Maritime Habitations and the Socioeconomic Life of Fishermen along the Srikakulam Coast: A Study of Coastal Settlements, Livelihoods and Cultural Practices

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Abstract

All 106 villages of 11 revenue mandals are categorised into four groups based on natural landmarks to analyse habitation pattern against maritime habitat. The river confluence of Mahendratanaya (Bendigedda), Vamsadhara and Nagavalli are considered for the landscape division. They are i. Villages located towards north of Bendigedda (36), ii. Villages located south of Bendigedda (32), iii. Villages located between Vamasadhara and Nagavali- Inter valley (17), and iv. Villages located south of Nagavali (21). This division is purposive in nature to compare and to analysis the habitation, housing, infrastructure, religious and development patterns of the study area.

Keywords: *Fishing communities, Boats, economic asset, Livelihoods and Cultural Practices*

Introduction:

The Srikakulam district (182 km coastline) has been the habitat of fishermen communities. They are Vadabalija, Jalari and Palle communities. Among these Vadabalija is the numerically dominant community followed by Jalari, the Palle are a few, and they gave up fishing and taken up agriculture. People of these communities live in villages, which are located very contiguous to the coast. They are small, and no town but considerable big villages, one each at Kalingapatnam and Bhavanapadu are seen. In addition to the revenue records of the villages of the coastal landscape, Surveys of India topo-sheets, landsat imagery, googleearth maps are used to ascertain habitations of fishers, and they are thoroughly verified by ground truth check. A total of 106 fishermen villages are recorded and they are distributed in 11 mandals (Etcherla (10), Gara (5), Itchapuram (1), Kaviti (11), Mandasa (5), Polaki (7), Ranasthalam (11), Santhabommali (14), Sompeta (8), Srikakulam (16), Vajrapukotturu (18). The primary emphasis of recent studies documented the healthcare

and healing (Pukkalla & Sharma 2018, 2020a) and fishermen and their plurality of deities (Vijaya Prakash, 2022), livelihoods (Rama Mohan 2016; Pukkalla & Rama Mohan, 2021), fishers' knowledge and contribution to their economies (Pukkalla & Sharma, 2020b; Kodi, 2021) by integrating resilience perspectives to draw scholarly contributions to these small-scale fishing communities and their developmental dimensions (Vasanthi et al 2015; Pukkalla & Rama Mohan 2023; Nikku et al, 2024; Pukkalla and Gangadhar 2025).

All 106 villages of 11 revenue mandals are categorised into four groups based on natural landmarks to analyse habitation pattern against maritime habitat. The river confluence of Mahendratanaya (Bendigedda), Vamsadhara and Nagavalli are considered for the landscape division. They are i. Villages located towards north of Bendigedda (36), ii. Villages located south of Bendigedda (32), iii. Villages located between Vamasadhara and Nagavali- Inter valley (17), and iv. Villages located south of Nagavali (21). This division is purposive in nature to compare and to analysis the habitation, housing, infrastructure, religious and development patterns of the study area.

Between inland and marine fishing, marine environment is hostile and alien. Fishing has been a hazardous occupation. It takes place in an uncertain and risky environment with constant threats of storms, accidents, or equipment failure (Binkley 1991). People depending on marine fishing developed a set of norms, values, various social networks and institutions. These societies have generated knowledge to combat ocean and weather conditions. The common property nature of marine resources makes fishing a competitive endeavour. Maritime literature has gained some strength on studies made since 1970s, and has produced ethnographies of fishing communities (Barth 1966, Acheson 1981, 1988, 2003, Palsson 1988, 1989, 1990, 1991, 1994, Vestergaard 1990); cultural histories of sea faring (Frake 1985, Finney 1994, D'Arcy 2006), coastal recreation and tourism (Brown 1997, Davis 1997, Desmond 1999, Boissevain and Selwyn 2004). In addition to these understandings, scholars have examined the diversity of beliefs about fishing a symbolic enterprise (Cordell and Fitzpatric 1987, Hoefnagel 1991), and focused on gender-race-class structures (Chapman 1987, Garrity-Blake 1994, Kaplan 1988, Nieuwenhuys 1989, Volkman 1994, Gerrard 2007, Soreng 2007).

Methodology:

- Two villages/habitations each in urban, semi-urban and rural areas are selected for intensive study on navigation and fishing paraphernalia.
- Socio-cultural and economic aspects are also digitized to produce a document (at a later date) on maritime communities and their criticality in marine food supply to the region.
- Collected information is classified and analyzed by using statistical programmes.
- The data are organized into different tables and they are incorporated in the text, wherever necessary, as value addition.

- Every aspect related to boat making and repair, net weaving and repair, navigation, fishing strategies, preservation and conservation, and their variations was documented and digitized.
- Both qualitative and quantitative data are collected at several places depending upon the activities such as at house, beach, landing, market and vending places,

Location of Villages in Coast of Srikakulam District (Distance from the sea coast):

The coast of Srikakulam district is interspersed by three major rivers and a few streamlets. The mouths of these rivers, backwater streamlets and wetlands around these, and several sand ridges and sand dunes in between these characterise the Srikakulam coastal landscape. Such landscape is the habitat of fishing populations spread over 106 villages. The study on geophysical aspects of fishermen villages indicate that a considerable number of villages are vulnerable to the maritime vagaries due to their location in relation to the tidal margin and mean sea level (MSL). Fishermen villages are located on sand dunes, at the mouth of the rivers (Nagavali, Vamsadhara and Mahendratanaya) and a few hill streams and nallas. Beach ridges together with sand dunes are most preferred as they facilitate landing, anchoring and net spreading. Data pertaining to their location in relation to distance from the coast and elevation in relation to tidal margin are calculated by using maps, imageries, compass and altimeter, in view of sea level rise in recent years.

Distribution of fishermen villages in relation to sea shore

S. No	Habitation Category	Distance from the sea in Kilometres					Total	Per cent
		>0.5 km	0.5-1 km	1-1.5 km	1.5-2 km	2-2.5 km		
1	BG North (36)	1 (0.94)	14 (13.21)	12 (11.32)	9 (8.49)	0	36	33.9
2	BG South (32)	18 (16.98)	5 (4.72)	7 (6.60)	2 (1.89)	0	32	30.3
3	Inter Valley (17)*	4 (3.77)	3 (2.83)	0	9 (8.49)	1 (0.94)	17	16.0
4	NGV South (21)	4 (3.77)	12 (11.32)	2 (1.89)	3 (2.83)	0	21	19.8
	Total (106)	**27**	**34**	**21**	**23**	**1**	**106**	
	Per cent (100)	**25.6**	**32.0**	**19.8**	**21.7**	**0.9**		**100**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

Figures in the parenthesis indicate per cent to total number of villages

The data of the table indicates that 25.6 per cent of fishermen habitations are very close to the sea at less than 500 meter distance, followed by 32.0 per cent between 500 (half a kilometre) and 1000 meter (one kilometre) distance. These two categories account for about

58 per cent, which are most vulnerable to climate change due to global warming. The remaining 42 percent are distributed at 19.8 per cent and 21.7 per cent between 1.0-1.5 km and 1.5-2.0 km respectively. Only one village is located between 2 and 2.5 km distance. It is clear from the analysis that the main habitat of the fishermen of the Srikakulam district is within 2 km swath maritime landscape.

It is further observed from the data that most vulnerable villages are seen between Bendigedda and Vamsadhara, while all villages, with an exception to one village, located north of Bendigedda are vulnerable. Similarly 11.32 per cent of villages located south of Nagavali are also vulnerable.

Elevation of Village in Relation to Tidal-Margin/MSL:

Data pertaining to elevation of fishermen villages in relation to tidal-margin or the Mean Sea Level (MSL) is calculated on contour lines of the Survey of India topographical sheets and ground truth check, and the same has been presented in table-3.2. The data indicates that about 93 per cent of fishermen villages are located less than 10 meter contour, thereby vulnerable for inundation even during cyclones, tsunamis and high tides. Out of these 36.8 per cent are most vulnerable as they fall less than 5 meter contour. Only 6.6 per cent of villages are located between 10 and 15 meter contours. No fishermen village seen more than 15 meter contour line. It is clear from the location analysis that most of the fishermen villages and habitations are vulnerable to maritime calamities.

The field observations indicate that the villages close to wetlands are more prone to calamities, as most of them are at the verge of water body. The villages located in between wet land patches, to some extent, are protected by the sand ridges and settled dunes, where marine vegetation with casurina and cashew plantations acting as binding matrix of sands. It is further observed that at several places beach is eroded and even some of the houses are washed away by cyclonic tides. Most of the fish landings are also subjected to erosion.
Distribution of fishermen villages' elevation in relation to sea coast

S. No	**Habitation Category**	**Altitude in Meters**				**Total**	**Per cent**
		>5 m	**5-10 m**	**10-15 m**	**>15 m**		
1	BG North (36)	3	29 (27.36)	4	0	36	33.9
2	BG South (32)	20 (18.87)	10 (9.43)	2	0	32	30.3
3	Inter Valley (17)*	5	12 (11.32)	0	0	17	16.0
4	NGV South (21)	11 (10.38)	9 (8.49)	1	0	21	19.8
	Total (106)	39	60	7	0	106	
	Per cent (100)	36.8	56.6	6.6	0		100

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

Figures in the parenthesis indicate per cent to total number of villages

About 19%, and 9% of the villages located between Bendigedda and Vamsadhara, and about 10% and 8% south of Nagavali are most vulnerable and vulnerable respectively. The villages fall between 5 and 10 meter contour line seem to be characteristic habitation feature fishermen villages of Srikakulam district.

Demographic Profile of Marine Fishers – Srikakulam District:

Specific demographic figures of fishing communities under discussion are not available. Though some statistical figures are available at Fisheries department there is inconsistency among the figures of NGOs, Fishermen Cooperatives and Community leaders. A survey had been conducted by the present study at village level. A village schedule is designed and collected information from village elders, heads and other community functionaries through face-to-face interview. This exercise has provided basic information on various demographic, infrastructure facilities, religious and development programmes in vogue on fishing communities. The sought information is physically verified to assess the relative status of the village in terms of people, assets and other related issues.

The fishermen villages of Srikakulam district are exclusively inhabited by fishermen communities only with an exception to very few other caste people. They are Vysya and Sondi (trading communities), a few Kshatrifa (warrior community), Telaga/Kapu (Agriculture community), come under upper castes of Hindu hierarchical system, and Chettibalija (toddy tapping), Yadava (shepherds) and Reddika (Agriculture community) and a few less known communities, which come under Sudra category of Hindu *varna* system. A sporadic number of Scheduled Caste people are also seen in a few villages. The hinterland of the fishermen villages is mostly owned by the Vysya, Sondi and Kshatriyas people. Among these a few of Vysya and Sondi have petty shops in the fishermen habitations. Chettibalija people tap the toddy from the palm trees found both in private and public coastal lands and sell among the fishing populations, while the Yadava use the coastal stretches to graze their cattle, sheep and goats. Other than these the rest of the people are fishermen only. The community-wise distribution of 106 villages indicates, that there are villages exclusively inhabited by single community such as Vadabalija 75, Jalri 8 and Palle 2, while the remaining 21 villages are multi community such as Vadabalija and Jalari 12, Vadabalija and Palle 7, Jalari and Palle 2, and all three fishing communities 2. The community-wise analysis indicates, single community residence in the form of a village is the characteristic feature of coastal habitation pattern. Even in multi community villages' one caste is numerically dominant, while the others are negligible. Single community coupled with close kin networks seem to be an adaptation to vulnerable maritime habitat.

The data related to population with gender divide and children below 14 years age group are collected with a view to assess the current and future fishing human resource. In addition to

fishers, the other communities living in fishermen villages is also sought to have holistic assessment of population inhabiting the maritime habitat of Srikakulam district.

Distribution of Population in Maritime Habitat of Srikakulam district

S. No	Habitation Category	Fishermen Population			Other Communities (Total)	Total	Per cent
		Male	Female	Children			
1	BG North (36)	24899	24209	8974	1045	59127	41.86
2	BG South (32)	17721	17963	7597	742	44023	31.17
3	Inter Valley (17)*	6903	6546	3659	166	17274	12.23
4	NGV South (21)	8500	8535	3617	163	20815	14.74
	Total (106)	**58023**	**57253**	**23,847**	**2116**	**1,41,239**	
	Per cent (100)	**41.08**	**40.54**	**16.88**	**1.5**		**100**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

The data of the table indicates that out of about 1.41 lakh population only 1.5 per cent is other than the fishing community people. At present about 55 thousand families are found along the Srikakulam district, out of which only about 35,000 people are actively involved in fishing (Source: State Fisheries Development Corporation, Visakhapatnam). The data further shows that only about 16.88 per cent people below the age group of 14 years are present in the study area. This group is progressive when compared to the households who are conservative, rather traditional, subjected to processes of development. The services available in terms of health and Medicare, education and training are being accessed by this group and the youth of the traditional category. The youth and adolescent children are taking up semi-skilled occupations like mechanics, drivers, tailors, painters etc within their village premises. In this given situation, continuity of fishing on traditional means may not be possible, but the children category is the only hope. It is likely that there is a possibility, if monitored scientifically and systematically, this group would take up mechanized fishing with all development and welfare inputs.

Housing and Households of Coast of Srikakulam District:

Census and Surveys collect data on households or group of persons, who commonly live together and eat from a common kitchen. A household may contain mutually relaed persons and unrelated persons or both. The fishermen people of the study area living in villages are living in small houses made up of different materials, and they are classified as huts (mud walls with thatched roof on wooden skeleton), tiled (walls of mud or brick with tiles on wooden frame), and slab (cement plastered brick walls with steel and cement concrete slab) categories. Most of these houses are with a living room and kitchen with a front or back corridor. Very few houses have two living rooms. The roofs are of conical shape in huts category, bevelled in tiled and flat in concrete house categories. Conical shaped thatched huts

are typical with very low entrances, is an indigenous adaptation to high velocity winds, which often hit the east coast of India. To enter into the traditional house one has to lean as the height is about three feet only. The traditional houses are slowly converted into concrete houses with the support of government hosing schemes. During the initial years of development process (1980s and 90s) some of the thatched roofs are replaced by the tiles, while in 1990s and thereafter houses are showing considerable change.

The change is more progressive towards north coastal mandals as indicated by absence of huts as one moves from south to north. Field observations further indicate that the government sponsored materials like bricks, tiles and asbestos are used to have semi-permanent houses in most of the cases. Concrete houses in a wagon type, adding a unit to the existing, are also in considerable in number, which has been an outcome to overcome space shortage for housing, as per a few informants. Two types of cyclone relief centres, round and rectangular types with two stories are built in some of the villages, in two spells to mitigate the natural calamities. At present most of them are in dilapidated conditions, standing in villages as examples of negligence. Data related to living houses is visually counted in the field and virtually compared with Google-earth digital image data, and the same has been presented in

Distribution of house types and households in Maritime Habitations

S. No	Habitation Category	Type of House			Total Houses	No of Households	Family Density
		Huts	Tiled	Slab			
1	BG North (36)	0	10241	4364	14605	24,562	1.68
2	BG South (32)	0	5106	4570	9676	17,838	1.84
3	Inter Valley (17)*	3	500	4340	4843	6,722	1.39
4	NGV South (21)	1062	378	4568	6008	8,513	1.42
	Total (106)	**1,065**	**16,225**	**17,842**	**35,132**	**57,635**	**1.64**
	Per cent (100)	**3.0**	**46.3**	**50.7**	**100**		

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category
(Figures in the parenthesis indicate per cent)

All 106 villages put together 35,132 ‘units’ of dwellings recorded, and they are shared by 57,635 households, out of about 1.41 lakh fishing population of the district. A unit means a living room (round in share encompassed by corridor in traditional houses, rectangular room(s) in other types) with common veranda and kitchen/cooking yard. The analysis related to housing, households and the population clearly indicates that there is shortage of housing. Most of the houses/dwelling units are shared by two nuclear families, average being 1.64 households or families. It is interesting to note that the house is shared by the parents and their married sons. It is observed that, the roof is shared but not the hearth. Cooking and dining are independently being done at different corners of the house depending on

availability of space. Since most of the houses had limited space for cooking hearths are provided outside the house. Most of these hearths are ‘mobile type’ an indigenous technological system (ITS), where the coastal temperatures and wind directions vary in a day due to differential heating between land and water.

Some pockets of habitations in a village are government sponsored colonies (rows of houses). People uprooted from traditional villages, due to some development activities like laying road, government offices etc, are rehabilitated in colonies. The geographic extent of villages is limited by encroaching sea on east and private landholdings on the west, and acquisition of coastal land for development activities such as Ports, Pharmaceutical factories, thermal and nuclear power plants etc. In fact, their habitation requires some natural setting than a cultivable land. Thereby, the fishermen villages are sandwiched by natural barriers on one side and the private landholdings on the other coupled with the state development requirements.

With an exception to government colonies, most of the houses do not have toilet facility and sceptic tank, which collects sewerage, is unheard in a few villages. Outskirts of the village, streets, paths and beach are used for defecation and urination. Fishing settlements due fishing profession stink and the absence of toilets make them horrible. Some villages are unhygienic state in terms of premises, drainage and civic amenities.

Water Resources and Women Activities in Coast of Srikakulam District:

vailability of sweet water is prerequisite for human habitation. Though fishermen settlements are on the coast of Bay of Bengal, whose sheet of water is the main source of economic activity, the fresh water source is essential and plays an integral role in life of fishing communities. The freshwater table in local rocks and substrata of the coastal region made the area habitable, and is being used in different ways for domestic chores. Data related to sources of water at village level is collected and presented in table.

Distribution of water sources in use in Maritime Habitations

S. No	Habitation Category	Water sources				Total	Per cent
		Open well	Tube well	Storage tank *	Natural tank		
1	BG North (36)	100	187	26	21	334	36.8
2	BG South (32)	85	95	13	19	212	23.4
3	Inter Valley (17)*	119	123	12	5	259	28.5
4	NGV South (21)	21	67	9	5	102	11.3
	Total (106)	**325**	**472**	**60**	**50**	**907**	
	Per cent (100)	**35.83**	**52.04**	**6.62**	**5.51**		**100**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

* Storage tanks both at ground and overhead levels

It is clear from the table that four different sources of water sources, such as open wells (35.83 per cent), tube wells (52.04 per cent), storage tanks (6.62 per cent) and natural tanks (5.51 per cent) are catering to the water requirements of the people living along the coast of the study area. Groundwater is the main source for all these operations. Water is drawn manually from open wells with buckets through string on a pulley, while tube wells are fixed with either electric motor pump or hand pump to draw either mechanically or manually. Ground water is pumped into storage tanks by electrical succession motor pumps. Storage tanks are of two types in operation, one at ground level and the other overhead, from which water is delivered by gravitation flow. Cemented plates are platforms are provided around open well and bore wells. These platforms are provided to maintain clean and hygienic premises, but they are used for various household activity.

Besides consumption, cleaning utensils, washing cloths and taking bath, certainly extend personal cleanliness, but making unhygienic premises due to poor drainage. In fact these points are most social interactive centres of settlements, where women of different age groups often chitchat and gossip, socialize and share knowledge. Such social and economic knowledge exchange activity is more at open and tube wells. Natural tanks are also used for different household activities mostly for cleaning, washing of household items.

Infrastructure Facilities and Other Amenities in Fishermen Habitat

Since the habitat of fishermen is away from the mainstream infrastructure facilities like highways, state roads and towns and mandal headquarters, but close to sandy beaches, wetlands, and streamlets, the data related to village infrastructure facilities like roads, transport, communication, and other amenities is collected and analysed. Besides this, the data on traditional and modern community centres, market yard, calamity relief centres, etc are also collected. The facility-wise collected data against the habitation categories to assess their accessibility and denial of such facilities and amenities is presented in table.

Distribution of infrastructure facilities and civic amenities

S. No	Habitation Category	Infrastructure Facilities										
		Approach Road	Public/Private Transport	Communication	Electricity (%)	Traditional (Ratchabanda)	Community Centre	Calamity Relief Centre	Government Office	Lighthouse	Market	Bus Shelters
1	BG North (36)	36	36	36	90-	24	20	11	16	1	23	17

					100							
2	BG South (32)	32	32	32	90-100	23	7	5	9	2	17	14
3	Inter Valley (17)*	17	17	17	94-100	12	6	3	8	1	10	11
4	NGV South (21)	21	21	21	79-100	7	11	2	7	2	16	6
	Total (106)	**106**	**106**	**106**		**66**	**44**	**21**	**40**	**3**	**66**	**48**
	Per cent (100)	**88-100**				**62.26**	**41.51**	**19.81**	**37.74**		**62.26**	

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

Analysis of the data indicates that all the fishermen villages are connected on ground by blacktopped roads to approach (with an exception to a few conker roads), and in air by electromagnetic waves for communication (either of BSNL, Airtel, Tata, Vodafone, Reliance signals). Most of the villages can be reached by bus transport provided by Andhra Pradesh State Road Transport Corporation (APSRTC) under its "pallevelugu" (village glow) programme on certain timings, while auto services (three wheelers) are available round the clock, operated in private sector. Andhra Pradesh State Electricity Board (APSEB) has brought all fishermen villages under its power connectivity and supply of power, but about 20 to 30 per cent of the houses are yet to be connected. Such houses are more in the villages located south of Nagavali River. Though the democratic institutions are regulating and controlling the law and order issues of fishermen through Police Stations located nearby panchayat or mandal headquarters, the fishermen village community had traditional self-ruling institutions, and they are operated by caste functionaries, besides Panchayat members and elders. Various community issues and disputes such of social, economic, political and cultural are resolved by these functionaries, while the secular issues are governed by the panchayat authorities. The religious and rituals related to life-cycle ceremonies are managed by the traditional community or village heads. The traditional 'ratchabanda', a concrete platform at one of the centres of the village is a standing testimony, where most of the disputes are resolved by traditional village functionaries, whose authority is honoured at community level, besides acting as culture conservators and heritage promoters. It is clear from the data that 66 of such structures are at present in vogue counting to about 62%. It seems that traditional open air structures are replaced by the closed community centres (44), which account for 41.51 per cent. Four villages are having both traditional ratchabanda and community centre.

In order to mitigate the natural calamities like cyclones, tidal waves, surges, tsunamis, etc, the government of Andhra Pradesh under its World Bank Welfare programmes had built 21 'Cyclone Relief Centres' in two phase. The first one is of round type and the second

rectangular. All round ones in dilapidated condition while the rectangular ones are often used as either anganwadi centres or schools. In 40 villages out of 106, government offices are seen and they are mostly the nodal points for government functionaries. Market facility in 66 (62.26%) villages and bus shelter facility in 48 villages (45.28%) are noticed and these perhaps depended mostly on the size of the village and its population. Light houses located at different spatial intervals such as Bhimunipatnam in Viskhapatnam district, Bhavanapadu and Kalingapatnam in Srikaulam district are are catering to the navigation needs of fishermen of Srikakulam District.

Healthcare Services in Fishermen Villages in Srikakulam District:

Human development is calculated by the health status of a population. Health of a population depends on the day-to-day activity against local climate, weather and environment conditions. In traditional societies like fishermen, qualities of air they breathe, water they fetch and foods they consume play a vital role in up keeping the status of health. The quality of air depends on biomass (flora and fauna) and the development and industrial activities in vicinity of human habitations. The hygienic conditions in rural villages are far from satisfactory due to improper drainage, unclean streets (streets look as dumping yards), mud-holes near water points, open air defecation and such allied. In addition to these the economy related fish processing and drying within the village/habitation is also contributing to the unhygienic conditions. Poor or absence of such civic amenities are converting the human habitations as stinking, thereby causing air pollution. The groundwater resource used in different ways (open well, bore-well, storage tanks) is not properly treated and often polluted. A cursory look at food habits and the physical stature of fishermen indicate that they are healthy, in spite of unhygienic habitations, as they consume protein enriched balanced food. The government of Andhra Pradesh in its healthcare programmes had extended three-tier healthcare delivery system (village, panchayat and Mandal level) to up keep the health status of the people.

There is no special healthcare programme specially designed for fishing communities, but they are treated on par with the rest of the populations. Though allopath medicine is commonly used among fishing populations, traditional ethno-medicine is also occasionally practiced on the directions of the elders and '*Dasudu*', the traditional community doctor. In order to assess the healthcare delivery services available among fishing communities, the data pertaining to such is collected and the same has been presented in table.

Distribution of Healthcare Services available in Maritime Habitations

S. No	Habitation Category	Healthcare Services				Total	Per cent
		Angan-wadi	ANM	Sub-Centre	PHC		
1	BG North (36)	39	36	2	4	81	33.9
2	BG South (32)	33	34	1	1	69	28.8

3	Inter Valley (17)*	21	16	4	0	41	17.3
4	NGV South (21)	26	21	1	0	48	20.0
	Total (106)	**119**	**107**	**8**	**5**	**239**	
	Per cent (100)	**49.8**	**44.7**	**3.3**	**2.2**		**100**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area- Mofusbandar falls in this category

It is clear from the table, that four types of healthcare delivery systems, Anganawadi (a trained health worker to look after the pregnant and lactating mothers at village level), Auxiliary Nurse Midwife (ANM) who attends to deliveries and maintains birth-death records at village level, Sub-Centres- qualified medical staff at Panchayat level, Primary Health Centres (PHC) - trained medical and paramedical staff at mandal level) are noticed in fishermen villages of Srikakulam district. Anganwadis (119 in 106) are outnumbering actual 'units'/villages indicate their presence in every village and more than one in a few habitations, which depends on size of population. Distribution of ANMs shows balanced number against villages, with an exception to inter-valley category, where district headquarter facilities balance the shortage. Variation of both sub-centres and PHCs among four categories is due to facilities available in nearby townships such Srikakulam, Narasannapeta, Tekkali, Palasa etc.

A detailed study on 'hygienic conditions and diseases' on one hand and dependency on neighbourhood facilities for healthcare delivery system on the other would through some light on the parity. It is not out of context to mention chronic renal (kidney) disease found in Uddanam, a place in Vajrapukottur mandal in Srikakulam district. The reasons for chronic incidence of kidney failure are being investigated and debated by medical people and scientists. Similarly the incidence of leprosy is more prevalent among the inhabitants of Vamasdhara River basin. These two ailments are not noticed among fishermen, in spite of their proximate habitation, to the chronic areas.

Education Services in Fishermen Villages of Srikakulam District:

Education is the prime parameter that makes the society more knowledgeable. The literacy rate is very poor among fishing populations across the globe and more so in the study area. In spite of illiteracy the fishermen are capable of sailing at open sea harvesting a variety of fish in varied climatic and weather conditions. Fishing knowledge is gained by 'trial and error' processes over the ages, and transcended from generation to generation through oral and practical experiences, is known as Indigenous Technological Knowledge (ITK). However, the governments both at central and state, under the 'universalization of primary education' programme had extended several elementary and adult education institutions in all villages including the fishermen. Further, state governments have introduced high schools

and colleges, both junior and degree, in many areas to provide upward linkages in education. Since the fishermen communities come under Backward Class-A category (a list of communities) the state government has extended free education, at a few villages residence education (hostels for boys and girls). The data related to educational institution is collected from villages and the same is tabulated in table.

Distribution of Education Services in Maritime habitations

S. No	Habitation Category	Education Services			Total	Per cent
		Elementary Schools	High Schools	Junior/Degree Colleges & Others		
1	BG North (36)	34	18	0	52	35.6
2	BG South (32)	29	13	0	42	28.8
3	Inter Valley (17)*	18	5	0	23	15.8
4	NGV South (21)	20	9	0	29	19.8
	Total (106)	101	45	0	146	
	Per cent (100)	69.18	30.82	0		100

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

The data categorically indicates that access to higher education is decimal, as indicated by the absence of colleges, either junior or degree colleges in the study area. In total 101 elementary and 45 high schools are recorded in 106 fishermen villages. Out of which elementary schools account for 69.18 per cent while the remaining 30.82 per cent is high schools. The ratio between elementary and high schools is striking a balance between elementary and high schools towards north and misbalancing towards south. It is reasonable to interpret that the district headquarters having residential education facility is the reason in not having balanced ratio between elementary and high schools. In many villages schools are being conducted in permanent buildings or in cyclone relief centres, whose conditions are either poor or in dilapidated conditions. Only a few schools are in congenial conditions with regular staff. All schools have coeducation and Telugu is the medium of instruction. In a few villages hostels are functioning.

Information sought from the school teachers and headmasters on gender divide, they are of the opinion that boys' enrolment in schools as well as dropout is high. It is observed that most of the boys are seen along the coast playing, swimming or assisting elders in repair

of nets and boats, fishing expeditions and the catch. The boys abstaining schools is not seriously felt by the elders and parents. It seems that the boys of such groups (schooling age) are acclimatizing to the sea weather conditions and learning the knowledge on fishing gear, navigation and fishing by means of participant observation and involvement. It may not be out of context to perceive that the informal nature of acquiring the trio- by means of learning 'repair-sailing-harvesting', which are integral of marine fishing coupled with gender tag, exclusively male, keeping the boys away from formal education.

It is further observed, that female children are better educated than boys (interview outcome with a few school teachers) up to elementary and high school levels, but their further continuity is not taking place for want of colleges within the villages. The fishermen are not showing interest in sending female children outside the village for education. It is interesting to note that a few girls had education above high school level (intermediate) and undergone training in some skills are employed in fishermen villages as anganwadis, teachers, etc are facing problem of not getting a suitable spouse. This is a recent phenomenon, and is due to differential education in cohort groups between male and female. The passed out girl students are, getting training and sought employment, where the boys are adopting to fishing activity. It is observed that now the boys are showing interest in getting training in marine activity related opportunities.

Marine Fishermen Educated and Employed in Srikakulam District

In the process of development, as a policy the governments have established educational institutions at different time intervals in and around the marine habitations. Though the expected results are far from satisfaction there is a perceptible change among fishermen towards education. The data pertaining to fishermen, who are educated over the years (ever since the establishment of schools) has been collected orally on snowballing method from elders, educated and employed as well, and the same has been presented in table.

Distribution of Educated and Employed among the Marine Populations

Habitation Category	Educational Qualifications										Total	Employed	% Employed to Educated
	PG	Graduates	B.Ed	Inter	10th	7th	ITI Diploma	Engineering	Medicine	Others			
BG North (36)	51	369	123	647	2091	3941	4	68	6	37	7337	458	6.24
BG South (32)	14	254	35	602	2053	2485	5	63	3	43	5557	391	7.04
Inter Valley (17)*	9	189	16	366	853	1713	1	18	1	31	3197	248	7.76

NGV South (21)	5	103	21	247	897	1912	5	5	0	31	3226	258	8.00
Total (106)	**79**	**915**	**195**	**1,862**	**5,894**	**10,051**	**15**	**154**	**10**	**142**	**19,317**	**1,355**	
Per cent (100)	**0.4**	**4.73**	**1.4**	**9.63**	**30.5**	**52.03**	**0.08**	**0.78**	**0.0**	**0.73**	**100**		**7.01**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

The data of table clearly shows so far there are 19,317 educated people among the fishermen of 106 villages of the study district. The bulk of the educated are 7th standard (52.03%) followed by 10th standard (30.51%) and Intermediate (9.63%). The remaining belong to various stages of college years leading to different qualification such as graduates (4.73%), post graduates (0.41%), engineers (0.10%) and doctors (0.12%). In additions to these there are people get trained in vocational courses like ITI (0.78%) and such allied (0.73%). Out of 19,317 educated only 1,355 accounting for 7.01% are employed so far. The low per cent of employed in spite of schooling for several years is generating some suspicion among fishermen. Several fishermen are complaining that the education is not generating employment, but the educated youth are of no use for fishing. However, some of the youth are migrating outside in search of better livelihood opportunities. As per the data, employability is better in south region, may be due to district headquarters, and descending while moving to north from 8.00% to 6.24%. Further, field observations are indicating that the education is slowly generating interest among the fishing population as indicated by more number of schools (chronological data) in maritime habitations and increasing in enrolment, and youth getting training in some skills and showing interest to leave the villages, at least seasonally, for better wages and employment outside home base, and even beyond the home state, is a promising trend. There is an increase in fishermen children admitted in private sector English medium schools established in nearby multi-caste villages further attests the attitudinal change among fishermen towards education.

Religions and Religious Structures in Fishermen Villages of Srikakulam District:

There is no society without some form of religion or the other. India is the land of many religions and religious sub-sects. Hinduism is the most dominant religion practiced in India and is characterised by polytheism. Both ‘little and great’ traditions, as identified by Robert Redfield, are in practice. The little or local traditions are practiced either independently or simultaneously with great or classical traditions and practices. Therefore, different stages of religious developments are found among Indian populations. Next to Hinduism, Islamism is the most prevailing religion followed by Christianity. In addition to these religious orders several cults are also in practice. Shrines, temples and ashrams are the centres of worship in Hinduism, while mosques and churches are the centres of worship in Islamism and Christianity respectively. Data related to such religious centres found in

fishermen villages of Srikakulam district are collected and the same has been presented in table.

Distribution of Religious Structure found in Maritime Habitations

S. No	Habitation Category	Religious Structures				Total	Per cent
		Shrines	Temples	Ashrams	Churches		
1	BG North (36)	149	48	2	11	210	32.2
2	BG South (32)	121	42	1	16	180	27.6
3	Inter Valley (17)*	96	21	0	3	120	18.5
4	NGV South (21)	123	11	2	6	142	21.7
	Total (106)	**489**	**122**	**5**	**36**	**652**	**100**
	Per cent (100)	**75.00**	**18.72**	**0.76**	**5.52**		

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area- Mofusbandar falls in this category

In altogether 652 different structures of sacred significance are found in 106 villages of the study area. They are shrines, temples, ashrams and churches. With an exception to churches all sacred structures in maritime habitation come under the Hindu religious order. It is interesting to note that though Islam is the second largest religion followed in India, no structure denoting Islam is seen in the study area. The total Hindu sacred centres accounting to 94.48 per cent and the remaining 5.52 per cent are the Churches of different denominations of Christian faith. Among the Hindu structures, shrines (75.00 per cent) numerically dominate, followed by temples (18.72 per cent) and ashrams (0.76 per cent). Among 122 temples found in the study area, the Venugopalaswamy temple at Vadapalem in Baruva mandal and Siva temple at Akkupalli, in Vajrapukotturu are of historical significance.

Shrines are simple structures (mostly single roomed with conical or dome shaped roof, with or without mandapa- a front room) enshrined to place the objects of worship on raised platform. The worshipping objects are invariably family and community deities, locally called *ammorlu* meaning “Mother Goddesses” in the form of abstract objects or anthropomorphic figurines chiselled on wood or stone, clay or cement. At most of these shrines a male deity, locally called ‘*pothuraju*’ (the tradition tells that he is the brother or he protector of *ammorlu* is installed by the side of the diety or in front of the shrine. Village or community head known as ‘*bhaktudu*’ performs all the rituals and offers sacrifices on behalf of the devotees. Elderly person of a lineage or surname is called as ‘*dasudu*’, who performs the rituals on life cycle occasions like birth, puberty, marriage, death etc. These spiritual functionaries’ advices the community to organize regular festivals and cults, besides special rituals as and when crisis like epidemics, accidents at sea and poor harvest.

Economic Assets (Boats) of Fishermen of Srikakulam District:

The fishing economy of the study area is of peasant type, operated on traditional mode. However, introduction of motorized boats brought some change among the boats, nets and tenancy of marine fishing. In traditional fishing territoriality of the sea is limited to operational range of about 15 to 20 fathoms or 3 to 5 km offshore area as complementary to low carrying capacity of boats, lack of shelter in boats, and operation by sail and muscle power. In course of time the extent of seafaring up to 10-15 km offshore for fishing is achieved by country boats fixed with 9 hp diesel engine. Later on fibre boats are introduced with onboard space and capacity for storage and chilling with capability of sailing longer distances with high speed. Introduction of trawlers, in recent years, brought phenomenal change in fish harvest, which had shown considerable impact on market as well as the life of traditional fishermen. The data related to type-wise number of boats in operation for fishing in the study area has been collected and the same has been presented in table.

Distribution of Types of Boats used for fishing in Maritime Habitations

S. No	Habitation Category	Number of Boats				Total	Per cent
		Country Boats	Motorised Boats	Fibre Boats	Trawlers		
1	BG North (36)	1101	244	59	0	1,404	27.53
2	BG South (32)	1045	241	107	0	1,393	18.74
3	Inter Valley (17)*	646	258	45	26	975	26.76
4	NGV South (21)	1088	286	58	0	1,432	26.97
	Total (106)	**3,880**	**1,029**	**269**	**26**	**5,204**	
	Per cent (100)	**74.57**	**19.77**	**5.17**	**0.49**		**100**

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

A total of 5,204 boats are in operation along the coast of Srikakulam district. Out of which 74.57 per cent (2,437) are country boats, followed by motorised boats (country boats fixed with diesel engine) which account for 19.77 per cent. It is clear from the data that a large majority of boats (74.57+ 19.77 = 94.34%) in use are traditional in spite of introduction of high powered motorised boats. Trawlers have not yet in operation in the district, may be for want of harbour. The data clearly shows that the fishermen of the study area are peasant fishers. Adoption of fibre boats gained momentum in recent years, and the fishermen are of the opinion that they are more durable, can sail longer distances, but the investment is high. All four categories are showing their presences, but they are more between Bendigedd and Kalingapatnam. The ports at Bhavanapadu and Kalingapatnam are used for fish landing and anchoring the fibre boats.

The fishing capacity and manoeuvrability of mechanized vessels had been a threat to the peasant fishing, if they are operated by non fishermen investors. A paradigm shift in fishing operations is noticed, where the youth of present fishermen are showing interest to convert their boats to fibre category, or showing interest to become entrepreneurs in maritime activities. The peasant fishermen have realised the importance of upgrading and mechanizing boats to operate in a wider fishing grounds.

Infrastructure Facilities of Marine Fishing Economy in Srikakulam District:

Fishing economy to thrive on certain types of infrastructural facilities are necessary. Separate yards for boat building, coastal strip for anchoring and fish-landings, fish-drying yards or platform are important for marine fishing, as the catch is at large scale unlike fresh water fishing. Such infrastructural facilities need to be located invariably onshore along the coastal landscape. The open, surf-beaten beaches do not provide sufficient shelter and security to crafts. The rainy seasons in two spells, south-western and north-eastern monsoons, and cyclonic rains and gales are continuous hazards to traditional crafts and nets. Fish landing place is the dividing line between (sea and land) where the men harvest the fish at sea and bring them on to the coast while women buy the catch onshore for inland vending. Thereby, the landing place is crucial in both 'men-sea-harvest' and 'women-land-trade' nexus in traditional fishing economy. The other important facilities are storage yards to keep nets, and platforms to dry fish. About 9 varieties of nets are in use as a specific type of net is used for a category of fish. The large ones weigh about 100 kg, the medium range to about 50 ± 20 kg. In volume, the bulk one is about one cubic meter, while the medium about 0.5 ± 0.2 cubic meters. These nets are invariably kept on the beach, as there is no enough space in the house (they are already densely peopled) and heavy to carry longer distances on sandy terrain, for which the fishermen need a secured yard for keeping nets right on the beach. Nets kept on the beach are secured by conventional understandings regulated by the community functionaries and elders. Boat building is a specialized artisan activity mastered by a few households belongs to fishing communities of the study area. However, Vadabalija community people claim to be the masters of boat building and navigation on open sea. Traditional boat building and fishing are complementary to each other in sustaining peasant fishing economy. The data related to such infrastructure facilities at village level are collected and presented in table.

Distribution of Infrastructure Facilities for Fishing Economy in Maritime Habitations

S. No	Habitation Category	Type of Facility available				Total
		Boat Building Yard	Fish Landing Place	Net Yard	Fish Drying Platform	
1	BG North (36)	10	13	10	14	47
2	BG South (32)	6	11	9	9	35
3	Inter Valley (17)*	10	17	13	13	53

4	NGV South (21)	10	23	16	17	66
	Total (106)	36	64	48	53	201
	Per cent (100)	17.91	31.85	23.88	26.36	100

BG= Bendigedda (Mahendratanaya), NGV=Nagavali River, *Specific Study Area-Mofusbandar falls in this category

(Figures in the parenthesis indicate per cent to the item total)

Traditional as well as value added versions of boat building are noticed in the study area. In addition to age old catamaran (katla theppalu), country boats (plank-stitched boats) and fibre boats are also being built by the local fishermen. Many plank-stitched boats are provided with a hull to fix 9 hp (horse power) propulsion engines to have some control over time and space. Fibre boat manufacturing or modifying the country boats with fibre sheets has gained momentum due to their light weight and durability. It is surprising to note that a few of the fishermen had ventured to build heavy boats with high power engines to the tune of 100 hp. All these boat building techniques are being done in informal and conventional domain of artisan activity go a long way in understanding the capability and ingenuity of traditional fishermen.

In total at 36 localities boat building activity is taking place. Out of these at 5 places fibre boat units are fabricating on conventional mode. Either full form of fibre boats or partial conversion of country boat is being done in these places. None of the fabricated boats had any brand at all.

In some of the fishermen villages net keeping yards are built with permanent structure with a store room and a platform by the fisheries departments. They are located very contiguous to the sea. Fishermen keep nets either in room or platform. This structure is being used as resting place of the fishermen before or after sailor, for meetings as when government persons come. Such are 48 (23.88%) in number. These buildings are very useful to the fishing activity, and they are being properly used.

Fish landing places (FLP) account only for 31.85 per cent (64 of 106 villages) in the study area. It is clear from the table the remaining 42 villages have to depend on the neighbourhood FLPs. This situation is due to non availability of congenial beach for landing (no jetty or harbour) and corresponding trading junction (market and transport facilities). Due to these limitations the fishermen are incurring more expenses in sailing to FLPs. The proportional ratio of fishing villages to FLPs is about 1:2. Thereby, it is necessity to develop FLPs and secured anchoring place by constructing small range jetties along the coast of Srikakulam district to promote traditional fishing.

The surplus, unsold and spoiled fish is dried either on beach sands or at front yard of the house in a settlement. The bulk is dried at beach while small quantities at home base. In

order to extend a facility to dry fish in a hygienic manner raised rectangular concrete platforms (measuring about 40x20x5 feet) are built on the beach sands at the outskirts of the settlements. They are seen only in 53 villages. Though they are built with a motto of extending a facility to dry fish, they are not being used due to a technical flaw. The mucous surface of the fish contact with the smooth cemented surface is not good for drying as skin attaches to cement surface (fisher women voice). Thereby it is desirable to 53 more platforms with coarse grained sandy surface to extend functional and hygienic conditions for drying fish, an important asset in promotion of traditional fishing. It is interesting to note that the fisher women are spreading sand on the platform before keeping the fish to dry, an ingenuity of the people in a given situation, where fish will not establish contact with the cemented surface, otherwise skin will be peeled off leading to loss.

Conclusion:

The fishermen communities of Srikakulam are living in villages in rural and coastal envorons. Since the district has the longest coastline in Andhra Pradesh to an extent to 182 kilometrs interspersed with Rivers like Mahendratanaya (Bendigedd), the Vamsadhar and the Ngavali, the present study divided the coatline into four groups. The division is based on natural landscapes and at the same time purposive to compare 106 fishermen villages into four groups. They are villages located north of Bendigedda (36 villages), south of Bendigedda (32 villages), inter-valley (17 villages) and south of Nagavali (21 villages). In order to assess relative position of fishermen villages in terms of geographical position, infrastructure facilities and development activities at villagelevel the study had takenup. The variation in relation to demographic profile, housing pattern, water resource, health and education services, infrastructure facilities like roads and buildings, religious structures are ascertained on comparative methodology of all four groups of villages. The economic assets like boats, nets, and specific infrastructure facilities for fishing are also assessed. Most of the villages (57.6%) are located at less than a kilometre from the sea or tidl margin and about 93.4% villages are at less than 10 meter contour line, which are subject to most vulnerability to sea vagaries. Moreover, these villages are located at the mouths of several hill streams. About 1.41 lakh fishermen people are living along the coastal landscape of Srikakulam District, out of which only 16.88 per cent are children, which need to be addressed. The house unit number (35,132) is less than the total number of households (57,635) indicating sharing of roof by more than two households is an adaptation of habitation congestion. Freshwater table at coastal landscape is being used in different ways as open wells (325), tube wells (472) and storage overhead tanks (60). These water points are acting as socialization centres in rural villages. Most of the villages are connected by road networks and supplied with electric power, but lacking in public utility centres like community centres (44/106), calamity rescue centres (21/106), market places (66/106) etc. Variation among four regions is marginal in several aspects. The health care delivery systems are relatively better as indicated by Anganwadis (119/106) and ANMs (107/106). In education sector only elementary and high school facilities are available in fishermen villages, not even a single college, which provides Intermediate education (10+) is located. Though a considerable number of fishermen people are educated (19,317) only about seven percent of them (1355) are

employed. Basically the fishermen are Hindus and practice little traditions but now sowing preference for great traditions and Christianity as evidenced by temples (122) and churches (36) respectively. As many as 489 mother goddess shrines are located in 106 fishermen villages.

Four types of navigation boats/vessels are seen the study area (5,204), out of which 74.57 per cent are traditional boats, the others are motorised country boats (19.77%), fibre boats (5.17%), and trawlers (0.496%) only in the intervalley sample. In the study area there are 36 traditional and 5 modern boat building yards supplying the boat requirements to the local fishers. The area has 64 fish landings, 48 net yards or shore sheds and 53 fish dry platforms.

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