

A Comparative Study of Maritime Habitations: Exploring the Socioeconomic Landscape of Fishing Communities in Visakhapatnam

Dr. K. Srinivasu

Post-Doctoral Fellow-ICSSR, Department of Anthropology, Andhra University, Visakhapatnam,
Andhra Pradesh, India, anthrosrinu.kodi@gmail.com

Abstract - The study explores the Visakhapatnam region's fishing villages' infrastructure connectivity. It looks at how social order is shaped by traditional governing structures, how easily and well healthcare is offered and how fishing infrastructure and boats support the local economy. It draws attention to issues including poor hygienic conditions, restricted access to healthcare, and changing fishing methods. In order to support livelihoods and well-being in a changing socioeconomic landscape, the research reveals the coexistence of traditional institutions alongside modern governance systems, highlighting the significance of sustainable development initiatives, improved healthcare facilities, and upgraded fishing infrastructure.

Keywords: *Fishing communities, Boats, economic assets, livelihoods, sustainable development, and infrastructure connectivity.*

I. INTRODUCTION

About 5 km swath of the Visakhapatnam (155 km coastline) and Vizianagaram (25km coastline) coast (180km) has been the habitat of fishermen communities. They are Vadabaliya, Jalari and Palle communities. Among these Vadabaliya is the numerically dominant community followed by Jalari, the Palle are a few. People of these communities live in villages, which are located very contiguous to the coast. Those who live in the urban agglomerations are also segregated into wards proximate to the coast. In all 79 villages and 8 urban wards/habitations are noticed in the study area. Secondary sources like Surveys of India Topo-sheets, Land Sat imagery, Google earth maps are used to ascertain habitations of fishers, and they thoroughly verified by ground truth check. All 85 villages /habitations are further divided into three groups based on location in consonance with the geophysical resources and urban agglomeration. They are 1. Villages located towards north of Visakhapatnam City (Rural North-RN), 2. Fishermen habitations in Visakhapatnam City (Urban) and 3. Villages located south of Visakhapatnam City (Rural South-RS). Visakhapatnam city has 8 fishermen habitations distributed along 5 km coast between Port and Kailasa Hill range. The urban agglomeration between Port and Steel Plant do not have any fishermen habitations. The rural north (RN) is about 50 km coastline with 42 villages including Bhimunipatnam, while the rural South (RS) is about 80 km coastline with 35 villages. This division is purposive in nature as the city divides the traditional fishermen habitat by about 50km urban space in between along the coast, and moreover acts as hub between north

and south. Total analysis is based on this trio division to assess the habitation, housing, infrastructure, religious and development patterns of the study area.

II. REVIEW OF LITERATURE

The study of fishing communities, whether on the mainland or on islands, has always been a fascinating topic for social scientists. These groups have a unique way of obtaining nutritional energy from the water and have managed to balance their lifestyles between the land and the sea. Island-based studies, in particular, have garnered a lot of attention because their cultures tend to be more isolated and pure, and because they showcase some really cool adaptive strategies when it comes to using land and water resources together.

A quick look at the literature reveals that famous anthropologists like Malinowski (1931), Hocart (1937), and Radcliffe-Brown (1948) have all written about 'primitive' fishing practices in island communities, but their focus was mainly on the technical aspects of these techniques. Other scholars like Coke (1908), Osgood (1940), and Lebar (1964) delved deeper into the fishing industry and archaeology to show just how old these fishing economies really are. Firth (1946) broke new ground by looking at the sociology of fishing and the role of fishermen in the regional peasant economy.

In his book "Anthropology of Fishing," Acheson (1981) provides a really comprehensive review of global fishing practices and economies. He covers a lot of different aspects of fishers' lives and work, like crew organization, egalitarian principles, kinship ties, fishing rights access,

market dynamics, cooperatives, and more. He also talks about miscellaneous institutions, fishing clusters, information management, rituals, magical practices, competition dynamics, political processes, individual strategies, skills, capital management, innovations, technical advancements, commitment to fishing, psychological attributes of fishers, women's roles, family life, and intra-cultural diversity.

Shepard Forman (1967) wrote about the intricate systems of named fishing grounds, sea landmarks, and how this knowledge is passed down from one generation to the next. This shows how the economic fabric of villages is maintained and expanded at a steady pace. By carefully arranging their rafts in designated areas, fishermen in these villages can keep their daily productivity high and contribute to the overall production for their village.

Kenne Chang's (1971) study on "Industrial Changes and Development of the Fishing Industry in a Japanese Island Community" looks at how modernization has changed local fishing practices and economies. It shows how fishing cooperatives have been able to adapt to these changes, while traditional household-based fishing operations have faced more challenges. Overall, the study highlights the importance of institutional transformations in helping communities navigate economic shifts.

These sustainable practices sustain their local knowledge, which has been transmitted from generation to generation over the decades (Rama Mohan 2016; Dalibandhu & amp; Rama Mohan, 2021; Dalibandhu & amp; Sharma, 2020a; Srinivasu 2021a; Srinivasu 2021b, Raju et al 2022). Another study by Dalibandhu and Rama Mohan (2022) noted significant changes in marine fishing practices after introducing boat fishing. These changes were not only limited to livelihood practices but also brought changes in the socio-economic conditions of the Jalari fishing caste. Vijaya Prakash (2022) explored the role of religious institutions and their engagement in the fishing castes, which is significant in understanding lifecycles and fishing economy among the Vadabaliya and Jalari fishing castes. Similarly, the article by Dalibandhu and Sharma (2020b) also noted how divinatory functionaries and healing dynamics influence the decision-making of fishing expeditions and exploring fishing economic possibilities. The fishing communities also have strong belief systems regarding the prosperity of the community and social and economic well-being, which influences their occupational health (Dalibandhu and Sharma 2018; Vijaya Prakash 2022).

Objectives:

- Evaluate the settlement patterns and socio-cultural characteristics of fishermen residing in the study area.

- Investigate the land-sea activities of fishing communities in the study region.
- Examine the rural-urban dynamics of fishing practices.
- Assess the impact of traditional and modern fishing methods on fishing communities.

III. METHODOLOGY

- Conducted a survey to locate habitations of fishermen communities using revenue records, Survey of India Topo sheets, and satellite images.
- Collected secondary sources of information on population statistics from census reports, revenue records, and Marine Fisheries state and Central Departments.
- Conducted a two-tier survey, gathering information at both the fishing village level and fishing activity level.
- Designed a village-level schedule and collected information on fishermen habitations, as well as natural and cultural resources.
- Followed purposive and representative sampling procedures in the selection of field areas, communities, villages, households, and respondents.
- Collected information on boat building, net maintenance, fish landing, auctions, and marketing through face-to-face interviews at activity centres.
- Classified and analysed collected data using statistical programs.
- Followed emic and etic patterns in data collection and thesis development.
- Presented data and explanations using semantic and scientific formats.
- Used photography and videography, with cross-checking during thesis preparation.
- All villages/habitation in the study area are covered to elicit information on location database, while two habitations, one urban and the other rural are selected to collect individual information.

1. Location of Villages/Habitation (Distance from the seacoast)

The coast of Visakhapatnam region is interspersed by the ephemeral river mouths and backwater streamlets and in between these several sand ridges, sand dunes including red sands present a vivid topographic features. Such landscape is the habitat of fishing populations spread over 79 villages and 8 urban habitations. On socio-cultural parameters they are grouped into 3 castes, viz. Vadabaliya, Jalari and Palle, the Vadabaliya are numerically dominant while Jalari are traditional and moderately distributed. The Palle are very few and gave up fishing. These fishermen villages and habitations are vulnerable to the maritime vagaries due to their location in relation to the tidal margin and mean sea level (MSL). The study on geophysical aspects of location of fishermen villages and habitations indicate that they are

located on headlands (elevated hillocks), at the mouth of the rivers (Champavati, Gosthani, Gambheeram and Sarada), several 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. The data are presented in the table 1.

Table- 1: Distribution of Villages and Habitation location (in relation to sea coast)

S.No	Habitation Category	Distance from the sea in Kilometers					Total	Percent
		>0.5km	0.5-1km	1-1.5km	1.5-2km	2-2.5Km		
1	VSKP- Urban (8)	8	0	0	0	0	8	9.41
2	VSKP-Rural North(42)	14	10	8	7	3	42	49.41
3	VSKP-Rural South(35)	10	9	6	7	3	35	41.18
	Total (85)	32	19	14	14	6	85	
	Per cent (100)	37.65	22.35	16.47	16.47	7.06		100.00

Source: Field Work

The data of the table-1 indicates that about 38 percent of fishermen habitations are very close to the sea with less than 500-meter distance, followed by 22.35 per cent between 500 (half a kilometer) and 1000 meter (one kilometer) distance. These two categories account for 60 per cent, which are most vulnerable to climate change due to global warming. The remaining 40 percent are distributed equally at 16.47 per cent between 1.0-1.5 km and 1.5-2.0 km, and only 6 (3 villages each in north and south) are between 2 and 2.5 km. These six villages are at headlands of the coast.

2. Demographic Profile /Population

The fishermen villages/habitations of Visakhapatnam region are exclusively inhabited by fishermen only with an exception to very few other communities. They are Kshatriya (land owning community), Vysya (trading community) come under upper castes of Hindu hierarchical system, and settibalija (toddy tapping), Yadava (shepherds)

and a few little known communities, which come under Sudra category of Hindu varna system. The hinterland of the fishermen villages and the coastal land is mostly owned by the Kshatriyas, while the Vysyas have petty shops in the fishermen habitations. Settibalija 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. Out of 85 habitations exclusive Vadabalija villages are 72, out of which 38 in rural north (RN), 30 in rural South (RS) while the remaining 4 in urban area. Exclusive Jalaris are seen only in 2 villages in north and 2 habitations in city. However, they are also seen along with Vdabalija. Palle do not have exclusive villages or habitations, but they are seen along with Vadabalija in 2 villages each in rural north and south, and with both Vdabalija and Jalari in one village in rural south and one urban habitation.

Table- 2: Distribution of Population in Maritime Habitations

S.No	Habitation Category	Fishermen Population			Other Communities (Total)	Total	Per cent
		Male	Female	Children			
1	VSKP- Urban(8)	2,726	2,710	4,431	*0	9,867	9.19
2	VSKP-Rural N(42)	9,734	9,657	15,417	466	35,274	32.87
3	VSKP-Rural S(35)	13,968	14,099	28,533	**5,576	62,176	57.94
	Total (85)	26,428	26,466	48,381	6,042	1,07,317	
	Per cent (100)	24.63	24.66	45.08	5.63		100.00

Source: Part of the data is from State Fisheries Development Corporation, Visakhapatnam

* Plurality of other communities stay temporarily as petty traders-Not included

** Three multi cast villages have fishermen habitation/colonies adjacent to sea coast

The data related to the adult males and females, and children below 14 years age group are collected with a view to assessing the possible fishing human resource. In addition to fishers, the other communities living in fishermen villages is also sought to have a holistic

assessment of population inhabiting the maritime habitat of Visakhapatnam region, as there has been a terrorist threat from thesea.

The data of the table-2 indicates that out of about 1.07 lakh population only 5.63 per cent are other than the fishing community. At present, about 51 thousand families are found along the Visakhapatnam coast, out of which only about 25,000 people are actively involved in fishing (Source: State Fisheries Development Corporation,

Visakhapatnam). The data further shows that about 48,381 people below the age group of 14 years are categorized as children. This category is subjected to development and welfare processes through extending health and Medicare, education and training. Other than this category most of the people are illiterates, eking their livelihoods either from traditional fishing, or some wage work available in the local labour market. A few households have taken up menial occupations like mechanics, drivers, tailors, painters, etc within their village primacies. In this given situation, continuity of fishing on traditional means may not be possible, but the children category is the hope. It is likely chance that this group would take up mechanized fishing with all development and welfare inputs.

3. Housing and Households:

The fishermen people of the study area, whether living in villages or urban habitations live 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 in huts, beveled in tiled and flat in concrete house categories. Conical shaped thatched huts are typical with very low entrances are an indigenous adaptation to high-velocity winds, which often hit the east coast of India. To enter into the traditional house one has to bend as the height is about three feet only. The traditional houses are slowly converted into the present housing patterns with the support of government housing schemes. During the initial years of the development process (the 1980s and 90s), some of the thatched roofs are replaced by the tiles, while in 1990s and thereafter houses are showing some change. The change is also progressive, initially partly permanent with fireproof materials like bricks, tiles and asbestos sheets, and subsequently permanent structures with cement and steel. Two types of cyclone relief centers, 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 the settlements as examples of negligence. Data related to living houses is visually counted in the field and cross checked with Google-earth digital image data, and the same has been presented in table-3.

Table- 3: Distribution of house types and households in Maritime Habitations

S. No	Habitation Category	Type of House			Total	No of Households	Family Density
		Huts	Tiled	Slab			
1	VSKP- Urban(8)	9	145	1,077	1,231	2,677	2.17
2	VSKP-Rural N(42)	1,304	499	1,612	3,415	8,764	2.57
3	VSKP-Rural S(35)	2,399	1,773	1,751	5,923	14,084	2.38
	Total (85)	3,712	2,417	4,440	10,569	25,525	2.42
	Per cent (100)	35.12	22.87	42.01	100.00		

Source: Field Work (Figures in the parenthesis indicate percent)

In all 85 villages/habitations put together 10,569 ‘units’ of dwellings recorded are shared by 25,525 households, out of about 1.07 lakh fishing population. A unit means a living room (round in share encompassed by a 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 an acute shortage of housing. Most of the houses/dwelling units are shared by at least two families, the average being 2.42 households or families. It is interesting to note that the house is shared by the parents and their married sons and further observed that house 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.

Number of families sharing ‘unit’ of the house in urban habitations is due to two or three storied buildings. Some pockets of habitations had government sponsored colonies (rows of houses) in the city. People uprooted from traditional villages are rehabilitated in planned colony with double storied buildings, specifically designed for resettlement. Since there has been a gap of about 20 years between uprooting and resettlement, shortage of housing had risen, due to increase in family members. The allotted units are shared by the incumbent and their married children. The density of families in a house and congestion of houses is due to non-availability of space for expansion. The villages/habitations are limited by encroaching sea on the east and private landholdings on the west, and acquisition of coastal land for development activities like SEZs, Ports, Petrochemical and Pharmaceutical corridors on either side. 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, almost all the houses do not have toilet facility and septic tank. Outskirts of the village, streets, paths and beach are used for defecation and urination. Fishing settlements by occupation stink and the absence of toilets make them unpleasant. They are in a most unhygienic state in terms of premises, drainage, and civic amenities.

4. Infrastructure Facilities and Other Amenities

Table- 4: Habitation Category-Wise Distribution of Infrastructure Facilities and Civic Amenities

S. No	Habitation Category	Infrastructure Facilities										
		Approach Road	Public/Private Transport	Communicate	Electricity (%)	Traditional(Ratchabanda)	Community Centre	Calamity Relief Centre	Government Office	Lighthouse* Same	Market	Bus Shelters
1	VSKP- Urban(8)	8	8	8	98-100	1	6	4	2	2*	8	5
2	VSKP-Rural N (42)	42	42	42	80-100	27	17	19	13	2*	11	6
3	VSKP-Rural S (35)	35	35	35	85-100	11	14	20	9	2	16	3
	Total (85)	85	85	85	88-100	39	37	43	24	6	35	14
	Per cent (100)					45.89	43.53	50.59	28.24	7.06	41.18	16.47

Source: Field Work

The data indicates that all fishermen villages/habitations are connected on ground by blacktopped roads (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, provided by Andhra Pradesh State Road Transport Corporation (APSRTC) under its “pallevelugu” (village glow) programme on certain timings while auto services (three wheelers) under private operators round the clock. Andhra Pradesh State Electricity Board (APSEB) has brought all the villages /habitations under its power connectivity and supply, but about 5 to 10 per cent of the houses are yet to be connected. Though the democratic institutions are regulating and controlling the law and order issues through Police Stations in Panchayats, the fishermen village had traditional self-ruling institutions, and they are operated by caste functionaries. Various traditional issues such as social and economic issues and activities are attended 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 centers of the village is a standing testimony, where most of the disputes are solved by inherent traditional village functionaries, besides acting as culture conservators and heritage promoters. It is clear from the data that only 22 of such structures are at present in vogue. It seems that such open air structures are replaced

by the closed community centers (32) in the form of buildings. 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 40 ‘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 24 out of 85 villages/habitations government offices are seen and they are mostly the nodal points for government functionaries. The market facility in 35 villages and bus shelter facility in 14 villages/habitations are noticed, and these perhaps depended mostly on the size of the village and its population. Lighthouses located at different spatial intervals such as Visakhapatnam and Bhimuniapatnam in the north and Pudimadaka and Pentakota in the south are catering to the navigation requirements of the entire region.

5. Healthcare Services

The status of health has been considered as one of the important parameter to calculate human development. Health of a population depends on the local climate, weather and environment conditions there by utilizing these resources is important. The qualities of air they breathe, water they fetch, and foods they consume play a vital role in up keeping up the status of health. The quality of air depends on biomass (flora and fauna) and the industrial development in the vicinity of human habitations. With an

exception to urban habitations (8 urban wards) all 77 ‘units’ of habitation- villages under rural category are away from industrial pollution. But 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 (no toilets) 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 holes, thereby causing air pollution. The groundwater resource used in different ways (open well, bore- well, storage tanks) is not properly treated and often polluted (informants opinion). A cursory look at food

habits of fishermen indicate more or less balanced with a few deficiencies of iron and vitamins. The government of Andhra Pradesh in its healthcare programmes had extended three-tier healthcare delivery system (village, panchayat and Mandal level) to keep up 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 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* (Jalari shaman). 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-5.

Table- 5: Distribution of Healthcare Services available in Maritime Habitations

S.No	Habitation Category	Healthcare Services				Total	Percent
		Anganwadi	ANM	Sub-Centre	PHC		
1	VSKP- Urban(8)	9	3	4	2	18	10.53
2	VSKP-RuralN (42)	43	33	10	8	94	54.97
3	VSKP-Rural S(35)	39	7	9	4	59	34.50
	Total (85)	91	43	23	14	171	
	Per cent (100)	53.22	25.15	13.45	8.19		100.00

Source: Field Work

It is clear from the table, that four types of healthcare systems, Anganwadi (a trained health worker to look after the pregnant and lactating mothers at village level), Auxiliary Nurse Midwife (ANM) who attends for deliveries and maintain birth-death records at village level, Sub-Centers- qualified medical staff at Panchayat level, Primary Health Centers (PHC) - trained medical and paramedical staff at mandal level are noticed in the maritime habitations. Anganwadis (91 in 85) are outnumbered actual ‘units’ indicate their presence in every habitation and more than one in a few habitations, which depends on the size of the population. Distribution of ANMs shows remarkable variation among three categories of units under study, which needs special attention. However, it may be reasonable to deduct that the ANMs of neighboring clusters of urban agglomeration may be catering, while in rural north smaller villages are depending on ANMs of large villages. The meager number of ANMs in rural south seems to be dependency of fishing villages on neighboring multi-caste villages for ANM services. The marginal variation of both sub-centers and PHCs in rural north and rural south seem to be dependency of fishing villages on the neighboring multi-caste villages. The distribution of healthcare delivery systems data indicates a clear distinction between the rural south and north. A detailed study on ‘hygienic conditions and diseases’ on one hand

and dependency on neighborhood facilities for healthcare delivery system on the other would through some light on the parity. The urban and suburban nature of Visakhapatnam and Bhimuniapatnam respectively has some impact on more facilities of health care delivery system.

6. Economic Assets (Boats for Navigation)

Until the introduction of motorized boats the fishing in the study area was on traditional mode depended on country boats and indigenous knowledge coupled with wit and manpower. The territoriality of sea in traditional fishing is limited by operational range (about 15 to 20 fathoms or 3 to 5 km offshore area), low carrying capacity of boats, lack of shelter in boats, and operation by sail and muscle. 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 fiber boats are introduces with a wider space and capacity (storage and chilling), capable of sail longer distances with high speed are introduced. 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-6.

Table- 6: Distribution of Types of Boats used for fishing in Maritime Habitations

S. No	Habitation Category	Number of Boats				Total	Per cent
		Country Boats	Motorized Boats	Fiber Boats	Trawlers		
1	VSKP- Urban (8)	454	432	65	172	1,123	22.34
2	VSKP-Rural N (42)	810	479	90	203	1,582	31.46
3	VSKP-Rural S (35)	1173	809	341	0	2,323	46.20
	Total (85)	2,437	1,720	496	375	5,028	
	Per cent (100)	48.47	34.21	9.86	7.46		100.00

Source: Field Work

A total of 5,028 boats are in operation along Visakhapatnam coast. Out of which 48.47 per cent (2,437) are country boats, followed by motorized boats (country boats fixed with diesel engine) which account for 34.21 percent. It is clear from the data that a large majority of boats (48.47 + 34.21 = 82.68%) in use are traditional in spite of introduction of high powered trawlers. The data clearly shows that the fishermen of the study area are peasant fishers. Fibre boats (9.86%) and trawlers (7.46%) accounting for 17.32% are mostly operated from Visakhapatnam fishing harbour and Bhimunipatnam jetty. The data further indicates that the adoption of hi-tech boats is taking place in sub-urban and rural-north villages, which are contiguous to the urban centers. Use of more number of country boats in rural south may be due to absence and distance of harbours and jetties. The fishing capacity and maneuverability of mechanized vessels had been a threat to the peasant fishing, at the same time has harvesting advantage. A paradigm shift in fishing operations is noticed, where the present fishermen youth are showing interest to work on fishing vessels or want to become entrepreneurs in maritime activities. The peasant fishermen have realized the importance of upgrading and mechanizing boats to operate in wider fishing grounds.

7. Infrastructure Facilities for Fishing Economy

Fishing economy to thrive on certain types of infrastructural facilities is necessary. Separate yards for boat building, coastal strip for anchoring and fish landings, fish-drying yards or platforms, cold storage are necessary 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 northeastern 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 yards to keep nets and platforms to dry fish, the former again in the domain of male activity while the later in female activity. About 9 varieties of nets are in use as a variety of net is used for a specific 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. 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-7.

7: Distribution of Infrastructure Facilities for Fishing Economy in Maritime Habitations

S. No	Habitation Category	Type of Facility Available				
		Boat Building Yard	Boat Building Yard (Fiber)	Fish Landing Place	Net Yard	Fish Drying Platform
1	VSKP- Urban (8)	1 (8.33)	2 (40)	5 (12.5)	2 (4.25)	1 (2.04)
2	VSKP- Rural N (42)	2 (16.67)	2 (40)	17 (42.5)	27(57.45)	22 (44.90)
3	VSKP- Rural S (35)	9 (75.00)	1 (20)	18 (45.0)	18(38.30)	26 (53.06)
	Total (85)	12	5	40 (47.06)	47 (55.29)	49(57.65)

Source: Field Work

(Figures in the parenthesis indicate percent 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 teppalu) and country boats (plank- stitched boats), fibre boats and trawlers are also being built by the local fishermen. Many plank-stitched boats are provided with a hull to fix nine hp (horse power) propulsion engines to have some control over time and space. Fiber boat

manufacturing or modifying the country boats with fiber sheets has gained momentum due to their light weight and durability. It is surprising to note that a few of the fishermen had ventured even to build heavy boats or trawlers with high power engines to the tune of 100 hp. All these boat building technological stages in the informal and conventional domain of artisan activity go a long way in understanding the capability and ingenuity of traditional fishermen.

In total at 11 localities boat building activity is taking place. One each of boat building units seen in urban habitations (Visakhapatnam) and rural north (Bhimunipatnam) are fabricating large boats, while the remaining one in the rural North is also at Bhimunipatnam and all 9 in rural south are distributed in different villages of considerable size. A fibre boat building unit in Pukkallapalem, located between Visakhapatnam and Bhimunipatnam is fabricating fibre boats. The other four fibre boat units are local type attending to partial conversion of traditional boats into fibre boats. They fabricate low-grade boats (catamarans, country, and fiber). None of the fabricated boats had any brand at all.

In some of the fishermen villages/habitations, 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 or for meetings as when government persons come. Such are 47 (55.29%) in number one each in 47 villages/habitations. These buildings are useful to the fishing activity, to thrive on.

Fish landing places (FLP) account only for 47.06 per cent (40 out of 85 villages /habitations) in the study area. It is clear from the table that 53 per cent of the fishermen villages/habitations have to depend on the neighborhood 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 in the rural South, 1:3 in urban, and 1:4 in the rural north, clearly indicates that there is a necessity to develop FLPs and secured anchoring place by constructing small range jetties along Visakhapatnam coast 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 49 villages/habitations. 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). There by it is desirable to build 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.

IV. CONCLUSION

The fishermen communities of the Visakhapatnam region are living in villages in rural areas and in urban pockets of Visakhapatnam city. The growth of Visakhapatnam urban agglomeration had divided the rural coastal landscape into north and south by about 50 km urban habitation. Eight urban pockets/habitations along the coast of Visakhapatnam city are inhabited by Jalari and Vadabaliya fishing communities. The villages adjacent to the coast are invariably inhabited by the fishers, either as single community or both the communities. A comparative analysis of fishermen villages/habitations has been made by considering three areas of inhabitation based on location, the Urban (8), rural North (42) and rural South (35), thereby a total of 85 villages/habitations of fishermen are compared to assess their geographical position, infrastructure facilities and development activities at total fishermen habitations of the study area. The variation between the rural north and south is marginal in several parameters while with urban and rural is striking.

The demographic profile, housing pattern, water resource, health and education services, infrastructure facilities like roads and buildings, religious structures are ascertained on comparative methodology among the urban, rural north and south at village/habitation levels. The economic assets like boats, nets, and specific infrastructure facilities for fishing are also assessed. Most of the villages (37.65%) are located less than half a kilometer from the sea and about 65.88 percent of villages are at less than 10 meter contour line, which are subject to most vulnerability to sea vagaries. About 1.7 lakh fishermen people are living in the study area, out of which about 45 percent are children. The house unit number (10,069) is less than the total number of households (25,525) indicating sharing of roof by more than two households is an adaptation of habitation congestion. Sweet water ground water table at coastal landscape is being used in different ways as open wells, tube wells and storage overhead tanks. 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, calamity rescue centres, market places

etc. They are better in urban habitations. The health care delivery systems are more accessible to urban inhabitants, while in rural villages they are underserved. Similarly education facilities are better in urban pockets than the rural villages. Only elementary and high school facilities are available in fishermen habitations. Though a considerable number of fishermen people are educated (20,585) only about three percent of them (615) are employed. Basically the fishermen are Hindus and practice little traditions but now showing preference for great traditions and Christianity as evidenced by temples (13.48%) and churches (12.07%) respectively. As many as 469 mother goddess shrines are located in the fishermen villages/habitations (85).

Four types of navigation boats/vessels are seen in the study area, out of which 48.47 per cent are traditional boats, the others are motorized country boats (34.21%), fibre boats (9.86%), and trawlers (7.46%). In the study area, there are 12 traditional and five modern boat building yards supplying the boat requirements to the local fishers. The area has 40 fish landings, 47 net yards or shore sheds and 26 dry fish platforms.

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