Small Watercrafts on the Western Indian Ocean: Interaction of Human and the Sea in the Pre-oil Era

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Abstract This chapter gives an overview about the small watercrafts, used in the countries along the Western Indian Ocean from the nineteenth century until the oil-caused development changed their maritime culture. The compilation bases on fieldwork in the Gulf and Oman, literature research and the study of photo collections. Not true boats but the *shāsha*, a palm stalk raft, was the most numerous craft in Oman, like the dugout *hūrī* was the numerous small craft on the entire Western Indian Ocean. Planked boats are classified by their features, not by their names. It also tries first steps to understand the concurrence of human culture, sea, sea live, land resources and the resulting watercrafts in Western Indian Ocean.

Keywords Small watercrafts · Western Indian Ocean · Pre oil times · Interaction human–sea

1 Introduction

Humans are land-beings; without aids the sea is a deadly environment for them. Even in the warm waters of the Indian Ocean, a human could survive unaided only for hours in the water and only for few minutes under the surface. If humans must deal with the sea, they always need tools or devices; the only exceptions are the gathering of flotsam and the collection of animals like shells on the coastline. Even the ancient ichthyophagi, described as primitive by Agatharchides of Cnidus, used intertidal stone traps to catch fishes (Burstein 1989). Such intertidal fish traps but very large were used until the recent times in the Arab Gulf, especially in Qatar (Ahmed 2002). Recent satellite images of Bahrain and Iran show the remains of similar traps. Cast nets and handlines were used on every shore of the Western Indian Ocean.

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Fig. 1 Model of a Magan ship, Vosmer 2006, Photo Weismann

Watercrafts were used on the Western Indian Ocean since more than 7000 years; there are archaeological evidences that bitumen-covered reed vessels were among the earliest types (Connan et al. 2005). A reconstruction of such craft was made by Vosmer (2003) (Fig. 1).

Until the eighteenth century, some images are known regarding ships but very few archaeological evidences: The Belitung wreck from the ninth century AD (Flecker 2000, 2008) and the ship timbers from Al Balīd in Oman from about the tenth century AD (Belfioretti and Vosmer 2010). Useful sources about boats and other small watercrafts are even more scare. The original of a silver boat model from third century BC in Ur (Hall 1928) navigated certainly only inland waters. Nicolle (1989) compiled images of vessels in Islamic art; some boats are depicted but they enable no classification. Only since the nineteenth century I found more detailed descriptions and images of small watercrafts.

The distinction of watercrafts in ships and boats could be difficult. In this chapter I follow the definition by Steffy (1994): A boat is a small vessel designed for operating in sheltered waters, while a ship is a large vessel designed for deep-water navigation. This classification avoids most of the overlap between ships and

boats on the Western Indian Ocean. Because there was virtually no deep-sea fishery in the nineteenth and twentieth century in the whole region, ships were used for transport. These ships, here simplifying called *dhows*, are described by Pâris (1843, 1882–1886) in the nineteenth century and in some works in the twentieth century; Hawkins (1977) made the best overview. Fishermen used boats, rafts and inflated skins, and such vessels are the focus of this chapter.

To classify a planked boat, I use the features of the stem, stern and keel only. All vessels have, with very few exceptions, settee rigs. The shapes of the hulls, specifically the main frame shapes, enable in most of the cases no discrimination. The naming of boats in the Western Indian Ocean could be a challenge. For most of the wooden boats, not only one but several names exist (Agius 2002). The *kambārī* from Dhofar in Oman, for example, was called *sanbūq, sanbūq ẓufāri, sanbūq mukhayaṭ, dhawāki, beden, ibri, huri*, or *qarib* too. In such cases I will use the least ambiguous term. The name given for the type of a boat is not sufficient to classify the vessel; this is only possible together with a description. The spelling of Arab names for types of vessels and for parts of watercrafts follows the systematic used by Agius (2002).

2 Planked Boats: Common Features

The Arabian Peninsula, parts of the west coast of India and East Africa north of Mozambique, is dominated or strongly influenced by the Islamic culture, and this community was one base of the ship and boat building tradition in the Indian Ocean. The other base was India with its dense population and its wood resources. Together, they generate the Indo-Arab tradition where all the planked wooden watercrafts had common features.

They were shell first built. The planks were only fixed temporarily together until the shell is nearly finished (Figs. 2 and 3). Not till then, the frames were inserted. This is one of the construction principle developed for sewn vessels, used in the region at least for two millennia. In the nineteenth century, the sewing was replaced by nailing on most of the vessels, but few sewn boats were used until about 2000.

The parts of the frames were not directly connected, and the beams were not fixed to the frames, so no self-supporting framework existed. Besides on the fore and after ends of a vessel, the frames consisted alternating only of futtocks and of floors and futtocks. On nailed vessels the planks run into grooved rabbets in the stem and stern post but were nailed only to internal posts (Fig. 4). There were lodging knees for the mast beam and other important beams. Hanging or standing knees were not used on frames and or beams but only for large main sheet stanchions and for foredeck bulkheads, which were common since the twentieth century. The main hatch was trapezoid; this construction helped to erect the mast (Fig. 5). Only after the introduction of engines, the main hatches became rectangular.

The rig starts to change from a square sail to the *settee* sail in the fourteenth century; this transformation was mainly finished in the nineteenth century, but some vessels like the *mtepe* of East Africa and partly the *kambārī* in South Arabia carried in the twentieth century still a square sail.

Fig. 2 *Shū'ī* under construction, inside, Sur 2003, courtesy of Piotr Dziamski, Poland

Some types of *dhows* like the *sanbūq* (Moore 1940) and the *baghla* (Burningham 2007) were built and used all over the Western Indian Ocean, while other types like the *batīll* and the *badan* were built only locally or in a certain region. Boats were always built in local traditions, in some cases as the *jālbūt* (Bowen 1949) and the *kambārī* in the Arab Gulf and the Gulf of Oman regionally. An exception was the dugout *hūrī*, which operated on the entire Western Indian Ocean. For many types of ships a boat version existed. For example, the *būm,* the *batīll*, the *baqqāra,* the *sanbūq*, the *badan* and the *jālbūt* were ships, but boats with the same features existed too.

Teak was the preferred wood for planks because it was resistant against *Teredo navalis*; mango, local available in Zanzibar or imported from India, was used for dugouts and sewn boat planking because it doesn't split easy and it is *Teredo navalis* resistant too. Inside parts of the vessels were often made from local wood.

3 Borders and Influences

Three natural border regions regarding the construction of vessels exist in the nineteenth and twentieth century at the Indian Ocean: the northern Red Sea, Tanzania in East Africa and the southern part of the Indian West Coast (Fig. 6). Since the middle age a sharp border existed in the boat and ship building tradition between the

Fig. 3 *Shū'ī* under construction, outside, Sur 2003, courtesy of Piotr Dziamski, Poland

Mediterranean and the Red Sea as part of the Indian Ocean. The vessels in the Mediterranean were frame first built with a self-sustained framework; clenched nails were not usual. Anyhow, in 2001 I found on old boats in El-Quesier without clenched nails and with connected frames; others were built in the Western Indian Ocean tradition. It seems that in the twentieth century boats in northern Red Sea were built in a mixed way. All wooden vessels in the middle and southern Red Sea were until recent times built in the Western Indian Ocean tradition. On the river Nile, the traditional wooden watercrafts had mostly lateen sails like Mediterranean ships. Hornell (1970) reports the frame first method for the building of all the wooden vessels north of Luxor in the twentieth century but Morsy (2016) found in 2014 shell first constructions on boats in Dendera, 60 km north of Luxor.

Southward of Lamu in Kenya vessels with untypical features like the posts and the square sails of the *dau la mtepe* occurred, probably remains of a local tradition (Jewell 1969; Lydekker 1919). In Zanzibar and Tanzania, outrigger dugouts were used, not found on other places in the Western Indian Ocean.

On the west coast of India is some coexisting with other traditions in watercraft building. Fishermen on the middle and the southern part of this coast used enlarged outrigger dugouts. The construction principles of the planked vessels were the same as in the Western Indian Ocean, but there were regional types of boats.

There was some discussion about the influence of European shipbuilding on the Indian Ocean after the journeys of Vasco da Gama. The square sterns of many Indian

Fig. 4 Setting the internal stern post, *sanbūq* Dhi'b, Khor Rori 2011, courtesy of Alessandro Ghidoni, England

and Arab vessels and the quarter galleries of the *baghla* and *ghanja* were used as proof for such an influence (Hornell 1942). At a closer view, the similarities concern only the decoration; the construction itself is not altered (Dziamski and Weismann 2010). Further, there are some images of square stern ships from the thirteenth and fourteenth century in India (Swamy 1997). The *jālbūt* with its upright stem and square stern, used in great numbers in the twentieth century on the Arab Gulf, seems to indicate especially European influence (Bowen 1949). Rowand (1915) stated: "the name is probably borrowed from the man-of-war Jolly-boat" but Agius (2002) discussed Indian and Arabian origin of the name too. Anyhow, the construction of the still existing *jālbūts* follows entirely the Indo-Arabian principles. I found no hint of Chinese or East Asia influence on the construction or design of vessels in the Western Indian Ocean.

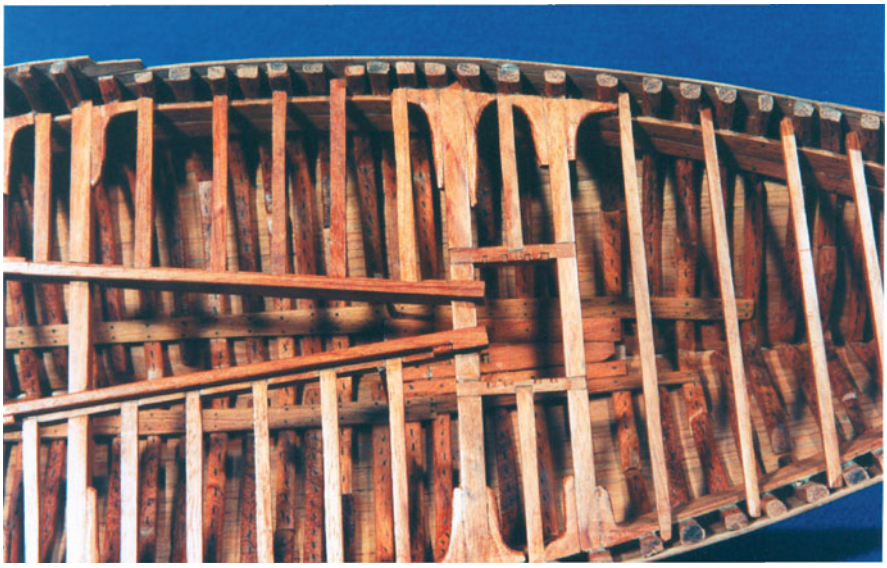

Fig. 5 Model of the cargo *badan* Al-Khamman, frames and beams, Weismann 1996, photo Weismann

4 Interaction

While modern ships require large harbour installations, wooden sail ships had in the Western Indian Ocean minimal influence on the shape of the shoreline. There were very few harbour installations in the pre-oil era. In the late nineteenth century were coral stone moles in Kuwait; in Bahrain the first stone pier was constructed in 1901 (Wheatcroft 1988). Dubai had some small stone piers for the *ʿabra*, the water taxis in the creek. On all other places, people and merchandise were transhipped in boats or dugouts to an unaltered beach.

Ships had only few impact on the sea live too. Ships transport goods like fish, pearls or shells, items which would not be taken out of the sea in such amount without the possibility of water transport. Their anchors could harm the seabed live locally especially on reefs, and if they sink little more, temporary damage will follow. Anyhow, not so much *dhows* sailed the Western Indian Ocean. There was no comprehensive counting for such deep-sea vessels in the pre-oil era but for vessels calling in Tanganyika ports (Martin and Martin 1978). In the year 1921 departed from Dar es Salaam 374 *dhows* to East Africa and 153 *dhows* to India, Arabia and Zanzibar (Martin and Martin 1978). I estimate the overall number of *dhows* at the beginning of the twentieth century of about 1000, not much for the large area.

Small watercrafts were used for short distance transport but mainly for fishing and pearl diving. No harbours were needed for them because they were launched and beached for every trip. Only the pearling vessels stayed at sea during the seasons but

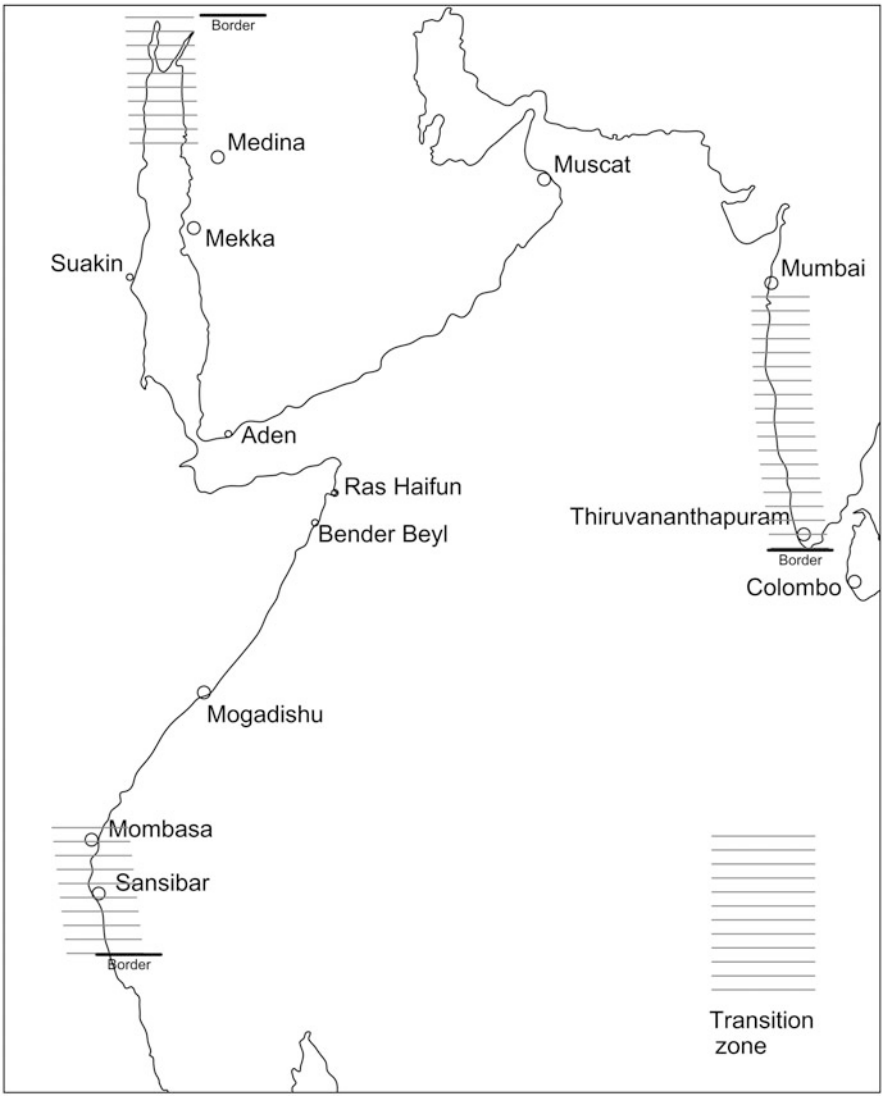

Fig. 6 Map of Indo-Arab tradition vessel zone

were taken out of the water immediately after return. Smaller vessels were carried by beams into and out the water or pushed over logs. Today, fishermen used sometimes beach winches, but I found no evidence for such devices before 1994.

Fishing had certainly an impact of the sea live but in the pre-oil era no overfishing is reported. Neither MacIvor (1880–1881), Bertram (1948) nor Donaldson (1979) reported an exhausting of fishing resources in Oman. Head (1987) came to the same conclusion regarding the Red Sea.

Fisheries provided everywhere a part of the needed food on the Western Indian Ocean, but the importance of fish for sustentation was regionally different. For example, in Qatar were in the pre-oil era only few wells and very few agricultures. For food, the people there depended mainly on import and fishing. At the beginning of the twentieth century, about 250 fishing boats were used in Qatar (Ahmed 2002) for about 12,000 inhabitants; therefore about every third family owns a boat. The fish production to that time was about 400–500 tons in a year (Ahmed 2002). Other communities depended not to that extent on fisheries. Al-Hijji (2010) estimated the 90 fishing vessels in Kuwait about 1930; to that time the population was about 80,000. Abbes and Farrugio (1976) estimated in 44 towns on the Iranian Gulf coast 3000 fishermen, 435 larger boats with inboard engine, 120 oared fishing boats and 225 small boats with outboard engine. They reported a yearly catch of about 16,000 tons (Abbes and Farrugio 1976). In the former Somalia fisheries were not very important: "The fisheries have historically not been a priority area for the Somaliland people..." (Gulaid 2004).

On the Red Sea larger gastropods were collected for food and used as bait; the opercula of conchs like the *Strombus tricornis* were used for perfume manufacture (Head 1987). Also, corals were gathered in the Red Sea; further oyster and trochus shells for their mother of pearl mainly on the western shores of the Red Sea using dugouts operating from *sanbūqs* (Head 1987).

Besides fishing boats were needed for pearling. Since the Neolithic period, pearls were found in archaeological context on the Arabian coast (Carter 2012). From the Roman times Bahrain was known as a centre of pearl diving in the Western Indian Ocean (Carter 2012). Regarding the numbers of pearling boats in the Gulf, Carter (2012) compiled the sources since the twelfth century. In the early nineteenth century, the pearling boom started, and pearling became in the Arab gulf a very important industry. Palgrave (1866) cited the Emir of Qatar: "We are all from the highest to the lowest slaves of one master, pearl". Indeed, Lorimer (1915) counted 817 pearling vessels in Qatar in the years 1905–1907. According to his count from the 27,000 Qataris 13,000 men working in pearl diving (Lorimer 1915). Other statistics tally about 10,000 souls to that time in Qatar (Lahmeyer 2005). Lorimer (1915) counted in Kuwait in 1905 461 boats; Al-Shamlan (2000) reported for 1913 812 pearling boats, in 1920 about 1200 vessels used for pearling each with about 30–100 men aboard. Carter (2012) estimated that Kuwaiti divers could collected annually 1,500,000,000 oysters with about 350,000 pearls, of which 100,000 were large (>4 mm).

The pearling and mercantile practice used up to the twentieth century was already known in the Gulf since the twelfth century (Carter 2012). In the nineteenth century pearling in the Gulf was well organized by law and customs. There were for seasons: The main season starts in May, when the sea gets calm and warm and lasted 120 days. The date for the leaving of the whole fleet was in Bahrain and Kuwait set by the ruler. There was a kind of extended main season; after that oysters were collected from the shore or nearby. From April to May some pearl fisheries were done by small boats. The most of pearl banks lay in the northern Arab Gulf, and consequently the centre of pearling was there; in other areas of the Western Indian

Ocean were only small-scale pearling with small boats. Since about 1920 was a decline in pearling; the last traditional commercial pearl diving in Kuwait stops in 1959 (Al-Shamlan 2000). Although there was some temporary exhaustion of oysters on certain pearls banks visited by too many vessels at one time, it seems no general overfishing of pearl oysters occurred in the Gulf even in the boom times (Carter 2012).

Pearling was always exhausting and sometimes perilous for the divers. Sharks, jellyfishes and sea snakes could harm the divers severely; there was sometimes poor provision and diving in cold water, and currents were dangerous and strenuous. Loss of pearling boats and ships seemed to happen seldom. Al-Shamlan (2000) mentions one shipwreck during pearling only.

The sea took many ships by storm and waves, and reefs caused many losses of sailing vessels. Vosmer (2005) wrote about the winds in the Gulf: "The average strength of wind is force 2 to 3 (very light, 4-10 knots) rising to 3 to 4 (7-16 knots) in the northern part of the Gulf during the winter. The variations from the mean are, however, great, and calms to strong winds are rather common". For the Gulf of Oman, he mentioned ". . .winds reach force 7 on about 1 to 2 days per month from December to March, but rarely higher. Squalls are common. Designing and building boats to cope with all these extremes of conditions would have been challenging, while acquiring the ability to read the approaching weather would be equally important". In 1961 a gale sunk 23 dhows in one night at Muttrah, Oman (Hawkins 1977). It is not known how many boats were lost by strong winds.

The sea live is very active in the warm waters of the Western Indian Ocean. A small *sanbūq*, coated with modern anti-fouling coat, was left about 1½ year in the lagoon beside the Museum of Islamic Art in Doha, Qatar; then it sunk down to the rail. Recovered on land it shows a very incrusted underwater hull, a layer partly more than 10 cm thick (Fig. 7). Probably, some infestation with marine borers caused the sinking. Even if teak wood is regarded to be resistant against *Teredo navalis*, other molluscs as *Martesia striata* or Crustacea as *Limnoria* could damage even such wood.

Beside teak other Indian wood could be used for planks. Aini (*Artocarpus hirsula*) was used for planks in India and the Sohar; for a replica form of a sewn Omani ship, built in 1980–1981, aini was used (Severin 1982). It has some resistance against marine borers. Benteak (*Lagerstroemia lanceolata*) could be used too, but it is not known to what extent such woods was used for boat building in the Western Indian Ocean. Mango (*Mangifera indica*) was used for *kambārīs* and *hūrīs*.

The marine borers and the incrustation are reasons why every boat everywhere in the Western Indian Ocean is taken out of the water immediately after use. Fishing boats get usually a cover of fish oil; boats which stay longer in the water as pearling vessels get a coat of *chunam*, a mixture of lime, rendered animal fat and fish oil every few months. While used, the *hūrīs* were coated with local made shark-liver-oil called *sall* usually every month (Donaldson 1979).

It is yet irreproducible why a certain craft was built and used on the Western Indian Ocean. Many parameters with unknown importance hinder the trial. Only in the case of the *shāsha* on the Batinah coast, Oman, it is possible to name the reasons

Fig. 7 Sea live on a *sanbūq*, Qatar 2010, photo Dziamski courtesy of Piotr Dziamski, Poland

for the frequent use up to recent times. Because of the date plantations on the Batinah coast, every needed material for these rafts was easily and local available. It was a simple construction and could be built by a fisherman itself or cheap bought from a professional builder; a planked boat cost about 1965 40 times more. Besides drying after each trip, no maintenance in its short lifetime was needed. A fisherman possessed usually two or three *shāshas*, so he could fish almost every day under the weather and sea conditions on the Batinah coast. Even the introduction of engines since 1964 in Oman could not stop its use because since that time it was filled with Styrofoam instead of palm butts. That halved the weight and reduced the water absorbing during a trip even more. Since about 1990 it fell out of use because it is too small and had too less range for profitable fisheries.

5 Regions

5.1 Kuwait

The Al-Sabab seafaring family moved in the eighteenth century to Kuwait and established in the small village a successful seafaring and pearling city. Niebuhr (1772) heard about 1764 that in Kuwait, 10,000 people lived and there were

800 ships, but this relation is not realistic. Buckingham (1829) counted in 1816 at least 100 vessels, which seems to be more probably. Lorimer (1915) counted in 1904 about 35,000 inhabitants in Kuwait, using 70 fishing boats, 461 pearl boats and 120 cargo vessels. In this time 20–25 vessels were annually built by 300 carpenters; all material was imported from India and Karachi (Lorimer 1915). Kuwait remains very active in ship and boat construction until the end of wooden vessel building; and the guild of shipbuilder still have an assembly house with a workshop for ship models in the city. In 1946 Kuwait exported the first oil.

I have no information about the use of log rafts in Kuwait since the nineteenth century. In the important photo collections[1] from the twentieth century, no raft is depicted and there is no mention in any source.

The smallest vessel used for fishing only was the *wāriyya*, the palm stalk raft (Agius 2002). Lorimer (1915) counted 20 of them at Faikala island. None of such vessels survived in Kuwait, but there are descriptions, for example, by Dickson (Bowen 1952), and a photo of a *wāriyya* by Stark is published by Facey and Grant (1999). They were about 4 m long, oared and sometimes sailed. The chapter about Oman contains more details about these rafts.

The *hūrī,* the ubiquitous dugout on the shores of the Western Indian Ocean, was used in Kuwait too but seemingly not at a great extent. There is no depiction of a *hūrī* in Kuwait in the large photo collections; Al-Hijji (1998) shows a *hūrī* in Kuwait and mentioned that such dugouts were built in India and they were normally not longer than 5 m. I found only one example, painted white and blue, in 2007 in the Scientific Centre, Kuwait (Fig. 8); Al Bashar Al-Rhoomi (1996) says that such *hūrīs* were cheap, imported from Calicut and sailed with 3–5 men.

The planked wooden boats in Kuwait are in general stouter built than on other places in the Gulf. There is a model of a stout, double-end boat in the assembly house of the shipbuilder guild but I found no denomination for such a boat and could not classified it (Fig. 8).

I know only one example of the *kīt* (Agius 2002) in Kuwait; It was exhibited beside the boom Al-Muhalab in the National Museum Kuwait in 2003 and had a square stern boat with a nearly upright stem as on the *jālbūt* and was 6–7 m long, used as tender for dhows (Fig. 9). Al-Hijji called it "cutter" (2001). Because some Kuwaiti *jālbūts* had a somewhat raked stem post, I regard them as a local boat version of the *jālbūt*. Al-Hijji (1998) differs between *kit* and *kitr*. A *kitr* is according to him a small double-end, canoe-like boat. I have no further information about such vessels.

On the replica of the Al-Muhalab in the Kuwait National Museum is another kind of tender exhibited, the *māshuwwa* (Fig. 10). Al-Hijji (2001) called them "long-boat"; they were known as the typical tender to *booms*. Rowand (1915) describes the

[1]Burchardt collection 1903–1904, Ethnologisches Museum, Berlin; Shakespeare collection about 1911, Royal Geographical Society London; Vaughan Collection 1928–1930, National Maritime Museum, Greenwich; Villiers Collection 1939–1967, National Maritime Museum, Greenwich; Thesiger collection, 1945–1950, Pitt Rivers Museum, Oxford; Middle East Centre Archive, St. Anthony's College, Oxford.

Fig. 8 Model of a harbour boat, shipbuilder assembly house Kuwait 2003, courtesy of Piotr Dziamski, Poland

square stern *māshuwah* as 20–40-feet-long boat for fishing, usually half decked and a full decked, larger cargo version, "a very common type in the Gulf". There are details of the rig but no information about the stem features. Therefore, I could not judge if it is the same type as described by Al-Hijji (2001) and Agius (2002). Rowand (1915) mentioned information by Captain Knox which says that *māshuwahs* were used for pearling too. Allan Villiers (1969) called both, the *kit* and the *māshuwwa* "longboat". There are some images of booms with such an *māshuwwa;* the large model of a *boom* outside the assembly house of the shipbuilder guild in Kuwait had such a tender too. The *māshuwwa* had in the later twentieth century a transom, was about 6–7 m long and had a doubled curved stem, always with a fender around the peak of the stem. Even if the *kit* and the *māshuwwa* looks like European types, they were built in Arab tradition.

Villiers (1969) made a list of "types of Arab Dhows as I saw and knew them". Among them is the ". . .Belem: Usually small craft trading from the Basra river in the nearer waters of the Persian Gulf. They have often only one mast and are pretty little double end craft with curved bows, lacking the projecting stem post of the boom and the built-up horn of the sambuk and baggala. Belems are much used in the Kuwaiti pearling fleet". For Lorimer (1915) the *Ballam* is a long, narrow boat, important in the Shatt Al-Arab and mostly poled, but he mentioned a cargo vessel of *Ballam* type too. For Al-Hijji (2001) is the *balam* "a type of cargo dhow," and he reported that in 1917–1918 besides 5 large- and medium-sized dhows, 11 *balams* were built in

Fig. 9 *Kit*, National Museum Kuwait 2003, courtesy of Piotr Dziamski, Poland

Fig. 10 *Māshuwwa* model, Shipbuilder assembly house Kuwait 2007, photo Weismann

Kuwait. Bowen (1949) published a drawing of such a *Ballam* and a photo of a small boat of this type. Agius (2002) mentioned two subtypes, the "*balam ashari*, which served as a passenger boat or lighter" and the *balam nasāri* for fishing. Vaughan (Riley 1977) depicted in 1929 in Kharag in the northern Arabian Gulf a sharp ended boat with a straight stem post; Riley labelled it in his catalogue of the Vaughan collection *ballam* (Fig. 11). This boat could be the *balam fudiri* mentioned by Al-Hijji (2001): "A double-ended fishing boat, with the stem- and sternposts at the same angle to the keel". The stern post head is shaped as on a *boom*; and even there could be a yoke on the rudder as on these ships. Al-Hijji (2001) described the boat fully decked, sailed and up to 10 m long. No boat of this type had survived.

A small double-end boat is depicted twice by Villiers 1939 (Villiers collection, NNM Greenwich PM5215/14 PM5419–25), and in the Thesiger Collection, Pitt

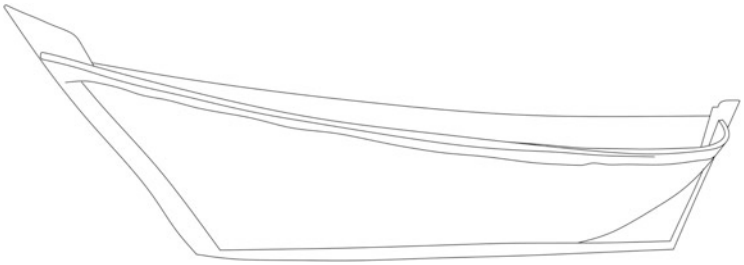

Fig. 11 *Ballam fudiri*, about 10 m long, Kharag 1929, redrawn from Vaughan, NMM Greenwich Neg. p 34690

Fig. 12 *Tashshāla*, built 1994, Scientific Centre Kuwait 2017, photo Weismann

Rivers Museum, Oxford, are some images of such boats. Possibly they are kinds of a *balams* too.

It seems that the term *balam* was used in the northern Gulf and on the river Euphrates for specific boats as well as for double-end boats in general.

A typical boat of Kuwait was the *tashshāla,* the boat version of the *boom.* These boats were in Kuwait only used for lightering and transport of coral stones. Only two examples of this type seem to exist, a small replica in the store of the National Maritime Museum, Greenwich, and a full-size replica, built in 1994 by the old shipbuilder Hasan Abdul-Rasoul and now exhibited in the Scientific Centre, Kuwait (Fig. 12). In the Thesiger Collection in the NMM, Greenwich, are some photos of this type. Al-Hijji (2001) described it up to 20 m long, partly decked and with a tiller instead of a yoke as on the *boom*. In the Amiri workshop in Doha, the last working shipyard for wooden vessels in Qatar, was in 2010 a replica of a *tashshāla* too.

Fig. 13 Small *jālbūt*, built 1957, after part, Scientific Centre Kuwait 2007, photo Weismann

For Rowand (1915) was the *jālbūt* about 1900 only a small passenger boat, 20–30 ft long, open, only in Kuwait and Bahrain half-decked. Its heyday reached the *jālbūt* few decades later.

In the middle of the twentieth century, the *jālbūt* was the common small- or medium-size all-purpose ship in the Arab Gulf; its boat version was also popular. Bowen (1949) described these vessels in detail, easily to recognize by the square stern and upright stem post inside the stern plate. In Kuwait the stem post was on most of these vessels not upright but somewhat raking (Figs. 13 and 14). *Jālbūts* were seemingly among the first vessels in the Gulf which receive an engine since 1927 (Al-Shamlan 2000). They could be a transition to the recent *shūʿī*, the last wooden fishing boat in the Gulf and Oman.

The *shewe* in Kuwait, used for fishing and pearling, was according to Al-Hijji (2001) 7–12 m long. It must not confuse with the type still used as fishing boat with an engine in the Gulf and Oman called *shūʿī*. On these vessels, the stem post is raking and straight; the stern post is inside the stern plate. On the Kuwaiti *shewe*, the stem is rounded and the stern post outside. The after part of the stem head is deep concave. This feature and that the stem post is not so much raking and not so pronounced bend is the only difference to the *sambūq*. Indeed, the Kuwaiti *shewe* should be taken as a small local variation of the *sambūq,* a prototype of wooden Arab vessels in the nineteenth and twentieth century. Rowand (1915) too says "(it) is a small Sambūq". A Kuwaiti *shewe* built in 1988 for exhibition, is now in the Scientific Centre in Kuwait (see Fig. 15).

Fig. 14 Small *jālbūt*, built 1957, front part, Scientific Centre Kuwait 2007, photo Weismann

Fig. 15 Kuwaiti *shewe* and *hūrī*, Scientific Centre Kuwait 2007, photo Weismann

The recent *shūʿī* in Kuwait was called by Al-Hijji (2001) *fishing launch*. The proper *sambūq* was used in Kuwait too but only as a ship.

Only very few information exists about the Arab coast between Kuwait and Qatar. There are entries in Lorimers work about the Qatīf oasis with mention of some pearling boats, but no details are given. Buchhardt (Nippa and Herbstreuth 2006) took a photo of Uqair harbour, but it is not possible to classify the depicted boats.

5.2 Bahrain

Because of many fresh water wells Bahrain was occupied since prehistoric times. After a changeful history the Al-Khalifa Dynasty rule the islands since 1783. In the nineteenth and twentieth century, the people on the islands lived by agriculture, pearling, fishing and trade. Bahrain was the centre of pearling in these centuries with the most pearling vessels (Carter 2012). Since 1932, earlier than in Saudi Arabia, oil was produced. Lorimer (1915) counted for about 1905 100,000 inhabitants in Bahrain, sailing 245 ships and 1515 boats. An estimation for 1941 gives 90,000 people in Bahrain, in 1965 lived 180,000 there.

The smallest craft for fishing was the palm stalk raft, in Bahrain called *firteh*. These rafts were sometimes sailed but also paddled and punted (Agius 2002). On other places on the Arabian shores such canoe like rafts were oared and sailed; paddling and punting was not common. Possibly, the palm stalk rafts in Bahrain were slender as elsewhere. The ones in Oman are more than 100 cm wide and the side frame poles protrude; therefore I found them during trials in 2017 difficult to paddle.

The only mention of a dugout in Bahrain is by Agius (2002) "...and (I) saw a dug-out fishing *balam* made from teak, which looked like a flat-bottomed rectangular box, decked over the ends...its length between four and five feet". Certainly, the *hūrī* was known in Bahrain, but it seems in general that *hūrīs* were used in the twentieth century in the northern Gulf less than elsewhere in the Western Indian Ocean.

Lorimer (1915) wrote about the types of planked wooden vessels in Bahrain: "Trading vessels are Baghlahs, Būms, Shū'ais and Māshuwahs, pearl boats are chiefly Baqārahs, Māshuwahs, Sambūks and Batīls; cargo lighters are Būms of a wide flat bottom species called Tashāshīl, ferry boats are Māshuwahs and Shū'ais, and so are fishing boats". In a list he adds "Jolly boats" (Lorimer 1915).

Of the boat types listed by Lorimer above, I have no information how the "Māshuwah" in Bahrain looks like and for the "Tashāshīl" only his description. Probably it was like the Kuwaiti *tashshāla*. The Sambūk should be the common *sambūq,* used all along the Arabian coast. Figure 16 shows such a *sambūq,* used for pearling in the Al-Fahidi Fort museum in Dubai. It has the characteristic features of this type: scimitar-shaped stem post, square stern and the stern post outside the stern plate. There is little evidence from the seventeenth and eighteenth centuries about the

Fig. 16 Pearling *sanbūq*, Al-Fahidi Fort Dubai 2006, courtesy of Piotr Dziamski, Poland

sanbūq, and British agents and mariners in the Arabian Gulf did not mention a *sanbūq* until the late nineteenth century. In the nineteenth century, Hunter described this type in Aden as medium-sized vessel with "overhanging stem, slightly curved at the upper part, small decks forward and aft" (Hunter 1877). LeMasson, an engineer working on the Suez channel, recorded the same type on the Red Sea in 1870 (Pâris 1882). Only the decoration and place of the bend in the stem post differs, because the same vessel could be used as boat for pearling and as ship for trade the classification as ship or boat fails at this case.

With the *baqqāra* a vessel with *fashīn* occurs in Bahrain (see Fig. 22). This rudder construction with a high stern fin, a deep immerged rudder and a reverse tiller with ropes to the sides of the after deck is typical for ships in the Gulf and Oman in the nineteenth century. I will describe these vessels in the paragraph about Qatar, because I know only one image, made by Cox about 1905 of a *baqqāra*-type boat in Bahrain from 1905 (RGS, London, 092793/neg. C 3441).

Regarding the *battīl* some information exists in general about the ship version, extinct since about 1950. Only two boat versions are still in use in Musandam, Oman, and will be described there. The boats called "Shū'ais" by Lorimer (1915) should be the same as the *shewe* in Kuwait; in Qatar it had the same features too. Lorimer itself did not list the *jālbūt* in Bahrain, but Rowand (1915) mentioned it as a boat in Bahrain. A photo from about 1919 shows in harbour of Muharraq many small *jālbūts* as ferries (Wheatcroft 1988).

5.3 Qatar

The Qatar peninsula was unknown to the Europeans until the end of the eighteenth century. In 1850 Shaikh Mohammad bin Thani came to power in Doha and established the still lasting dynasty. During the Second World War, Qatar endured hard times by shortage of food; the first oil export was 1949. As mentioned before, because of few fresh water resources, agriculture was difficult in Qatar; the Qatari relayed in the pre-oil time mainly on fishing and trade. Pearling was very important; for Doha alone Lorimer (1915) counted about 350 boats for pearling, 90 for fishing and 60 ships for trade.

Ahmed (2002) mentioned three types of boats used for fishing: the "gals, huri and *shāsha*." The shāsha or "Warghya" (Ahmed 2002) is the palm-stalk raft used everywhere on the Gulf and in Oman. In 1997 I found no exemplar of these vessels in Qatar anymore. Because in pre-oil times not many date palms were cultivated in Qatar, it is not probably that *shāshas* were used in Qatar in great numbers.

The *hūrīs*, depicted by Ahmed (2002), are painted, and their ends are raised by planks. A postcard of the corniche in Doha about 1965 depicts some *hūrīs* without such raised ends, and the ones I found in 2011 in the dhow harbour in Doha (Fig. 17) and the Qatar National Museum have no raised ends either. All these *hūrīs* were imported from the Malabar coast of India.

The smallest planked boat I found in Al Khor, Qatar, in 1997 was square stern vessel with a flat bottom and a straight stem post (Fig. 18). I found no other source about such a boat, certainly used in the very shallow parts of the Al Khor bay. On later visits in Al Khor, this boat disappeared. A similar boat but with a round bottom is depicted several times by Gérard (1970) in photo book about Qatar. In the Amiri

Fig. 17 *Hūrī*, dhow harbour Doha 2011, courtesy of Piotr Dziamski, Poland

Fig. 18 Flat bottom boat with transom, Al Khor, Qatar, 1997, photo Weismann

workshop, the last working yard for wooden vessels in Doha was in 2010 such a newly built boat with rig labelled "Keeth".

Another small but double-end boat, punted and possibly with a flat bottom is depicted three times in Al Khor (Gérard 1970).

In Al Khor I found in 1997 another double-end boat with straight sternpost and bend stem post (Fig. 19). This vessel was probably a *kitr* or *keter* as mentioned by Agius as a double-end vessel (2002). I found images of such crafts on a photo of Al Khor by Gérard (1970) and on an undated photo from Qatar (Fig. 20).

The *gals*, mentioned by Ahmed (2002), was a fishing boat and tender to pearl vessels; only one example survived until 2011 in Al Khor. It had typical sanbūq features. A similar but bigger vessel was common in Al Khor. In 1997 I found some of these boats, apparently an intermediate stage to the *shūʿī* (Fig. 21).

The *baqqāra* and the *battīl* are in Qatar only as ship documented, but probably boat versions were used too. Buchardt depicted at least four *baqqāra* type ships in 1904 in Doha (Nippa and Herbstreuth 2006). On this photo the keels are not to be

Fig. 19 *Kitr* or *keter*, Al Khor, Qatar, 1997, photo Weismann

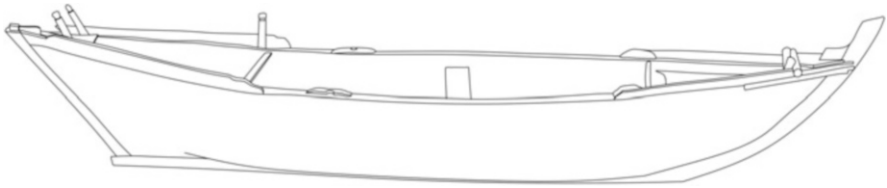

Fig. 20 *Kitr,* about 8 m long, Qatar, redrawn from an undated photo

seen, but some images from 1929 in the Vaughan collection (NMM, Greenwich) show these vessels with a central keel plank and bilge keels. The ends of the keel plank were upward bended, the stern had a *fashin*, and there was a plank as additional stem post, painted in the upper part. In Qatar today, there are only a half-size replica, built in 1975 in the Amiri workshop with a bar keel, only bended abaft (Fig. 22).

5.4 Iran

The inhabitants of the Iranian Gulf coast were to some extend Arabs with connections to the Arabian side of the Gulf. In the nineteenth and twentieth century, their boats and ships were basically the same as in other parts of the Gulf. Although on the Gulf coats of Iran the oil production starts as early 1909, this area was in 1973 still underdeveloped (Martin and Martin 1978).

They are only few sources regarding boats in Iran and I am not aware of recent research. Lorimer (1915) described the regions and towns of the Iranian side of the Gulf and listed beside ship types some types of boats too: Sambūks, Shū'ais, Māshuwahs, Baqārahs, 'Amilahs, Varjis, jolly boats, Horis, Zārūqahs, ballams and Shāshahs. For the Qatar Bay on the border to Balūchistān, he mentioned ". . .also 22 fishermen's boats called Gazdānis of 10–20 tons burden and 4 smaller boats called Yakdārs", but I found no other reference for such types. The Sambūks, the

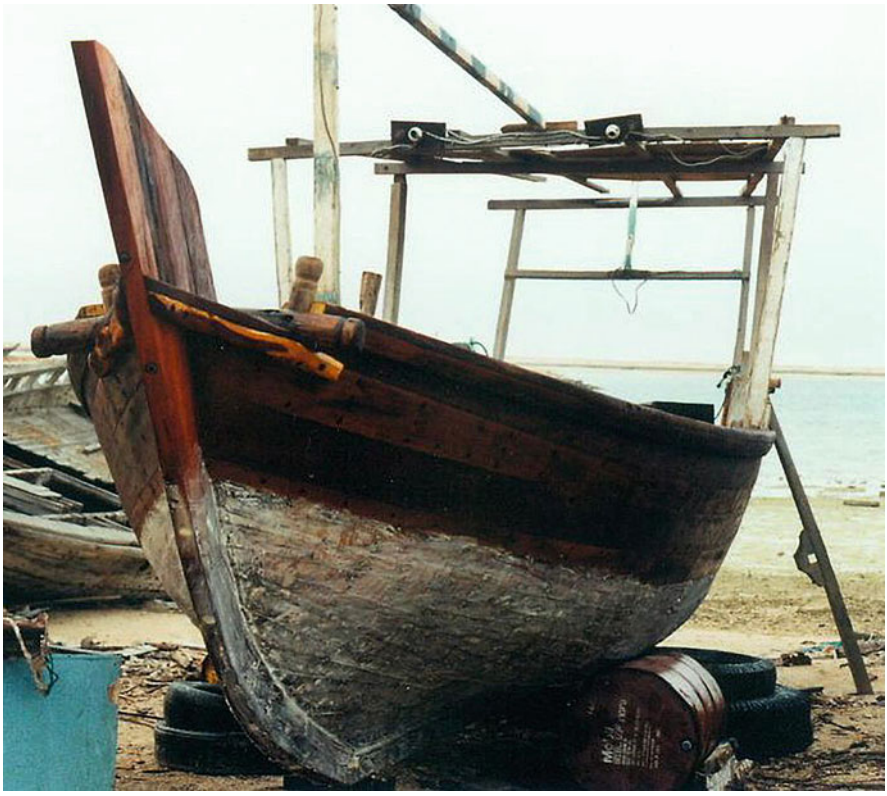

Fig. 21 *Gals*, Al Khor 1997, photo Weismann

Shū'ais and jolly boats are most probably the same type as descripted for Bahrain and Kuwait. Abbes and Farrugio (1976) published a description of a typical sambūq with engine called "Motor launch" which could vary in length from 8 to 25 m (Fig. 23).

A Māshuwah could be every kind of square stern boat; no further details are known for the ones in Iran. Possibly an image by Martin and Martin (1978) in Bandar Abbas shows such boats. The *baqārah* mentioned by Lorimer (1915), e.g. in Duvvān, should be like the ones in Qatar and in Dubai. I have no information if they had a bar keel or a keel plank and bilge keels.

Lorimer (1915) wrote in the entry about Kangūn: "...also 10 Baqārahs of the kind called 'Amilah which are used for fishing' the same place". Abbes and Farrugio (1976) called them *en-meleh* and gives details of this vessel, used for pilchard fishing only (Fig. 24). Their keel construction is peculiar: It had a bar keel with skates instead a keel plank and bilge keels. The keel has two straight parts like on a model of a batīll made in 1851 in Bombay, now in the Science Museum London, and of a drawing by Pâris (1843). The *battīls* pictured elsewhere in the twentieth century had bended keels abaft.

Fig. 22 Half size replica of a *baqqāra*, Doha 2013, courtesy of John Cooper, England

Rowand (1915) wrote regarding the Varji: "(it) is perhaps the Persian equivalent of the Shāshah". I have doubt that this classification is right. Lorimer (1915) describes a palm stalk raft in Pushat and called it *shāsha*. Further, he listed only very few Varjis in ports like Bustāneh. For Duvvān he mentioned "about 26 smaller crafts Baqārahs, 'Amilahs, Shū'ais and Varjis used for fishing and for pearling near Bustāneh and at Farūr island". The distance between Bustāneh and Farūr island is more than 20 km and therefore hardly in reach for a 4–5 m long *shāsha*. I believe that "Varjis" were planked boats. Abbes and Farrugio (1976) found *shāshas* called "chach" on Qeshm island. The "Horis" of Iran are the common Malabar dugouts; one is drawn by Abbes and Farrugio (1976).

Rowand (1915) mentioned regarding the *zārūqah* that this vessel was used on both sides of the Gulf. A description of this vessel is in the chapter Oman. A similar vessel, called *balam*, was recorded by Abbes and Farrugio (1976) (Fig. 25). They

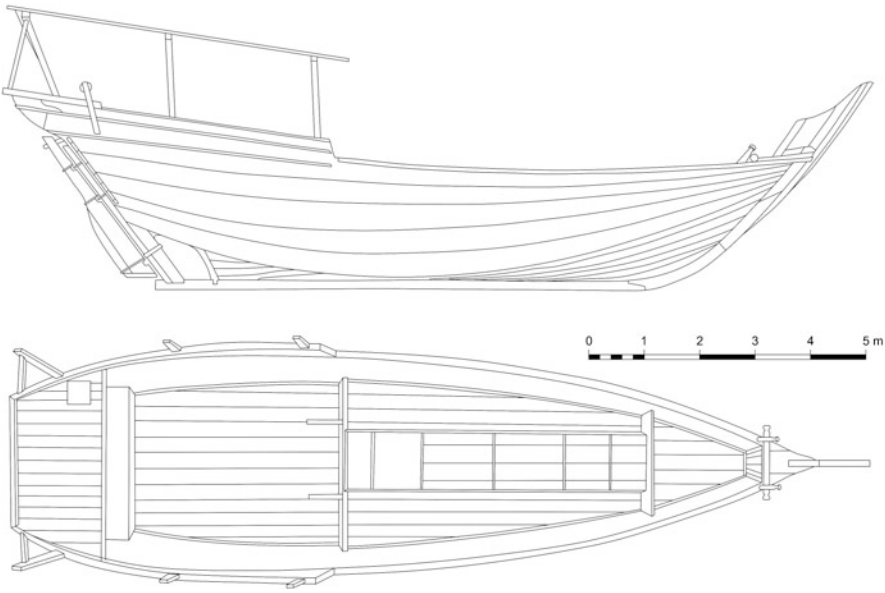

Fig. 23 Motor *Launch*, length 15 m, Iran 1976, redrawn from Abbes and Farrugio (1976, 6–8, Fig. B1-B2)

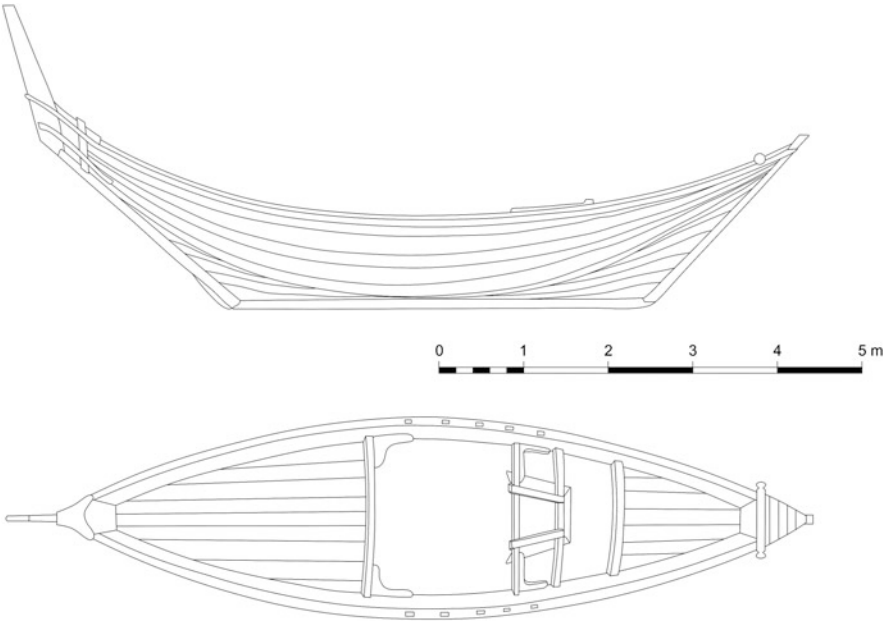

Fig. 24 *En-meleh*, length 9.40 m, Iran 1976, redrawn from Abbes and Farrugio (1976, 9–10, Fig. B5, B6)

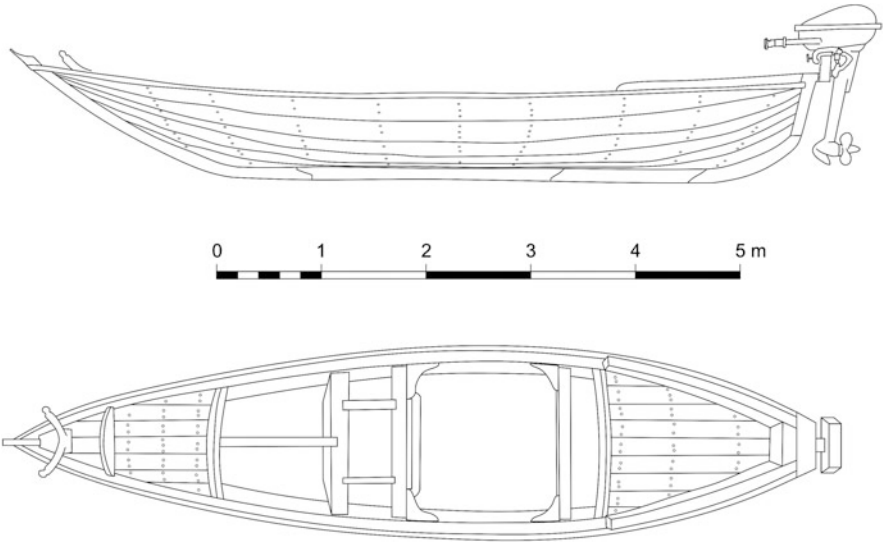

Fig. 25 *Balam*, length 7.50 m, Iran 1976, redrawn from Abbes and Farrugio (1976, 9, Fig. B4)

also saw a square stern boat "chaouf of 6.60 m length with a bended stem, fitted with outboard engines.

Lorimer (1915) listed for Muhammareh (today Korramshar) "...19 Mahailahs and a dozen ballams, 80 'Asahri or passenger ballams...". There is an image of a canoe-like boat called "guyuck" in Korramshar by Martin and Martin (1978). Such boats belong to fresh water boat building tradition on the river Euphrates and the marshes.

5.5 *Trucial Oman*

The countries of the United Arab Emirates were in the early nineteenth century regarded as the pirate coast; later they became the Trucial Oman until they reach independency in 1971. The oil production started in 1962 in Abu Dhabi; the population grew from 93,000 in 1960 to 235,000 in 1970.

In the large photo collections from the twentieth century (see above), many boat size *jālbūts* are depicted in this region, but the most numerous boat in Dubai was and is still the *ʿabra*, used for crossing the creeks only. Before the introduction of engines, it was rowed boats of about 6–7 m length with bended stem post and square stern, like a *sanbūq*, but the stern post runs inside the stern plate. Today they are longer and have inboard engines and a low structure on the deck, used as bench for passengers (Fig. 26).

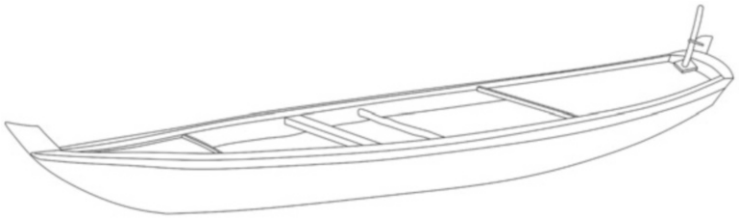

Fig. 26 *ʿAbras,* Dubai 1949, redrawn from Thesiger (Pitt Rivers Museum Oxford) (2004_130_22835_1–0 Dubai 1949)

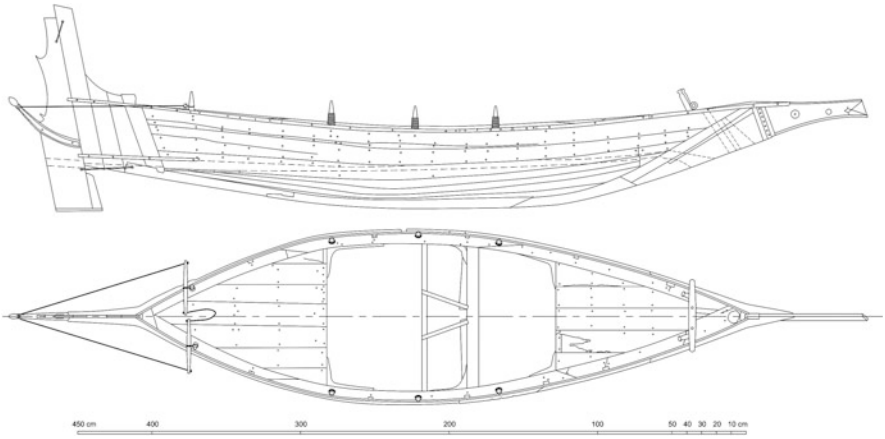

Fig. 27 Small *baqqāra*, elevation, side view, Al Fahidi Fort Dubai, record Weismann 2000

Baqqāra types of boats were used especially in Dubai and Sharjah; a nice example is displayed in the Al-Fahidi Museum, Dubai (Fig. 27). These boats had the *fashin* and the stem features of a typical *baqqāra* but a bar keel. Larger ones of these vessels were imaged by Vaughan (NMM, Greenwich) and Howarth (1977). Very long boats of this type are depicted by Codrai (2003). The look very like the Batinah *baqqāra* in Oman but have bar keels instead a keel plank and bilge keels. Because I found no depiction of vessels with keel plank, and bilge keels on images from the Trucial Oman bar keels seem to have replaced there this construction in the early twentieth century.

Similar but not so decorated was the *shāḥūf*, used for fishing and inshore pearling; one is now in the Deutsches Museum, München (Fig. 28). The *shāḥūf* is probably a boat version of the *zārūqah* (Weismann et al. 2014, 423). The *zārūqah* had no stem decoration and I know only exemplars with a bar keel.

Lorimer (1915) mentioned *badans* in Dubai; these boats are described in the part about Oman.

Few photos, made in 1941 in the Thesiger Collection, depict doubl-end vessels which I could not classify. One type had no special features (Thesiger coll. Pitt

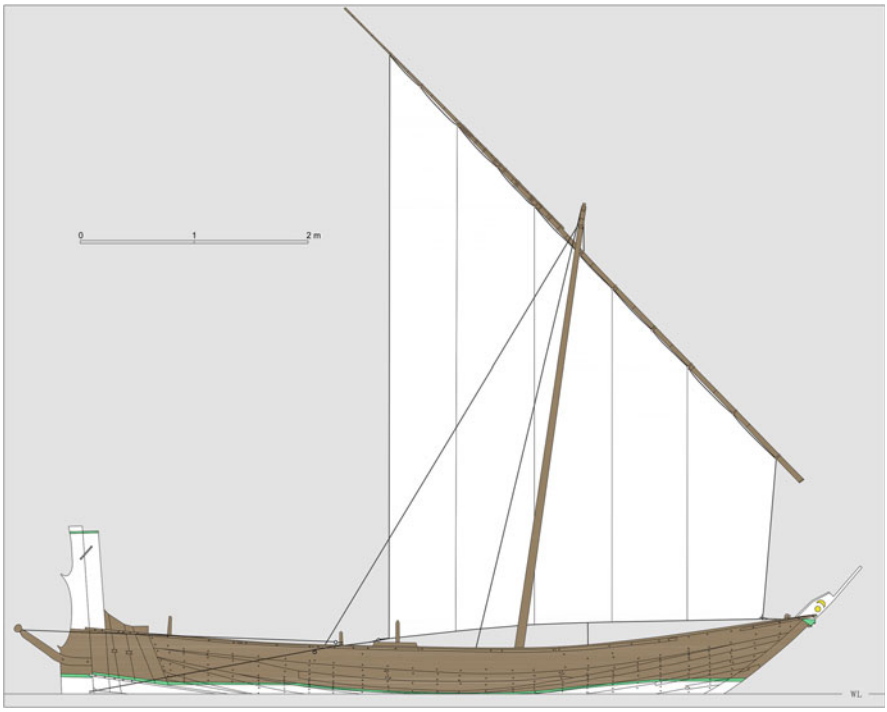

Fig. 28 *Shāḥūf*, side view, Deutsches Museum, München, record Weismann 1996

Rivers Museum, Oxford, e.g. 22,838, 22,879–81); possibly it is a Dubai version of a *ballam*. Further images show a double-end vessel with a pointed stem head (Thesiger coll. Pitt Rivers Museum, Oxford, 25,289, 25,291). Dugout *hūrīs* and *shāshas* were used in the Trucial Oman too. *Sambūq* type of boats seems to be used in Dubai mainly for pearling; I have already mentioned such a *sambūq* in the Al-Fahidi Museum (see Fig. 16). Codrai (2003) published images of pearling *sanbūqs* in Dubai from about 1950.

5.6 Oman

After the dead of Sayyid Said 1856, his sons divided his empire into the Sultanate of Zanzibar and of Muscat. While Zanzibar flourished further for some decades, Muscat and Oman, separated from the international trade and de facto dependent from the British Empire, entered a century of decline.

Estimations indicate that between 1850 AD and 1870 AD the city of Muscat lost 42,000 of 50,000 inhabitants. Lorimer (1915) counted about 470,000 souls in the whole Sultanate Oman—approximately the same area as today. In 1950 AD 459,000

Fig. 29 *Shāsha*, Khalil, Batinah coast, Oman 2014, photo Weismann

souls were estimated to live in Oman; this number increases in 1960 to 545,000 and in 1970 to 712,000 (Countrymeters 2017). The gross domestic product was 1965 $63m, 1970 256m, in 1980 5982 (The World Bank 2017). The first export of oil was in 1967. Until 1970 the access to modern technics was restricted in Oman. Only since 1963 fishermen were permitted to buy small outboard engines up to 4 HP (Donaldson 1979). Even when in 1970 AD all these restrains were lifted, passengers from ships in the Muscat bay were still transhipped in rowed boats in 1971 (Ch. Butt Oman collection, MECA Oxford).

Traveller like Osgood (1854) reported the use of inflated skins for fishing sharks on the east coast of Oman.

Up to the early twentieth century, fishermen use rafts in Oman. Osgood (1854) mentioned them in the ninteenth century. One of such rafts is depicted by Allemann (1901).

On the 300-km-long Batinah coast of Oman, the *shāhsa* was by far the most numerous vessels in the twentieth century. Bertram (1948) reported thousands of such vessels in the year 1948. Because of the many date palm plantations on this region, the materials for such crafts were present in surplus. Their construction is simple and cheap but sophisticated (Figs. 29 and 30). About 4–5 m long and about 1.10 m wide, they cost in 1978 about US$30 (Donaldson 1979). One fisherman in Dabian Al-Busaid on the Batinah coast used his *shāshas* for fisheries near the beach until 2017. The recent *shāshas* were filled with Styrofoam pieces instead of palm butts.

Dugouts called *hūrīs* were used everywhere in Oman except on the Batinah coast where fishermen used them only since 1963, when small outboard engines were available (Fig. 31). The first image of a *hūrī* in Muscat is a from engraving by Zechmeier (Hartleben 1834–1835). *Hūrīs* were paddled and sailed, seldom rowed. I saw the probably last working *hūrī* in 2007 in Al-Ashkara; but some of them still exist. Larger ones could carry ten passengers and were used in Muscat for

Fig. 30 *Shāsha*, altered for engine, side view, Batinah coast Oman, record Weismann 2015

Fig. 31 *Hūrī*, side view, Sidab, Oman, record Dziamski and Weismann 2014

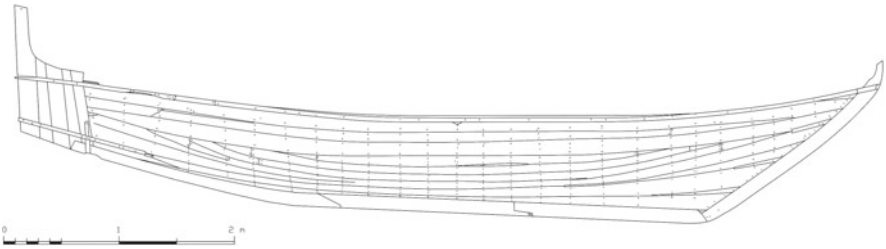

Fig. 32 *Zārūqah,* side view, Muhki, Oman, record Weismann 2001

transhipping and as ferry to Muttrah (Palgrave 1866). Every *hūrī* was imported from the Malabar coast; few came possibly from East Africa; Saleh Juma Hassoon Alarrimi, the owner of the last shipyard in Sur, Oman, mentioned that in an interview in 2018.

The smallest planked boat in Oman is the *zārūqah* from Musandam. It is like the *shāḥūf* descripted above but its forefoot is more pronounced. These oared boats with a *fashīn* and a bar keel are still built and used in Musandam for inshore fishing (Fig. 32).

The last sewn boat in Oman was the *kambārī* (Fig. 33). Fishermen used these vessels in Yemen and former Somalia too for seine fishing; lightering was done with such boats too (Alian 2006). The lightweight sharp end vessel was constructed to cope with heavy surf. Their length was 7–10 m; the wide was up to 2 m. Beside teak, local or mango wood was used to plank these boats. They were mainly oared but sometimes sailed with a settee or a square sail.

A vessel used on the Batinah coast and Muscat only was the *bānūsh.* Original built with sharp stern the stern of these boats was often converted into a square stern aft the introduction of engines since 1970 in Oman. Later only square stern *bānūshs* were built. I found in 2012 of this type 34 remaining boats, most of them in bad condition. A *bānūsh* has bended posts, a keel plank and bilge keels and was used for every kind of fisheries (Fig. 34).

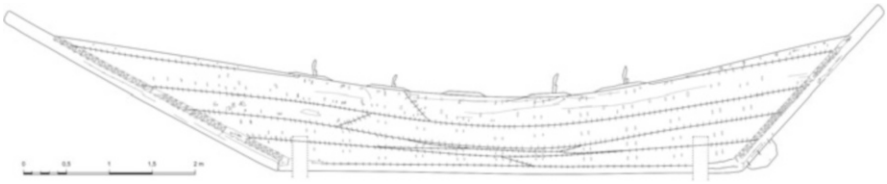

Fig. 33 *Kambārī*, side view, Salalah, Oman, record Dziamski and Weismann 2014

Fig. 34 *Banūsh*, altered for engine, Sohar, Oman, 2011, photo Weismann

The *battīl* is 8–12 m long and characteristic for the Omani exclave Musandam where two subtypes are still in use, the *battīl bahwy* and the bigger *battīl qārib*. The bar keel is abaft bended, the head of the raking stem has a small disk like extension as the true *battīl* (Fig. 35). The *fashīn* of the *battīl bahwy* has the same decoration as on the extinct ship, while the *battīl qārib* has a plain fashīn. Some parts as the posts and the through beams are still fixed by ropes. The vessel is down by the stern and the widest beam is two third from ahead. The fishermen in Musandam use the *battīl* mainly for seine fishing. A detailed description is published by Weismann et al. (2014).

The *badan* was the typical fishing boat in Oman (Fig. 36). A first description with measured drawings was made by Pâris (1843). Stem and stern posts are vertical; at the stem is a clipper-like deadwood; they have a *fashīn*. In the nineteenth century, the boat version of this vessel was sewn, and its keel plank was lanceolate and bend. In the twentieth century the *badan* was, except the stem and stern post, nailed, with a bend in the keel plank at the stern. On most existing vessels, the keel plank is horizontal at the stem. The *badan* was 10–14 m long and up to 2.3 m wide (Weismann 1998) and used mainly for beach seine nets.

The Batinah *baqqāra* (Fig. 37) is a long, narrow boat that needs a large crew for rowing. Its distinguishing features are a small *fashīn* without decoration, a slim, straight, raking stem post ending on the hull's edge, and the keel plank and bilge keels. Only few examples exist. The naming *baqqāra* results from ships with the bilge keels and the simple *fashīn* only, because it had not the decorated deadwood as the ship versions.

Fig. 35 *Battīl bahwy* from Kumzar, Oman, new rigged, 2011, courtesy of Alessandro Ghidoni, England

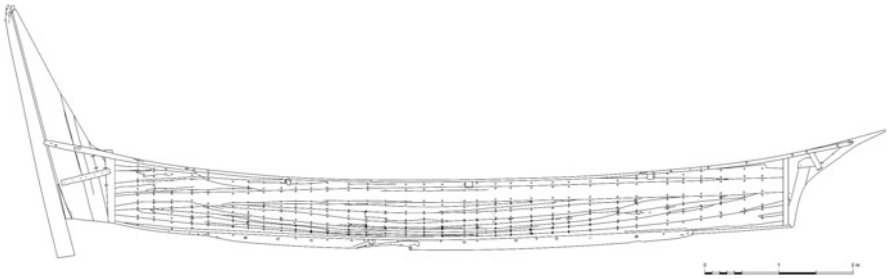

Fig. 36 *Badan*, side view, Bait al Zubair, Muscat, Oman, record Dziamski and Weismann 2012

In Sadh, Dhofar, South Oman, I found some boats with typical *sanbūq* features (Fig. 38), but on others the sternposts were inside the stern plate. Some photographs from the 1980s show a kind of small double end boat with a *sanbūq* like stem on the same place (Fig. 39). The last could be a boats version of the *zaʿima,* but there is no further information about these vessels.

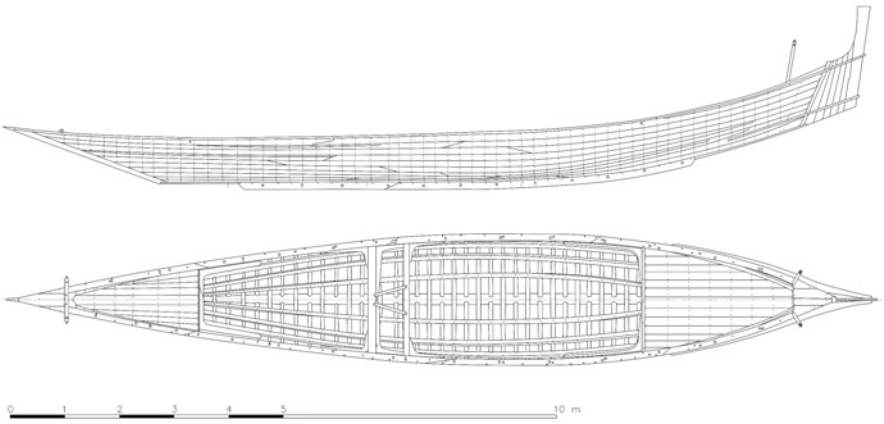

Fig. 37 *Baqqāra*, elevation, side view, Sohar, Oman, record Weismann 1994

Fig. 38 *Sanbūq* type boat, Sadh, Oman, 2005, courtesy of Piotr Dziamski, Poland

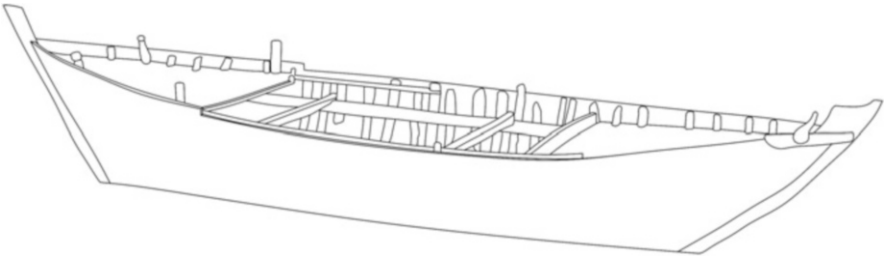

Fig. 39 *Zaʿima* like boat, Sadh 1963, redrawn from a photo by Tom Vosmer, Australia

5.7 Yemen

In 1839 Aden was occupied by the British Empire; in 1963 it gained independence. In the other parts of the country changing governments and quarrels between north and south interfered with the development of economy. In 1990 Yemen was united but since 2013 open war raged in Yemen. The first oil was in 1993 exported.

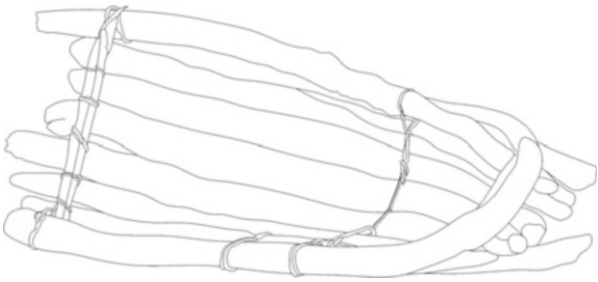

Fig. 40 *Khashab*, raft, Tihamah coast Yemen, redrawn from Stone (1985, 126 Fig. 8.7)

Although Yemen has minor resources, about 90% of the national income was by oil and liquid gas; the exports of fish had some importance. In 1950 about 4.4 million people lived in Yemen, in 1980 about 8.1 million; in 2012 Yemen had about 28.3 million inhabitants.

Some sources about boats in Yemen exist since the nineteenth century. Pâris (1843) published the drawing of a nailed fishing boat from Moka (Mocha) with similarities to the *kambārī*. The boat has a peculiar rig and no rudder, but it was steered by movements of the crew (Pâris 1843). With a length/beam ratio of 7.7 it was very narrow. The rig, the keel and the post sections are unusual, better shown in the original drawing from 1838 in the Musée national de la Marine, Paris, as in the publication. A similar boat but sewn is described by Osgood (1854).

Hunter (1877) gave an account of frequent ships and boats in Aden harbour. He saw some types of boats there: Zaimah, Abri, Badan, Zarugah or Baghārah, Machwah and jolly boats. Regarding the Zaimah he wrote: "Curved bows; stern-post slightly raked aft; mat bulwarks forward; small deck forward and aft. . .". "Cargo or ballast boats of 2 to 12 tons each". Hawkins (1977) drew this double-end type with curved posts and a sambūq-like stem head. The boats, Prados (1998) had classified as *sanbūq,* could be a boat version of the *zaʿima*.

The Abri was "a small double ended boat of 5–15 tons" with a raking bow and stern; the Machwah had a "Carved stem and square stern"; the jolly boat was "built after the model of an English rowing boat", possibly a *jālbūt* (Hunter 1877). The description by Hunter (1877) of the "Badan" and the "Zarugah" come up to the already described vessels. In the Thesiger Collection (Pitt Rivers Museum, Oxford) are *hūrīs, kambārīs, sanbūqs* and *zaʿimas* depicted.

Stone (1985) describes rafts on the Tihāmah coast of Yemen. These vessels were about 3 m long and built by 8–12 trunks, paddled and pooled (Fig. 40). Even in 1996 such rafts, called *khashab*, were used numerous on the Red Sea coast of Yemen (Prados 1996). There is no mention of *shāshas* in Yemen. In Yemen two kinds of vessels were often called *hūrī*: the common dugout and a planked, sometimes large boat with a square stern built for use with an engine (Fig. 41). The dugouts were often enlarged by planks, used occasionally until today (Agius et al. 2010). Agius et al. (2010) found in 2009 some of such crafts beside very simple boats (Fig. 42). A further boat type Prados recorded in Yemen was a typical *sanbūq*, called *saiyya* (Prados 1997).

Fig. 41 Large planked *hūrī,* Tihamah coast Yemen 2007, courtesy of Reinhold Weismann, Germany

Fig. 42 Very simple planked *hūrī,* Ma'allah, Yemen, 2007, courtesy of John Cooper, England

The boat I described above as *kambārī* was known as *sewn sanbūq* in Yemen; Prados (1996) gives details about this craft. Many of them were used even in the twentieth century, but none of them were found there by Agius and his colleagues in 2009 in Yemen (pers. com.). I know only one image of a *galbah*, made by Cooper (Agius et al. 2010, 77). It shows a narrow, planked boat about 11 m long with a transom, but original possibly with a sharp stern. Possibly it is a local version of a planked *hūrī*.

In Yemen, the Red Sea and East Africa ships and boats are usually colourful painted in contrast to the vessels in the Gulf and Oman.

5.8 Red Sea

Muhammad Ali founded the kingdom of Egypt in 1805 lasting to 1882, followed by British rule. In 1922 the kingdom was re-erected; since 1953 is Egypt a republic. It has now the second biggest industry in Africa; the oil area starts about 1940. The coast of the Red Sea remains underdeveloped until the tourism stars about 1990.

After fights since the eighteenth century, the Saudi family constituted a kingdom in Saudi Arabia in 1932. The production of oil since about 1938 enabled a fast development; it is now the largest and richest country in Arabia.

Sudan was since the early nineteenth century under Egypt rule; after a short period of independence, it became British colony. Since 1953 it is independent but political quarrels interfere with its development, even it was regarded as one of the richer countries in sub-Sahara Africa. Oil is exported since 2000. The sea fisheries are, compared with the fisheries on the river Nile, less important.

I know few sources about boats in the Red Sea north and east of Yemen. On the Red Sea *hūrīs* seems to be used everywhere, outside Yemen too. In Suakin Agius (2012) reported three types of *hūrīs*, the simple dugout, up to 6 m long, a canoe like planked, round bottom vessel with 5 m length (Fig. 43) and the *ramas*, a very small planked flat bottom, double-end boat (Fig. 44). He found similar crafts in Jizan (Saudi Arabia): planked, flat bottom, very lightweight *hūrīs* and dugout *hūrīs* made

Fig. 43 Small planked *hūrī*, Suakin 2004, from Agius (2012, 183, detail)

Fig. 44 Small planked flat bottom *hūrīs*, Suakin 2004, from Agius (2012, 183, detail)

Fig. 45 *Zārūk* and *shaṭṭiyya,* Suakin 2004, from Agius (2012, 186, detail)

in India (Agius et al. 2016). Saeed (2006) reported 1800 fishermen operating 410 boats in Sudan, including 3–5 m *hūrīs* and 7–10 m "lunches (Sambouk)".

LeMasson recorded a boat of *sanbūq* type in 1879 called *kathira* (Pâris 1882–1886). Such s*anbūq*were used still in the twentieth century, for example, the *shaṭṭiyya,* descripted by Agius (2012). He regarded them, together with the *zārūk*, as the most common wooden recent vessel in Sudan. The *zārūk* was a similar boat but with a straight stem, 5.00–8.50 m long and used like the *shaṭṭiyya* with an outboard engine (Agius 2012) (Fig. 45). These vessels were built for inboard engines too; then they were called *lansh* and could be up to 12 m long (Agius 2012). The construction

Fig. 46 Boat, built in Indo-Arab constructional tradition, El-Quesier 2001, photo Weismann

Fig. 47 Boat, built in Mediterranean constructional tradition, El-Quesier 2001, photo Weismann

method is according to Agius (2012) hybrid, the planks were nailed over few permanent frames, and the other frames were built in after finishing the planking. Agius (2012) described a frame first vessel called *fallūka* in El-Quesier, Egypt. I saw in El-Quesier in 2001 shell first built boats with clenched nails and also frames first build vessels without clenched nails (Figs. 46 and 47).

5.9 Eritrea

Eritrea was more than 300 years a colony of different empires; after 30 years of liberation war, it is independent since 1993. In 1950 one million people lived there, in 1980 about two million. There is no oil production. Tsehaye (2007) reported in 1970 80 wooden boats, mostly canoes and small planked boats. Since 1960 some of them were motorized but in the wartime after 1970 nearly all wooden boats were destroyed (Tsehaye 2007).

5.10 Djibouti

Djibouti is a small country of the African side of the Gulf of Aden with no oil production, since 1963 independent. In 1950 it had about 60,000 inhabitants, in 1990 about 600,000. Waldstein and Lampe (1988) counted 250–300 fishermen in the country. Perrier (1994) published a work about the dhows of Djibouti, but it contains less information regarding boats. There are some drawings of boats called "Ib'ri", a small planked boat with sharp ends (Perrier 1994). He published a drawing of a planked *hūrī* with transom like those in Yemen too (Perrier 1994).

5.11 Somalia

After the end of the colonization by Italy and the British Empire in 1960 Somalia remains underdeveloped and since the civil war starting in 1991 it is a failed state, very poor with no oil production.

In his article about sewn boats in the Western Indian Ocean, Chittick (1980) described "Bedens" in the Somalia of that time. These vessels are what I called *kambārīs*. Eight of such boats were counted by Barbour (1985), one of them were motorized with an outboard engine. Elmer (1985) reported 23 further "beden" in Ras Haifun and 36 in Bender Beyl. The common small vessel in Somalia of that time was the houri; Barbour (1985) counted 172 of them. These crafts could be dugouts, imported from India or Kenya, enlarged dugouts and canoe-like planked boats, padded, rowed or sailed. Another type Barbour descript was the Mashura, a boat with nearly upright stem and transom (1985).

5.12 Kenya and Tanzania

Kenya is since 1963 independent and political stable, but without oil resources it remains rather poor. In 1960 it had about 6 million inhabitants, in 1980 about

16 million. “In the early 1990s, there were about 15,000 fishermen on the coast, operating some 4,800 boats, over 80% of which were unmotorized” (Ruwa 2006).

In the nineteenth and twentieth century, a German and British colony, Tanzania is since 1961 independent and ruled by a socialistic government. There is some development, but the country is still poor. Zanzibar is now part of Tanzania but belongs to Oman in the nineteenth century before its dependency on European empires. In Tanzania there is no oil production.

Burton (1872) saw beside ships in Zanzibar some type of boats “ngaráwa, matumbi and machua”; van Hoof and Kraan (2005) listed the same types but added the “dau” and the “dhingi”. Prins (1965) describes the Lamu dhow or *jahāzi* with a nearly upright stem, as square stern and no poop deck. The stem head is lower as on the similar *jālbūt* and its upper edge in almost straight horizontal. There was a boat version of this type but not regarded as *jahāzi*. Wiebeck and Winkler (2000) published a photograph from 1983 of such a boat in Tanzania too, called it “Machwa” (Fig. 48). M*ashua* seems to be a denotation for any square stern fishing boat on Zanzibar because De Leeuwe (2004) described another *mahsua* in detail: up to 12 m long, raking stem and transom, used for fishing, built in hybrid sequence (Fig. 49). *Dau* was a general name for double-end vessels in Kenya and Zanzibar. Prins (1965) published an annotated drawing of a *dau la Mataruma* with a flat bottom. In this drawing he indicates built up posts as on the *dau la mtepe*. He further describes a small vessel called *dau la mtumbwi*, “intermediates between a dug-out and a plank-built dau” with a stem made of a block of wood and planked bottom and sides (Prins 1965). Both constructions are not common elsewhere in the Western Indian Ocean and marked together with the outrigger dugouts the south border of the Indo-Arab boatbuilding zone.

De Leeuwe (2004) described a *dau* with keel in Zanzibar, but this boat had Indo-Arab kinds of keel and posts (Fig. 50). The outrigger canoes in that region, known as *ngalawa* with its characteristic lip-like extension of the bow (Fig. 51), are described since the nineteenth century (Burton 1872). Used up to today, they are made of mango, are up to 7.30 m long and have double outrigger (Winkler 2009).

There is a local type of dugouts without outrigger, called *mtumbwi*, different to the *hūrī* made on the Malabar coast of India (Fig. 52). They have not the frame-like, out of the trunk carved reinforcements of the *hūrī* (Martin and Martin 1978), and their upper edge are often inward bended (Falck 2014; Winkler 2009). Mango trunks seem to be preferred for such dugouts in Zanzibar too (Martin and Martin 1978). Dugouts were imported dugouts from India too, but I have now no information if they are the same as on the Arabian shores (Falck 2014). On the other hand, dugouts were exported from Pemba (Martin and Martin 1978).

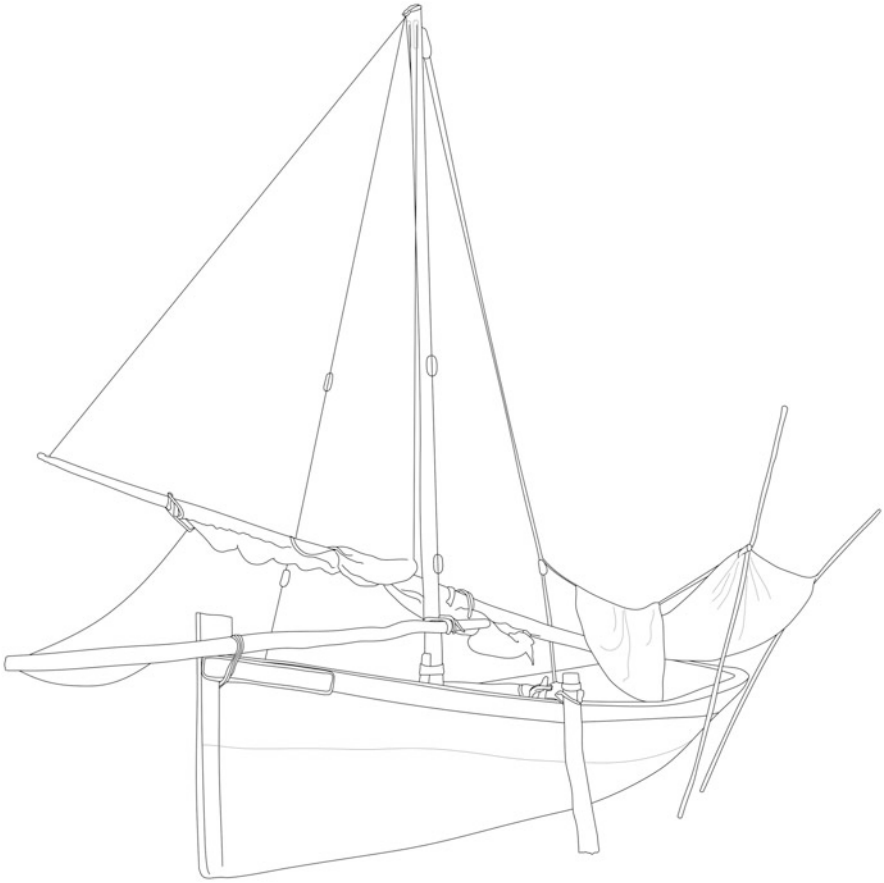

Fig. 48 *Jahāzi* type boat, Tanzania, drawn from Wiebeck and Winkler (2000, 83)

6 Summary

In the pre-oil times humans had only a small impact on shores, sea and sea life of the Western Indian Ocean. The nautical conditions have certainly an impact on the watercrafts, but only in few cases I could relate them to features of boats like the *kambārī* which is built to cope with heavy surf and the flat bottom boats in regions with very shallow waters. Wood destroying sea life was faced with the choice of wood and constant maintenance and by taking smaller vessels immediately out of the water after use.

Local material resources—or the lack of them—were important, but on the entire Western Indian Ocean, every material was available by shipping. The persistence of the *shāsha* on the Batinah coast of Oman could be an example for the concurrence of

Fig. 49 *Mashua*, Zanzibar 2003, from De Leeuwe (2005, 109)

Fig. 50 *Dau*, Zanzibar 2003, from De Leeuwe (2004, 56, Fig. 2.59)

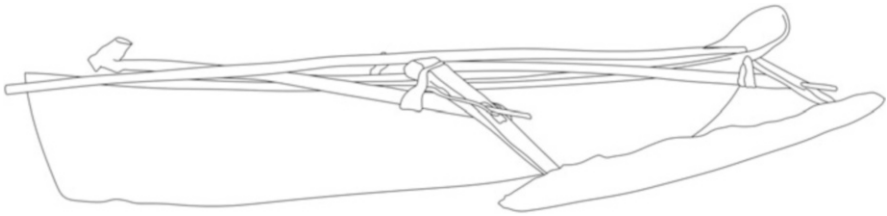

Fig. 51 *Ngalawa*, about 1950, redrawn from a photo in the Zanzibar collection, Bait Al-Zubair, Muscat

Fig. 52 *Mtumbwis,* Dar es Salaam, about 1980, courtesy of W. Eberhard Falck, France

local available material, cultural and economic reasons, maritime conditions and fishing possibilities.

In the nineteenth century fishermen employed inflated skins only in desert regions of Oman. Log rafts were used in the nineteenth century on some places but in the twentieth century only on remote regions. Only the palm stalk raft *shāsha* sailes in Oman up to recent times. Together with the *hūrīs* they were by far the most

numerous crafts on the Western Indian Ocean in the last centuries prior to the oil times.

The *hūrī*, the dugout built on the Malabar coast of India, was used on the entire Western Indian Ocean; outrigger dugouts mark the border of Indo-Arab boat tradition in Tanzania and India. Planked boats had on the Western Indian Ocean everywhere the same construction principles. Only in the transition zones—Red Sea and Tanzania—other constructional features occur. On some crafts important features change from nineteenth to twentieth century. The central keel plank with bilge keels in the Gulf were replaces by a bar keel and the straight upraising after part of the keel give way to a rounded construction. Only in Oman boats with such construction remain, and even on them the keels are less bended abaft in the last 60 years.

The boats could not be classified by the names given by local people, scholars or travellers. This is only possible—if ever—by the features of the crafts. The typical features of a type could change over time and were modified in different places. Most types were regional used, few like the *ʿabra* in Dubai and Sharjah only local; only the Malabar dugout operated everywhere in the Western Indian Ocean. The last sewn boats sailed in South Oman, Yemen and Somalia.

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