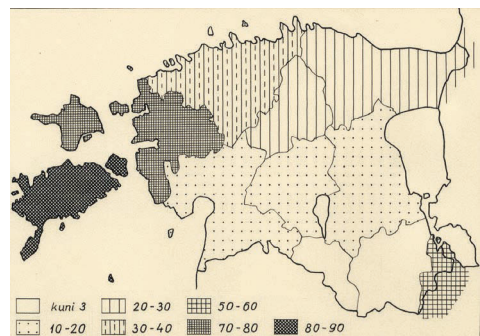


Fig. 3 – The percentage of rural dwellings with straw and reed roofs in Estonia in 1934 (Estonian National Museum).

The islands and the Läänemaa region in western Estonia, lacking in abundant forests and lagging behind other parts of Estonia in agricultural development, found reed to be a valuable alternative to straw. Areas such as the Kassari meadows, Matsalu Bay, and the Väike väin (Small Strait) (Saaremaa, 1934, pp. 73, 491, 631, 689, 719), rich in reed, provided an excellent resource for roofing material, offering a sustainable option where straw was less available.

Threshing machines became widely used in Estonia at the turn of the 19th and 20th centuries. During this period, the sickle was gradually replaced by the scythe, and soon after, grain harvesters were introduced. These machines no longer produced the neat, uniform sheaves typical of earlier methods.

As a result, reeds began to be used more frequently for roofing, with construction techniques for reed roofs being quite similar to those for straw roofs. The use of reed for roofing declined significantly during the Soviet era. However, in the past few decades, it has made a notable comeback across Estonia, even in regions where reed has never historically grown. Reed roofs resemble traditional thatched straw roofs, making them hard to distinguish for those without expertise. At times, reed roofs seem to have become a status symbol in Estonia, with new reed-roofed houses popping up like mushrooms after rain.

With regular maintenance and periodic brushing (replacing the ridge), a reed roof could last up to 50 years. Unfortunately, the lifespan of modern reed roofs is considerably shorter.



Fig 4 – A special splitting bench was used to split pilbas shingles by hand with a drawknife (Estonian National Museum, 1947).

3.2. Wooden roofs

During the 19th century, split wooden board (*kisklaud*) roofing gradually declined across Estonia, with shingle roofs becoming the most common type. However, board roofs still accounted for 41.4% of roofs in northeastern Estonia, especially on outbuildings (Viires, 1962, p. 112). One of the main factors behind the rapid spread of the new roofing methods was the availability of inexpensive industrially produced roofing nails. Before 1940, the rapid shift from thatch to wood shingle roofs became common in rural dwellings.

At this point, describing four different, yet superficially similar, wooden roofing materials is necessary. In English and German, these materials are generally referred to as "shingle" (Eng.) and "der Schindel" (Ger.). However, in Estonian, four distinct terms are used: *pilbas*, *laast*, *sindel*, and *kimm*.

Pilbas refers to a thin hand-split wooden strip, approximately 43 cm long, 6–7 cm wide (with each strip varying in width), and 3–4 mm thick.



Fig. 6 – Hand-split thin *pilbas* shingles compared to mechanically produced *laast* shingles (Lutsepp, 2019).

The primary material is pine, although spruce or aspen could also be used. *Pilbas* shingles were produced in only two regions of Estonia. The process is labor-intensive and requires specific skills. *Laast* refers to a mechanically cut wooden strip. At the end of the 19th century, *laast* shingles were about 53 cm long and up to 13 cm wide, whereas today they typically measure 61–62 cm in length and 10–12 cm in width, with a thickness of 4–6 mm (Metslang, 2016, p. 90). Historically, pine was considered the best material for *laast*, though today spruce and aspen are more commonly used. As *laast* shingles are machine-cut, they are more standardized and easier to produce in larger quantities.

Sindel refers to a thin wooden strip cut from a board, with a groove along the wider edge that gives it a slightly triangular profile. This groove allows the shingles to fit tightly together, but it can also be a disadvantage, as it may prevent the material from drying properly. In the late 19th century, *sindel* shingles were made by hand, primarily by itinerant merchants of Jewish origin. By the turn of the century, mechanical production of *sindel* shingles began.

Historically, *sindel* shingles were typically 56 cm long and 7.5–9 cm wide. Modern *sindel* shingles vary significantly, ranging from 50–70 cm in length and 7–12 cm in width. By the 1930s, *sindel* had become such a common roofing material that it was produced in local sawmills (Metslang, 2016, pp. 95, 96).

Kimm refers to a wedge-shaped wooden shingle sawn from a log or plank, measuring 7–10 cm in width and 50–70 cm in length. Its thickness varies from 14–15 mm at the bottom end to 2–3 mm at the top (Metslang, 2016, p. 102). Although *kimm* has been used in Europe and the Nordic countries for centuries, it was only introduced to Estonian farm architecture in the 20th century (Metslang, 2016, p. 101). Initially used mainly on churches and manor houses, *kimm* is becoming more common on historical farmhouse roofs due to its superior durability compared to the previously mentioned wooden materials.

3.3. Concrete tile roofs

Concrete tiles are made from sand, cement, water, and color pigments. They became more widespread in the first half of the 20th century, particularly during the 1920s and 1930s when the Republic of Estonia promoted fireproof building materials and supported the domestic cement industry. Roof tiles could be easily molded on construction sites using forms, and with proper maintenance, they were expected to have a long lifespan. For years, hand-operated presses with various profiles were used to manufacture the tiles.

4. The current situation

Corrugated asbestos cement, introduced in the 1960s, was often installed directly over existing roofing materials. As a result, in many farm buildings, straw, *laast* shingles, and, to a lesser extent, *sindel* or *pilbas* shingles can still be found beneath the asbestos tiles. Overall, it can be said that thanks to asbestos cement, many of our farm buildings have been preserved to this day.

4.1. Is it possible to restore thatched straw roofs?

Today, the winter rye is entirely harvested using combines, making it nearly impossible to find a farmer willing to grow rye for experimental purposes. For a typical traditional farmhouse, such as a barn dwelling with a roof area of about 360 m², it would take the harvest from at least 9 hectares of land to gather enough thatching straw.

As a result, no Estonian Open-Air Museum has been able to restore a thatched straw roof on any of its exhibits.

The most recent straw roof in Estonia was built in 2009, covering the 70 m² roof of the Malvaste Chapel on Hiiumaa Island. The roofer, when asked, complained about the quality of the straw

grown in Hiiumaa (variety 'Matador'), noting that the stalks were too short and weak for proper thatching.² By autumn 2023, the roof had already begun to deteriorate.

4.2. The present day of wooden roofs

The construction of hand-split *pilbas* shingle roofs ended about 10 years ago with the passing of the last *pilpameister* (master craftsman of making shingles).

However, over the past 15 years, there has been a notable increase in the construction of *laast* and *sindel* shingle roofs. This growth has been supported by various roofing training programs across Estonia, including those organized by the Estonian Open Air Museum's Center of Rural Architecture. As mentioned earlier in this article, the cultural value of wooden roofs has also been emphasized through state funding. *Laast* shingle roofs are the most commonly built, primarily because they are more affordable than *sindel* roofs.

However, it must be admitted that the lifespan of modern wooden roofs is considerably shorter than that of historical ones, mainly due to the decline in wood quality caused by intensive forestry practices. Our climate has become warmer and more humid, affecting the wood's durability. Yet, an even greater issue is that modern homeowners, with their updated lifestyles, are often not accustomed to the idea that wooden roofs require annual maintenance.

The restoration of wooden roofs raises several concerns, including the cost of materials and labor, the challenge of finding skilled workers with traditional craftsmanship, the durability of the materials, and the availability of modern industrially produced alternatives, which are often advertised with lifespans of up to 100 years.

² Phone interview with Siim Sooster on 28.11.2023. Notes in the possession of the author.

4.3. There are no concrete roof tiles

Only a few molds have survived, and it is unclear whether they are still usable. Modern concrete tiles produced by European manufacturers are consistent in quality and relatively affordable for today's builders. However, the problem is that these tiles often replicate the profiles and colors of fired clay roof tiles, which diminishes the authenticity of the material.

4.4. How can we preserve and pass on knowledge of heritage technologies and traditional skills?

It is not enough for a few educational institutions in a small country to teach heritage technologies to a small group of future builders. This knowledge does not reach the broader public, especially homeowners. Following an original example, the Estonian Open-Air Museum (EOAM) has set a goal to reconstruct a thatched roof made of straw to replace the reed roof on at least one exhibit building within the next 10 years. This could serve as a valuable model for other open-air museums as well.

So far, the Estonian Open-Air Museum has organized practical workshops for building traditional wooden roofs. However, the corresponding heritage building tools have been collected randomly, and the existing tools are currently stored away from the public's view. It's not just the collection itself that matters, but also the opportunity to introduce these technologies to museum visitors through this collection.

5. Conclusions

National support measures are essential to preserve traditional skills and materials and promote their wider use, as shown by the number of grant applications during the 2021–2024 call for proposals.

The preservation of cultural heritage and heritage skills cannot be left solely to the efforts of a few homeowners. In today's rapidly changing world, with increasing emphasis on sustainable technologies and reducing carbon footprints, now is the ideal time to rediscover and adopt these traditional techniques.



Fig. 7 – A roof of original concrete tiles on the Härjapea farm dwelling relocated to the Estonian Open-Air Museum (Pärdi, 2007).

Although this article focuses on a small region of Europe, the same issue is likely present in many other European countries and beyond. Preserving the authenticity of vernacular architecture at any cost is neither practical nor reasonable for society. Perhaps we must acknowledge that safeguarding this aspect of our historical memory should remain the responsibility of museums. However, museums require both material and theoretical support to carry out this important work.

An increasing number of architects are incorporating local traditional materials into their designs, creating buildings that reflect a modern architectural language while honoring rural heritage. This approach emphasizes the history and techniques behind these materials and breathes new life into old traditions, resulting in fresh, innovative creations.

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