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SAILING ACROSS TOPOLOGY: VESSELS OF THE NORTH-ODISHA-BENGAL-ARAKAN ARCH

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I am looking in this paper to the issues related to the study of ships and boats of the north-Odisha-Bengal-Arakan (NOBA) arch. I use this expression to name the estuary and coastal areas directly related to the navigation system providing access to the Ganga-Brahmaputra-Meghna (GBM) river system (**Map 15.1**). The GBM represents arguably the widest river navigable system in the world accessible from a delta.

If the present modern states of Odisha and of Arakan are today territorially beyond the (GBM) river system today, in earlier times their border overlapped with it. The Arakan kingdom controlled Chittagong and large parts of today's Bangladesh, and their coast provided anchorage to pilot ships guiding vessels on their way to the delta and up the rivers, or loading their cargo to shallower draft ones.

It was also the case for long decades with the well-known *Balasore road* for instance, where the ships of European East India companies anchored before proceeding to the Hooghly river, and prior to that to the Saraswati river for the early Portuguese vessels and other ships coming from oversea. The Arakanese were well known sea marauders both on the mouth of the Ganges and in Pipli and Ballasore during the sixteenth and seventeenth century, the Rogue River branching on the Hugli being considered as a direct access to the kingdom of Arakan by the English Pilot Streynsham Master during the seventeenth century.¹ The two last point are a reminder that not only the borders of the main polities fluctuated but that the flow of the GBM rivers and their tributaries changed as well, and indeed keep on changing. Finally, both north Odisha and Arakan share common features in the shipbuilding technology with today's Bangladesh and West Bengal.

An immense river navigation system, the GBM provided access to one of the most populated landmass – from the north-west of the Indian peninsula, including the Himalayas, to the Yunnan and Sichuan – while the NOBA arch opened to the Bay of Bengal and the Indian Ocean, arguably the most considerable sea trading networks during the historical period at least until the nineteenth century.

It was a common place for the European till the eighteenth century to see the Ganga as originating from Tartaria, and even further. Thomas Bowrey wrote regarding Pattana (Patna): “A Very large and potent Kingdome but long since become tributary to the Emperors of

Hindustan (or Great Mughal). This is a Country of Very great Traffic and Commerce, and is really the great Gate that Open into Bengala and Orixia, and so consequently into most parts of India, vizt. from the Northern Kingdoms or Empires (by land), namely, Persia, Carmania, Georgia, Tartarian etc”.²

The eastern part of the river system was far less known, though it was perceived as providing an access to China by both Moghul and Europeans. It was indeed known that it provided an access to the riches of Assam, the Himalayan foothills and the Eastern Himalayas, as well as upper Burma and South West China, particularly Yunnan with which a great trade was operating. Sea and riverine navigation were both intricately linked in the context of an estuary navigation taken to its widest extent in the context of the GBM delta. The rulers of Bengal located their capital at the upper intersection of the channels of the GBM delta, according to the change of the rivers’ course, in order to benefit from the trade circulating in both direction. This centrality of navigation in the life of Bengal has been assessed by Chapman and Rudra as the reason behind the shifting of the sites of the capital during the medieval and early modern period.³

Hence the question of navigation is a central one to the history of the NOBA arch and to the whole of the space of the Northern Bay of Bengal. In spite of this centrality the academic literature with regards to shipbuilding in the NOBA arch remains very thin and disjointed.

I) Contradicting views in the existing literature:

With regards to shipbuilding technology in Bengal, macro and micro academic productions propose contradicting conclusions. The macro-scale studies do not report any specific shipbuilding technology in Bengal, at the most they acknowledge the riverine one. The reference work on shipbuilding tradition of the Indian Ocean by Pierre-Yves Manguin introduces indeed the whole of the Bay of Bengal stands as a *mare incognita*.⁴ In most studies of maritime history, the shipbuilding and sailors in the NOBA receive no or very little mention, to the notable exception of Simon Digby.⁵ This absence of mention about a sea vessel shipbuilding technology particular to the NOBA or the conclusion of an absence of it are both the consequence of lack of archaeological remains in the form of shipwreck. The latter is itself the result of lack of maritime archaeological excavations and studies.

The divide between a picture of Bengal with water – including the blue sea – as central to the material and cultural life, and the one with Bengal as deprived of indigenous sea shipbuilding technology has further implications. The lack of archaeological evidences, and the inference about Bengali people lack of geographical accuracy support the idea of merchants and rulers who would be deprived from shipbuilding technology and the proposition that they commissioned their sea sailing vessels to shipyards in South-east Asia and the Arabian sea: “the naos (mauriscas) in the western part of the Indian Ocean, from fellow Muslim merchant communities, and the juncos somewhere in Southeast Asia”.⁶



Map 15.1: Nieuwe kaart van het koninkryk Bengale - Nouvelle Carte du Royaume du Bengale c. 1747-1755 Engraved coloured map by Jacobus van der Schle.

This proposition is stimulating and is scientifically supported by the lack of archaeological research in contrast to the findings from land and submarine excavations in both South East Asia and in the Middle East. This by default conclusion of an absence of shipbuilding technology in Bengal is also reinforced by the idea that “Bengali culture” was deprived of geographical accuracy, least about navigation: This idea is widespread in contemporary studies of Bengal.⁷ To make things worse, the overarching clichés about the Kalivajrya/kalapani and an overall Indian taboo about sea voyages still prevails.⁸ The question often comes even during specialized academic gathering. Interpreting selective part of the *sastric* as a reflection of the knowledge of sailing practices and of maritime communities is very questionable; not to mention that not all the communities were under the *sastric* rule. Interestingly some nationalist authors such as Radhakumud Mookerjee used the same classical literature to promote the idea of a highly

develop tradition of navigation and shipbuilding in India.⁹ Whatever the relevant point raised in those studies, in both cases the actual empirical aspects of shipbuilding technology and culture is not really addressed.



Plate 15.1: A picture of the Balam (Tome 3. Pl. 16 : Baläum), François Balthazar Solvyns, *Les Hindous*, Paris, 1808-1812@Bibliothèque nationale de France.

At the micro-level, the picture departs widely from the macro-level ones. First, most of the travel accounts in Bengal,¹⁰ but also the factory records of the East India Company provide a different picture. Besides, few monographs on Bengal and the rare ones focusing on the ship technology draw an exactly opposite conclusion: shipbuilding technology appears central to the cultural and material life of the region.¹¹ For instance, ship expert Basil Greenhill proposed that it was an evolved, and most probably an ancient one.¹² In 1998, Enamul Haque wrote: “the maritime history of Bengal is yet to be written”.¹³ He then enumerates various epigraphic evidences or references to shipping in Bengal. As for John Guy, he observed too the centrality of boats and ships in both the religious and economic life of Eastern India.¹⁴ Most of those micro-level studies emphasizes the lack of specific studies, and particularly archaeological work dedicated to shipbuilding. It is on this very aspect that the contradicting macro and micro studies converge.

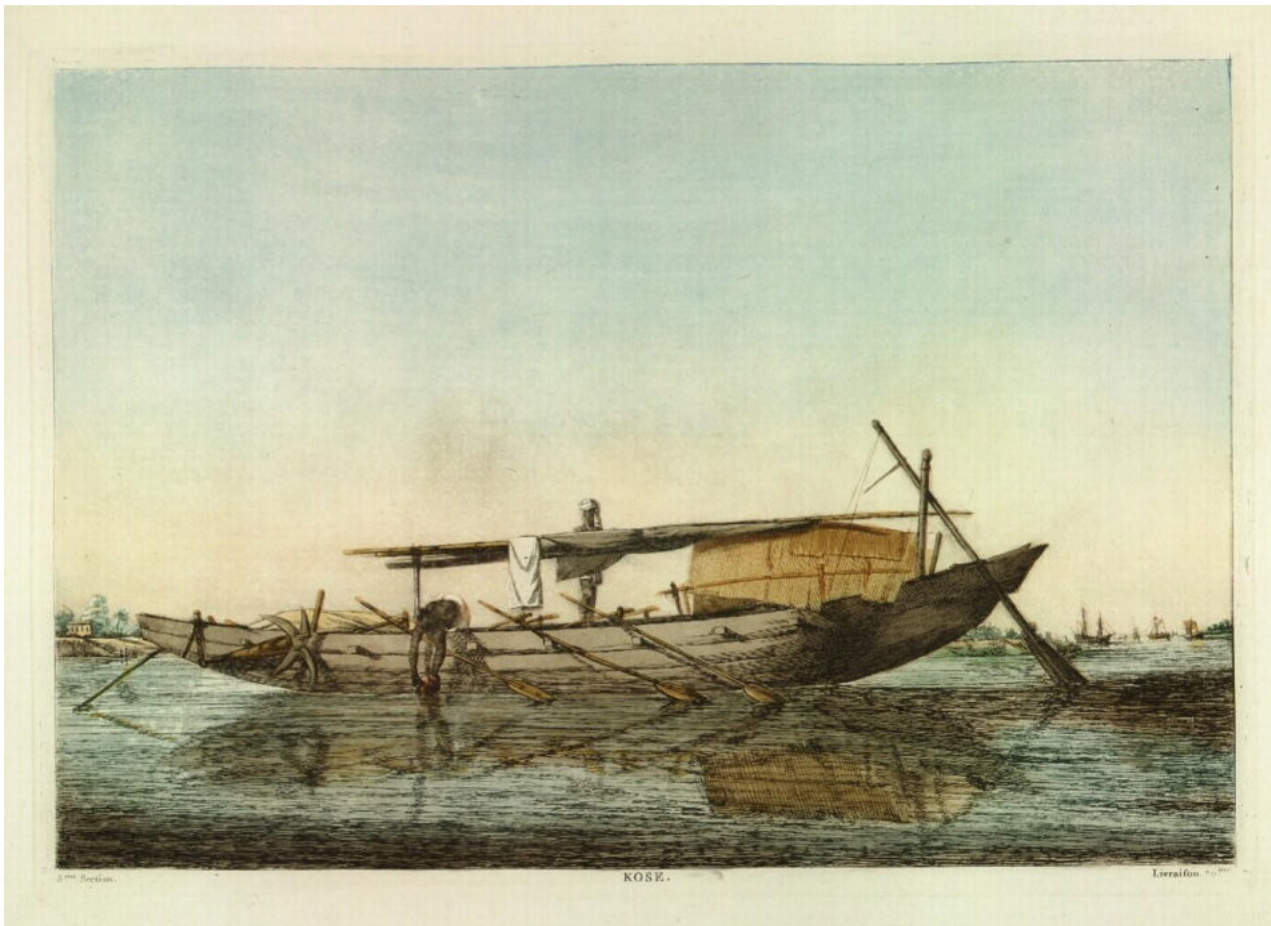


Plate 15.2: A picture of the Kosa (Tome 3. Pl.19: Kose, bateau hindou), François Balthazar Solvyns, *Les Hindous*, Paris, 1808-1812 @Bibliothèque nationale de France.

Due to lack of research no shipwreck has been excavated on the coast line of the North Odisha-Bengal-Arakan (NOBA) arch, though they instances of shipwreck are mentioned in most of the traveling account related to the navigation in the NOBA arch. This is not exactly true, since there is a very rare instance of shipwreck being excavated near Kuakata in 2012.¹⁵ Newspapers' articles proposed extremely imaginative interpretation regarding its provenance during its excavation, but it has not made the object of any academic study since then. One element to reckon with is the constant and significant change of the rivers' course and of the coast line. Yet, to mention John Guy once again, anthropological and epigraphic evidences require more attention and can open up different considerations.

II) Technological and anthropological considerations:

Anthropological observations may not be considered as straight forward historical evidences. Yet, they provide decisive inputs for the understanding of history. Regarding boats in South and South East of East Pakistan Basil Greenhill wrote in the late 1960's:

“(…) it is in the extreme south-east of Pakistan on the rivers of Noakhali and Chittagong that the sewn, plank-extended dug out reaches what is perhaps its most highly developed form in the world today. These plank-extended dug outs and the simpler forms from which they have developed and which still continue alongside them are not strictly river boats, because they sail across the open Bay of Bengal from the Chittagong coast to the villages of the delta”.

This inference does not provide any chronological framework, but it deserves our attention as it is proposed by one of the foremost world ship experts. Greenhill spent five years in South Asia in the 1950's, mostly in East Pakistan,¹⁶ besides serving in the Navy and travelling widely over the various seas. Anthropological observations, historically contextualized, are of prime importance, since very little manuscript or printed evidence exist. Besides, Greenhill noted the sailing worthiness of the sailors from Chittagong and Noakhali.

During the early twentieth century, Dineshchandra Sen¹⁷ collected ballads of the rural eastern Bengal. Several of them conveyed the importance of sea voyages from the medieval period up to the early twentieth century. Many stories relate to the modern period, such as the seventeenth Portuguese *harmada* and the expedition to fight them back. Interestingly the trope of the merchant-prince making fortune at sea, and possibly meeting with misfortune too, one that is generally associated to both Buddhist and Jain ancient and medieval culture¹⁸ is still prevalent in some of those ballads.¹⁹ It is generally believed that this culture of sea voyage and merchant-princes would have gradually receded in front of mid or late medieval Hindu revivalism. It remained present in the oral culture of the NOBA.

The spread of Muslim trading networks and the spread of Islam in Bengal on the one hand, as well as the resilience of Buddhism in the NOBA arch through the Arakanese communities but also the resilience of a Bengali Buddhist community – the Barua – may be interpreted as the factors for this overall resilience of maritime culture in front of the condemnation of sea voyages in the reformed Hinduism. If the presence of non-Hindu community on whom the taboo did not prevail, this does not tell the whole story. Vessels were represented on Hindu temples in the NOBA arch during the medieval and modern periods, and prevailed in the oral culture which was shared across religions until the contemporary period. Rituals with ships as artefact, such as the *bali yatra* in north Odisha, are other translations of the centrality of vessels in the community life even among Hindus, while there are plenty of reference to the sea in the myths of other religions particularly among Muslim and Buddhist communities as well. Besides, Badami, a community of ship builders whose name indicate a direct connect to sea vessel- the *balam*-, and Jaldas, attached to fishing and located in the estuary of Chittagong, are associated to Hinduism.

Archeological evidences require much more investigation, particularly in the coastal area or the neighboring ones such as Chittagong, Noakhali, or Comilla. The terracotta bas reliefs of Mainamati Vihar for instance remain by and large unstudied. There exists a wide corpus of iconographical evidence such as seal, coins and early terracotta from Bengal which represent

either river boats or vessels.²⁰ A comprehensive and critical studies needed linking the various representations, the written and oral sources with anthropological and technological studies over a long span.

John Guy contrasted this centrality of water transportation to the lack of historical records: “Given the pervasiveness of boat imagery in the eastern Indian psyche, it is surprising how little specific historical information is recorded about ships and the ritual calendar with which they must have been associated, particularly those linked to the seasonal sailings dictated by the pattern of the monsoons. The existence of depictions of ceremonial boats in Eastern Indian reliefs points to an established ritual or ceremonial practice linking royalty and water in a temple context. This should not be surprising, given that the power and wealth of the region was bound up with the promotion and regulation of water transport, both riverine trade and ocean ventures”.²¹

III) Some epigraphic and archival evidences:

Though written records are either very scarce, they are not absent altogether. The sea trade across the Bay of Bengal from the NOBA arch to the south of the Indian peninsula probably started during the first millennium BCE. Fine pearls, ivory, silk cloth, spikenard from the NOBA arch, and malabathrum from the foothills of the Himalaya were among the items traded.²² By the time of the *Periplus* (first Millenium CE) the trade of horses established post 1200²³ may have started during the early historic period according as per the Tamil text *Paṭṭinappālai*. V. Selvakumar also mentions movement of small groups of people (specialized traders, monks, pilgrims, craftsperson, sailors and workers) from the Northern Bay of Bengal to the ports of South India by the second half of the first Millennium CE. He also sources from Bengal the assemblage of wares, or at least for its clay of various ceramics found in north Arikamedu. There are possible parallel between a Brāhmi inscription from Sri Lanka, the name of a ship-owner in Maṇimékalai and the Bengali surname Datta.²⁴ Finally, V. Selvakumar underlines the possible connection between Bengal and the ship *Vaṅgam* recurrent in the *Saṅgam* Tamil texts, or at least of a generic term used for ships of various kinds specific to the Bay of Bengal and further to South East Asia. The role of the NBB as a trading hub from the early historic period onwards between the Indian Ocean and South West China has been also highlighted by Bin Yang.²⁵

By the 13th century, Bengal played an important role as an export region of horses coming from both Persia and the Eastern Himalaya towards South India and maybe beyond, therefore linking both ends of the peninsula.²⁶ At least by the 14th century CE, most probably before, Chittagong served as the departure port for the hajj for pilgrims from Bengal, Bihar and other neighboring regions.²⁷ Chittagong and the NOBA being on the shipping lines of the Indian Oceans seems also clear in the itinerary followed by Ibn-Battuta.

Simon Digby uses Chinese sources mentioning maritime shipbuilding activities in Bengal during the fourteenth and fifteenth CE.²⁸ Since the Sultan of Bengal could send a ship accommodating three different diplomatic delegations – from Bengal, Sumatra and Brunei – in South East Asian waters,²⁹ or a giraffe to the Chinese emperor in 1414,³⁰ he concludes that vessels of high capacity were then built in Bengal. Ships from Bengal did indeed carry huge cargo of horses, rice, cowries since at least the early middle age along with human, free and enslaved, from a period yet to precisely determine for the latter.

Further, Digby also refers to Ma Huan's mention that in Bengal the 'wealthy individuals who build ships and go to foreign countries are quite numerous'.³¹ In the early fifteenth century, one part of the Zheng He's seventh expedition branched out to sail to Chittagong.

We have also at least two precise occurrences of maritime expedition in the Indian Ocean supported by the governor of Chittagong. In 1518, the first one was identified with the Chittagong *gromale* or representative of the King in the port city, and was composed of two ships sailing to Cambay when it was captured by the Portuguese.³² The second one is a military expedition in the Maldives to capture the canons kept by the king of the archipelago in February 1607 depicted by Pyrard de Laval.³³ The latter mentions the expedition as launched from Chittagong to be of sixteen *galères* ou *galiotes* (galleys) term probably used in a very generic way. The term galleys probably points towards light ships, possibly combining oars and sail, often suited for swift maritime operations.

Besides, Bowrey gives a more detail account of the maritime trade in the NOBA arch in his chapter on Bengala:

"The Nabob and Some Merchants here and in Ballasore and Pipli have about 20 Saile of Ships of considerable burthen, that annually trade to Sea, Some to Ceylone, some to Tanassaree (Tenasserim). Those fetch Elephants, and the rest, 6 or 7 yearly, go to the 12000 Islands called Maldiva to fetch cowries and Cayre (Coir), and most commonly doe make very profitable Voyages. The Prince' now (neither did the Nabob before him) not in the least concern themselves with their Ships, only acquaints the Governor of each respective Sea Port that they will have so many Elephants of such a comeliness and Stature brought them that year and for the rest it is wholly left to the discretion of the Governor".³⁴

It is not exaggerated to speak of shipping lines between the Chittagong and Maldives, and other important emporia, as well as Jeddah. Pyrard de Laval mentioned that the ruler of Chittagong (the king of Arakan) maintains embassies in Goa?³⁵ Another was to Masulipatnam, a port which entertained close commercial links with the kingdom of Arakan, Sri Lanka. It appears in the travelling account that those destinations were the objects of regular shipping lines from Chittagong, as Java and the Coromandel coast (probably Arikamedu) were during Tamluk/ Tamralipti time. Besides, the ships and merchants of the NOBA arch were engaged in

trade of slaves, horses, rice, elephants, salt, cowries, textile of different variety, and quantity of goods listed in Pyrard de Laval's account.

It is not exactly true that there were no records kept of the shipbuilding activities, but those were mainly produced in relation to naval warfare and military fleet. According to Radhakumud Mukerjee an enormous coast born channelized from the land revenue under Akbar towards the protection of the coast. It represented up to 1/3 of the land revenue system of Bengal:

“Under the royal jurisdiction of the Nowwara or Admiralty of Dacca was placed the whole coast from Mundelgaut (near the confluence of the Damodar and Rupnarayan) to the Bundar of Balesore, which was also liable to the invasion of the Maggs. In fact, the ordinary established rental of the whole country was then almost entirely absorbed in jaigeers and protecting the sea-coasts from the ravages of the Maggs or Arrakanese, aided by the Portuguese, who inhabited the port of Chatgaon, and who, in the hope of benefiting through their commerce, had also been allowed to make a settlement at Hugli. The jaigeers that were assigned to the Dacca district for the support of these military establishments of the country were computed to comprise nearly one-third of its extent. The Nowwara jaigeer, which was the principal assignment in the district, included the best lands of the Neabut, and was sub-divided into numbers of small taluks, which were granted to the boatmen and artificers of the fleet”.³⁶

The riverine economy was not spared and the boats were also taxed:

“Besides the pergunas assigned for the support of the Nowwara, a fruitful source of revenue for the support of the naval establishment was derived from the Mheer Baree, which was a tax on the building of boats varying from 8 as. to R. 1/4 as., according to the size of the vessels”.³⁷

Those are useful information, though we need to reconsider the sources used by Mookherjee, here the Ausil Toomar *yumma* (original established revenue) of Bengal translated in Grant's “Analysis of the Finances of Bengal”, in the Fifth Report of the Select Committee on the Affairs of the East India Company,³⁸ and Taylor's *Topography of Dacca*.³⁹ There is at least a discrepancy in the form of a tax mentioned on the boats to and from Calcutta, while the port-city was not yet developed under Akbar.

During their mid-seventeenth century rivalry with the Arakanese kingdom, Shihabuddin Talish, chronicler of Shaista Khan's naval expedition to seize Chittagong from the king of Arakan, mentions that the Mughal Vice-Roy levied a tax under the form of sea sailing vessels in order to compose their navy.⁴⁰ The fleet assumed considerable size.

“On the 13th December, 1664, Shaista Khan first entered Dacca (...). He devoted all his energy to the rebuilding of the flotilla; not for a moment did he forget to mature plans for assembling the crew, providing their rations and needments, and collecting the materials for shipbuilding and shipwrights (...). To all posts of this department expert officers were

appointed. Through the ceaseless exertions of the Nabob, in a short time nearly 300 ships were built and equipped with [the necessary] materials”.⁴¹

Since at least by November 1665, the fleet is already operational, we can deduce that the 300 ships of various capacity and functions were built in less than a year. If we go by their provenance and the unfolding of the capture of Chittagong, they had both the capacity to sail in the large rivers, estuary and on the coast. It informs us about the organization of shipbuilding, spread over the main estuary, riverine and coastal part, rather than centralized. The short span required tells about the capacity of the NOBA arch’s shipbuilding technology to mobilize the required human and natural resources to build such numerous fleets. This can proceed only from a very organized and well established labor and resource organization.

Regarding the importance of shipbuilding in Dacca in those years we can refer to Jean-Baptiste Tavernier’s account. In his travelogue, he provides the following depiction of the capital of Mughal Bengal: “Dacca is a large town, which is only of extent as regards length, each person being anxious to have his house close to the Ganges. Its length exceeds 2 cos; and from the last brick bridge, which I have mentioned above, up to Dacca, there is a succession of houses, separated one from the other, and inhabited for the most part by the carpenters who build galleys and other vessels”.⁴²

Tavernier is referring here only to the capital city of the Mughal in Bengal. As per Shihabuddin Talish’s account, we know that shipyard was also spread in other important nodes of the sea-estuary-river navigation of the Ganga-Brahmaputra-Meghna delta under their authority, which did not include the south-eastern part, evading the Mughal authority.

From the Arakanese side, shipbuilders deported from Chittagong to Mrauk-U were instrumental in the building of the opponent fleet.⁴³ The account of the battle on water led by the Moghul to seize Chittagong from Arakan by Shihabuddin Talish provides precious mentions about the composition of the fleet. We shall be wary about any direct association between names and shipbuilding technology since often names are given according to the function of the ship or the boat rather than its structure and the technology used. Yet, one can attempt some remarks.

First, the fleets are composed by a range of different boats and ships. It should not come as a surprise since. If sea trade has various requirements: cargo, landing of part of the crew or its transfer to another ship on sea, feeder, rescue, transshipment, etc. it was even more the case for naval warfare with the transport and supply of troops, and in some cases horses, of weaponry, the necessity to fight on different front such as the sea, the creeks and the estuaries. We may notice also that *balams*, and *ghrabs* are recorded both during the 1662 riverine war and the 1666 sea estuary war, but that the former were in far bigger number in the capture of Chittagong by the Moghul. This underlines a specificity highlighted above by Greenhill about extended dug-out which are not strictly river boats since they also “sail across the Bay”.

Moghul fleet 1662 (riverine war)⁴⁴								
Ghrab 10	Ratgiris 10 Mahalgiris 5	Patilas 50	Parindhhas 7	Bajrah 4	Salbs 2 Balams 2	Patils 1 Bhars1	Palawaras and other small ships...24	Total 323
Moghul fleet 1665-66 (sea-estuary war)⁴⁵								
Ghrab 21	Kusa 157	Jalba 96	Parenda 6	Bachhari 2	Salb 3	Not specified 3	Total 288	
Arakanese fleet 1666 (sea-estuary war)⁴⁶								
Ghrab 9	Kusa 12	Jalba 68	Balam 22	Khalu 2	Jangi 22		Total 135	

“As timber and shipwrights were required for repairing and fitting out the ships, to every mauz’a of the province that had timber and carpenters, bailiffs (muhasat) were sent with warrants (parwanah) to take them to Dacca. It was ordered [116, a] that at the ports of Hughli, Baleswar, Murang, Chilmari, Jessore, and Karibari, as many boats should be built as possible and sent [to Dacca] (...).⁴⁷

Some of the vessels could reach Dhaka by the channels and riverways, while some had to engage at least for a short portion in sea navigation, as for instance those from Baleswar (Balasore). With regards to the versatility of ships in the NOBA arch Tavernier wrote: ‘Those *galeaces* goes sailing in the whole Bay of Bengal and enter the Ganges, the sea going upper than Dacca’,⁴⁸ and later: “It is most surprising to see with what speed these galleys are propelled by oars. Some are so long that they have up to fifty oars on each side, but there are not more than two men to each oar. Some are much decorated, whereon the gold and blue paint have not been spared”.⁴⁹

This modus operandi is confirmed by Bowrey who traveled to Bengal shortly after the conquest of Chittagong and wrote:

“Strange kind of Oppressions are laid Upon the Merchants of these Kingdoms, more Especially the most Vaine and Idle of which were annually put upon them by the Old Nabob *Shah-hest Kan*, who would not be Satisfied that all both rich and poor should bow to him, but the Ships upon the Water should doe the like, for the performance of which he would every year Send down to the merchants in Hoogly, Jessore, Piplo, Ballasore for a ship or two in each respective place of 4, 5, or 600 tons, to be very well built and fitted, even as if they were to Voyage to Sea, as also 10, 20, or 30 galleys for to attend them, the Moors Governors having strict orders to see them finished with all Speed, and gunned and well manned, and Sent up the River of Ganges as high as Dacca, where (at their arrival) they come abreast of the Nabob’s

palace. Strike their topsails and hall up their other sails, with many flags and pendants flying, fire many guns, all or most part of the whole day. And then they have done their duty; and this he accompted a Salam; and they are soon after hauled on shore, and there lie and rot, which is all done at the proper cost and charges of the Banjan and Gentile Merchants”.

Hence, we have a confirmation from another source, written by a seasoned sailor, about the capacity of merchant communities in the ports of the NOBA arch to produce sea going vessels yearly of a capacity comprised between four and six hundred tons, apart from numerous lighter galleys which are mentioned by Bowrey in addition to those. The presence of shipbuilding communities and shipbuilding sites producing vessels that sailed large rivers, estuaries and the sea is therefore attested in records of various provenances during the seventeenth century.

The capacity to sail both the shallow coasts and the estuary of the GBM delta up the river using the tide is one characteristic of the ships of the NOBA arch. Jean Thévenot (1633-1677) wrote: “The tide comes from the sea up to Dacca, and as a result the galleys which are built there can easily go to the Gulf of Bengal to trade there, the Dutch fruitfully use the ones they have for their own trade”.⁵⁰

Let us come back now to the vessels mentioned in Shihabuddin Talish’s account about the Mughal capture of Chittagong after the naval battle of 1665-66. *Kusa* composed the majority of the fleet apart from *jalba* and *ghrab*. Neither *kusa* nor *jalba* appear in the riverine flotilla of the Shaista Khan’s expedition in Assam where *patilas* (50), *ratgiris* (10) and *mahalgiris* (5) predominate. The name of former is still well-known as a river cargo boat of impressive capacity and building technology. *Kusa* and *jalba* are also important component of the Arakanese fleet, along with *balam* and *jangi*. Based in Chittagong port, the fleet needed to have at least a coastal sailing capacity. Besides, the narrative of the battle mentions for both flotillas the occurrence of anchoring in creeks, Khamaria for the Mughal one to cut a road across the forest to supply the troops in parallel to the naval attack, p. 411, and Kathalia for the Arakanese one coming from Chittagong.

Michael Charney also highlighted how the Arakan king, wary of seeing the governor of Chittagong building his own fleet and gaining autonomy, deported the shipbuilders from the port town on the estuary of the Karnaphuli to its capital of Mrauk-U.⁵¹

The volume of shipbuilding capacity involved in producing such a fleet in a very short span also deserves a notice. Some names seem to clearly point towards ships particular to the NOBA arch. Ships’ and boats’ etymology are to be considered with utmost care. Local name may be applied to ships built faraway, names of exogenous etymology may apply to local vessels, the same name may apply to different vessels, and different names to the same ones. To give a contemporary illustration of this linguistic collage, when asking in the port of Chittagong or the local shipyard of Shamlapur, between Cox’s Bazar and Teknaf, shipbuilders interviewed

in Shatgaya would acknowledge only *trawlers* and *boats* as name of their ships, including the “moon boat” which arguably bears very little European influence in its design and structure, and can be only of local design.

Keeping in mind those precautions with regards to ship mentioned in the sea battle, we notice the presence of *ghrab*, a pretty generic name during the modern period in the Indian Ocean, of *jalba* – possibly galley/*jalia* – of *kusa* and *balam*. The two latter are so far precisely identified with the NOBA arch. *Balam* is also the name of rice, and till the early twentieth century, Dineshchandra Sen, the Bengal folk culture specialist, identified the shipbuilder community with the *Balami*. We can find their name in Hunter’s *Statistical account of Bengal*, but in small numbers only and with little details about them.⁵² The names of *Jalba* remained in use at least till the nineteenth century and the *Kusa* and *Balam* till the 1980’s. Besides, in the present state of knowledge they are not known in any other coastal region and may indicate ships specific to the NOBA arch which came down from at least the modern period to the contemporary one (**Plates 15.1-15.2**).

Kusa, or *kośā*, is spelt as *kose* by Solvyns.⁵³ He introduced the ship as fit for both river and sea sailing and associated it particularly with Mugs, i.e., Arakanese. He also described them as “more expeditious” than their outlook would suggests, and said to be “strong and safe”. While Greenhill classified them as of *chine* construction, or with wide planks stapled from the side from the bottom, Hardgrave’s highlights that Montgomery Martin (1838), only four decades after Solvyns, based on Francis Buchanan’s survey classified them as clinker built, insisting on their design being particularly adapted for shallow waters. Either both techniques were used, or one of the observations was erroneous. The association with Arakanese population and Eastern Bengal, its capacity to sail both on rivers and sea, most probably on shallow coastal waters, certainly explained the importance of the *kośā* in the 1665-1666 naval expedition against Chittagong, though interestingly more numerous on the Mughal side than on the Mrauk-U’s one where *jalba* and *balams* predominate. Hence those *kośā* were built from shipyards under the Mughal, mainly in today’s North Odisha, West Bengal and Dhaka-Khulna region, while they were far less numerous in the fleet of the Arakan kingdom which then controlled Chittagong. Besides, Greenhill’s tentative etymology as being “from a Bengali word for a small votive vessel used in Hindu temples which is of a similar shape”⁵⁴ may corroborate John Guy’s study of the votive vessel and relocate the *kośā* in the wider NOBA arch context, rather than exclusively Arakanese. Its association with the latter may have occurred later in the eighteenth or early nineteenth century.

The identification of the *jalba* numerous in both Mughal and Arakanese fleet present many challenges. It could be associated to both the *jellee-a* (*jāliyā dīngy*) in Solvyns⁵⁵ as well as to a hybrid form of the versatile *galley* appellation.⁵⁶ Hobson-Johnson even quotes the following mention by Ibn-Battuta: “We embarked at this town (Jedda) on a vessel called *jalba* which

belonged to Rashīd-eddīn al-alfī al-Yamanī, a native of Ḥabsh” followed by a translator’s comment: “A large boat or gondola made of planks stitched together with coconut fibre.”⁵⁷ Much more work has to be conducted regarding the possible significance of *jalba* in the NOBA arch in the 1660’s. Yet, the importance of galleys, light vessels, to accompany the larger burthen ones, as mentioned by Thomas Bowrey with regards to Shasita Khan’s tribute extracted from merchant communities from riverine ports under Mughal authority, probably confirm this association with *jalba*.

Balams in the fleet of the king of Arakan represent another very interesting case. A bit more than a century later, Solvyns mentions them as “consisting merely of the trunk of a tree hollowed out, to the extremities of which piece of wood are applied to represent a stern and a prow: the two sides are boards joined by rattan or small bamboo without nails: no iron whatsoever enters their construction, even the anchor is of wood”.⁵⁸ He associates the ship with Chittagong and adds that it is also to be seen in the latest stage of their life in Calcutta for shipbreaking. Hence it provides another instance of a ship able to sail the shallow sea, the estuary up the river to Calcutta. Greenhill has also documented and discussed the *balam*: “The large sewn *balams* are large and impressive vessels. Sea-going boats, some of them over 60 feet long, 7 feet deep and 12-14 feet in the beam, they are quite without iron in their whole structure (...). Their occasional beams are lashed into position with split bamboo, which is the main form of fastening throughout the vessel. The heavy floors which keep the extended dugout in shape are, in *balams* built in the classic tradition with treenails”.⁵⁹ Greenhill enumerates other features such as the absence of deck, or the lashing, characteristic of the vessels built in the Indian Ocean, as compare to those built in the European or Chinese yards, and seem to point towards what Pierre-Yves Manguin has called the South East Asian type of ship.⁶⁰ Some additional features, such as the rigging can be closer the Arabo-Indian type, and Greenhill depicts a transition towards the use of iron nails for planking. Yet, this transition follows the earlier method of lashing.⁶¹

This early enumeration of vessels is used in the NOBA arch is limited to a war for the control of Chittagong. Yet, it is very informative in various regards. First, it informs about the capacity to mobilize human and natural resources for the construction of a flotilla, one that is delocalized and suggest ship building technology spread over rivers, estuary and coast. The fact that most of the ships’ names can be compared with later attempt to survey the NOBA arch such as Solvyns, but also Hornell,⁶² Greenhill and Jansen⁶³ also proves extremely insightful. The ships mobilized on this occasion for warfare must be connected with vessels sailing the estuary, coast and sea going for other purpose: transport, fishing and trade. As we saw in Shihabuddin Talish’s account, the ships were built not in shipyard managed by Mughal administration, but commissioned to existing shipyards, which were key coastal, estuary and riverine ports engaged in commercial activities. We would need more details to know how those ships were fitted to

warfare activities, or if particular indications were given on order to adapt regular some of the ships in fighting ones. The most plausible hypothesis is that they were built according to the regular pattern and later on fitted for their particular purpose. Besides, by the seventeenth century, but most probably well-earlier if we go Digby's views,⁶⁴ the commercial ships sailing in the Indian Ocean did accommodate some military capacity in order to face piracy and naval warfare which intensified after the coming of the European trading companies.

Conclusion and Research Questions:

A first set of conclusions can be brought forward regarding the shipbuilding technology in the NOBA arch. Within the current broad framework of shipbuilding technology in the Indian Ocean which distinguishes two main traditions, the South-eastern ship, also called *jong*, and the Arabo-Indian one, often associated with the *dhow*, the shipbuilding technology in the NOBA brings decisive inputs. Both anthropological and archaeological data – in form of epigraphy and artifacts but not shipwreck – point out towards a sea vessel technology running at least since the early historic period. The scale and speed of mobilization illustrated by Shaista Khan's naval expedition, the continuity displayed in the various surveys, but also the rare but precise mentions available by travelers leave little doubt about a robust sea shipbuilding production in the NOBA arch. The necessity to sail across various and changing water topographies (high sea, shallow draft coasts, estuaries, rivers, channels and creeks) triggered also strong light vessels technologies.

Few shipbuilding technologies cohabited side by side. The clinker and the dugout can be identified. The latter under the designation of the *kosa* and the *balam* is identified since at least the early modern period. Besides, it also runs galleys (*jalias-jalba*), lighter vessels which accompanied the bigger cargo, and a wide variety of rivers boats.

Hence, to the exception of some official naval embassies, the dominant pattern for sea expeditions, at least by the seventeenth century, but most probably earlier, was few large cargo of 400 to 600 burthen accompanied with galleys. The bigger cargo sea going vessel production probably declined gradually during the seventeenth and eighteenth century, after the Portuguese, but mostly after the Dutch took over the long distance sea shipping lines. In a manner similar to the one observed in South East Asia, the shipbuilding in the NOBA arch increasingly produced vessels adapted to coastal and peddling trade.⁶⁵

The dug out technique, the absence of iron, the clinker, and the lash and lug tradition as the few technical features identified since the early modern period are characteristic of the Indian Ocean, pointing may be more towards the South-eastern type of ships. Yet we have to be wary of any single association of particular shipbuilding technology with a "land-defined" region. The shipbuilding technology landscape depicted by Basil Greenhill in the late 1960's clearly points out the adoption of a wide range of technologies, a kind of cosmopolitan and composite register of technology. It fits with the idea of the versatility of the shipbuilders in the NOBA. Besides, the many etymological overlaps noted by V. Selvakumar, during the late ancient and early

medieval periods, as well as the various technological overlaps mentioned above, point out a continuum of technology, with local variation, rather than a centralized diffusion pattern, or spread along the lines of area studies. It seems all the more logical for a technology traveling back and forth seasonally, and in between two travels across sea basin, long stations when exchange and intermediation could occur.

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45. Jadunath Sarkar, "The Conquest of Chatgaon, 1666 AD", p. 410.
46. Mookerji, *A History of Indian shipping*, p. 231.
47. Jadunath Sarkar, "The Conquest of Chatgaon, 1666 AD", p. 406, in *JASB* June 1906, pp. 419-425. Chilmari is today in Kurigram district on the bank of both the Tista and the Jamuna river. Though rich of the wood of the same name (Murangi wood, see Salim, Gulam Husain *Index To Riyazu-s-salatin A History of Bengal*, Baptist Mission Press, Calcutta, 1904, p. 38). The zamindari of Murang between Purniah and the foothills of Nepal seems a bit far from the river and coastal location delineated by the other riverine, estuary and sea ports.
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50. Translated by the author. Jean Thévenot, *Voyages de Mr de Thevenot, contenant la relation de l'Indostan, des nouveaux Mogols et des autres peuples et pays des Indes*, Paris : Veuve Bietskins, 1684, p. 199, Gallica, Bibliothèque Nationale de France.
51. Charney, 'Shipbuilding at Chittagong'.

52. Numbered only 69 along other boating and fishing castes including *Jaliá* (9823), *Málá* (120), *Málá* and *Manjhi* (110), *Pátuni* (2419) and *Tior* (190), In Chittagong the census shows *Gunri* (13), *Jaliá* (9284), *Málá* (525) *Máchuá* (4), *Pátuni* (150), *Pátur* (41) and *Tior* (1128). The carpenter per say *Sutradhar* surveyed are respectively 2778 and 1328. W. W. Hunter, 1973, *A Statistical account of Bengal*, Delhi: DK Publishing house (first published 1876), p. 273 and p. 141. *Jaliá* or Jal Das are also musicians particularly skilled in the drumming and the *shnai*. Music and particularly drums are mentions in many sources often related to oaring. Besides many boats had ceremonial functions. Dineschandra Sen also associates the Balami with the Jogi community numbered 32, 314 in the same survey of Chittagong district.
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