

Proceedings of the 3rd Asia-Pacific Regional Conference on Underwater Cultural Heritage



Edited by
Brian Fahy
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Brian Fahy, Sila Tripati, Veronica Walker-Vadillo, Bill Jeffery, Jun Kimura

Editors

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Session 14: Beyond the South China Sea: Cross regional studies of maritime communities

The history of Southeast Asia is marked by the strong maritime networks that were established since prehistoric times within the boundaries of mainland Southeast Asia, island Southeast Asia, and southern China. These connections, which extended beyond their barriers to reach Far East Asia and India, had the South China sea as its nodal hub for trade networks.

Similar maritime hubs developed in other regions of the world, like the Mediterranean, the Baltic and North Seas, the South Pacific, or the East China Sea. Ongoing research in these areas have produced solid theoretical frameworks and relevant case studies that can be of great use for the study of Southeast Asian maritime communities. Westerdahl's concept of the Maritime Cultural Landscape brewed on the shores of the Bothnian gulf in the Baltic sea, but this theoretical framework is now applied in many regions of the world. In the Mediterranean, Braudel's conceptualization of the northern and southern shores as a single entity has often been used to define the boundaries of Southeast Asia by researchers such as Manguin or Reid. These examples show that finding common ground with researchers studying maritime cultural clusters can result in the cross-pollination of ideas and methods.

This panel seeks to bring together case studies from across these regions to generate debate that will help to further develop the theoretical framework of maritime archaeology in Southeast Asia. We encourage the submission of papers with clear theoretical approaches or analytical frameworks that may be replicated in other maritime clusters.

Session Chair: Dr. Brian Fahy

One boat-building tradition? How can Lake Lugu in Yunnan/Sichuan province, Lake Suwa in Nagano prefecture, Lake Ohrid in Macedonia and Lake Cerknica in Slovenia be connected? Preliminary research

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Abstract

What do lakes that are separated by up to 9,500km have in common? These are Lake Lugu, Lake Suwa, Lake Ohrid and the Ljubljanica River Basin. It is impossible to imagine what could bring these together, since different cultures were living in the Japanese "Alps", the Mosuo people in China and on the other side in the Balkans and the foothills of the Alps?

*However, there is a field of study where we have a mentality that can be much closer than it appears. There are adamant similarities between four very common farm boat building traditions based on the logboat. These are the expanded logboat, which are, at least of traditional origin in the 'Notranjski drévak' (ang. Notranjska 'treeboat') from the Ljubljanica River Basin, which most likely evolved entirely indigenously in the region. The most convincing similarity is in the design features and parts of the boats. The backbone consists of chine-girders with a **C** or **L** cross-section and inserted bottom planks. The combination of bow and stern could be slightly different. All boats are very similar in width and length. Such a construction provides excellent stability and the boat is almost impossible to overturn. These were farming boats intended for local activities, such as cargo transportation, social life, fishing and hunting.*

It might be that the tradition for all four boats would be unique and they all arise from one boat-building tradition. However, at least for 'Notranjski drévak', we can assume that the origin lies in the Celtic-Roman shipbuilding tradition that arose in the area of the basin of the Ljubljanica

and Kupa Rivers. The Lake Ohrid ćun even suggests that the boatbuilding skills here derive from Celtic-Roman tradition, but the answer to the question about the influences behind the boat construction at Lake Lugu and Lake Suwa is not as self-evident.

Key words: boatbuilding, lakes, landscape, logboat

Introduction

While investigating the roots of the boat building tradition of *Notranjski drevák* from the Ljubljana River Basin in 2014-2015 due to registering this old Slovenian boatbuilding tradition on the national list of intangible cultural heritage, we first observed the traditional *marutabune* from Lake Suwa through an internet visual archive.

This discovery attracted our attention due to the unbelievable similarity in boatbuilding in these regions 9,500km apart. Later, we also discovered an amazing similarity in extended logboat construction in the boatbuilding tradition of Lake Lugu on the border of Yunnan and Sichuan in China, and finally on Lake Ohrid in Macedonia. What is going on? (Fig. 1)

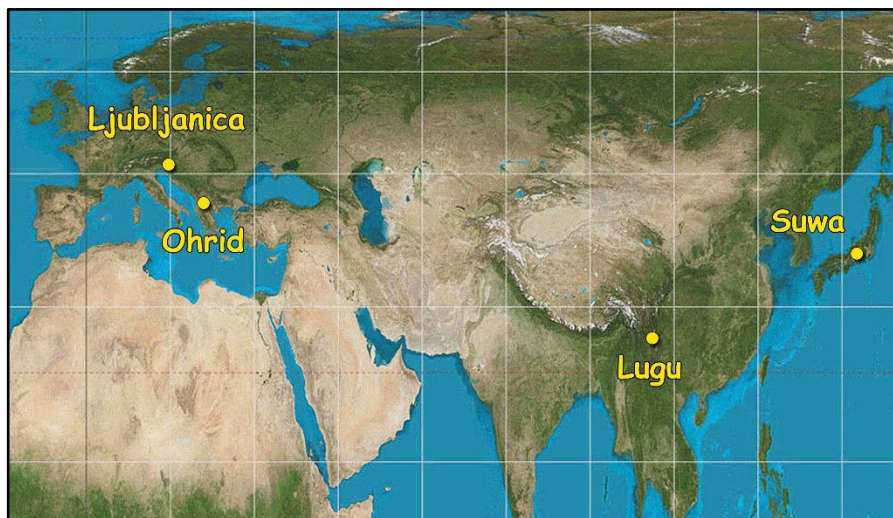


Fig. 1: Locations of the four different region in Europe, China and Japan (Gal - Peters Earth projections).

Environmental

Lake Lugu between Yunnan and Sichuan province, China: Lake Lugu lies in south-west China on the border between the Yunnan and Sichuan provinces. The closest larger town to the south is Kunming in Yunnan province, and in the north-east, it is Chengdu in Sichuan province. It is a natural lake in the Hengduan Mountain System, which is the eastern foothills of the Tibetan plateau and consists of Himalayan leucogranite. It is located on a high plateau with a surface elevation of 2,685 metres in the middle of the Xiaoliangshan hills by the Lion Mountain. This sub-alpine zone in the southern Hengduan Mountains is covered with rich forest habitat mainly of Yunnan pines (*Pinus yunnanensis*), Chinese pines (*Pinus armandii*), lacquer (*Toxicodendron vernicifluum*), camphor (*Cinnamomum camphora*), kapok (*Ceiba pentandra*) and dragon spruce trees (*Picea asperata*). Lake Lugu is bounded on all sides by mountains and partially forested slopes. The lake has a length of 9.4 kilometres, a width of 8 kilometres, a water area of around 49 square kilometres and a maximum depth of 95 metres, making it the second deepest lake in China. The primary inflows are the Mosuo River, and the outflows are the Gaizu and Yalong Rivers. Geologically, it is inferred to be one of the youngest fault lakes in the Yunnan Plateau. The lake waters exhibit transparency to a depth of 11 metres, and there are four peninsulas and five islands. The history of the place is known back to the Middle Ages when Kublai Khan and his Mongolian army established a headquarters south of Lake Lugu. However, it is also well known for its matriarchal culture and for the dress of the Mosuo women and girls in particular, which is conspicuous for its maroon blouses and skirts that establish an aura of authority (Xing, 2017; Chung, 2005; Wikipedia, 2017; L.L.M, 2006).

Lake Suwa in Nagano prefecture, Japan: Around 3,700 kilometres to the north-east in the middle of the biggest Japanese island of Honshu, in the Nagano and Gifu prefectures, is a group of mountains collectively known as the Japanese Alps (*Chūō Arupusu*). They consist of the Hida Mountains (*Hida Sanmyaku*), also known as the Northern Alps (*Kita Arupusu*), the Kiso Mountains - Central Alps (*Kiso Sanmyaku - Chūō Arupusu*) and the Akaishi Mountains - Southern Alps (*Akaishi Sanmyaku - Minami Arupusu*). However, the range mainly consists of Cenozoic granitic rocks and Jurassic accretionary prisms (Taira, 2001; Sueoka et al., 2016). Lake Suwa is situated between the tripoint of Hida, Kiso and Akashi Sanmyaku and just 70 kilometres south of Nagano. The subalpine zone of the Suwa Lake environment is mainly inhabited by conifer (*Abies veitchii*, *Tsuga diversifolia*, *Larix kaempferi*, *Pinus densiflora*) and evergreen broad-leaved (*Quercus mongolica*, *Betula japonica*) forest zones (Miyawaki, 1973, 1984; Sharma 2016). The size of Lake Suwa is around 13 square kilometres with a maximum depth of 7 metres. Its surface elevation is 759 metres with the inflow of 31 small rivers from the Kiso Mountains and the outflow of the Tenryū River. Lake Suwa is the site of the interesting natural phenomenon of a hot spring under its surface. When the lake's surface freezes in the winter, its lower waters are still circulating. This results in ice pressure ridges forming in the surface ice, reaching heights of 30 centimetres or more. An interesting local particularity is The Onbashira Festival (Japanese: 御柱祭 *Onbashira Matsuri* or "Honoured Pillars Festival"), which is one of the oldest festivals with an uninterrupted 1200 year history which shows how highly connected the local inhabitants are to nature and the forestry landscape in this area. The festival is held every six years, and the main topics are to symbolically renew the four shrine buildings by felling sixteen fir trees, preparing them as honoured pillars (onbashira), and transporting them

down a mountain to the shrine. Participants ride the onbashira as they are slid down the mountain, dragged to the shrine, and raised. It has a reputation as the most dangerous festival in Japan since participants risk being injured or killed when riding the logs (Sueoka et al., 2016; SBSI, 2003; Robertson, 2013; Miura, 2016).

Lake Ohrid, Macedonia: Let turn 9,400 kilometres to the west and to the Balkan Peninsula in Europe. One of the most remarkable landscapes is the mountain chain stretching from south-east to north-west along the east coast of the Adriatic sea called the Dinarides, the Dinara mountain or the Dinaric Alps. The Dinarides geologically consist of Mesozoic limestone forms, notable for features such as the Karst, which has given its name to all such terrains of limestone eroded by groundwater. The basic vegetation cover is two major forest zones. A conifer zone (*Picea abies*, *Abies alba*, *Pinus nigra*, *Picea omorika*), which characterises the highest elevations above 1,200 metres in altitude. Below this elevation, mixed broadleaf (*Fagus sylvatica*, *Quercus: ceris, robur* and *petraea*, *Carpinus betulus*, *Fraxinus excelsior*, *Ulmus minor*, *Tilia*, *Acer*, *Sorbus* and other) forest is mostly present (Mihevc et al., 2010; WWF, 2017). Just on the south-east edge of the Šar-Korab massive, part of Dinaric Mountains, Lake Ohrid is situated on the mountainous border between southwestern Macedonia and eastern Albania. Lake Ohrid is the deepest lake in the Balkans and one of the deepest in Europe, with a maximum depth of 288 metres, it covers an area of 388 square kilometres, and it has a surface elevation of 693 metres above sea level. The main inflow is from the Sateska River, which is connected to nearby Lake Prespan through underground watercourses in the karstic landscape. The outflow of the lake is the Black Drin River to the north through Albania to the Adriatic Sea. It should be mentioned that Lake Ohrid is one of the oldest human

settlements in Europe. At Plate Michov City, a prehistoric pile settlement was discovered belonging to the Late Bronze and Early Iron Age. Lake Ohrid was colonised by Illyrians in the 5th century BC. Archaeological findings show an Illyrian settlement that was fortified in the 4th century BC. By the 3rd Century BC, Roman forces had taken control of Pogradec. The Via Egnatia road is found in the Pogradec region, near to the shores of Lake Ohrid, and is evidence of the former Roman presence. Ohrid town was mostly built between the 7th and 19th centuries, Ohrid is home to the oldest Slav monastery and more than 800 Byzantine-style icons of worldwide fame dating from the 11th century to the end of the 14th century (Spirkovski et al. 2000; WHL, 1979).

Ljubljana River Basin, Slovenia: Lastly, around 750 kilometres from Lake Ohrid at the Northwest end of Dinarides where they connect to the Alps and Karst region, we can find the Ljubljana River Basin. Because of the specific geological structure of the Dinarides to the south, which is Mesozoic limestone forms, and the Eastern Alps mountain range on the other side, the area is under extreme compressive stress and pressure, uplifting marine sedimentary rocks and creating characteristic recumbent folds, or nappes, and thrust faults. However, the bedrock of this geological formation is extremely soluble, as can be seen in the Karstic character of this landscape where more than 11,000 caves are recorded on at least 8,000 square kilometres (Gerrard, 1990; Graciansky, 2011). The vegetational cover is nearly the same as it is near Lake Ohrid, consisting of two major forest zones. A conifer zone (*Picea abies*, *Abies alba*, *Pinus nigra*, *Picea omorika*) and mostly a mixed broadleaf zone (*Fagus sylvatica*, *Quercus: ceris, robur* and *petraea*, *Carpinus betulus*, *Fraxinus excelsior*, *Ulmus minor*, *Tilia*, *Acer*, *Sorbus* and other) (Mihevc et al., 2010; WWF, 2017). It is not surprising that such a landscape is home to the river

with seven names. It starts is as the Trbuhovica near the border with Croatia and disappears into the karstic field of Babno Polje. However, the same process continues all the way to the point where it flows into the Sava river. Next is the Obrh river running through the Lož Valley, then the Stržen river through the Cerknica Field, the Rak River through the Rakov Škocjan Valley, the Pivka River through the Pivka Basin, the Unica River in the Planina Field and finally the Ljubljanica river as it flows through the Ljubljana Marshes (Gams, 2004). Meanwhile, the Karstic character of the valleys, fields and marshes means that water in this area can outflow very slowly and over a long time, meaning that the water can stagnate for a longer period. However, this also means that all these landscapes could be flooded, even up to ten months per year. That means that past residents near the Lož Valley, Lake Cerknica, the Planina field and the Ljubljana Marshes, mostly live near up to 5 metres deep intermittent lakes. The Ljubljanica River Basin is abundant with water, as the water is collected from 1884 square kilometres. The Ljubljanica riverbed and Ljubljana Marshes are one of the most important archaeological sites in Slovenia in its 170 square kilometres. It has the world-renowned and UNESCO-listed monuments of Alpine pile dwellings, a 45,000 year old wooden hunting point, the oldest known wheel, more than 70 logboats, three Roman Age flat bottom ships and many other significant findings and sites (Velušček, 2005; Velušček et al. 2009; Erič et al. 2014; Gaspari et al. 2011).

Extended logboats

Lake Lugu: The extended logboat from Lake Lugu (Lúgū Hú 泸沽湖) was observed coincidentally when searching the internet a few months ago – however, later research failed to find any serious studies about boat construction. However, because Lake Lugu with its resident's Mosuo

minority ethnic people is a rare and exotic world travelling region, plenty of photographic material including the traditionally extended logboats was accessible. Through a study of this photographic material, it was possible to make a rough reconstruction of many construction details. By comparing with the other extended logboats mentioned here, it was possible to recognise the basic similarity with the others in all areas except the wood species. However, as this region is characterised as a subalpine zone with mainly mixed coniferous and broadleaf forest, it can be assumed that the boats are made from one of the local species of pine wood. The extended logboats are known as *Zhu cao chuan* (豬槽船), which in the local language means "pig trough boats", and they were used for fishing, farming and living purposes by the local ethnic group. After reconstruction using the available photographic material, a 3D model was generated and compared with the other similar extended logboats analysed in this article. However, they seem to be mainly built in a ratio of 1:6.1 and were usually used for fishing activities, rather than for the transport of people and goods in the farm's villages of the region as well. They seem most likely 7 and up to 10m long with the width of the boat about one metre. It is hollowed into two chine-girders with a **C** cross-section and a tiny concave bottom plank inserted. The boat is also expanded with 10 cm high vertical gunwale planks up to the chine-girder stern and bow, which consists of the bottom planks rising in a gentle curve. The *Zhu cao chuan* seems to be a wide and very stable fishing and farming boat with a flat bottom, which cannot be overturned (Fig. 2).



Fig. 2: Zhu cao chuan (left) and a landscape from Lugu Lake (right). Available at: https://en.wikipedia.org/wiki/Lugu_Lake [Accessed July 10, 2017].

Lake Suwa: The boats on Lake Suwa traditionally include extended logboats (marutabune 丸子船), a survival of the basic logboat (kuribune 割舟), and plank boats (sampan 板) with a strip-plank construction (hagibune 舟剥). The standard lengths, as taken from Shimosuwa's Cultural Heritage register (Shimosuwa-machi Bunkazai Senmon linkai 下諏訪町の文化財; SBSI, 2003: 132) is up to 7 metres, and they have a ratio of 1:6.3. They were traditionally intended for fishing on Lake Suwa, as well as for the transport of people and goods between the farms and villages of the region. The width of the boat is about one metre, and in Meiji period they were traditionally hollowed from keyaki (*Zelkova serrata*), katsura (*Cercidiphyllum japonicum*) or chestnut trees (*Castanea crenata*). However, they later began to use Japanese larch (*Larix kaempferi*). These were hollowed into two chine-girders with a C or L cross-section and a flat bottom plank inserted. Three boards are laid side by side and joined in the centre, making six planks. Since the curved gunwales are attached to one

another, they required considerable craftsmanship, and thus gave the boat builders an opportunity to showcase their skills. The forward and aft sheer of the flat bottom (*shiki*) confers a slightly trough-shaped form that makes them extremely easy to manoeuvre. The weight of the hull confers a high degree of stability, and it is said they are strong in the wind. Since the boats do not rock, capsizing is rare. In addition to the forward sheer, the high deck offers a broad field of view and allows nets to spread out when cast. As one's feet are well down between the gunwales, there is little danger of falling overboard. In cold weather, they also had the benefit of being cosy, and the gunwales would hold in the heat and smoke when someone brought along a hot-pot (*hinabe*) and lit a small fire on board to keep warm. The superiority of both structure and function made the Lake Suwa logboats strong in the waves, enabling fishing by day and night, even in foul weather. The boat had a lifespan of between 10 and 12 years. Navigation with oars requires specific skills and rowing through shallow and deep water are different (SBSI, 2003: 132; Robertson, 2013; Fig. 3).



Fig. 3: Marutabune in the Suwako National Museum (left; SBSI 2003) and a landscape from Suwa Lake (right). Available at: https://en.wikipedia.org/wiki/Lake_Suwa [Accessed July 10, 2017].

Lake Ohrid: The generic name for fishing and farming boat in the Macedonian language is *Ćun*, and the term is also simply a personal

name for the particular kind of boat construction examined in this article. Like the other ones, the *Ćun* is an extended logboat and, aside from tiny design difference, it is analogous to the Lugu, Suwa and Notranjska boats in its significant constructional details. In its contemporary form, it seems to have a highly baroque design, which has no exact fundamental reason. Today, studies by Goran Patčev and Vesna Naumovska from the National Institute for heritage protection and the Museum of Ohrid (Stavrić, 1983; Patčev and Naumovska, 2014) declared that it is 5m long and 1.1m wide in bow cross-section and 1.9m wide in stern cross-section, with an average ratio of 1:2.6. However, the basic constructional fundamentals are the same as the other compared boats. This means two chine-girders hollowed into a C-shape cross-section with inserted bottom planks, with uprising bottom planks in the stern and bow section. Like the Lugu boat, it is expanded by 30cm vertical gunwales. These are additionally expanded by higher stern planks and an extremely high the bow section. However, critical studies of accessible historical photography from the end of 19th and beginning of 20th centuries show a less standardised tradition with more similarity to the others. Moreover, it is known that the boats were traditionally used for fishing and farming needs on the lake (Fig. 4).



Fig. 4: Ćun od Ohridsko ezero (left; credit by the National Institute for heritage protection and the Museum of Ohrid) and a landscape from Ohrid Lake (right). Available at: https://sl.wikipedia.org/wiki/Ohridsko_jezero [Accessed July 10, 2017].

Ljubljanica River Basin: The original name of this extended logboat was 'Notranjski drevák' (Eng. *Notranjska tree boat*), and it was made in two or more lengths. Compact, standard lengths of up to 7 metres have a ratio of 1:4.8 and were intended for the transport of people and goods between the farms and villages of the region. The larger drevák, up to 14 metres, was fundamentally used to transport large cargoes and livestock, but the ratio was changed to 1:10 because the standard boat width was the same as that of the shorter one. In both versions, the width of the boat is about one metre, and the pendulum is up to ten centimetres. It is hollowed from a fir tree (*Abies Alba*) into two **C** or **L** cross-section chine-girders with a flat bottom plank inserted. The central bottom planks were regularly a width of 70 centimetres, and there were most often two, but sometimes three planks. However, they never exceed the width of a single bottom plank. The decision is likely due to the availability of suitable material. The stern and bow consist of four bottom planks in a gentle curve cut out from a naturally curved fir. The chine-girder and the bottom plank are bound with iron nails, in the middle, right and left. In the end, the outer and inner surfaces are carefully sanded. Longitudinal joints are sealed with hemp (*Cannabis sativa*) twine. The boat has a lifespan of between 10 and 12 years. The *drevák* is a wide and very stable farming boat with a flat bottom, which cannot be overturned. Navigation with oars requires specific skills and rowing through shallow and deep water are different. Up to the 1960s, dreváks were used in the flooded Notranjska Karst fields for farming, fishing, hunting and transport throughout the Ljubljanica River Basin, in particular on the Ljubljana Marshes, the Planina Field, Lake Cerknica (Peršič, 2003), and the Lož Valley. (Fig. 5).



Fig. 5. Notranjski drevák in the Lož Valley (top left; Kebe 1996) and the Planina Field (top right) with a landscape of Cerknica Lake (bottom left) and the Ljubljana Marshes (bottom right). For Cerknica Lake, Available at: <https://www.rtv slo.si/tureavanture/podobe-slovenije/cerknisko-jezero-cudez-narave/200667> [Accessed July 10, 2017].

Environmental and constructional similarity and purpose

Environment: We would like to emphasise at list three important environmental characteristics of these different regions that significantly affect the behaviour of inhabitants in usage of and living in the landscape.

The landscape of these four different regions in entirely different parts of the world has surprisingly similar nature environmental and climatological characteristics. All of these landscapes are in subalpine zones. At first glance, Lake Lugu seems different to the others due to the high altitude – 2685m above sea level. On the other hand, it is much further south from the other region and the average temperature and humidity are nearly the same as in Lake Suwa, Lake Ohrid and the basin of the Ljubljanica River.

The next significant environmental similarity is that they are positioned in a configuration with mainly Alpine foothills. From the geological point of view, lakes with young highly eroded mountains around are classified as

alpine lakes. However, the Ljubljana River Basin, lying in the foothills of the Alps, has a special Karstic character of flow through the rock to the intermittent lakes and finally finishing in the Alpine Sava River.

The third meaningful character of these landscapes that have a significant influence on the living condition and shapes human behaviour through the millennia is the vegetation habitats, which in all the regions are deciduous-coniferous woodland. That is a direct and significant influence manifesting the traditional use of elementary tree trunks for logboats and boat building in water-rich countries for fishing, hunting and farming necessities.

Boat construction: The most important characteristics of all four boats have so many similarities that they could be assumed and treated as the same type of boat. There are also some elements that vary (Fig. 6).

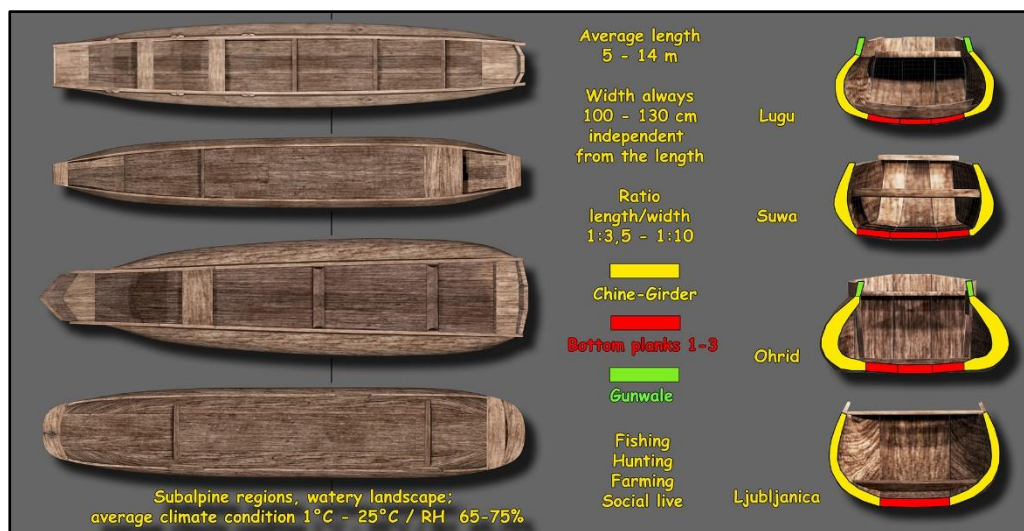


Fig. 6: 3D models of the extended logboats from Lake Lugu - based on the available photographic material, Lake Suwa - based on plans and photography (SBSI, 2003), Lake Ohrid - based on plans and photography (Patčev and Naumovska, 2014) and the Ljubljana River Basin - based on a photogrammetric 3D model. Important construction details determine all four extended logboats as the same type of farming boat in similar environmental landscapes (Modelled by LaniXi).

Chine-Girder: the most important and significant construction details are the very prominent and robust chine-girders, which are carved from a tree trunk mainly with a **C** cross-section profile; however, version from the 20th century could also have an **L** shape.

Bottom and Stern/Bow Planks: between the extended chine-girders are installed one to three or four bottom and stern/bow planks, which probably depend on available raw wooden material.

Gunwale: the basic boat construction is upgraded with expanded elements – mainly as vertical gunwales or side planks. This is a basic element in the construction of the boats from Lake Lugu, Lake Suwa and Lake Ohrid, but not in the construction of those from the Ljubljana River Basin. The intermittent character and temporarily existing lakes in the Lož Valley, Lake Cerknica, the Planina Field and the Ljubljana Marshes could explain this since all these lakes are never deeper than 2-3m. This means that even in heavy wind, it is physically impossible for high waves to develop.

Stern/Bow Wale: in all four constructions, we can see differences in the design of the stern and bow wale to firm up the body of the boat and also serve for accommodating users.

Dimension: All the boats range in length from 5m up to 14m in the case of some from the Ljubljana River Basin. However, due to the underexplored backgrounds of Lake Lugu, Lake Suwa and Lake Ohrid, the same dimensions could be assumed. The width is nearly identical – 110cm to 130cm, which guarantees significant stability and allowing users to walk around the boat during fishing, hunting and farming activities. The ratio of length/width varies from 1:3.6 to as much as 1:10 in the case of longer versions of the extended logboat from the Ljubljana River Basin.

Application: In all cases, the use of the boats is for fishing, hunting, farming and community life.

Origin of the boat building tradition

Research into the four specific extended logboats / farming boats with extremely similar construction, boatbuilding philosophies and use in completely different parts of the world, history and tradition is rare and exciting. As we researched the extended logboats from the Ljubljana River Basin, the history of which could be traced back to the Roman empire with assumed Celtic-Roman north-east Adriatic shipbuilding tradition, it is difficult to make any final decision. However, for the *notranjski drevák*, we can assert that they are endemic and indigenously developed in the eastern hinterland of the Northern Adriatic Sea. Visual sources (engraving, photography) from the last few centuries and the testimony of knowledgeable witnesses allow us to conclude that the *notranjski drevák* was in regular use on the Ljubljana Marshes, the Planina Field, Lake Cerknica and the Lož Valley until the first half of the 1960s. The construction technique and details - from the selection of trees to launching - is today passed down orally from generation to generation, usually by boatbuilders and sometimes by farmers. In the case of the *notranjski drevák*, we have raised more new questions than we have answered. We have begun new research questions into the provenance of this particular kind of boat building construction. We have seen a long tradition of forms such as the **C-** or **L-**shaped chine-girder, the gentle curve with a longitudinal bilge in the bow and stern, a chine-girder joined with bottom planks using horizontal nailing into the planks, etc. New evidence from the Ljubljana River Basin (Čufar et al. 2014) and the Kupa River Basin have given us an opportunity to conclude that this particular boatbuilding tradition stems from a more than 2000-year-old, probably

Roman-Celtic shipbuilding tradition. However, we are left with one open and unanswered question: why the similarities between types of extended logboat in entirely different regions of the world: China (Yunnan/Sechuan), Japan (Nagano), Macedonia and Slovenia?

According to the photographic source and accessible information, it is possible to say that the extended logboats from Lake Lugu, Lake Suwa and Lake Ohrid have been a part of the regions' tradition for a long time – at least the last few hundred years.

Conclusion

Researching questions at this stage of discovering a possible single source of boatbuilding tradition of specific extended logboat construction is still open and without answers. However, we have enough evidence to assume that there is a relatively high possibility that all these four similar traditional boatbuilding styles could be developed without any influence between them.

We assume that the specific character of the natural environment and climate conditions, which are extremely similar in all four regions, lead inhabitants throughout the history to find very similar traditional construction solutions. Moreover, these could have the best characterization for the specific environment and purpose of use – fishing, hunting, farming and social apparatus.

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