CHAPTER 3
MEANS OF WATER TRANSPORT

Mughal India had considerable coastal area and many navigable rivers, therefore coastal and river navigation played important role in carrying both the goods of bulk as well as high-grade products.

1: River Navigation

Mughal India, being a vast country had several rivers. However all the rivers were not navigable for commercial purposes, but those rivers which were navigable supplemented very well land transport in their respective areas especially in carrying goods of bulk.¹

In Mughal India, the Ganga, with Jumna, and other rivers formed the biggest navigation system.² This river system carried very brisk trade between the capital city of Agra and Bengal. Ralph Fitch, in 1583, from Agra went down the Jumna, to Satgaon in Bengal, in company of 180 boats laden with, salt, opium, *hing* (asafoetida), lead, carpets, and diverse other commodities.³ William Finch (c. 1608-11) observed that Jumna river at Agra was broader than Thames at London, and noted the presence of many boats, some of which were of 100 ‘tunns’.⁴ John Jourdian in 1612 found at Agra that in the Jumna, in great barges of four and five hundred ‘tonns’

¹ For maps and descriptions of various rivers in Mughal India, see Irfan Habib, *Atlas*.
² The Ganga river system has been dealt in detail in chapter IV, section: Navigable Rivers.
³ Fitch in *Early Travels*, p. 18.
⁴ Finch in *Early Travels*, p. 185.
apiece, made according to the manner, in which the merchants had their
tents set up as in a field, yearly above 10,000 ‘tonns’ of salt was carried
from Agra to Bengal. Peter Mundy, in 1632, during his journey from Agra
to Patna, also found at Etawah, ‘Great Lighters’. He further noted “And in
the river are many great lighters [barges], such as are in Agra, from whence
this place theie transporte to and again [to and fro], and from hence down to
the River Jemina [Jamna], into Ganges, and soe to Puttana and farther into
Bengala, as also from Agra, Their Cheifest lading being salt, which is
hereabouts digged out of the mountaine. They are 3 or 400 Tonns a pce,
both ends extraordinarie high.” However from Agra to Patna, as we have
seen in the (Chapter II), trade was carried on mainly by land routes, but
from Patna to Bengal, the trade was mainly carried on by the rivers. In
1620, English factors noted at Patna that the Portuguese from their two
ports Hugli and Pipily in the bottom of Bengal, from where they had yearly
shipping with Malacca and Cochin, used to come with their frigates to
Patna, usually bringing tin, spices, and China wares and used to return with
ambertye calicoes, carpets and all sorts of thine cloth, which they die into
reds purposely for southwards sale. Thomas Bowrey in the eighth decade

5 Jourdain, p. 162.
6 Peter Mundy, II, pp. 87-88.
7 Manrique, II, pp. 120, 145. In early fifth decade, Manrique during his journey from
Bengal towards Lahore and then Europe, in accordance of the opinions he had
heard from the men familiar with those routes, decided to hire a boat as far as the
City of Patna (p.120). Tavernier also left Patna in a boat to be descended in Dacca
(I, p.101).
8 EFI, 1618-21, pp. 213-4.
of seventeenth century noted at Patna that all the Saltpetre was sent from hence to Hugli in great flat bottomed vessels of an exceeding strength, called ‘Patellas’ and each of them was capable to bring down 4, 5, 6000 ‘Bengala maunds’. And he further noted that many ‘Patellas’ come down yearly laden with wheat and other grains, and go up laden with Salt and bees wax. Hamilton also described the trade of saltpetre as “and there are Vessels that bring Salt-petre from Patana, above 50 Yards long, and 5 broad, and two and half deep, and can carry above 200 Tuns. They come down in the Month of October, before the Stream of the River, but are obliged to track them up again, with Strength of Hand, about 1000 Miles.”

The other most important river navigation system was the Indus river system, which comprised besides others, of five important rivers namely Indus, Ravi, Jhelum (Bihat), Sutlej and Chenab. These rivers served as an important means of transport in their region. In late sixteenth century, Abul Fazl noted that in the sarkar of Thatta, there were 40000 big and small boats for the navigation. In early seventeenth century William Finch noted that “(from Lahore)...Ravee, a goodly river which falleth into Indus, downe which go many boats, of sixtie tunne or upwards, for Tatta in Sind, after the fall of raine, being a journey of some fortie dayes amongst by Multan,

---

9 Bowrey, p. 225.
11 For details of this river system see chapter IV, section: Navigable Rivers
12 A’ in, II, p. 165.
Seepore, Bucher [Bukkur], Rauree [Rohri] etc. In c.1626, Pelsaert noted that the rivers Ravi, passing through Lahore, and Behat/Jhelum and Indus passing the cities of Multan, Bhakar, etc. carried a large trade in shallow-draught vessels to Thatta. He further noted that from Tattah to the port of Lahari Bandar, where all large vessels used to anchor, the goods were brought up in boats. In 1635, English factors at Thatta noted that from Sehwan, 60 ‘course’ by land, indigo, baftas, opium, butter and oil, etc. were brought to Thatta by boats. In March 1639, Henry Bomford noted that “from Lahore to Tutta the usual transport of goods is down the river in the flatt bottom boates of a thousand and 2000 maens;...” He also noted that “from Multan the river is navigable at all times; but from Lahoare in the beginning [of] March till the cool tyme enter in October.” This river system served through out our period as main means of transport in this region. In the late seventeenth century, Sujan Rai perhaps copying from A’in of Abul Fazl, noted that the main means of transport in the suba of Thatta was boat

---

13 Finch in Early Travels, p. 161.
14 Pelseart, pp. 30-31. He noted that in Multan which commanded the route to Persia by way of Qandahar, the Persian trade was extensive, because the city was conveniently served by three great rivers, the Ravi (which serves Bakkar in Sind, and also Lahore), the Behat (Jhelum) and the Sind (Indus), became productive by largely using the shallow-draught vessels for carrying merchandise. He especially mentions sugar as a product of Multan which was carried in large shallow-draught vessels to Thatta and Lahore also in large quantities.
15 Ibid. pp.31-32.
16 EFI, 1634-36, p. 129. They also noted that from Nasarpur, about 30 ‘course’ distant from Thatta and situated on Indus river, ‘comeing downe with the current, charges of transportacion must be very little’ (ibid., p. 128).
17 EFI, 1637-41, p. 137.
and there were 40,000 big and small boats in that *suba*. Merchants from Multan and Bhakkar used to bring their merchandise to Thatta in boats as it took less time then by the land which was tortuous due to forest and unavailability of drinkable water. In the beginning of eighteenth century, Hamilton also noted about navigation in the Indus river system that “the River Indus is navigable for their Vessels, as high as Casmire,...; and one Branch runs up to Cabul to the Westward, and others to Penjeb, Lahore, Multan, Buckor, and other large provinces and Cities to the Eastward, and all share the Benefits of inland Navigation.”

In Kashmir the carriage of goods was effected by boat besides loads carried by human in the difficult tracts. There boatmen and carpenters drove a thriving trade. There were 5700 boats (*kishti*) and 7400 boatman (*mallah*) at the time of visit of Jahangir in Kashmir. Behat was the river which served navigation in Kashmir. Originating in Vernag, Bihat, entered in the Kashmir valley and passing through Wular Lake, re-entered in the hills at Barahmula. In Kashmir the Bihat river was navigable from Khanabal to Barahmula.

---

21 *Tuzuk*, p. 298; Iqbalnama, p. 149.
22 *Tuzuk*, p. 294 (Jahangir during his visit to Kashmir through the Paklig Barahmula route, took boats at Barahmula to reach Srinagar); *Iqbalnama*, pp.141,148; Lahori, I, part ii, p. 22, 24; Lawrence, 18; Irfan Habib, *Atlas*, Map 3B, p.7.
2: COASTAL NAVIGATION

Having vast area surrounded by the ocean, Mughal India had very well developed coastal navigation. This was the coastal navigation which mostly fulfilled the need of all the coastal areas and their hinterland, from Bengal in the east to Gujarat and Sind in the west. Fitch in the 1580s found scarcity of victuals in Cochin, as neither corn nor rice was grown there, and the greatest part used to come from Bengal. In the second decade of seventeenth century Methwold noted about the import to Masulipatam on the Coromandel from Bengal that once a year there used to arrive at Masulipatam a fleet of small vessels, planks sewn together with coir only and no iron in or about them, of burden about twenty ‘tunnes’ carrying rice, butter, sugar, wax, honey, gum lac, long pepper, calico lawns and divers sorts of cotton-cloth, raw silk, and moga (which was made of bark of a certain tree), and very curious quilts and carpets stitched with those moga. However all these were found in plenty at Masulipatnam, but they used to sell them at moderate profit. In the same decade Schorer noted about the coastal trade of Pulicat with Orissa that “Some ships arrive from the Gingelly Coast or Orissa in February or March each year, laden with rice,

---

23 Fitch in *Early Travels*, p.44. Earlier he had noted about export of cotton and cloth of cotton, sugar, and very much opium and other commodities which were carried from Patna to Bengala and India (p.24) and he had also noted the export of great store of cotton cloth and much rice from Sonargaon, situated east of Dacca to all India, Ceilon, Pegu, Malacca, Sumatra, and many other places (28). Here by India, Portuguese possession was usually meant (Irfan Habib, *Agrarian System*, p. 78).

24 *Relations*, p. 40.
butter, and gingelly seed; the return in April or May, laden with salt and some spice.” And he further added that “Ships sail every year to the coast of Bengal, Arakan, Pegu, and Tenasserim, carrying a variety of cotton cloths, glass, iron, cotton yarn (red and white), tobacco, and certain shells which are used instead of coins in Bengal and Arakan; they carry also some spice and sandal-wood. The return cargoes consist of rice, butter, oil, gingelly seed, sugar, a variety of woven cloths, some fine embroidered quilts, rubies, sapphires, lac, pitch, benzoin, China root, gold, tin, eagle-wood, sappan-wood, which is used for dyeing red, large jars called Martabans, and a drink called nipa. These goods are brought to the whole Coast, as far as Cochin.” In c.1626, Pelseart noted that sugar was shipped from Bengal to Gujarat. In 1634, English factor at Masulipatnam, advocating for setting factory in Bengal argued that “First, for the trade 'twixt that and this place in rice, sugar, butter and divers other sorts of provisions and course commodities, which will not only produce a sufficient gaine to cleare the charge of such small vessells as shall be imployed for its transport but also raise an able overplus to quitt the great expence that Your Worships are at yearely in these factoryes of Mesulapatam and Armagon. Secondly, it affordes store of white cloth at

---

25 Ibid., pp. 54, 59-60.
cheape rates, such as is sutable for England, Persia, and the Southwards.”\textsuperscript{27} Further they placed example of the Dutch having vessels of some 80 to 120 ‘tunnes’, which drew little water and carried 13 to 14 guns, used to “trade from port to port all the yeare longe, sometimes buyinge rice and other provisions where they are cheape and transport it to better markets…. and by these meanes they cleare at yeares end all the great charges they are at uppon this coast.”\textsuperscript{28} Later the English also bought that type of vessels for trading on the coast.\textsuperscript{29} Bernier in the sixth decade of seventeenth century considering Bengal as factor behind the pre-eminence ascribed to Egypt as the finest and most fruitful country in the world, noted that “The latter country [Bengal] produces rice in such abundance that it supplies not only the neighbouring but remote states. It is carried up the Ganges as far as Patna, and exported by sea to Maslipatam and many other ports on the coast of Koromandel. It is also sent to foreign kingdoms, principally to the island of Ceylon and the Maldives. Bengale abounds likewise in sugar, with which it supplies the kingdoms of Golkonda and the Karnatic, where very little is grown, Arabia and Mesopotamia, through the towns of Moka and Bassora, and even Persia, by way of Bender-Abbasi.”\textsuperscript{30} Raw silk from Bengal was a

\textsuperscript{27} EFI, 1634-36, p. 41.
\textsuperscript{28} Ibid, pp. 42-43.
\textsuperscript{29} Ibid., pp. 43-44.
\textsuperscript{30} Bernier, p. 437.
staple commodity all along the coast of Coromandel. Hamilton in early eighteenth century noted about the export of Bengal within India that “...Ophium, long Peper and Ginger and Commodities that the trading Shipping in India deals in besides Tobacco, and many Sorts of Piece Goods, that are not merchantable in Europe.” Malabar received opium chiefly from Bengal. Wheat was also exported from Bengal and Gujarat to the southern Indian ports. Cotton and cotton yarn from Gujarat by coastal navigation was exported to Malabar. Malabar also received large quantity of opium from Gujarat. Gujarat exported tobacco to Thatta and saffron received from Kashmir via Agra to Malabar. Malabar exported rice, pepper, coconuts, coir, palm-sugar, betel-nuts, etc. to Gujarat by sea.

3: TYPE OF VESSELS USED IN NAVIGATION IN MUGHAL INDIA

So far as types of vessels are concerned, taking into consideration the water where the vessels were used, we can broadly classify them into three categories. The first vessels used only in the ocean such as junk and other ships (jahaz), etc. second type, vessels used both on the ocean and along the


33 Bhimsen, Nuskha-i Dilkusha, Or. 23. ff. 113-114; Hamilton, I, pp.367-68.


36 Pelseart, p. 19; van Twist, p. 76; Fryer, I, p. 136.
coast but mostly on the coast such as ghurab, tawry, sambuk, shibar, manchua, balloon, purgo, masula and other kinds of boats, and the third kind, vessels used for internal navigation i.e. in the rivers such as parao, patella, jalia etc.

However it is very difficult to exactly identify the vessels by their name, as due to vastness of the empire it was possible that same name might identify the different vessel and at the same time same type of vessels might be identified by different names.

So far as vessels used on the Ganges river system are concerned, Abul Fazl has noted that in the suba of Bengal different kinds of vessels were made according to the purposes such as war, carriage or swift sailing. William Finch in the early seventeenth century found some of the vessels of 100 ‘tonns’. At the same time John Jourdain found very large barges of 400 or 500 ‘tonns’. Those were so much large in length and breadth that merchants used to set up their tent as in the field. In the fourth decade of seventeenth century Peter Mundy found ‘great lighters’ or barges of 3 or 400 ‘tonns’ having both ends extraordinary high. However neither Jourdain nor Peter Mundy named these vessels. Between Patna and Hugli in Bengal, in the eighth decade of seventeenth century, Bowrey found “great flatt bottomed Vessels, of an Exceedinge Strength, which are called Patellas each of them will bringe downe 4, 5, 6000 Bengal maunds. They are built

37 A’in, II, p. 50.
38 Finch in Early Travels, p.185.
39 Jourdain, p.162.
very Stronge, by reason of the most impetuous Eddies they meet with in some places, that force them many times Upon one Shoale or Other, soe that, were they not Stronge and very flatt, they wold be in greater peril of wringinge to pieces or turning bottom up.”

Perhaps Bowrey described the same vessels, which earlier Jourdain and Mundy had described. Hamilton also described the same vessels as “and there are Vessels that bring Salt-petre from Patana, above 50 Yards long, and 5 broad, and two and half deep, and can carry above 200 Tuns. They come down in the month of October, before the Stream of the River, but are obliged to track them up again, with Strength of Hand, about 1000 Miles.” Bowrey also informs us about a vessel called Boora mainly used on the coast, but also between Hugly and Dacca. He noted that “A Boora being a Very floaty light boat, rowinge with 20 or 30 Owers. These carry Salt peeter and Other Goods (from Hugly) downewards, and some trade to Dacca with Salt; they alsoe Serve for tow boats for the Ships bound up or downe the River.”

On the Ganga-Brahamputra river and into an arm of Ganga boats of up to 600 tunns burthen could go as far as Dacca. Earlier in late sixteenth century, we have also reference of a boat having 24 or 26 ores called Percose by Fitch.

---

40 Bowrey, pp. 225, 229.
42 Bowrey, pp. 228-29.
43 Ibid., pp. 149-50, 161-3.
44 Fitch in Early Travels, p. 26. The editor has identified it as ‘porgos’ or ‘purgoos’ of the later writers.
As far as type of vessels used in the Indus river system is concerned, generally flat bottom or shallow-draught vessels were used. In 1596, Akbar built a Jahaz, at Lahore on a shallow barge, which could carry 15,000 mans (or 376,650 kg.) or more, to carry it easily to the sea at Lahari Bandar. Finch in early seventeenth century noted that the vessels plied from Lahore to Thatta were of sixty tons or upwards. Salbancke in second decade of seventeenth century, found ‘barks’ of 40 or 50 tons at Bhakkar. In c.1626, Pelsaert noted that shallow-draught vessels were the usual means of conveyance. In 1639, Bornford noted that the flat bottomed vessels were of a thousand and 2000 ‘means’ i.e. 33 tons or 66 tons. In early eighteenth century, Alexander Hamilton noted for vessels in the Indus in detail that “Their Vessels are called Kisties, of several Sizes. The largest can lade about 200 Tuns. They are flat-bottomed, and, on each Side, Cabbins are built from Stern to Stem, that overhang about 2 Foot; and, in each Cabbi, is Kitchen and a Place for Exoneration, which falls directly in the Water. Those Cabbins are hired out to Passenger, and the Hold, being, made into separate Apartment, are let out to Freighters, so that every one has a Lock on his own and has his Goods always ready to dispose on at what Place he finds his Market. And indeed in all my Travels I never saw better Conveniencies of travelling by water. They have one Mast of a good  

45 AN, III, pp.715-16. (a man—i Akbari was about 25.11 kg.).  
46 Finch in Early Travels, p. 161.  
47 Purchas, III, p. 85.  
48 Pelseart, p. 31-32.  
49 EFI, 1637-41, pp. 136-137; Irfan Habib, Atlas, p. 12.
Length, and a Square-sail to use when the Wind is a-stern, or on the Quarter; but they never hale close by the Wind. They are obliged to carry a great Number of Men for tracting them up against the stream, when the Winds are against them.”\textsuperscript{50} Thus it appears that the maximum tonnage of usual flat bottomed vessels in the Indus was not more than 200.

Vessels plying on the coast though smaller in size in comparison to the vessels plying on the ocean, were larger than the vessels used on the river. \textit{Ghurab, tawry, sambuk, shibar, manchua, balloon, masula} etc. were the vessels which mostly used to ply on the coast but occasionally they were used on the ocean also. \textit{Ghurab} was also used for loading and unloading ships anchored at a distance from the shore.\textsuperscript{51} In the second decade of seventeenth century Methwold noted about ‘barkes’ (barges) at Masulipatnam on the Coromandel coast that “For once a yeere there ariveth at Masulipatnam a fleet of small vessels from thence [Bengal], of burden about twenty tunnes, the plankes only sowne together with cairo (a kinde of cord made of the rinds of coconuts), and no iron in or about them…”\textsuperscript{52} In 1634, English factor noted at Masulipatnam, that for trade on the coast of Bengal they needed vessel of some 80 or 120 ‘tunnes’ as the Dutch had. These vessels drew little water and carried 13 to 14 guns, and were used to “trade from port to port all the yeare longe, sometimes buyinge rice and other provisions where they are cheape and transport it to better markets.

\textsuperscript{50} Hamilton, I, p.123.
\textsuperscript{51} \textit{Tuzuk}, p. 206; \textit{Tarikh-i Tahiri}, Or. 1685, f. 50a-b.
\textsuperscript{52} \textit{Relations}, p.40.
otherwhiles they are imploied as men of warr (but never idle);...” They further noted that “...there 's noe thought of trade into the Bay without them, our greater shipps ridinge so farre from the shoare, and the Kinge of Arrackans jelliaes (or small boats of warre) ever scoutinge 'twixt them and the land, insomuch as neither goods nor provisions cann be brought of without pinnaces of some defence, such as we have nam'd, which may goe up the rivers for the same without feare and transport it to the bigger vessells.” Durson in partnership with a Moor of Balasore, had built a vessel of 200 tons, in which he intended to trade from port to port. Bowrey informs us about vessels used in Bengal and Orissa for carrying goods such as Purgoo, Boora etc. About Purgoo, a barge and also a sailing boat, he noted that “these Use for the most part between Hugly and Pyplo and Ballasore. With these boats they carry goods into the Roads On board English and Dutch &c. Ships. They will live a longe time in the Sea, beinge brought to anchor by the Sterne, as their Usual way is”. And about Boora or bhar, a lighter, he noted that “A Boora being a Very floaty light boat, rowinge with 20 or 30 Owers. These carry Salt peeter and Other Goods (from Hugly) downewards, and some trade to Dacca with Salt; they alsoe Serve for tow boats for the Ships bound up or downe the River.”

---

53 EFI, 1634-36, pp. 41-43.
54 Ibid., 1631-54, p. 92.
55 Bowrey, pp. 228-29 & 2n and 5n on p.228.
However, vessels of large size from 4, 5, or 600 ‘tons’ were also used to ply in the Bay.\textsuperscript{56}

So far as vessels plying on the ocean are concerned up till 1500, in India there were two broad traditions of ship-construction ‘dhow’ tradition which according to Archibald Lewis ‘long-standing Indian design’ and ‘junk’ or Chinese tradition which Lewis calls ‘Chinese-Southeast Asian style’.\textsuperscript{57} Persian sources generally used the terms of ‘jahaz’ and ‘junk’ for the vessels used on the ocean. It is true that Chinese junks were withdrawn from the Indian Ocean in middle of the fifteenth century, but Indians in Mughal period continued to copy the construction of Chinese type vessels.\textsuperscript{58} However the Mughal Indian junks were different in some particulars from their Chinese prototype. We have a very good description of the Indian junk from Peter Mundy at Surat. He tells us ‘Juncks are theis Country vessels, soe called by us, of which many belong to this place, among the rest some of 1000 or 1200 Tunn each, and but one Deck. Theis put to Sea with

\textsuperscript{56} Ibid., pp. 161-63.


\textsuperscript{58} The term is probably derived from the Malay ajong or jong. For the different characteristics of junks see Pierre-Yves Manguin, ‘Trading Ships of the South China Sea. Shipbuilding Techniques and Their Role in the History of the Development of Asian Trade Networks’, \textit{JESHO}, Vol. 36, No. 3 (1993), pp.253-280.
Easterly Monsoon, and before the wynde out goe our shipps, by reason of purpose, as being confident of the continuance of faire and moderate winds and weather during that Monsoon.59 These junks had particular kind of movement as noted in 1663 by English factors where they warned against using a ‘jounk for that ....doe by a wind too much resemble in their motion the nature of crabbs, who looke one way and creep a contrary’.60 Abul Fazl himself used the word qafila-i junk for the convoy of the vessels acquired by Akbar, for sending his family ladies for hajj in 1576.61 Of the two ships, built by Akbar himself at Lahore, the first one had length of its keel 35 gaz-i ilahi, a little over 93 feet and second one, a length 37 gaz, or nearly 99 feet, but whether at keel or at upper deck is not stated. One supposes that their design was based on the plan of the Indian junks.62 Again, it is inferred from a rare manuscript of Mughal period preserved in Bibliotheque Nationale Paris (Blochet. Supp. Pers. 482) and translated by Shireen Moosvi, that two famous ships of Shah Jahan, Shahi and Ganjawar were

59 Mundy, II, p.30. According to Irfan Habib, “these ‘junks’, which counted among them some of the biggest ships in the world at the time, had immense main sails, and were designed to take the best advantage of favourable winds. This fitted them for voyage across the Arabian Sea and the Bay of Bengal, where navigation was governed by the monsoons; but also rendered them difficult to manoeuvre.” (Irfan Habib, Technology in Medieval India, New Delhi, 2008, p. 109). See also Irfan Habib, ‘The Technology and Economy of Mughal India’, The Indian Economic and Social History Review, Vol. XVII, No. 1, pp. 1-34, especially p. 14).

60 EFI 1661-64, p. 253.

61 Ad. 27247, f. 285b; Shireen Moosvi, People, Taxation, and Trade, in Mughal India, p. 244-246.

almost certainly junks. In the English Factory Records big Indian vessels are usually designated as junks. The ships captured by the English off the Aden and Red Sea ports early in Jahangir’s reign were described by them as junk and they provided us with the measurements of some of the junks. The biggest among the captured junk, the *Rahimi* was of 1500 tons ‘burthen’, according to John Saris, ‘[It] was long from stem to sterne-post, an hundred three and fiftie foot. For rake from the Post afte, seventeene foot. From the top of her sides in breadth, two and fortie. Her depth, one and thirtie’. Again they measured the ‘*Mahomedee*’ which was ‘in length, an hundred sixe and thirtie foot. Her rake afte, twentie. In breadth, one and fortie. In depth, nine and twentie and half. Her maine Mast in length, was sixe and thirtie yards, an hundred and eight. Her maine yard, four and fortie yards, an hundred two and thirtie’. Further they found that the other junks were not much smaller. Junks were also built by the Portuguese for the Indians; however it is not clear whether they built these by their own methods or in the Chinese style especially for the Indians. Some Indian techniques like ‘rabiting’ were not followed, so that a ship built at Chaul ‘being (as the *Supply*) in the major part Calked work and not rabited, which building is only known to these people’ was rejected by the Governor of Surat and the servants of Prince

---

63 Shireen Moosvi, *People, Taxation and Trade* pp. 265, 272.
64 John Saris in *Purchas*, III, p. 396.
65 *EFI*, 1622-23, p.343. [Emanuel Butta, Master of the Blessing, in 1623, wrote in his account of his voyage from England, in company with the Discovery and Reformation that ‘On the 19th they met a junk, built by Portuguese but manned by Gujaratis, on which account they dismissed her’.]
Dara Shukoh. At the same time a ship built at Daman under the Portuguese aegis was not rejected by them which also confirm that the Portuguese did build ships for Indians keeping in mind the Indian method.\footnote{Ibid., 1646-50, p.90.} Later on the term junk was used for any big vessel in the Indian waters.\footnote{See Hobson-Jobson, A Glossary of Anglo-Indian Colloquial Words and Phrases and of Kindred Terms, by Col. Henry Yule, and A.C. Burnell, new edition edited by William Crooke, London, 1903, s.v. junk; Bowrey, p. 181, where term junk was used for Dutch vessel. Fryer used the term ‘Portugal junks’.}

### 3: MAJOR CENTRES OF SHIPBUILDING

In Mughal India, according to Abul Fazl, (c.1595) generally all over the empire ships and boats were built. He noted that on the sea-coast, in the east, west, and south, large ships were built, which “have became a source of comfort to the seafarers, the ports have obtained prosperity, and knowledge has grown.”\footnote{A‘in, 1, pp. 144-45.} There were certain places which were particularly renowned for the shipbuilding.

On the western coast Surat was one of the major centres of shipbuilding, such work being also carried out at Swally.\footnote{For shipbuilding at Swally see EFl, 1618-21, pp. 113, 314; 1637-41, p. 211; 1655-60, p. 313, 319; 1661-64, pp.24, 79; 1668-9, p.201; EFl, New Series, 1670-77, pp. ix, 39-40, 218, (two frigates namely Hunter and Revenge and ketch named Phoenix was built for the purpose of defense against the Malabars), 222-23 (‘at the suggestion of Cursetji, she (the Revenge) was made broader and deeper than at first was contemplated and changes were also effected in the ketch Phoenix to make a better sailer of her’), 31 (four large boats were built in 1670, for the service at Bombay), 44.} About the skill
of Surat carpenters, Ovington in 1689 noted that “....And the very ship-carpenters at Suratt will take the model of any English Vessel, in all the Curiosity of its Building, and the most artificial Instances of Workmanship about it, whether they are proper for the Convenience of the Burthen, or of quick Sailing, as exactly as if they had been the first Contrivers. The Wood with which they build their ships would be very proper for our Men of War in Europe; for it has this Excellence, that it never splinters by the Force of Bullet, nor is injur’d by those violent Impressions, beyond the just bore of the shot.”

70 Earlier in 1668, advocating the building of ships in India, the English factors noted: “And if any shall object they may not have that shape, or be soe profitable for stowage of goods, as our English shipps are, we answere that these carpenters are growne soe expert and masters of their art that here are many Indian vessails that in shape exceed those that come, either out of England or Holland.”

71 We have uncountable evidence for the shipbuilding at Surat. Abdur Rahim Khan-i Khanan, a great noble who

70 Ovington, p. 166.
71 EFI, 1668-69, p. 80. The English turned towards constructing ships in India on large scale and admired and adopted the Indian method of ship-construction after 1668, which Irfan Habib has called ‘an unchronicled revolution in the Indian ship-building industry’ (Irfan Habib, Technology in Medieval India, p. 111, see also Irfan Habib, ‘The Technology and Economy of Mughal India’, IESHR, Vol. XVII, No. 1, p. 15).
72 Shireen Moosvi, People, Taxation and Trade, pp. 244-256 and again pp. 257-274; see also EFI, 1655-60, pp. 301, 313, 319; in 1660, in Surat the number of ships increased about 400% in a span of ten years (A. J. Qaisar, ‘Shipbuilding in Mughal Empire during Seventeenth Century’, IESHR, Vol. V, No. 2, June 1968. p. 168); 1661-64, p. 24; 1668-69, p. 201. etc.
was governor of Gujarat under Akbar (1584-5, 1586-88) and held Surat in his jagir, built and owned three ships, namely, Rahimi, Karimi, and Salari. The ship on which Bayazid and other persons went to the Red Sea 'Muhammadi', was jointly built and owned by Qutbuddin Khan, a foster brother of Akbar who was posted as commandant of Baroch after the conquest of Gujarat, and Qulich Khan, who was the first Mughal governor of Surat after its conquest by Akbar. Another noble of Akbar, Sadiq Muhammad Khan, Khan-i Jahan, who held Surat and Baroch in jagir in 1593, built besides other ships, the Sadiqi and Akbarshahi. Surat obtained timbers easily from its surroundings. In 1618-19, for the building of Prince Khurram's Junk Shahi, timber was procured from the parchana of Telari in the sarkar of Surat. Gandavi which itself was a good port and known for shipbuilding, and Bulsar were known for their timber, which were considered best and cheapest. Navsari was also famous for its timber, and

---


74 *AN*, III, p. 31; Bayazid Bayat, p. 354; Cf. Shireen Moosvi, *People, Taxation and Trade*, pp. 245, 246-247.

75 Blochet, Sup. Pers. 482, ff. 170a-b, 167a-8b, 132b; and for its translation and other detail see Shireen Moosvi, *People, Taxation and Trade*, p. 249-50 and Appendixes E, F and G at pp. 255-6.

76 Shireen Moosvi, *People, Taxation and Trade*, p. 266.

77 *EFI*, 1622-23, p. 310, the English wanted to buy or build four frigats in a year either at Surat, Baroch or at Gandevi; 1634-36, p. 136, the English factors first suggested the building a couple of frigates at Naosari or at Gandevi, but they did not wanted to depend on 'the inconstant promise of our perfidious Governor', shifted its construction to Daman; Hamilton, I, p. 104; *EFI*, 1668-69, p. 65.
that were supplied in boats to Surat.\textsuperscript{78} It was also a shipbuilding centre and the Dutch claimed to be the first European purchasers of the Indian built ship from here.\textsuperscript{79} Shipbuilding at Baroch depended on the timbers from other places which were brought in boats.\textsuperscript{80} During the reign of Shah Jahan, Ali Akbar Isfahani, merchant from Persia, whose father had migrated from there, built a ship at Khabbayat.\textsuperscript{81}

Under the Portuguese, ships and boats were built at several places, such as at Diu, Goa, Daman, Bassien etc. but their main shipbuilding centres were Daman and Bassein.\textsuperscript{82} The English factors after their peace with Portuguese, used to purchase from these places. In December, 1639, a ship of 300 tons was purchased and was named the \textit{Supply}.\textsuperscript{83} In 1640, a Portuguese galliot of 140 tons burden was purchased and it was renamed

\textsuperscript{78} \textit{EFl}, 1618-21, p. 119; 1634-36, p. 136.
\textsuperscript{80} \textit{EFl}, 1622-23, p. 310; 1661-64, p. 24-25; Mendelslo, p. 14.
\textsuperscript{81} Lahori, \textit{Badshahnama}, II, p. 606.
\textsuperscript{82} We have many references to these places in English Factory Records, especially when the English built there vessels there, such as \textit{EFl}, 1618-21, pp. 82, 83, 1624-29, pp. 85, 198, 218; 1634-36, pp. 98, 103, 107, 108, 109, 119, 136, 137-138, 147, 148, 177, 180, 217; 1637-41, pp. 42, 110, 240, 243; 1646-50, pp. 90-91; \textit{Selections from Letters, Despatches and other State Papers preserved in the Bombay Secretariat, Home Series}, vol. I, ed. George W. Forrest, Bombay, 1887, p. 62; Abbe Carre also found at Bassein that “There is also a ship-building yard, six vessels were now on the stocks under construction for the Governor, who has the monopoly of this business here, but can at his discretion give permission for it to anyone else.” (Abbe Carre, III, p. 725).
\textsuperscript{83} \textit{EFl}, 1637-41, p. 209.
Hope. In 1646, a ship of 250 tons built at Chaul and rejected by the servants of Prince Dara Shukoh, was purchased by the English and after some modification it was turned into a good ship and was named as Expedition.

Later on areas adjoining Bombay, became the main centre of shipbuilding, after the coming of English there. Initially they wanted to bring timbers from Gandevi and Bulsar, where in their judgement timbers were the best and cheapest; however, they found the conveyance of timbers overland very expensive due to fear of payment of excessive customs to the Portuguese. Later on, timbers were brought from Bassein and they found “good tymber as the world afforded, and especially near Bombay, to be had cheaper then in any other places.” Timber was also brought from Karwar and Baliapatam, though the timber from Karwar was very good but very dear also. But Surat remained the important source of timber for Bombay as in 1672, the Captain of Bassein prohibited the supply of timber and at the

---

84 Ibid., p. 227.
85 Ibid., 1646-50, p. 90-91.
86 Ibid., 1668-9, pp. 61, 65, 66, 75 (two partly built vessels were sent from Bassein to be fitted at Bombay to enrich the fame of Bombay), 79, 80; EFI, New Series, 1670-77, vol. I pp. 54, 74, 108, 132 (boat building was encouraged by adopting various measures and it was further encouraged by Portuguese order forbidding their merchants to let out vessels to any belonging to Bombay)
87 Ibid., pp. 65, 66, 71.
88 Ibid., 1668-9, p. 75.79.
89 EFI, New Series, 1670-77, vol. I. pp. 30-31. About Karwar Hamilton noted that ‘The Woods produce great Quantities of good Teak Timber, useful in building both Ships and Houses. It is more durable than Oak. And there is good Poon Masts, stronger, but heavier than Fir.’ (Hamilton, I, p.264).
same time the English could not obtain it from the Malabar Coast, so they 
brought it from Surat. The duty charged on the timber from Bassein was 
33% in addition to 20% required for a permit from the Captain of Bassein 
for its transport.\(^{90}\) At the same time, they had to pay 33% custom to the 
Portuguese for the timbers for shipping and houses, which they called the 
“oak of India”, which grew at Kalyan and Bimurly, and passed necessarily 
by Tanna.\(^{91}\)

On the Malabar Coast besides other centre of shipbuilding, it was 
Badgara which attracted even the European like Hamilton to have a wish to 
buy a ship there. But it could not be fructified due a tradition there, that the 
new ship was not sold until it was first used by builder or buyer.\(^{92}\)

On the Coromandel Coast, shipbuilding was carried on, initially by 
the Golconda rulers and their nobles, but later on Europeans also began to 
build ships there. Shipbuilding was mostly carried on at Masulipatnam, 
Narsapur Peta and Madapollam. There was abundance of timber, especially 
teak, around these centres, it being floated down the river Godavari to both 
Narsapur and Madapollam.\(^{93}\) Above all, there was plenty of iron near this 
coast. Abul Fazl, recorded the presence of iron in Indur and Nirmal,

\(^{90}\) Ibid., 1670-77, p. 57, 159.

\(^{91}\) Selections from Bombay, I, pp. 62, 120.

\(^{92}\) Hamilton, I, pp. 302-3.

\(^{93}\) Relations, p. 80; Hamilton, Pinkerton, p. 397, 398; Bowrey, pp. 99, 102; Irfan 
Syncretic” Shipbuilding Centre in South India, 1570-1700’, JESHO, vol. 31, No. 3, 
convertible into steel.\(^94\) Iron was also available at Nagalvancha, Bimlipatam, and Mutapalee.\(^95\) Methwold, in the second decade of seventeenth century, found that their vessels were built of very good timber and iron.\(^96\) In the 1580s, Muhammad Quli used to send every year large ships of 600 tons, if not larger still built at Narsapur Peta to Red Sea.\(^97\) In the early seventeenth century, after the coming of the Dutch and English on this Coast, Narsapur became noted shipbuilding and repairing centre. Methwold, in the second decade of the seventeenth century, noted that for the purpose of trade "they build great ships, and good ones too, considered in their burthen and materials, but not comparable to ours for beautie, conveniencie, or defence, some of them not less than 600 tunns, substantially of very good timber and iron; whereof we have had upon some occasion good experience in careening the Globe, Salomon, and Clawe, in the river of Narsoporpeta."\(^98\) Similarly Schorer, in the same decade, noted


\(^95\) Master, II, p. 115; Thevenot, p. 148; Bowrey, pp. 55-6. (Bowrey noted that 'iron, steel' was brought down from 'Montapolee' in the high land behind Nizampatan).

\(^96\) *Relations*, p. 36. see also p. 63.


\(^98\) *Relations*, p. 36. The globe was refitted at Narsapur so as to be “a far better ship than when she first came out of England”. (*Letters Reced*, II, p. 41)
that “A place called Narsapur Peta lies about 10 to 12 leagues beyond Masulipatnam;...Here there is a river where the Moslems, the Portuguese, and also the Gentus, build their ships, because timber, iron, and other necessary materials are available, and wages are low.” 99 But there was a difficulty in bringing out ships built or sheathed in Narsapur river, until the northerly monsoon began to blow in October. 100 In 1638, a ship of 800 tons was built by Mir Muhammad Sayyid. 101 In 1668 English Factor, Jearsey, had built a new ship of 200 tons, at Madapollam. 102 In 1670, Thomas Bowrey, noted about Madapollum that “Many English Merchants and Others have yearely Ships and Vessels built here, beinge the onely Commodious Port on this or the next Coast adjoyneinge thereto, vizt. Gingalee.” 103 He further described the sheathing of a vessel in the range of 1000 tons, at Narsapur. 104 Besides these, there are several example of shipbuilding by the merchants and nobles of Masulipatam at Narsapur. 105

99 Ibid., p. 63.
100 Ibid., Anonymous, p. 80.( the river was southern or Vasishta, mouth of the Godavari)
101 EFI,1637-41, p.80.
102 Ibid., 1668-9, p.164 ( see also Ibid.,1661-64, p. 391 for convenient place of shipbuilding and repairing at Madapollam)
103 Bowrey, p. 102. He further noted that “Here is the best and well growne timber in Sufficient plenty ; the best Iron upon the Coast is for the most part Vended here and att reasonable rates, with the Workmanship alsoe; any Sort of Ironworke is here ingenuously performed by the Natives, as Speeks, bolts. Anchors, &c.”
104 Bowrey, pp. 103-104.
In the Bay of Bengal, boatbuilding was carried out on large scale in comparison to shipbuilding, due to the reason that in the bay for port to port trade and collection of merchandise, small vessels were needed as large vessels were not able to reach near the shore. In 1634, the English factors at Balasore noted that there was no thought of trade in the Bay without small vessels, as the great ships ride afar from the shore and it was the small vessel which used to bring provisions for the great ships. Therefore they thought to buy or build smaller vessels there. They purchased a ‘not half finished’ pinnace of 100 tons ‘burthen’ from the Governor of Balasore and finished it. Another small frigate was likewise bought in Bengal about the same time (named the Marigold) of some 30 tunns (cost rupees 900).106

Earlier, in 1633, when Burton, with other English colleagues, went Balasore, they found that it was a great sea town, where many ships and other vessels were being built. They further got licence “to build shipping, small or great, or any other vessels they think best and fittest for their occasions and uses.”107 Durson in partnership with a Moor of Balasore, had built a vessel of 200 tons, in which he intended to trade from port to port.108

In 1661, ships were built by English Factors in the Bay and were named

---

106 EFI, 1634-36, pp. 42-43, 44. Hamilton observed the problem in reaching the great ships on the shore, that “The Sea-shore of Ballasore being very low, and the Depth of Water very gradual from the Strand, make Ships, in Ballasore Road, keep at a good Distance from the Shore, for, in four or five Fathoms, they ride three Leagues off.” (Hamilton, I, p. 394).

107 Early Annals vol. I, pp. 9, 11, 12.

108 EFI, 1651-54, p. 92.
*Methew and Thomas.* Europeans, especially Dutch and English were employed in constructing small vessels for the Mughal authorities. The Dutch built a galliot for the Nawab (Governor), at Hugli, which was sent to Decca. Under the supervision of an English Mr. Pits a galliot was built at Decca. In 1663, Thomas Pratt an Englishman was employed by Nawab Mir Jumla for building boats. In 1664, Pratt with four other persons went to Rajmahal to offer the new Nawab their service in building ships and cannons. In 1664, English factor, Black had built three boats to carry goods between Balasore and Hugli. In 1669, the English noted regarding building of small vessels at Narsapur instead of at Hugli, that “wee are informed that vessels are better built in the Bay, and at easier rates for materials and workmen, then in these parts.” However, vessels of large size from 4, 5, or 600 ‘tons’ were also built in the Bay. The Bay was naturally filled with timbers especially the *sarkar* of Bazuha which had timbers especially for mast and boats. Sagar Island afforded great store of large timber to building ships. The Ganjam territory also had timbers for

---

109 Ibid., *1661-64*, p. 67.
110 Ibid., p. 70.
111 Ibid., p. 71.
112 Ibid., p. 294.
113 Ibid., p. 393
114 Ibid., p. 401.
115 Ibid., *1668-9*, p. 308.
building. Abul Fazl records iron mines in the *Sarkar* of Bazuha, which bordered the Khasia Hills. Iron was also found in the Nilgiri Hills, and between Bhadrakh and Balasore and near Ganjam.

Shipbuilding was also carried out at Lahore; due to availability of timber from the Himalayan region. However it was not a sea port, and the nearest sea port, Thatta whose outer port was Bandar Lahari, had little access to timber for building ships. In 1594 and 1596, as already mentioned Akbar built two large ships at Lahore in the river Ravi, whose technological aspect has been studied by Irfan Habib in detail. An immense quantity of iron in the form of nails, strips, rings, etc. was used in the construction of the first ship. However, we have no details of quantity of iron used in the second ship. Due to problem in transporting the first ship to Thatta, owing to shortage of water in the river, the building of the second ship was carried upon a barge, which in English parlance is ship’s camel. It carried the ship in the sea and later on the barge was scuttled there.

---

119 Hamilton, I, p. 379.


121 William Hedges, *Diary*, I, p. 67 (Hills afford store of Iron, which furnishes all this country); Hamilton, I, p. 379, Pinkerton, 405-6.


going vessels like ghurabs were also built in Kashmir, but these plied in the river Jhelum only.\textsuperscript{126}

In Mughal India, planks of vessels were joined mostly by a method called ‘rabeting’, a tongue and groove method. However other methods were also applied by them.\textsuperscript{127} Whereas ‘rabeting’ was also done by the Europeans, they mostly relied on the method called ‘caulking’.\textsuperscript{128} In 1668, the English factors advocating the building of ships in India wrote to the Company that “.....the carpenters wrought their work very cheape, substantial, and strong, of planke let into each other, with cotton tarr, and then spiked, which is called riveting worke, this is, to our knowledge, very lasting, and admitts no caukling or other trimming then chynaming once a year, which is done in one springe [tide], and this execuseth all caulking worke, ocum, pitch, and tarr, with the expence of many carpenter and caulkers;...”\textsuperscript{129}

Earlier, Indians used to join the planks by stitching or sewing with rope. It is only at the beginning of the sixteenth century that sources begin to note the presence of iron fastenings in Indian ships, as is shown by the accounts of Pedro Alvares Cabral, who tells us that on the south west coast

\textsuperscript{126} AN, III, pp. 727-28; Irfan Habib, ‘Akbar and Technology’, p.146.
\textsuperscript{128} A. J. Qaisar, \textit{Indian Response}, pp. 20-21. ‘a technique of making joints or seams tight or leakproof by forcing oakum between parts that are not tightly-fitted. Thus, caulking was actually the next step in European shipbuilding after the planks were joined together by any method in carpentry’.
\textsuperscript{129} \textit{EFI}, 1668-69, p.79.
that ‘the ships are made with iron nails’. Ludovico di Varthema, in the first decade of sixteenth century found at Calicut that ‘they put in an immense quantity of iron nails’ in building their ships. Gaspar Correa, writing the history of the first voyage of Vasco da Gama, noted that most vessels present at Cananor were sewn, but there were iron-nailed vessels also which were flat-bottomed. If we believe Gaspar Correa, who mentioned the presence of nailed vessels at Andijiva and Cananor, at the coming of Vasco da Gama, it cannot be denied the use of iron in Indian vessels, however, was not employed on a large scale. In Mughal times, on the contrary, we have ample evidence that there was no dearth of iron in India, especially on the Coromandel Coast. In Mughal India, in late sixteenth century, we have very interesting and informative description of use of iron nails in joining planks, in the Akbarnama of Abul Fazl. An immense quantity of iron nails was used in the building of two ships at

130 The Voyage of Pedro Alvares Cabral to Brazil and India, from contemporary documents and narratives, transl. with introduction and notes by By William Brooks Greenlee, p. 105.


133 A’in, II, p. 110; Thevenot, p. 148; Master, II, p. 115; Bowrey, pp. 55-6; Willam Hedges, Diary, I, p. 67; Hamilton, I, p. 379,; Pinkerton, 405-6.
Lahore by Akbar in 1594 and 1596. From the paintings of Mughal period it is also confirmed that they used iron in building their ships. And this is an important proof against the popular notion that, Indian ships were only stitched and sewn with rope and there was no use of iron. The use of iron was already prevalent in the China even before the coming of Portuguese, which undermines the supposition that this shift towards the use of iron was due to European influence. It may be possible as A.J. Qaisar has suggested that the shift towards use of iron was a necessity to cope with the strong and war-like ships of the Portuguese.

It is true that, most of the Indian vessels, before the Mughal period had no decks, as observed by the travellers in that period. Stefano in 1490, during his return journey from Sumatra to Cambay, met with an accident, "so that the vessel, having no deck, became filled with water to such a


135 Darabnama, BM Or. 4615, ff. 31a, 76b, 55a; Pl. 3/117 (Akhbarnama, V & A); see also S. P. Verma, Art and Material Culture in the Paintings of Akbar’s Court, Pl. lxxi.


137 A.J. Qaisar, Indian Response, pp. 23-27; Moreland ('The Ships of the Arabian Sea about A.D. 1500', Journal of the Royal Asiatic Society of Great Britain and Ireland, January 1939, pp. 63-74 and April 1939, pp. 173-92, especially p. 189) suggested the absence of iron was due to high cost of iron.
degree, that there was no means of bailing it out, and it sunk, and those who could swim were saved and the rest were drowned. Earlier Marco Polo (c.1290) and later Barbosa in 1516 had found the Indian vessels without decks. But at the same time we have a description from Nicolo Conti (1419-44), who found Indian vessels with decks and compartments. In our period the vessels were built with decks. During his return journey from Mecca in 1582, Bayazid had to retire due to the mutiny of Gujarati khallasis, who were sympathetic to Muzaffar, the former ruler of Gujarat, into special cabin (dabosa). According to Tek Chand Bahar, 1739-40, a dabosa was cabin in ship or boat which was below the elevated part of deck. And it was the characteristic of the junk-type vessels to have a deck. Most striking description of decks and cabin comes from Hamilton, who found these features even in a boat (kishti) on the Indus. He observed that, ‘Their Vessels are called Kisties, of several Sizes. The largest can lade

140 India in the Fifteenth Century, Nicolo Conti, p. 27. ‘they build some ships much larger than ours, capable of containing two thousand butts, and with five sails and as many masts. The lower part is constructed with triple planks, in order to withstand the force of the tempests to which they are much exposed. But some ships are so built in compartments, that should one part be shattered, the other portion remaining entire may accomplish the voyage’.
142 Peter Mundy, II, p. 30.
about 200 Tuns. They are flat-bottomed, and, on each Side, Cabbins are built from Stern to Stem, that overhang about 2 Foot; and, in each Cabbi, is a Kitchen and a Place for Exoneration, which falls directly in the Water. Those Cabbins are hired out to Passenger, and the Hold, being, made into separate Apartment, are let out to Freighters, so that every one has a Lock on his own and has his Goods always ready to dispose on at what Place he finds his Market. And indeed in all my Travels I never saw better Conveniencies of travelling by water." 

COST OF CONSTRUCTION:

Cost of construction of a ship is one of the important aspects. However there is almost no evidence in contemporary Persian sources except one in Akbarnama of Abul Fazl, but we can form some idea about it by collecting some references from the European sources. In 1594, Akbar built a Jahaz, probably an Indian junk, having length of its keel 35 gaz-i ilahi, a little over 93 feet, cost him Rs.17, 335 or 1950 pounds 10s. 6d. In 1616, a coasting vessel of 20 to 30 tons owned by Khawaja Arab, at Swally Marine was valued at 2000 mahmudis or Rs. 800. Thus its cost ranged between Rs. 26.66 to 40 per ton. In 1634, a vessel of 30 tons (named the Marigold) was purchased by the English factors in Bengal at the cost of

---

143 Hamilton, I, p. 123.
145 A supplement Calendar of Documents...1600-1640, p. 102; Relations, p. 40, EFI, 1634-36, p. 103.
146 See also A. J.Qaisar, ‘Shipbuilding in Mughal Empire..’ p. 162.
Rs.900.\textsuperscript{147} It means that it cost Rs.30 per ton. In 1639, in Multan a vessel (of flat bottom) of ‘2,000 maens’ (66 tons) burthen cost not more than Rs.250 or thereabouts and at Thatta the cost was more or less the same.\textsuperscript{148} Thus it cost less than Rs.4 per ton. Very cheap cost in comparison to the other vessels is perhaps due to the reason that these were river vessels, whereas others were coasting or ocean going one. In 1646, a vessel of 250 tons, of European-built, first purchased and then rejected from Chaul by servants of Prince Dara Shukoh, was later purchased by the English for Rs.13,500.\textsuperscript{149} Thus it cost Rs.54 per ton. Therefore from the above evidences, it may be concluded that, the average cost of Indian coasting and oceanic vessels were whereas about Rs.30, the European-built vessel cost about double of it. At the same time the river vessel cost very cheap, almost 8 times less than the Indian and 14\textsuperscript{th} times that of the European-built.

So far as wages of the ship-carpenters in Mughal India is concerned we have very scanty evidences. During Akbar’s period, Abul Fazl noted that in Kashmir due to prevalence of boat as main means of transport, carpenters derived a thriving trade.\textsuperscript{150} However he did not gave their wages, but it might be inferred that they were paid good wages. In 1622, chief carpenter at Surat, who was sent from Broach, with other carpenters was paid one mahmudi a day, and the rest three-quarters of a mahmudi each and

\textsuperscript{147} EFI, 1634-36, p. 44.
\textsuperscript{148} Ibid., 1637-41, p. 136.
\textsuperscript{149} Ibid., 1646-50, p. 90.
\textsuperscript{150} A’\textit{in}, II, p.170.
they were paid 25 mahmudis in advance.\textsuperscript{151} In 1668, the chief carpenters at Bombay were paid 1s.8d. a day and the labourers were paid 3 ½ d. a day.\textsuperscript{152}

**FREIGHT CHARGES:**

As so far freight charges on the different routes or between different ports are concerned, information is scattered and scanty. However I have tried to collect some quotations regarding this. These quotations are generally from the seventeenth century. During this period there were variations in weights and currencies and since for comparative purposes adjustments have to be made for them, I have to convert the freight into 100Kg/Rs. Before discussing the freight rates, we have to keep in our mind certain factors which affected the rates besides other factors, such as availability of vessels, competitions from the rival trading companies and atmosphere of safety on the vessels etc.

**Table 3.1: Freight Charges between different Ports**

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Particulars</th>
<th>Period</th>
<th>Freight Charges</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Freight charges/unit</td>
<td>100Kg/Rs.</td>
</tr>
<tr>
<td>Ormuz</td>
<td>Surat</td>
<td>Goods</td>
<td>1622</td>
<td>12 lasses/camel's load</td>
<td>Rs.2.18 or Rs.1.82</td>
</tr>
<tr>
<td>Broach</td>
<td>Swally Road</td>
<td>Goods</td>
<td>1622</td>
<td>fifty mahmudi/boat</td>
<td>Rs.0.1327</td>
</tr>
<tr>
<td>Sehwan</td>
<td>Thatta</td>
<td>Indigos, batas, butter, oil, opium etc.</td>
<td>1635</td>
<td>Rs.1/six maunds of 40 pice per ser</td>
<td>Rs.0.4978</td>
</tr>
<tr>
<td>Sind</td>
<td>Persia</td>
<td>Indigo</td>
<td>1635</td>
<td>Rs.7 or 17 larin/curwar</td>
<td>Rs.2.61</td>
</tr>
<tr>
<td>Multan</td>
<td>Thatta</td>
<td>Goods</td>
<td>1639</td>
<td>¼ rupee/maen</td>
<td>Rs.2.24</td>
</tr>
</tbody>
</table>

\textsuperscript{151} EFl, 1622-23, p. 93.

\textsuperscript{152} Ibid., 1668-69, p. 81.
<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
<th>Year</th>
<th>Item</th>
<th>Weight/Quantity</th>
<th>Unit Price</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bussra</td>
<td>Surat</td>
<td>1642</td>
<td>Horses</td>
<td></td>
<td>Five</td>
<td>EFl 1642-45, pp.2-3</td>
</tr>
<tr>
<td>Masulipatnam</td>
<td>Persia</td>
<td>1642</td>
<td>Cloth</td>
<td>1½ maunds</td>
<td>Rs. 44.515</td>
<td>Ibid. p. 55</td>
</tr>
<tr>
<td>Bengal sugar</td>
<td></td>
<td></td>
<td></td>
<td>8 pagodas/maund</td>
<td>Rs. 12.346</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Coarser sugar</td>
<td></td>
<td></td>
<td></td>
<td>4 pagodas/maund</td>
<td>Rs. 6.172</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Gum-lac</td>
<td></td>
<td></td>
<td></td>
<td>7 pagodas/maund</td>
<td>Rs. 10.80</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Benzoin</td>
<td></td>
<td></td>
<td></td>
<td>12 or 15 pagodas/maund</td>
<td>Rs. 18.51 or Rs. 23.148</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Cloves</td>
<td></td>
<td></td>
<td></td>
<td>16 pagodas/maund</td>
<td>Rs. 24.69</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Tin or totteguna</td>
<td></td>
<td></td>
<td></td>
<td>8 pagodas/maund</td>
<td>Rs. 12.346</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Steel</td>
<td></td>
<td></td>
<td></td>
<td>6 pagodas/maund</td>
<td>Rs. 6.613</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Sugar candy</td>
<td></td>
<td></td>
<td></td>
<td>10 pagodas/maund</td>
<td>Rs. 15.432</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Passengers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 15.432</td>
<td>Ibid. p. 136-7</td>
</tr>
<tr>
<td>Thatta</td>
<td>Kung</td>
<td>1652</td>
<td>Goods</td>
<td>18 rupees/kharvar</td>
<td>Rs. 6.72</td>
<td>EFl 1651-54, pp. 116, 118</td>
</tr>
<tr>
<td>Balasore</td>
<td>Masulipatnam</td>
<td>1643/44</td>
<td>Passengers</td>
<td>15 rupees/head</td>
<td>Rs. 15.432</td>
<td>Ibid. p. 72</td>
</tr>
<tr>
<td>Persia</td>
<td>Passengers</td>
<td>1643/44</td>
<td></td>
<td>40 rupees/head</td>
<td>Rs. 51.67</td>
<td>Ibid. p. 72</td>
</tr>
<tr>
<td>Sugar</td>
<td></td>
<td></td>
<td></td>
<td>7 rupees/maund of 64 lb.</td>
<td>Rs. 12.056</td>
<td>Ibid. p. 72</td>
</tr>
<tr>
<td>Calicoes</td>
<td></td>
<td></td>
<td></td>
<td>15 rupees/maund of 128 lb.</td>
<td>Rs. 51.67</td>
<td>Ibid. p. 72</td>
</tr>
<tr>
<td>Mokha</td>
<td>Coromandel Coast (Masulipatnam)</td>
<td>1646?</td>
<td>Passengers</td>
<td>20 rials of eight/head</td>
<td>Rs. 15.432</td>
<td>EFl 1646-50, p. 23</td>
</tr>
<tr>
<td>Money</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
<td>Ibid. p. 72</td>
</tr>
</tbody>
</table>

From the table 3.1, it is clear that in 1622, the freight charges between Ormuz and Surat was 12 larin per camel’s load i.e. Rs.4.94 were paid for 226.5 kg. or for 271.26 kg.\(^{153}\) In the same year we have information

---

\(^{153}\) *EFl*, 1622-23, p. 23. In 1617, the English factors made three types of bales to be loaded on the camels weighing 3 ¾ and 4 ½ maunds and on each camel two bales
for the freight for a short distance between Broach and Swally Road, that a
boat carrying one thousand maund of goods charged fifty mahmudis i.e.
Rs.20 were charged for 15070 kg (a man in Gujarat was half of man-i
Jahangiri, i.e. = $\frac{1}{2} \times 30.14\text{kg} = 15.07\text{kg}$) or Rs.0.1327 were charged for
100kg. The low freight rate was perhaps due to short distance as well
availability and engagement of many vessels at a time also. In 1635, besides
other charges, freight charge for 10 days journey between Sehwan and
Thatta, was Rs.1 for 6 maunds of 40 pice per ser i.e. Rs.1 were paid for
200.8kg. In 1635 between ‘Scinda’ and Persia, the usual charge for
indigo, sugar etc. was Rs.7 or 17 laris per ‘corwaur’(Kharwar), which was
equivalent to 8 maunds or pucka of 40 pice per ser and for the piece goods
rate was the same. Freight charge, besides other charges, between Multan
and Thatta, in 1639, was Rs.$\frac{3}{4}$ per ‘mean’ and from Bubak, 9 miles west of

---

\[\text{EFI, 1622-23, p. 261. For discussion on man in Gujarat see Agrarian System, pp.}
\[\text{428-30.}
\]

\[\text{EFI, 1634-36, p. 129. ‘The freight is usually 6 maunds of 40 pice per seer per}
\[\text{rupee. Other charges of customs in divers places is about 18 or 20 rupees upon a}
\[\text{boat that carries 100 maunds or more; whereof 6 rupees are paid in Seahwaun.’ A}
\[\text{man of 40 pice per ser was equal to man-i shahjahani = 33.48kg (Irfan Habib,}
\[\text{Agrarian System, pp. 421-22).}
\]

\[\text{Ibid., p. 133.}
\]
Sehwan and from Sann about 30 miles south of Sehwan, freight to Thatta was Rs.1½.\textsuperscript{157} In 1642, governor of Surat paid five tomands i.e Rs.5 x 29 ½ =Rs.147 ½, for each horse brought from Basrah.\textsuperscript{158} In 1642, 1 ½ pagodas were paid for a maund of cloth, for transporting from Masulipatnam to Persia.\textsuperscript{159} We have information that freight were not charged on the basis of fineness of the goods, but were weighed at ‘Bancksall’ (custom-house) and according to its weight both freight and customs were paid. From the same letter we have information that passengers got discount on lading goods paying certain amount, such as if a man lade goods paying 100 pagodas, he got his passage free and if 1000, then himself and another.\textsuperscript{160} Negotiations were also held for fixation of freight rates, for which brokers were used. In 1652, at Lahari Bandar, port of Thatta, by negotiating freight rate for transporting merchandise to Kung in Persia, was enhanced from Rs.15 per ‘carwar’ (kharwar) to Rs.18.\textsuperscript{161} If we set aside the security concern to some extant, rivalry between companies, benefited the merchants in certain cases. The Dutch competed very much with the English in freighting goods as they offered to the merchants less freight rates and better accommodation and no less safety. In 1637, the Dutch carried freight goods from Gombroon

\textsuperscript{157} Ibid., 1637-41, pp. 136-7.
\textsuperscript{158} Ibid., 1642-45, p. 2. Tavernier noted that in India, a toman was exchanged for Rs.29 ½ (Tavernier, I, p. 20).
\textsuperscript{159} EFl, 1642-45, p. 55. A pagoda was equal to Rs.3 ½ and a ‘maund’ at Masulipatnam was about 26 lb. or 11.7936kg. (Tavernier, I, pp.329-30; Moreland, \textit{From Akbar to Aurangzeb}, pp. 332, 336).
\textsuperscript{160} EFl, 1642-45, p. 55.
\textsuperscript{161} Ibid., 1631-54, pp. 116, 118.
to Surat at 25% less rate than the English. They even offered to take merchants’ goods at any rate the owners pleased to give. This tendency of the Dutch not only spoiled the trade of English but also snatched their freight goods.\(^{162}\) Therefore we found that there were no uniformity in the freight charges between the different ports and routes.

So far as pace of vessels in various rivers is concerned, we have some information regarding this but in scattered manner. The English Factors at Patna noted that, from Patna along the swift current, Portuguese frigates, used to reach Hugli and Pipli in five or six days, but in return against the current they generally took three times more time.\(^{163}\) Peter Mundy in 1632, noted about pace of vessels in Ganga river system that, in returning from Bengal to Agra they used to take five times more then in going from Agra to Bengal as they were pulled against the stream.\(^{164}\) In the Indus river system, Pelseart in c.1626, noted that, from Lahri Bandar to Thatta, shallow-draught vessels used to take 8 to 10 days owing the strength of currents.\(^{165}\) In 1635, English factors at Thatta noted that from Sehwan, 60 ‘course’ by land, indigo, baftas, opium, butter and oil, etc. were brought to Thatta by boats commonly in 10 days.\(^{166}\) In March 1639, Henry Bornford

\(^{162}\) Ibid., 1637-41, pp. 46-47; 1642-45, p. 142; 1646-50, pp.173, 199, 205, 208.

\(^{163}\) Ibid., 1618-21, pp. 213-4.

\(^{164}\) Peter Mundy, II, pp. 87-88.

\(^{165}\) Pelseart, pp.31-32.

\(^{166}\) EFl, 1634-36, p. 129. They have also noted that from Nasarpur, about 30 ‘course’ distant from Thatta and situated on Indus river, ‘comeing downe with the current, charges of transportacion must be very little’ (ibid., p. 128).
noted that from Lahore to Multan (‘150 course’) transport of goods down the river in the flatt bottom boates of a thousand and ‘2000 maens’ was accomplished in 11 days. 167 In early eighteenth century, Hamilton noted that from Thatta to Lahore, ‘Kisties’ of ‘200 tuns’ use to take six or seven weeks as they were obliged to track the vessels against the streams and winds with the help of number of men, but from Lahore in returning not above eighteen days and sometimes even in twelve days the journey was performed. 168 Therefore it is clear that pace of vessels fully depended on the current of the river and wind blowing at that time. They took less time along the current and wind and took thrice or fifth times more against them.

So far as interest of the Mughal Emperors, princes and princesses and nobles is concerned, the Mughal emperors from the very first day of their direct contact to the Indian Ocean just after the conquest of Gujarat in 1572 A.D., developed interest in the ocean. Akbar travelled in a tawry, a barge which also used to ply between India and Red sea. 169 And in a very short period Akbar sent, however, hesitantly his family members in two vessels built or acquired by him namely Salimi and Ilahi for the hajj pilgrimage. 170 Later on Akbar built two ships at Lahore in 1593 and

167 Ibid., 1637-41, p. 136.
168 Hamilton, I, p. 123.
169 AN, III, p 9; Shireen Moosvi, People, Taxation and Trade, p. 243; EFI, 1618-21, p.106.
170 Ibid., III, p. 195; Ad. 27247, f. 285b; Shireen Moosvi, People, Taxation and Trade, pp. 244-246.
This interest continued under other Mughal emperors also especially Jahangir, Shah Jahan and Aurangzeb. It was Jahangir during whose period Europeans established themselves in Surat by receiving royal farmans. He himself used to invest in the ships voyaging to Mecca. Shah Jahan, as Prince Khurram, took great interest in shipping, when he became governor of Gujarat, and he built and plied his own ships. The two famous ships owned by him were Shahi and Ganjawar. His interest continued after becoming Emperor also. Aurangzeb also took great interest in shipping especially in sending ships to Mecca. The Ganj-i Sawai was his ship whose seizure by the English is a well-known incident. Other royal family members also used to invest in shipping such as Princess Jahan Ara and Prince Dara Shukoh etc. Nobles were also involved in shipbuilding and shipping.

---

