BASELINE STUDY

FOR

TRAINING IN SEA SAFETY DEVELOPMENT PROGRAMME

IN EAST GODAVARI DISTRICT, ANDHRA PRADESH

INDIA

FOR

FOOD AND AGRICULTURE ORGANISATION
OF THE UNITED NATIONS

AND

DEPARTMENT OF FISHERIES, GOVT.OF ANDHRAPRADESH

BY

ACTION FOR FOOD PRODUCTION (AFPRO)

FIELD UNIT VI, HYDERABAD

1998

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November, 1997 – January, 1998

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EXECUTIVE SUMMARY

INTRODUCTION & BACKGROUND:

Andhra Pradesh in India assumes an unfortunate distinction of facing maximum number of devastating cyclones among the states bordering Bay of Bengal. The delta areas of Krishna and Godavari had been more prone to it. The 1977 Diviseema cyclone was the most catastrophic in the recent history.

The Cyclone of 6th November 1996 in East Godavari district was equally destructive. Total deaths and missing cases together were 2760 of which fisherfolk were 1435 apart from huge property loss.

Though the cyclone prediction system could locate the cyclone, its actual path and intensity and the areas it would strike are probably not so predictable. Adding to that the cyclone warning dissemination system had many limitations by which the villagers or the fisherfolk in fishing areas did not get the messages in advance.

FAO, Govt. of India and the Dept. of Fisheries, Andhra Pradesh Government, have proposed a pilot project to provide direct radio communication to the villages and fishermen at sea and to initiate appropriate sea safety measures and to study their effectiveness. Bhairavapalem & Balusutippa, the two worst affected villages during November, 1996 cyclone are hence proposed as pilot villages.

Action for Food Production (AFPRO) took up the baseline study for FAO in this regard. The study aims at giving the basic details of the two pilot villages as well as the general account of the villages affected by November, 1996 cyclone, analysing the Cyclone Warning Dissemination System and to make suggestions for improvement.

METHODOLOGY:

Secondary information and data were collected from concerned institutions/department offices at Hyderabad and Kakinada. At field level basic RRA techniques and survey methods were used to collect basic details about the village communication system and cyclone effects. Group discussions with villagers, general survey of village & surroundings and main fishing areas were conducted. Reconnaissance visits to nearby cyclone affected villages was also part of the study.

BHAIRAVAPALEM:

Bhairavapalem is a major fishing village closer to the Nilarava river mouth of Gautami Godavari river. Bhairavapalem has two major hamlets called Teerthalamundi and Bhairavapalem. Of the 927 households, 57% are in Bhairavapalem and 43% in Teerthalamundi. 80% of the houses are thatched, 15% tiled and 5% are concrete. Only 44% houses are electrified with 3% having radios and 11% televisions. The over all estimated population is about 8981 (as per the present study).

The basic facilities include a Govt. School with 3 teachers, one private school (more of a tuition centre). Health services are poor except for the visit of a Multipurpose Health Worker (MPHW). Few private medical practitioners also visit the village. General sanitation is very poor. Drinking water shortage is another problem. The whole village depends on a single open tank filled by Godavari water during monsoon or pumped in from an irrigation canal few Kms away. The telephone in the village has been defunct since the 1996 cyclone. Hardly any extension services are rendered. The only one cyclone shelter is in a totally dilapidated condition.

Fisherfolk at Bhairavapalem are active in sea/estuarine/river fishing. Shrimp seed collection at the river mouth beaches is another major occupation involving the whole family. Sea fishing include both gill net fishing using motorised nava (Plank built boats) (77% families) and trawl fishing using mechanised boats (22% families including workers). Mechanised boats numbering about 116 also land their catches here. They are capable of long duration fishing. Off late they go for more short duration fishing from this village. River fishing is done mainly using an anchored bag net fixed against the tide using anchors and is called Lunger veta, over the river mouth. Gill nets are also used in riverine fishing.

At least 453 families are engaged in shrimp seed collection, but the intensity of shrimp seed collection has come down after the large number of deaths in November, 1996 cyclone. About 976 navas of various sizes, of which 305 motorised, are reported in the village. The seasonality pattern of fishing shows that both marine fishing and shrimp seed collection seasons match with the cyclone prone months of October to December.

During cyclone of 6th November 1996 most of the thatched houses were damaged completely and tiled houses were damaged partially. The tidal surge in the village ranged from 2 to 2.4m as reported and people took shelter in the concrete houses. About 699 navas including 219 motorised navas were lost or severely damaged. Five mechanised boats were lost in sea while 88 mechanised boats were severely damaged. The maximum loss of life (66) during the cyclone were at the beach side, south of Nilarava river mouth, of which 38% were women, 23% boys and 24% girls who were engaged in shrimp seed collection.

No cyclone warning reached the village through any source including the village telephone. The radio bulletins were not taken seriously. But seeing the weather condition no one went for fishing starting from 6th. But those who were away from the village could not be informed. The shrimp seed collectors would have been saved from the peril if the warning reached at least by 6th morning. The relief reached after 3 days and eventually compensation were paid for loss of property and life. But long term measures are yet to be taken, seriously.

BALUSUTIPPA:

Balusutippa is located on an island on the southern branch of Gautami Godavari (Vrudha Godavari) river directly open to the river mouth. Balusutippa comprises 3 distinct groups of colonies, Kothapeta, Madyapeta and Paturu with total households of 1745. Of this 5% are concrete, 8% tiled and 87% thatched. Only 36% houses are electrified with 7.5% having radios and 2% televisions. The estimated population is 14,247 (as per the present study) with a literacy rate of 7.4%.

Balusutippa has a Govt. School with 3 teachers and 200 students on the rolls. Three more private schools cater to another 200 students. The health services are generally poor, though a Govt. Doctor visits the village often. The visit of MPHW was reported almost regular. Hygiene and health conditions are not very satisfactory. The drinking water sources in this village are 3 open tanks. The only telephone in the village had stopped working one year before and had not been repaired still. Out of the three cyclone shelters 2 are totally damaged. Extension activities are poor.

The main types of fishing include marine fishing using motorised navas & gill nets (20% families); working in mechanised boats operating from Kakinada (13% families); local river and creek fishing using various gill nets and lunger nets (11% families); migratory fishing in navas and shoe dhonies for various kinds of fishing including lunger fishing, gill net fishing, shell collection and shrimp seed collection (28% of families); shrimp seed collection in Masanitippa and Gautami (Vrudha Godavari) river mouth. This village is known for the migratory fishing where 28% of the families (whole families) move out for fishing in rivers/creeks for months together. The season of marine fishing, shrimp seed collection and migratory river fishing coincides with cyclone seasons.

During the 6th November 1996 cyclone most of the thatched houses were totally damaged and the tiled houses partially damaged. This village was also flooded up to about 1.5m. The temples and concrete houses saved the lives. 635 navas including 43 motorised navas and 190 shoe dhonies were reported lost. Most crafts except many shoe dhonies have been replaced by the fisherfolk. Total 375 deaths were reported in the village of which 80% (including men, women and children) are at shrimp seed collection sites near sea. Balusutippa too did not receive any cyclone warning. The radio bulletins or even the traditional cyclone predictions based on water & wind movements were not considered seriously. Relief works in Balusutippa started 3 days after the cyclone and regular compensation were given eventually. However, there is still a controversy on the death compensations, to be settled.

OTHER VILLAGES:

Some other villages visited were Masanitippa, Komaragiri fisherman hamlet, Jaggampeta of Guthindeevi, Gadimoga and Peddavalasala. Masanitippa is on the northeast of Balusutippa which is also a main shrimp seed collection centre and was affected very badly due to its remote location and low lying topography. Komaragiri and Jaggampeta of Guthindeevi were less affected because the whole island is protected by embankments. Gadimoga and Peddavalasala on the west of Bhairavapalem were affected badly but less than Bhairavapalem due to their interior location. None of these villages too received the warning message in time.

CYCLONE WARNING DISSEMINATION SYSTEM:

The State Government works according to well described Cyclone Contingency Plan of Action (CCPA) formulated in the eighties. It has clearly set up guidelines and processes to take place at state, district and mandal level on the cyclone contingency. It also describes the preparedness required at the village level. During November 1996, the cyclone warning dissemination mechanism was set in as usual, but the chain was too long, and many messages reached the mandal level very late due to limitation of men, equipment and infrastructure. The weakest link of the communication chain was between MRO and the villages, which is the

most vital link. Hence most vulnerable villages did not get the message in time and fishermen at sea and beach did not get the message at all.

SUGGESTIONS:

In the light of above experiences, suggestions are given to promote direct and rapid warning dissemination to fisherfolk at village and fishing areas. Multiple channels including VHF (Very High Frequency) or satellite linked communication systems are suggested to be utilised. For this preparedness at village and community levels and awareness to be promoted are described. NGOs can be involved in this process. Fishermen at sea should be informed by armed forces' helicopters or coloured signals in addition to VHF connections. Disaster preparedness and the training in sea safety development skills at village level are proposed. Life saving devices are to be made available to all volunteers who volunteer to go into the fishing areas or the villagers across rivers or sea which should include officials at Mandal level also. Increased infrastructure at mandal level and more involvement of the Dept. of Fisheries is suggested. The structures at district and state level are to support the grass root mechanism is also suggested.

CHAPTER 1

INTRODUCTION & BACKGROUND

INTRODUCTION AND BACKGROUND

1.1 HISTORY OF CYCLONES:

Cyclonic storms developing out of depressions are common phenomena in the Bay of Bengal. History shows that quite often the depressions had developed into severe cyclonic storms or hurricanes and had hit the eastern coast of India or Bangladesh causing great havoc and human misery. Among the eastern coastal states of India, Andhra Pradesh is most prone to cyclonic calamities. The cyclone that hit the Godavari river mouth area, south of Kakinada on November 6, 1996 is the latest bitter experience. Subrahmanyam (1978) had given an account of major cyclones that hit Andhra Pradesh Coast since 1679. Since then 18 major cyclones (including 1977 Diviseema cyclone) have been recorded to have hit Andhra Pradesh Coast. A brief account of these cyclones is given in Annexure 1.

Of these cyclones, the most devastating cyclone, fresh in the memory of the present generation, is that of November 19, 1977. In this cyclone there was strong tidal surge of 6m height, which affected an area of 80km x 16km; 60 villages were completely washed away and 70 were severely crippled. The human death toll was estimated to be about 10,000. Later three cyclones; one each in 1987, 1989 (both in Nellore Area) and in May, 1990 (Krishna Dist. and further north upto Visakhapatnam) were severe, but did not cause much loss of life.

The most vulnerable groups in these cyclones are the fisherfolk in the coastal villages, particularly villages along the river mouths and other low-lying areas. More than 70% of the major cyclones that had hit Andhra Pradesh Coast had affected the delta area of Krishna and Godavari. The storm surge of 2-6m is one of the prime factors of cyclones described to be the most devastating. The havoc created by the winds and floods are secondary.

Advancement in Science & Technology especially the technique related to Remote Sensing had made it possible to locate depressions as they are formed, often 48 hours in advance. The Cyclone Warning Centre at Visakhapatnam and the Area Cyclone Warning Centre at Madras have been doing commendable jobs in this regard. But still prediction of the actual path of the cyclone and the severity of it, by the time it reaches coast, is quite often unpredictable. There had been many incidents of cyclones playing hide and seek with meteorologists.

In spite of the above limitations, the predictions have been usually well in advance of the cyclones. But the warning dissemination systems are still complicated and the warnings either reach late to the villagers & fisherfolk who are likely to be affected or some times are not taken seriously by them.

1.2 CYCLONE OF NOVEMBER 6, 1996:

A low pressure area developed in Central Bay of Bengal off Ongole in the South Andhra Coast on 3rd/4th November 1996 at 16.4°N latitude and 90.4°E longitude (Fig.1.1). The low-pressure area developed into a depression by 5th November and lay centered at 350Kms south east of Visakhapatnam. On the morning of November 6, 1996 it intensified into a severe cyclonic storm and was located 300Kms east of Machilipatnam. By 6th evening it further intensified into a much severe cyclonic storm with hurricane winds and crossed the coast of East Godavari district along the Gautami Godavari river mouth south of Kakinada, between


INDIA
ANDHRA PRADESH
COASTAL DISTRICTS
ANDHRAPRADESH
DONKURU
SRIKAKULAM
NUVALREVU
SRIKAKULAM
MAHFUZBHANDARU
VIZIANAGARAM
VISHAPATNAM
VISHAKHAPATNAM
PUDIMADAKA
EAST GODAVARI
PENTAKOTA
GODAVARI
WEST GODAVARI
UPPADA
KAKINADA
KRISHNA
AMLAPURAM
ANTARVEDI
GUNTUR
MACHILIPATNAM
DIVIPOINT
NIZAMPATNAM
CHIRLA
VADAREVU
YELATTURDIBBA
PRAKASAM
ONGOLE
KAVALI
NELLORE
KRISHNAPATNAM
NELLORE
BERIPETA
N
NE
E
SE
S
SW
W
NW
LEGEND
Taluck/District
Important Coastal Centres
State Boundary
District Boundary
Lake
River
Small Streams/River
Scale 1 Centimetre=36 6 K.M.S

2000 to 2400 hours on 6th November, 1996. The wind speeds were reported to be upto 220Km/hour and storm surge 2.2m or even higher.

The cyclone caused vast destruction of life and property along its track. The worst affected were the fisher folk at sea, seed collectors at beach, low lying fisherfolk-villages along the Gautami Godavari estuary (Fig. 1.2) and the agriculture villages along the rich Konaseema belt.

The Government records show a total number of deaths of 1077 and missing cases of 1683. Of them 1435 deaths (including missing cases) are of fisherfolk in East Godavari district. 569 fishermen were reported to have died while fishing in mechanised boats. 830 fisherfolk including women and children died while shrimp seed collection in the beaches near the river mouth or estuary. 2400 fishing crafts were reported to have been lost and 3000 crafts damaged. About 36 deaths in the village were due to house collapse or falling of trees.

The maximum deaths were from 2 large fishermen villages, **Balusutippa** and **Bhairavapalem**, closer to the southern (Vrudha Godavari) and northern (Gautami - Godavari) distributories of Gautami - Godavari river.

The cyclone warning dissemination was set into operation on November 5, 1996 itself. But due to various limitations the messages reached very late or they were not taken seriously. The message did not reach the fisherfolk villages and fisherfolk at their fishing grounds at all. Hence the large death toll.

1.3 PROJECT ON TRAINING IN SEA SAFETY DEVELOPMENT PROGRAMME:

Keeping in view the background, the limitations of the Cyclone Warning Dissemination System and sea safety measures, the **Food and Agriculture Organisation of the United Nations (FAO)** and the Government of India had formulated a pilot project on 'Training in Sea Safety Development Programme'. This is to be implemented through the Department of Fisheries (DOF), Andhra Pradesh.

The project envisages pilot level trials using direct radio level communication to fisherfolk, ensuring distribution of life saving equipment, providing sufficient training for both fisherfolk and DOF officials and studying the impact over a period. The pilot villages selected for the project are **Bhairavapalem** and **Balusutippa**.

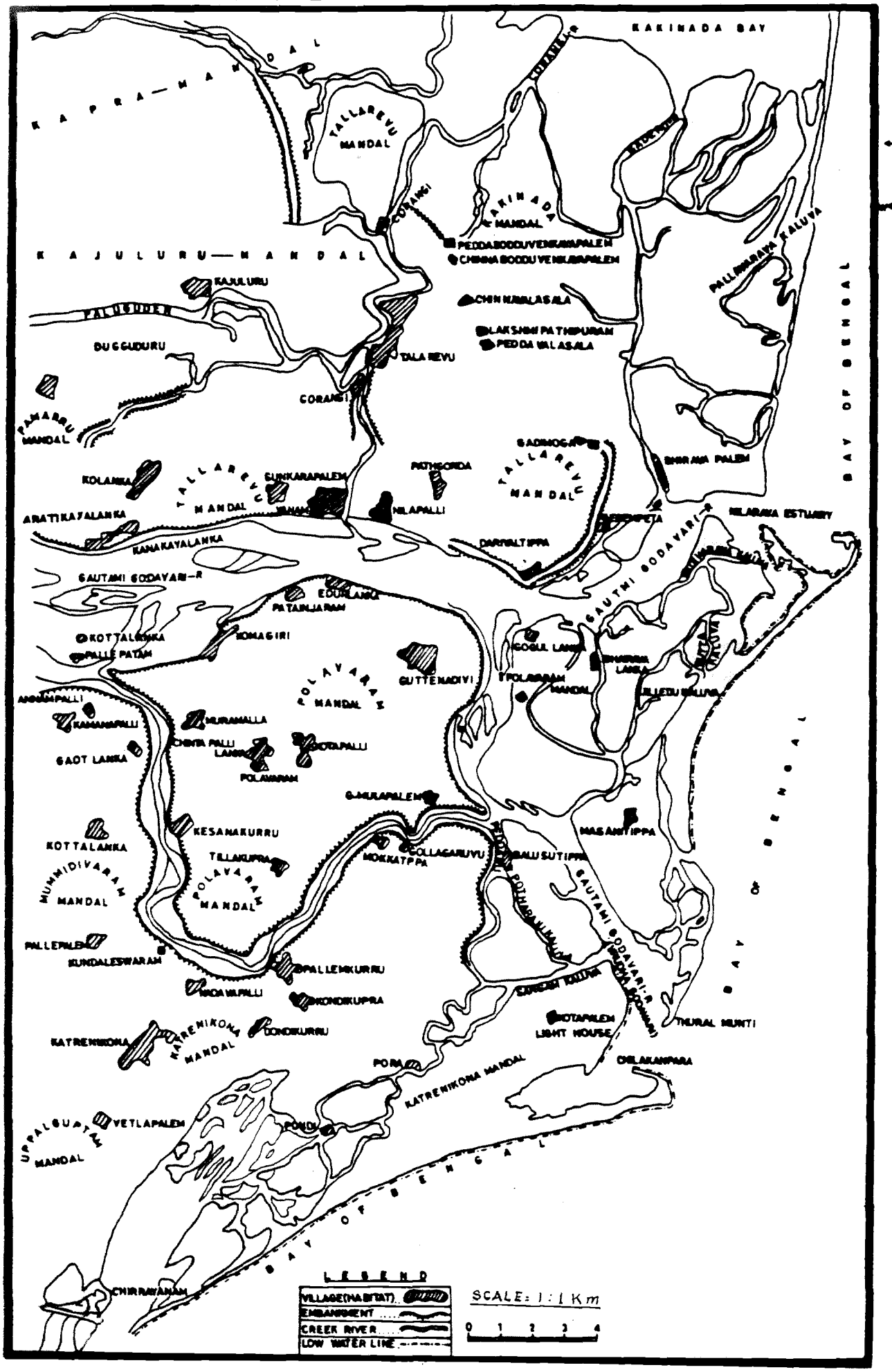
FAO and the Govt. Authorities at central and state level felt the need for a baseline study before the actual implementation of the programme. FAO assigned the work to **Action for Food Production (AFPRO)**.

1.4 OBJECTIVE OF THE BASELINE STUDY:

For the envisaged project of FAO and Government of India to be effective, a baseline information on the villages especially from the point of view of the cyclone effects and the actual cyclone warning dissemination that took place during November 1996 is required.

AREA COVERING GAUTAMI GODAVARI ESTUARINE SYSTEM WORST AFFECTED DURING 6 TH NOVEMBER 1996 CYCLONE

FIG : 1.2



Hence the present study was taken up by AFPRO aimed at the following:

- Detailed study of the two villages i.e., Bhairavapalem and Balusutippa on demographic details, facilities, fishing operations, effect of the last cyclone, warnings and relief.
- Reconnaissance study of few near by villages for comparison with the findings in the above two villages.
- Finding the reasons for the effects of the cyclone being more in these villages/areas.
- Analysis of the Cyclone Warning Dissemination System (CWDS) and the process of the dissemination followed in the November, 1996 cyclone.

Formulating suggestions in general and for the project in particular.

CHAPTER 2

METHODOLOGY

METHODOLOGY

The methodology for the study was developed based on the Terms of Reference (Annexure 2). The methodology basically included (a) collection of secondary information and data (b) Field level studies (c) Analysis and report preparation.

2.1 SECONDARY INFORMATION/DATA COLLECTION:

The secondary information/data on the following aspects were collected from the following sources mentioned during the 2nd and 3rd week of November, 1997 and some during the course of the field study.

Information/Data	Source
1. Maps related to the study area	(a) Shore Area Development Authority, Govt. of A.P., Hyderabad. (b) Standard Survey of India Maps. (c) AP State Remote Sensing Application, Field Office, Kakinada (d) Assistant Director, Groundwater Department, Kakinada. (e) Dept. of Fisheries, Andhra Pradesh.
2. Data on the cyclone/cyclone losses/cyclone warning dissemination	(a) Department of Fisheries, Andhra Pradesh (b) Relief Commissioner, AP State, Hyderabad (c) Relief & Rehabilitation wing of District Collectorate, Kakinada (d) Mandal Revenue Offices (e) All India Radio, Hyderabad (f) Fishermen Boat Owners Association, Kakinada (g) National Institute of Hydrology (h) Few voluntary organisations involved (FIRM, Kakinada; SRAVANTI, Rajahmundry; VJNNS, Tallarevu; SNIRD, Ongole; CRS, Hyderabad; OXFAM, Hyderabad)
3. Demographic Details	(a) District Planning Office, Kakinada (b) District Informatics Centre, Kakinada (c) Department of Fisheries, Kakinada Office (d) Mandal Revenue Offices

2.2 FIELD STUDIES:

The field studies were conducted during the first and second weeks of December 1997. The methodology involved was the following:

1. Reconnaissance visit to the two study villages Bhairavapalem & Balusutippa which included preliminary information collection and contacting key persons in the villages.

2. Detailed study in Bhairavapalem and Balusutippa (4 days each) included the following:

⇒ Rapid Rural Appraisal (RRA) techniques

⇒ Initially village mapping was done with the help of few fisherfolk representatives who identified the main features of the village. In both villages this was done on the terrace of cyclone shelters.

⇒ Later the village was divided into the conventional colony groups and colonies.

⇒ Questionnaire formats were prepared (Annexure 3A & 3B) for collection of basic details colony wise.

⇒ The study team divided into sub groups and collected basic information colony wise through discussions with representatives of each colony separately in their respective colonies.

⇒ Group discussions were held with separate groups of fisherfolk, engaged in different types of fishing, using some of the RRA techniques to understand the details of the fishing operations, the cyclone situation and on warning dissemination, as far as possible in their crafts and fishing areas in some cases.

⇒ The main features of the villages and surroundings were visited and observed.

⇒ Topography details in general with respect to the normal tides and cyclonic storms (November 1996) case were studied with the help of villagers.

⇒ Visits were made along with the fisherfolk to some of the fishing areas and especially to the main site of shrimp seed collection where the deaths occurred during cyclone.

⇒ Group discussions in both the villages and Grama Sabha (meeting with village elders) in one village were held to understand people's responses and reaction to cyclone and opinion on cyclone warning dissemination and precautionary measures.

⇒ Photographic documentation.

Village Mapping At Balusutippa Plate I

2.3 ANALYSIS AND REPORT PREPARATION:

This was done during the second half of December, 1997 and completed in the first week of January, 1998. The information and data collected were analysed, summarized and clear inferences drawn. Relevant maps and figures were prepared. Based on these, the documentation of the report was done.

CHAPTER 3

DETAILED STUDY BHAIRAVAPALEM

DETAILED STUDY: BHAIRAVAPALEM

3.1 VILLAGE BACKGROUND:

Bhairavapalem is an exclusive fishing village, 3Kms. from the coastline, situated on the northern bank of Nilarava estuary of the Gautami Godavari river. The village is separated from the main land on the west by the Gaderu creek and on the south by the Nilarava river mouth of Gautami Godavari. There is a considerable landmass consisting of tidal mud flats, mangrove forest and narrow beach east of the village. Similar landmass exists in the north of the village extending upto Kakinada Bay.

The Nilarava river mouth is 3½Kms away from the present location of the village. Bhairavapalem consists of two distinct groups of colonies, now together i.e., Teerthalamundi and Bhairavapalem. Both these colony groups earlier were on either side of Ramaswamy Kaluva, much closer to the sea. The village was shifted to the present location in 1954.

The present village habitat is a long strip bordering the southern end of the Gaderu creek, with Teerthalamundi on the northern side and Bhairavapalem on the southern side.

The sketch of the village as made by the villagers is shown in Fig 3.1. The famous Bhairavaswamy temple is located on the southern side of Bhairavapalem.

3.2 DEMOGRAPHIC PROFILE:

The demographic profile of the village was elicited out of the different Petas (colonies) within Teerthalamundi & Bhairavapalem. There are 7 Petas derived out of family names in Teerthalamundi and 15 Petas in Bhairavapalem. The details were collected Peta wise. To arrive at the population size, the sample size per household (under concrete, tiled, thatched houses) was found and multiplied by the number of houses in each Peta. The totals of all the petas were made. This was then compared with the population data available from various Authorities including 1991 Census.

Households:

Out of 927 households in the village 526 are in Bhairavapalem and 401 in Teerthalamundi i.e., 43% in Teerthalamundi and 57% in Bhairavapalem. Over all 80% of the houses are thatched 15% tiled and 5% concrete houses (Fig.3.2)

In Teerthalamundi 6% of the houses are concrete 20% tiled and 74% thatched. In Bhairavapalem 5% are concrete 11% tiled and 84% thatched.64% of houses in Teerthalamundi and 28% of houses in Bhairavapalem are electrified - overall 44% are electrified. 11% of the households have TV while only 3% have radio (Fig.3.3)

BHAIRAVAPALEM VILLAGE SKETCH

NOT TO SCALE

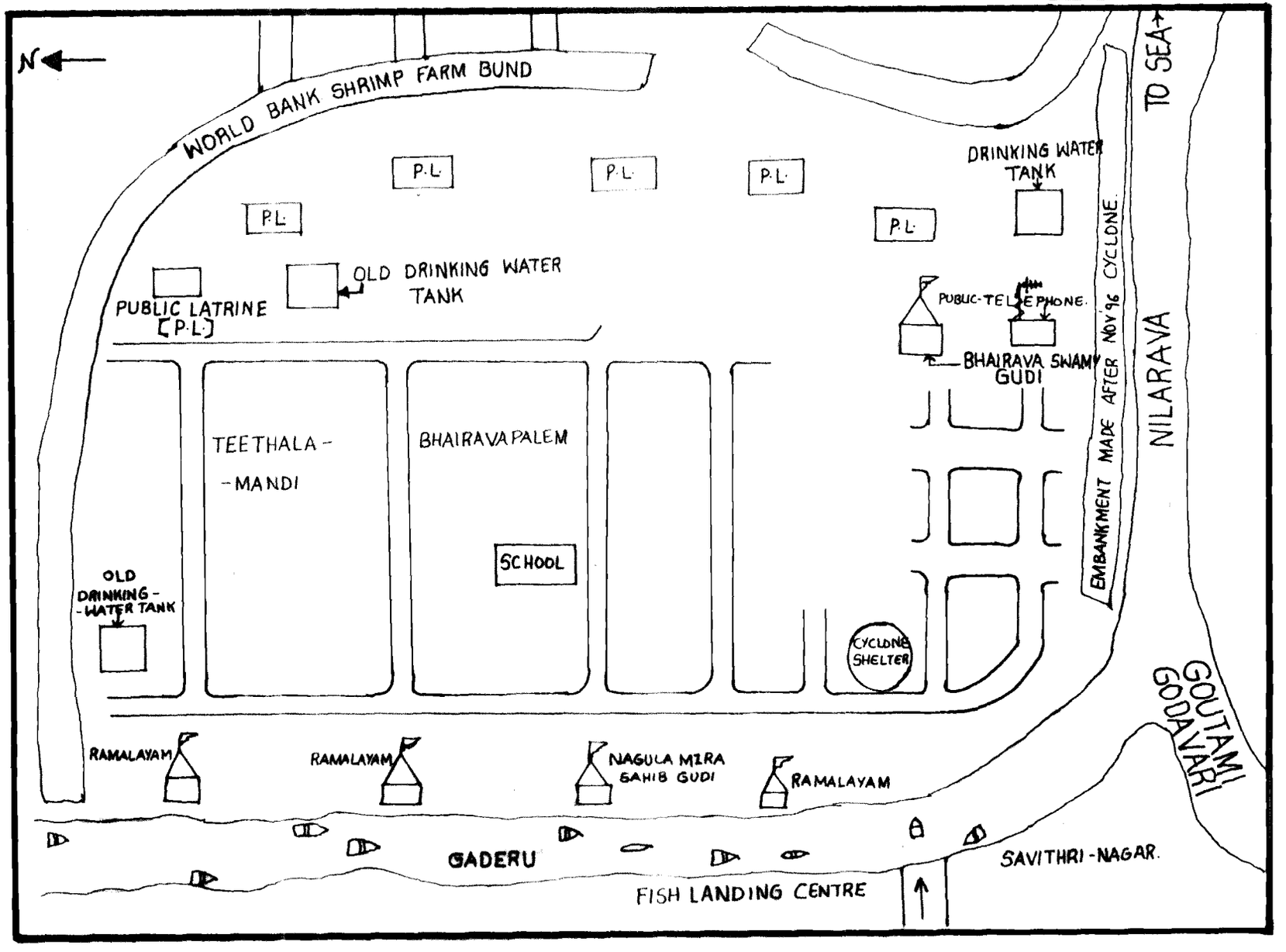
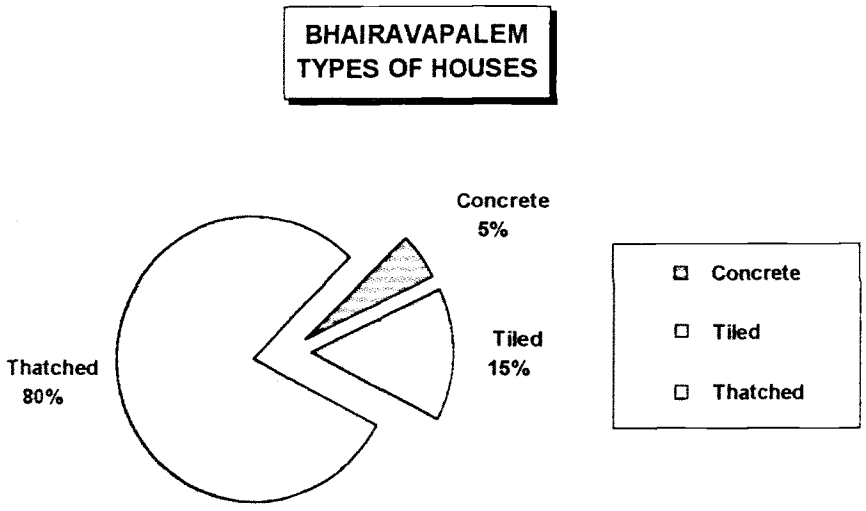


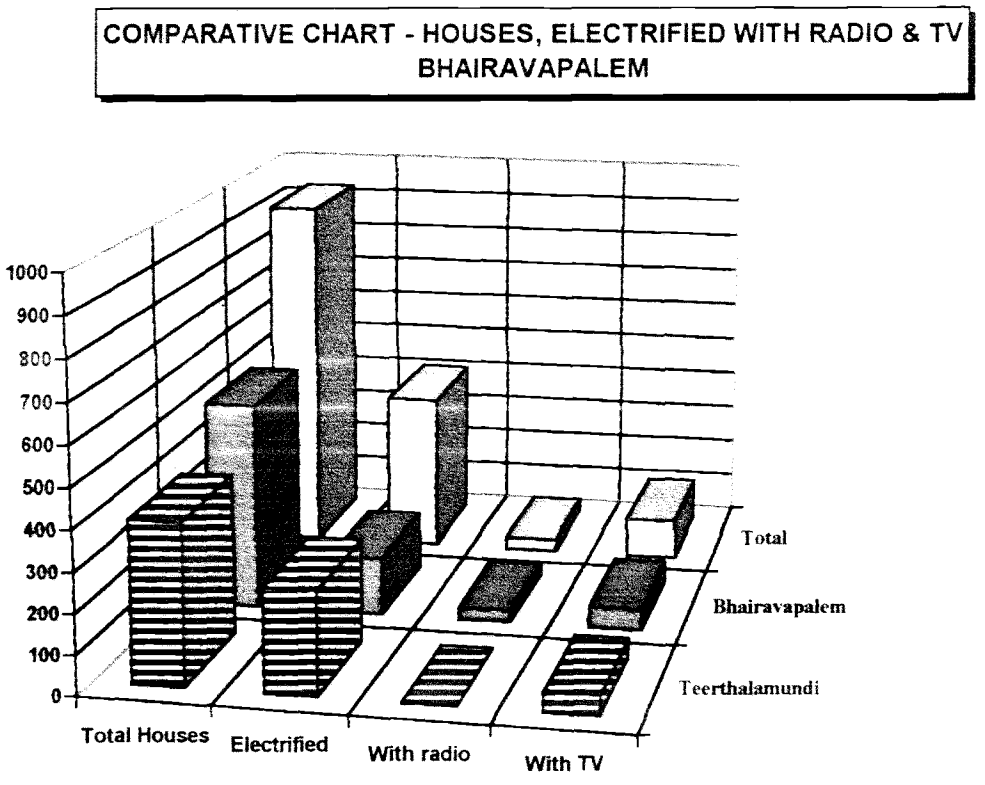
FIG 3.1

Fig.3.2



Total households: 927

Fig.3.3



The population details as arrived at, through the RRA is given below:

Table 3.1 *Population Details of Bhairavapalem(RRA)*

Type of house / Gender / age group	Teerthalumundi	Bhairavapalem	Total
Concrete houses			
Men	87	104	191
Women	87	78	165
Boys	159	50	269
Girls	166	69	235
Tiled houses			
Men	179	188	367
Women	179	174	353
Boys	397	141	538
Girls	429	113	542
Thatched houses			
Male	295	1135	1725
Female	590	1128	1718
Boys	1380	1160	2540
Girls	1415	875	2290

As per the above details the total population of Bhairavapalem is 10,873 of which 2283 are men, 2250 are women and 6354 are children.

According to 1991 census the total population was 3910 as given below:

Table 3.2 Population *Details - Bhairavapalem (1991 census)*

Category	Men	Women	Total
SC	15	12	27
BC(Fishermen Pallekarlu)	1971	1912	3883
Total	1986	1924	3910

According to information from the MRO office, a 1995 survey shown the population as 5630 with 2727 men and 2903 women. The Fisheries Department from some other source had given a figure of 6498 (3050 men, 2240 women, 1208 children).

In the RRA, it is felt that the number of children has been an over estimation at unit level in most Petas. Hence the figure is on the higher side. But however, from what was observed in the village the number of children is very close to the adult population, if not higher. A safe reduction of 30% in the child population brings the figure down to 4448 from 6354. That makes the total population 8981.

The community in the village is more or less homogeneous with a single community i.e., Pallekarlu (Agnikula Kshatriya) dependent completely on fishing activities. Only 4-5 families of Harijan (SC) are there in the village, who too are more dependent on fishing. There is a single Brahmin family who takes care of the Bhairavaswamy temple.

Traditional/Formal Leadership Pattern:

There are 3 group heads 2 from Bhairavapalem and 1 from Teerthalamundi. Under each group head there are 4 sector heads called "Pettandarlu". The Pettandarlu and group heads meet before important festivals or to settle village conflicts.

The formal head of the village is the Sarpanch (elected head through franchise), commonly called the President. The present Sarpanch is Mr.Kaladi Kabir.

3.3 SERVICES PROVIDED TO THE VILLAGE:

Education:

There is one Government school functioning in the village. This was situated in an asbestos shed in the centre of the village, and was completely damaged in the '96 Cyclone. The school building is being rebuilt now. Meanwhile the school is functioning in the Bhairavaswamy temple premises.

There are 291 students on the roll, from 1st standard to 5th standard. There are only 3 teachers coming from outside the village to attend to these students (nearly 1:100 and 3 teachers for 5 classes!). The situation is said to be really pathetic if one or two teachers go on leave.

Another private school also functions within the village, with classes 1st to 7th standard and about 225 students attend this school. The student fee per month is Rs.25/- to Rs.30/-. This is a good indication that the villagers are interested in educating their children. Many of them did express their interest in and concern about the education facilities in the village.

Health:

There is no hospital or Primary Health Centre available in the village. The nearest hospital is 10Kms away across the Gaderu creek in Tallarevu. It was reported that one doctor could be seen in the village only during some special camps. One Government nurse (ANM) visits the village almost daily. Though she does immunization injections and minimum treatments, she does not have stock of any medicine. The medicines have to be bought or paid for, it was said. The village is mostly served by 4 RMP doctors.

General Hygiene and Sanitation in the village are very poor. The low lying village with tidal inundation here and there without any drainage system is at its worst during rains. Open defecation adds to the problem.

A set of 3 or 4 community latrines attached to the cyclone shelter is not at all used and is in a dilapidated condition as the cyclone shelter itself. There are about 6 sets of community latrines constructed recently on the eastern side of the village with the system opening into the tidal creek. The approach to the toilets are yet to be completed. The villagers expressed that these would be used by women. But being community latrines, the maintenance on continued usage is doubtful.

Drinking Water:

Drinking water is a major problem in the village. The only source of drinking water is an open tank east of the Bhairavaswamy temple (40 year old tank). The size of this tank is 200m X 120m with an average depth of 1.5m. Fresh water is filled into the tank from the Gautami river when the salinity is almost nil during South West monsoon, through a sluice system. After January when the water level goes down, the water is brought to the tank through an underground (also underwater across Gaderu) pipe extending about 2Kms. to a place called Grant. There the water is pumped from an irrigation canal to an open tank and from the tank to Bhairavapalem. This system is managed by the Bhairavapalem Panchayath. Earlier they had a functional (?) filter system and an overhead tank to store. But these systems are out of order and the overhead tank is not used now. It was told that, there was another pipeline to Bhairavapalem connected to community taps. This was damaged by some boats crossing Gaderu and never repaired.

It is quite difficult to accept the fact that for a village with nearly 8000 and above population there is only one source of fresh water (drinking, washing, bathing etc.), that is this single tank and the quantum of time spent and strain suffered by the womenfolk to fetch water, especially for those in the opposite corner of the village is unimaginable. The salinity level, other chemical & microbial factors affecting the potability of water in such an open system and source are yet to be looked into. This only source of drinking water was flooded with tide water during the 6th November 1996 Cyclone and it took few days to drain out the tank and refill it.

Electricity:

The village is electrified. The main power line to the village comes through two tall towers on either side of Gaderu. The percentage of electrified houses has been shown in Fig.3.3 During the November 6, 1996 Cyclone power was cut off in advance and all poles fell off during Cyclone. Fortunately this was rectified and supply restored soon.

Telephone:

There was one telephone under the rural/remote area telephone schemes connected through a microwave system. this was located at the house of the temple priest. It was reported that the phone was functioning till the November 6, 1996 Cyclone and the antenna fell off and is yet to be restored.

It was very surprising to gather from the village that not a single message regarding the Cyclone came from any source (Revenue, Fisheries Dept. on any other) over the phone on the fateful day. Once it was disconnected, it has not been repaired & restored till this study (i.e., exactly 1 year since the Cyclone). This is the general (Government especially) apathy to a very vital communication link to this village even after such a bad experience as that of November 6, 1996.

Extension:

There is hardly any extension work done by Government or Non-governmental agencies in this village. The general impression is that people are more independent, self-centered and the

village conflict ridden. The study team does not really endorse this view. It depends on the approach. Extension through systematic participatory approach is needed.

Typical Thatched House - Bhairavapalem Plate II

Plate III Drinking Water Tank - Bhairavapalem

Inside The Cyclone Shelter ?! Plate IV

Cyclone Shelter:

There is one cyclone shelter in the whole village built with support of the Red Cross Society in 1980-81. The cyclone shelter is in a dilapidated condition with much of the steel rods exposed in the concrete, railings and part of the steps gone. The floor of the ground floor has completely sunk and it was in water logged condition. Naturally no one dared to take shelter in the building during the November 6, 1996 Cyclone.

Other Facilities:

There is no post office or any other facility.

3.4 FISHING, FISHING OPERATIONS, CRAFT & GEAR:

As already mentioned Bhairavapalem is a major fishing village south east of Kakinada. Fishermen of Bhairavapalem are mainly engaged in (1) Sea fishing in Mechanised boats (2) Sea fishing in Navas (usually motorised) (3) Riverine fishing mainly closer to Nilarava estuary (4) Some local creek fishing and (5) Shrimp seed collection along the beach (mainly southern side of the Nilarava estuary.

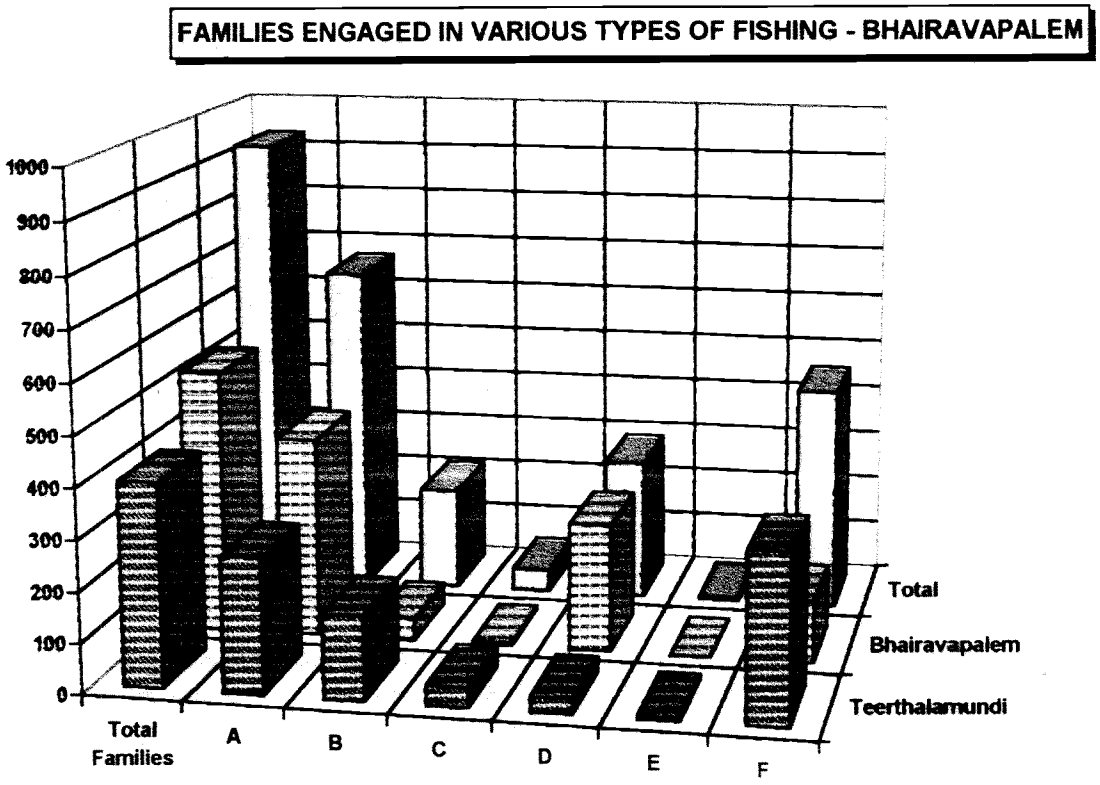
The West Bank of Gaderu, opposite Bhairavapalem (Savithri Nagar side), is a major fish-landing centre. Even local mechanised boats land their catch here. One can see traders coming here with insulated vans and mini trucks with ice. The following summarised table and figure No.3.4 will give an indication of the families engaged in various type of fishing activities and the number of fishing crafts in operation.

Table 3.3 *Various Fishing Crafts in Bhairavapalem*

Types of Crafts	Teerthalamundi	Bhairavapalem	Total
	Number of Crafts		
Nava Small - Non motorised	15	430	445
- Motorised	NIL		
Medium - Non motorised	205	21	226
- Motorised	20	130	150
Big - Motorised	125	30	155
Shoe Dhoni	3	---	3
Mech. Boat - Sorrah	58	14	72
- Sona	36	8	44

Nearly 100 families are engaged in more than one type of fishing. Hence each type of fishing is not exclusive to any family. Out of 976 navas in the village 305 are motorised.

Fig.3.4



A: SEA FISHING(Nava) (666)
B: SEA FISHING (Mech. Boat) (208)
C: CREEK FISHING (44)
D: RIVER FISHING (Nava) (286)
E: RIVER FISHING (Shoe Dhoni) (6)
F: SHRIMP SEED COLLECTION (453)

The various types of fishings engaged in by the fishermen of Bhairavapalem are summarised below. A detailed account of the same is given in Annexure No.9

Marine Fishing:

In Bhairavapalem majority of the families are engaged in marine fishing. Fishermen from about 71% of the families are engaged in Sea fishing by Navas. Fishermen from nearly 22% of the families go for fishing by mechanised boats.

River Fishing:

River fishing is another major occupation for Bhairavapalem fishermen. Unlike fishermen in Balusutippa, Bhairavapalem fishermen go for one day fishing that too mainly closer to Nilarava estuary or on main Gautami river, not very far from the village. The major fishing in the river is the lunger veta (Gidusu vala) followed by the Polasa vala veta in river mouth. Small and medium sized Navas are used for fishing.

Creek fishing:

The fishing in the creeks is usually by a barrier net called the Tharasuvala.

Shrimp seed collection:

Shrimp seed collection had become a major source of income for fishermen families since the early nineties when Shrimp farming took a fast pace in Andhra Pradesh. So is the case with Bhairavapalem. There was a peak demand for wild shrimp seed in 1992-94 when the tiger shrimp seed cost was upto Rs.2/- to Rs.3/- per piece. However after the widespread viral disease of shrimp called the white spot disease attack in 1994-95 and after setting up of a number of hatcheries and recently after the Supreme Court stay on Shrimp farming the demand for wild shrimp seed has come down. Hence the price too has come to 10 to 15 paise per piece. Shrimp seed collection is a comparatively low investment - fishing activity in which all family members including women and children participate. The details of the methodology are given in Annexure- 9.

Godavari river mouth being very productive due to the mangrove ecosystem, shrimp seed collection is comparatively good here. There is an organised trade chain of agents buying the seed and pooling it up at selected centres like Gutinidivi, Chollangi, etc., where the seed is grown for few days and sold out.

The main area for the Bhairavapalem fisherfolk to collect seed is the southeast part of Nilarava estuarine mouth, where there is a sandy beach strip separated from the main land and mangrove forest on the western side by a creek and backwaters. It was told that at least 300 families used to camp there for 6 months in temporary huts and completely engaged in shrimp seed collection. The agents go in navas to them and procure seeds. The fisherfolk come to the village occasionally (on Sundays) to take their provisions. But after the large loss of life during November 1996 Cyclone in this place, many families could not pick up courage for long camps. Most of the seed collection is a daily or short-term affair at present. Many families do collect some shrimp seeds in the creek near mangrove forest close to the village.

Table 3.4 ***Seasonality Pattern of Fishing Operations in Bhairavapalem***

Fishing operations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sea Fishing												
Mech. Boat	—	—	—	—	—	—	—	—	═	═	═	═
Nava – Chandvavala	═	═	═	═						═	═	═
- Pandu vala	—	—	—	—	—	—	═	═	—	—	—	—
- Kivala						═	═	═	═	═		
River/Creek												
Lunger veta					═							═
Polassavala					═	═	═	═	═			
Tarasu vala										═	═	
Shrimp seed collection	═							═	═	═	═	═

Index : ═══ Main season —— Lean season

3.5 FISH MARKETING AND PROCESSING:

Bhairavapalem has a major fish-landing centre on the Savithri Nagar side of Gaderu. Fish traders from Kakinada come here with insulated vans and procure fish from the fisherfolk. Hence fisherfolk from other villages too land their catch here. The women of Bhairavapalem procure fishes suitable for drying from this landing centre. Fish drying is one of the main occupations of women.

3.6 LOSSES IN THE VILLAGE DURING NOVEMBER 6, 1996 CYCLONE:

Loss and Damage to Houses:

As can be seen from the following table, based on the present survey almost all thatched houses had been severely damaged both due to the tidal surge of about 1.6 to 1.9 meters in various parts of the village (lasted for about one hour or less) and the high wind speed that had blown away the roofs. The heavy winds also blew away the roofs of most tiled houses and sunshades & window panes of some concrete houses.

As could be seen, the maximum damage had been to the thatched houses. The survival strategies adopted by the village were to abandon all thatched houses and even some tiled houses and take shelter in all available concrete houses and temples. The only one dilapidated cyclone shelter was the last place they would have preferred to go! Being traditional fisherfolk and quite familiar with basic survival strategies like keeping oneself and their children above rising water etc., the loss of life within the village was minimum (one woman and five children).

Table 3.5 *Houses Damaged During November 6, 1996 Cyclone*

Type of house/extent of damage	Teerthalamundi	Bhairavapalem	Overall
Thatched - Partially	35 / 295	20 / 445	55 / 740
- Fully	260 / 295	406 / 445	666 / 740
Tiled - Partially	24 / 82	47 / 57	71 / 139
- Fully	58 / 82	3 / 57	61 / 139
Concrete - Partially	5 / 24	17 / 24	22 / 48

Most of the houses have been rebuilt / repaired except few.

Loss of Fishing Craft & Gear:

The details of damage, or loss of fishing crafts in the village during the November 6, 1996 Cyclone as per the present survey is given in Table 3.6.

Table 3.6 *Cyclone Loss / Damage of Crafts*

CRAFTS	Lost	Damaged	Total
Nava+ Small	15	250	265
Medium Nonmotorised	175	40	215
Motorised	15	92	107
Big motorised	112	--	112
Shoe Dhoni	3	--	3
Mech. Boat - Sorrah	47	11	58
- Sona	28	2	30

This survey shows severe damage or loss of about 699 Navas including 219 motorised navas. 3 Shoe Dhonies were also said to have been damaged severely. This survey shows major damages to about 88 mechanised boats and only 5 mechanised boats were completely lost in the sea from this village. The enumeration done by the Dept. of Fisheries show that about 888 crafts worth Rs.177.60 lakhs were lost and 38 crafts were damaged worth Rs.3.80 lakhs. Both in the present survey as well as the Dept. enumeration, there is a fair chance of a slightly exaggerated figure, as people directly relate such enquires to some sort of likely compensation.

The Dept. of Fisheries statistics shows that 9260 gears of various kinds worth Rs.185.20 lakhs were lost. In the present survey, no attempt was made to enquire about the loss of gears, as it was certain that collection of details of losses Petawise is difficult after a lapse of 1 year and means of verification or confirmation are absent.

Shrimp seed collectors lost many of the small Navas in the tidal waves at the beach site. A few Navas were lost in the river while on lunger veta, or while attempting to go and inform about the cyclone to the seed collectors.

A large number of the loss of craft & gear in this village were from the berthed or anchored craft in the Gaderu close to the village itself. In the storm the Navas or Boats hit against each other. Some got cut off and carried away by the waves. Many Navas got damaged as the planks or the coir sealing between the planks gave way. Most of the gears lost were those kept in the crafts. The five mechanised boats lost were those on high seas most probably on the path of the Cyclone at that time. As craft & gear are their only means of livelihood, fisherfolk could manage to get new ones all by themselves over the past one year.

Loss of Life in Cyclone:

The details of deaths in the November 6, 1996 Cyclone as obtained through the present survey are given in Fig.3.5 (a) & (b).

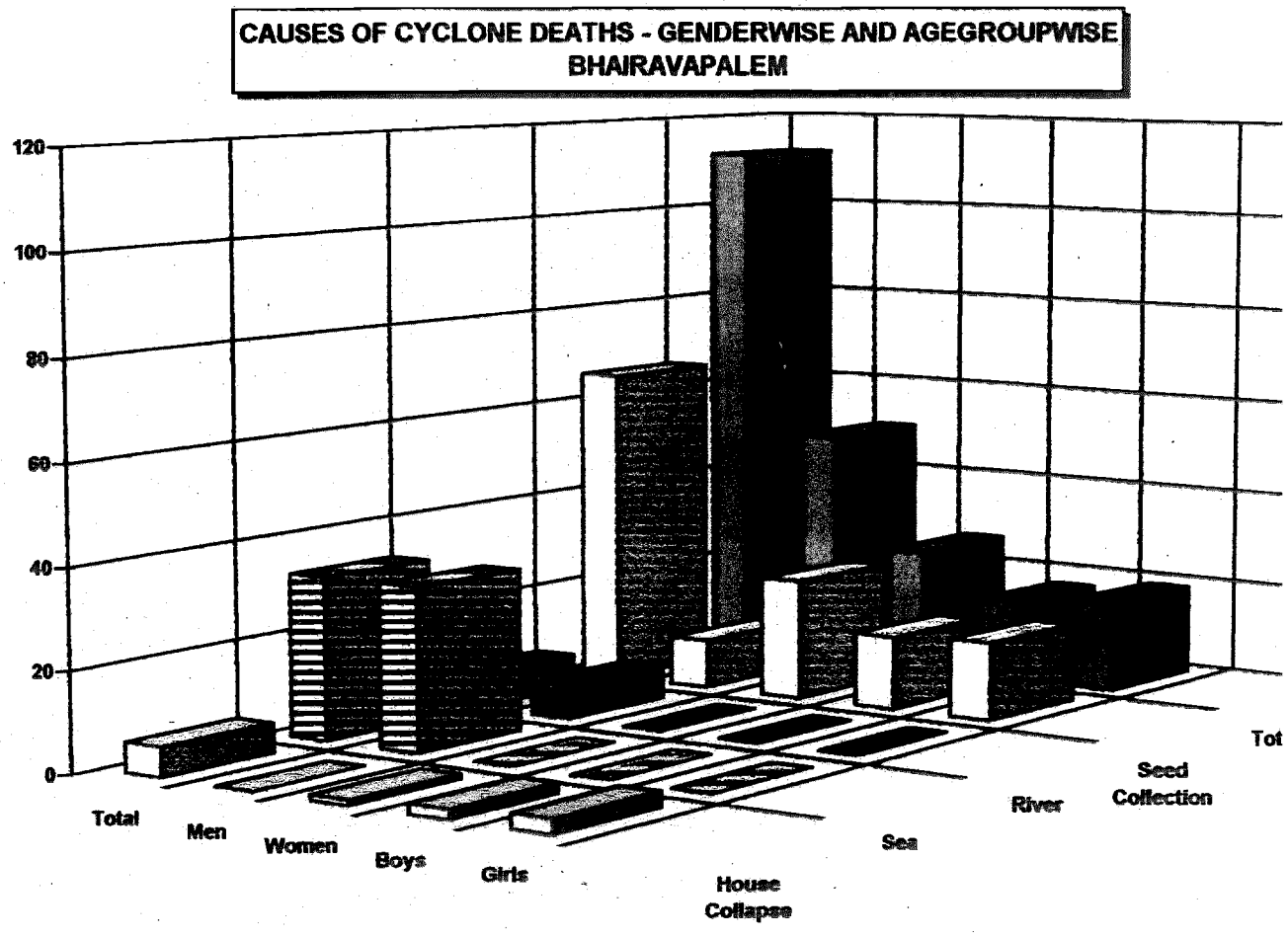
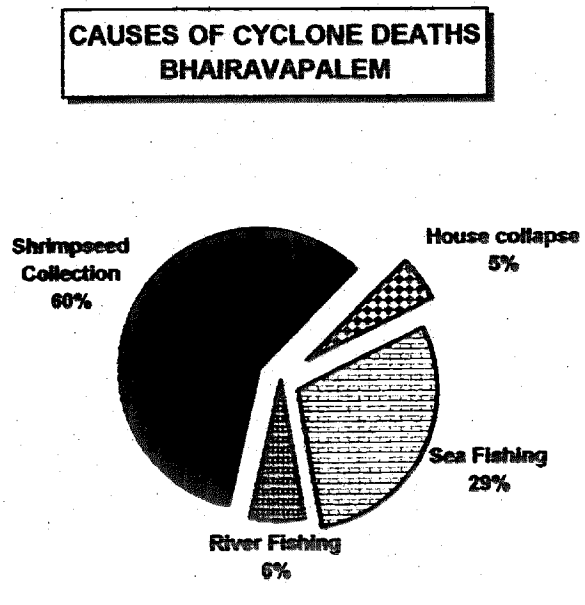
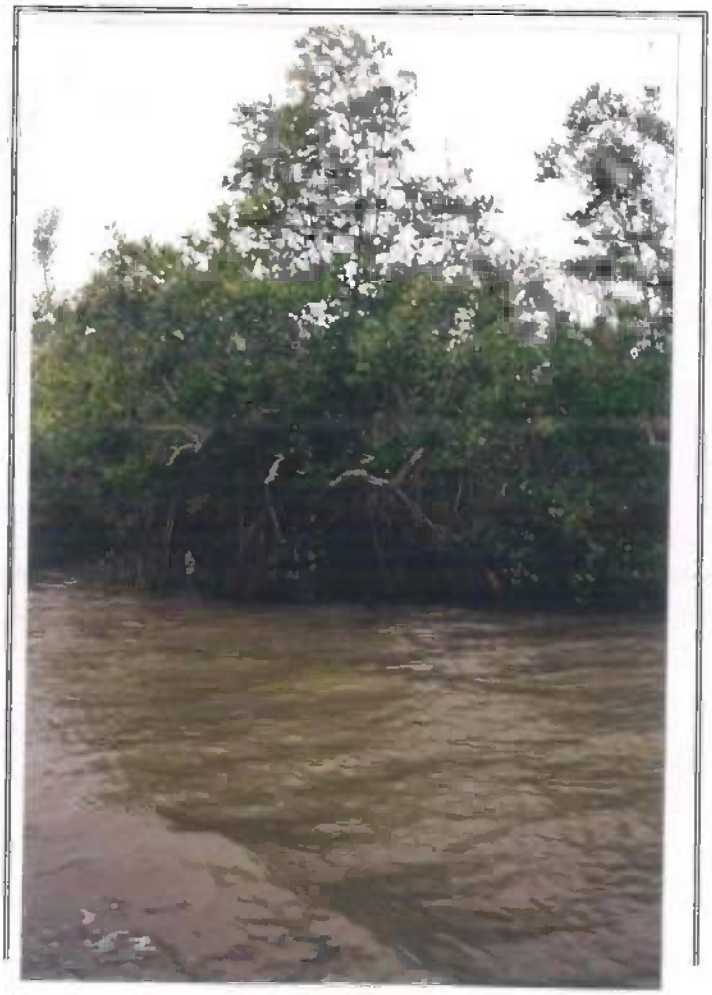

CAUSES OF CYCLONE DEATHS - GENDERWISE AND AGEGROUPWISE
BHAIRAVAPALEM
120
100
80
60
40
20
0
Total
Men
Women
Boys
Girls
House Collapse
Sea
River
Seed Collection
Tot

Fig. 3.5 (a) & (b)


CAUSES OF CYCLONE DEATHS
BHAIRAVAPALEM
Shrimpseed Collection 60%
House collapse 5%
Sea Fishing 29%
River Fishing 6%

Shrimp Seed collection site near Nilarava reminder of the '96 Tragedy Plate V

Mangroves, which saved lives during tidal surge Plate VI



The total deaths are 140 Nos. The Dept. of Fisheries and Revenue Dept. authorities had confirmed a number of 112 (36 deaths and 76 missing cases). The number 140 above is most likely because the number of men dead in the sea given in the survey would have included few of those who have settled in Kakinada too. This is again confirmed by verifications at village and Boat Owners Association level. It was confirmed that no one went on sea fishing in nava during cyclone. All those who lost life in sea were those in mechanised boats. They were about 33-35 in number from this village.

Table 3.7 ***Details of Cyclone Deaths In Bhairavapalem***

Cyclone Deaths	Teerthalamundi	Bhairavapalem	Total
House Collapse	--	6	6 (1 women 5 Children)
In Sea	23	38	61 (men) *
In River	--	7	7 (men)
Seed Collectors – Male	3	7	10
- Female	3	22	25
- Boys	4	11	15
- Girls	4	12	16

* This has been confirmed as 33.

If the loss of life in sea is only 33, then the major loss of life was at the beach, mainly the shrimp seed collectors, about 66 from this village - 38% women, 23% boys and 24% girls. The survivors among seed collectors during the cyclone explained that tidal wave as high as 5m washed them away. Many could remain afloat swimming and quite many fortunate people got washed towards the nearest mangrove forests where they could catch hold of mangrove trees/ plants. Those who could not hold on to anything got washed away in the forceful receding tide. There were pathetic stories of near and dear including children getting away right from the arms of some of the survivors. Here again the traditional swimming and other survival skills of the fisherfolk in water had in fact saved many.

The people who have lost life in river could be those who were reported to have attempted to reach the seed collectors to inform them about the cyclone.

3.7 CYCLONE WARNINGS AND RESPONSE IN VILLAGE:

Repeated enquiries in the village revealed that no official information or warning of cyclone from any Government authorities (Revenue, Fisheries or any other department) did reach the village before the Cyclone of November 6, 1996. Though there were radio bulletins, hardly any one had given any serious attention to the warning. The village got more alert on a possibly serious cyclone only after 12 O' Clock noon on November 6, 1996 after hearing the radio bulletin. Still most did not anticipate such a devastating cyclone.

The single telephone to the village (microwave) also remained silent through out. The villagers and the village priest in whose house the telephone is located believe that the telephone was in working condition on 5th & 6th November, 1996, but were not very sure as no call was made or received during those days. However it got damaged by the Cyclone.

The fisherfolk however had indication of a stormy weather by the water movements, clouds and wind conditions. So no one went for fishing starting on 6th. But those who were on the beach side to collect shrimp seed 4-5Kms away across the Nilarava estuary did not find it necessary to return to the village, as they too did not anticipate any thing like this hurricane. But after hearing the radio bulletins, few fishermen thought of informing the seed collectors and reportedly started in motorised Navas, but unfortunately they too got caught in the tidal waves.

Bhairavapalem comes under the revenue jurisdiction of I.Polavaram Mandal, but is the only village of the Mandal on the other side of Gautami. Geographically it is closer to Tallarevu Mandal. Hence as per the standing instructions, the responsibility of cyclone warning to Bhairavapalem village lies with MRO Tallarevu. In fact Bhairavapalem is no one's baby.

Those who had left in Mechanised boats 2 to 3 days earlier could not be informed at all. In those boats caught in the storm there is no survivor to tell the story. But few other fishermen (from this village as well as in Kakinada) who were on board some other mechanised boats in Narsapur or south of Narsapur area could share their experiences. Many of them heard about the cyclone over radio, and some were informed by other boatsmen. Some anchored at new Narsapur and some took shelter within Narsapur creek for survival. Few boats, which had gone towards north, have been lost.

But now all express that all those shrimp seed collectors could have been saved if the serious warning had reached the village at least 6 hours earlier.

But during the cyclone of 1st week of December, 1996 (which fortunately did not hit the coast seriously), Government authorities did inform by tom tom and public address system and did evacuate the people to Tallarevu, arranging transport. Almost all the people got evacuated and only few youngsters stayed back to guard the village.

Traditional Methods of Cyclone Prediction:

The last serious cyclone that hit this area was on November 7th, 1969, which is not very much fresh in most fisherfolk's memory. After that, though they have been hearing cyclone warnings over radio and other source none of the cyclones affected this area seriously.

Traditionally they get an indication of the cyclone, when they see rapid water movements (called Odi) much faster than the usual waves and tides and unusual rapid rise in water level. Rain clouds would be fast moving. As most of the cyclones come from a southeast direction, they say that any such serious cyclone is preceded by unusual winds from northwest direction. It did occur on November 6, 1996 also.

3.8 RELIEF WORK AFTER CYCLONE :

No relief came on 6th night or 7th morning. It was by 7th evening and 8th morning that some regular fish traders from Kakinada and some philanthropists brought some food packets.

It was only on 9th that various relieves like Kerosene & Rice reached the village from Government sources. Even the MRO of I.Polavaram could reach only on 9th. Drinking water supply came only after sometime. Meanwhile food packets were also air dropped. Later various voluntary organisations also brought food, water, clothes, vessels, etc.

The identified and unidentified dead bodies were removed and cremated only after 2 days.

In all the deaths or missing cases, Government gave Rs.5, 000/- as immediate ex-gratia. In case of identified dead bodies Rs.95, 000/- was handed over as fixed deposit certificate. For confirmed missing cases Rs.30, 000/- has been given in cash and Rs.30, 000/- as fixed deposit receipt. Total 36 death cases and 76 missing cases are confirmed in Bhairavapalem.

For loss of navas Rs.1200/- and loss of nets Rs.400/- was given. Rs.1000/- was given for loss of house.

Long term Measures:

The immediate long-term measure visible was the laying of foundation stone for a new cyclone shelter (square type) cum community centre by the Rajiv Gandhi Foundation during last week of November 1997.

Another attempt, which was supposed to be inaugurated by some Ministers on December 3, 1997, was a housing programme by the State Housing Corporation with support from (KFW) Germany. Though it was not inaugurated on that date officially, we hope the project has not been shelved.

3.9 TOPOGRAPHIC & HYDROGRAPHIC FACTORS THAT AFFECTED:

Bhairavapalem is situated on the eastern bank of Gaderu creek with joins the Gautami Godavari river prior to the unison with Bay of Bengal at Nilarava. Eventhough the river mouth, Nilarava, is very wide now (about one kilometer), it was reported that, earlier, about twenty years back it was a narrow one and got widened during a flood. This remained so ever since. The fisherfolk also used to go towards Balusutippa for fishing activity before the widening but the scenario changed later with Nilarava turning into a very intense fishing field.

Bhairavapalem is among the low-lying areas in Godawari delta directly exposed to the river mouth (also confirmed in an APSRAC study) and sea.

The village is a low lying area with hardly 0.5m above the level of Maximum Spring Tide The village between the two temples (Ramalayams) in the middle is comparatively at higher elevation with respect to the village on either sides. The level of tidal inundation on the fatal day of November 6, 1996 was about 1.9 meters above ground level at the elevated area of the village whereas it was about 2 to 2.2m at other low-lying areas of the village.

Vast area on the east of the village had been cleared and reclaimed recently for developing shrimp farms under a world bank schemes though the project is stayed due to the Supreme Court Order, the embankment formed still exists. The bund is not continuous and could not help the village from flooding. But the villagers believe that the force of water might have been abated by the bund.

The major tragedy occurred in the shrimp seed collection sites away from the village, on the open low lying beach facing the sea, where the tidal surge was reported to be about 4-5 meters.

CHAPTER 4

DETAILED STUDY
BALUSUTIPPA

DETAILED STUDY: BALUSUTIPPA

4.1 VILLAGE BACKGROUND:

Balusutippa is one of the major fishing villages located 20 Kms. away from Katrenikona (mandal) headquarters in East Godavari district. Balusutippa is located on an Island on the southern branch of Gautami Godavari river also known as the Vrudha Godavari. The island on which Balusutippa is located has the Gautami Godavari (Vrudha Godavari) on the east, a creek called Pedderu on the west and Sangam Kaluva on the south. The Balusutippa village proper is on the north west corner of this Island. One has to cross the Pedderu creek by Nava to reach the village.

The aerial distance from the village to Gautami (Vrudha Godavari) river mouth would be about 10Kms and along the creeks about 14 to 15Kms, located south east of the village. This river mouth is also known as Sacromento Shoal, in hydrographic maps.

Apart from Pedderu creek, which borders the Island, another creek called Potharaju Kaluva intercepts the island south of Balusutippa.

Balusutippa is a densely populated village with narrow lanes and closely packed houses. The sketch of the village layout drawn by the villagers is given in Fig.4.1. The village extends from the Urukaluva on the north to Potharaju Kaluva in the south.

The village is divided into 3 major Petas i.e., Kothapeta in the north, Madyapeta in the centre and Paturu in the south. There is a small Harijan colony on the southwest corner of the village. There are few temples (7Nos) on the western border of the village, 2 more on the eastern side, 3 Cyclone shelters (2 old, 1 new) and 3 water tanks.

4.2 DEMOGRAPHIC DETAILS:

As mentioned earlier Balusutippa has 3 distinct Petas called Kothapeta, Madyapeta and Paturu. Within each Peta there are family groups called Mutthas. In Kothapeta there are 10 Mutthas, in Madyapeta 24 Mutthas and 14 Mutthas in Paturu. As described in the methodology the demographic and other details of the village was first collected Mutthawise and then consolidated for each Peta and finally for the whole village.

The population details were calculated based on sample household sizes of each type in each Muttha and multiplied by the number of houses for each Muttha separately.

Households:

This survey shows that there are 1745 households in the village. 30% of the households are in Kothapeta, 41% in Madyapeta and 29% in Paturu. Maximum number of concrete houses are in Kothapeta followed by Madyapeta and Paturu (only two). Overall 36% of the households are electrified of which the maximum are in Madyapeta. About 7.5% of the households have Radio and 2% have TV (Fig.4.2, Fig.4.3 and Fig.4.4).

BALUSUTIPPA VILLAGE SKETCH

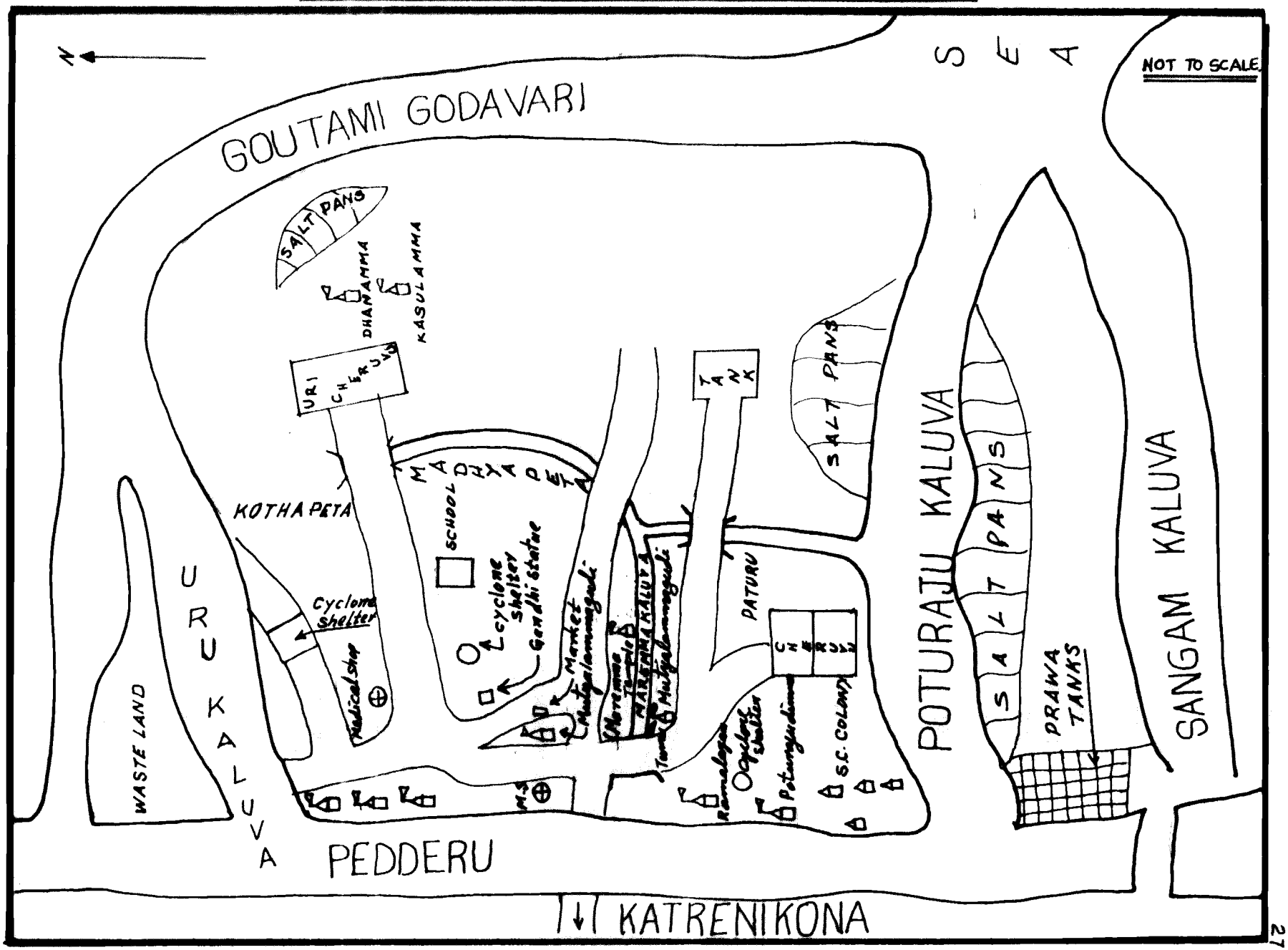


FIG 4.1

Fig.4.2

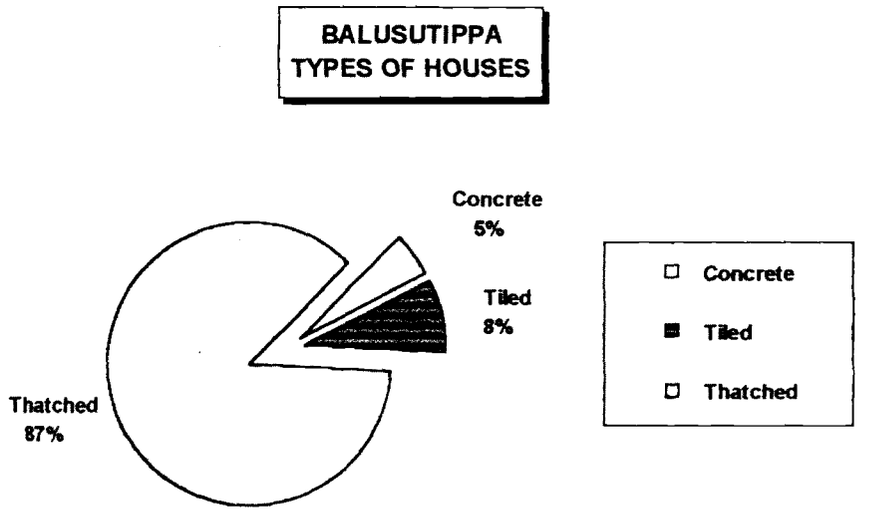
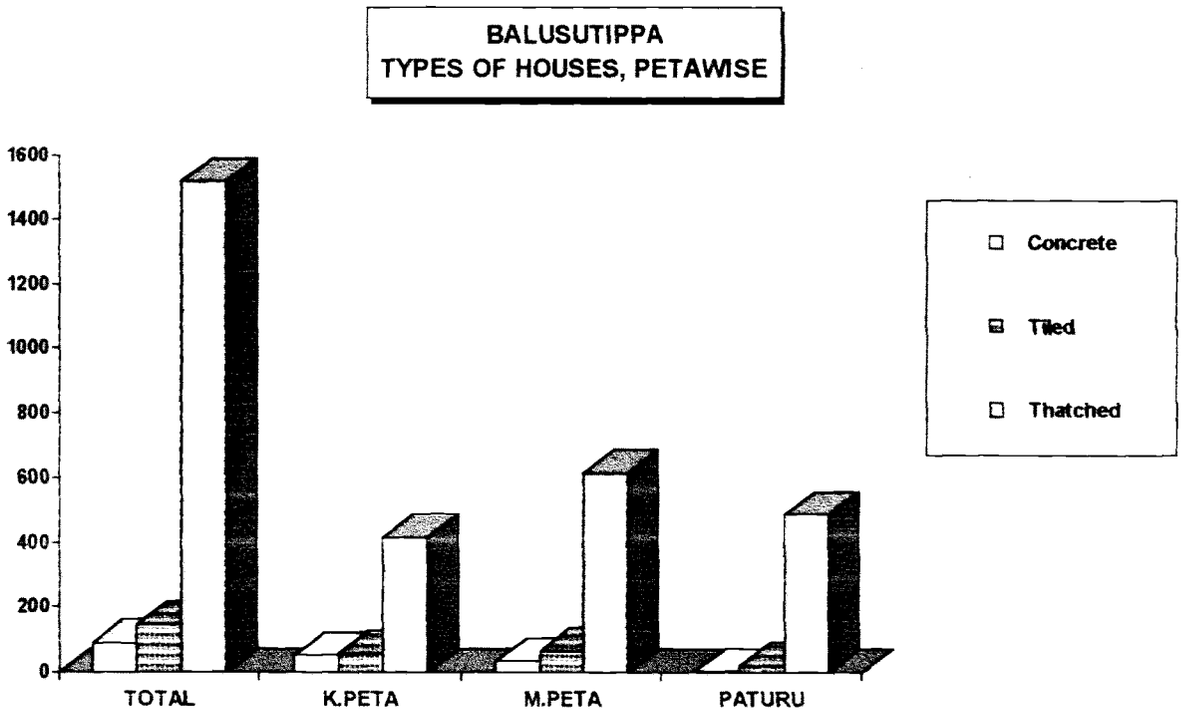


Fig.4.3



The detailed breakup of housing pattern appears as shown in Fig.4.2 and Fig.4.3.

Another significant feature of Balusutippa is that about 28%, quite often remain locked or with some elderly people as the whole family move away on dhonies or navas to distant places for fishing. They return only during festival seasons.

Population Details:

The present survey based on sample household size in each type of house (concrete, tiled and thatched) Mutthawise and extrapolating it to the whole Muttha and then to each Peta and finally to the whole village shows a total population of 16,629 for the whole village including men, women, boys and girls.

Table4.1 *Population Details of Balusutippa(Present survey)*

Type of house/ Gender/Age group	KOTHAPETA	MADHYAPETA	PATURU	TOTAL
Concrete - Male	128	79	4	211
- Female	123	77	8	208
- Boys	108	109	12	229
- Girls	105	108	12	225
Tiled - Male	102	133	81	316
- Female	100	133	72	305
- Boys	90	172	58	320
- Girls	93	158	58	309
Thatched - Male	902	1243	1622	3767
- Female	834	1183	1531	3548
- Boys	1169	1611	1004	3784
- Girls	1183	1480	1531	3407

Men: 4294 Women: 4061 Boys: 4333 Girls: 3941 Total:16 629

The 1991 census shows 1311 households and a population of 4743 (Male 2427 and Female 2316). An average family size of 3.6/household is however totally incorrect for the fishermen community of this area.

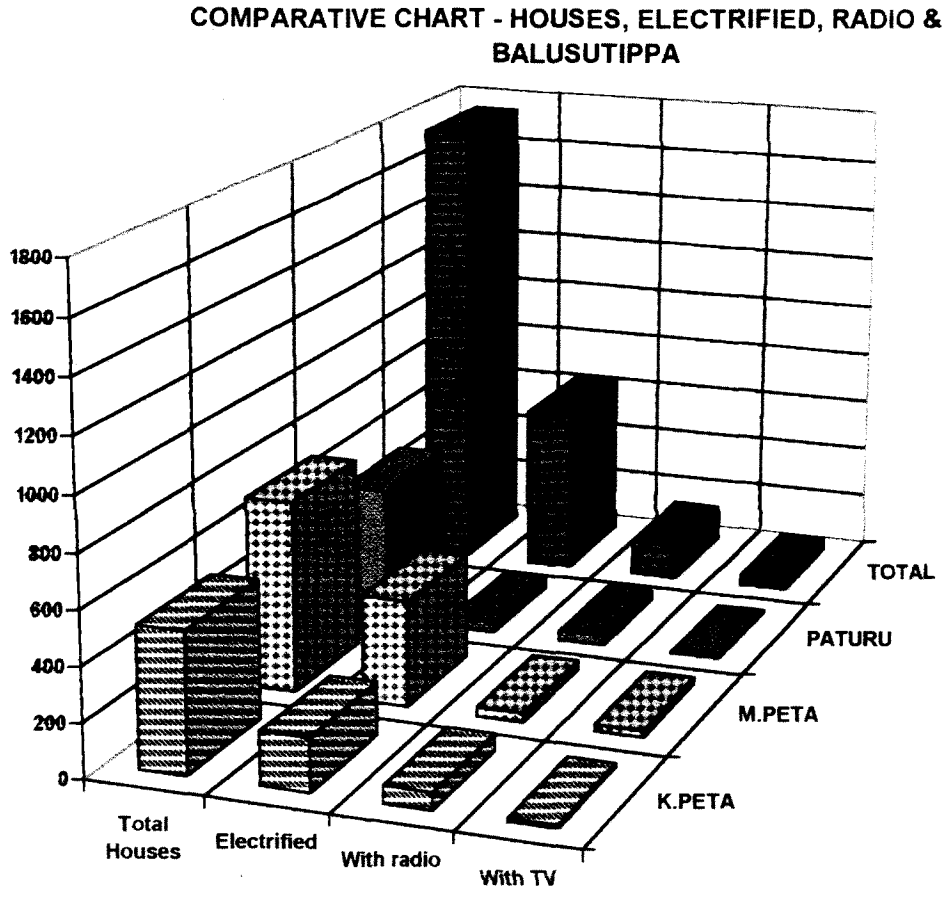
The Dept. of Fisheries from the local sources had obtained the following population figures for Balusutippa.

Men	3,500
Women	3,290
Children	3,286
Total	10,076

As already mentioned in the case of Bhairavapalem, there are chances of some over estimation of the population, in the specific methodology adopted. Here again we feel that the child population has been over estimated. A reduction by 30% brings down the population of boys to 3033 and girl's population to 2759. The total estimated population would then be as follows:

Men	4294
Women	4061
Boys	3033
Girls	2759
Total	14,147

Fig.4.4



Literacy:

The literacy level was found to be as follows Peta wise:

Table4.2 *Details of Literacy in Balusutippa*

Gender/ Age group	KOTHAPETA (No.)	MADHYAPETA (No.)	PATURU (No.)	TOTAL (No.)
Male	75	114	129	318
Female	22	52	50	124
Boys	100	143	128	371
Girls	65	103	83	251

This indicates a 7% literacy among men, 3% literacy among women, 12% literacy among boys and 9% literacy among girls. Overall literacy rate is 7.5%As per 1994 survey by Govt. there were 834 literate men and 434 literate women in the village. Many people still believe that, ability to sign or write ones name is literacy.

Community:

The fishermen community in the 3 Petas mentioned belongs to Pallekarlu community, also known as Agnikula Kshatriyas.

Harijan Peta of Balusutippa:

As mentioned earlier there is a Harijan Peta on the southern side of the village. There are 17 households of which only 2 are tiled. 15 of them are thatched. It was said that there are 25 families altogether.

Total Harijan population could be around 150. Atleast 25 men from the Harijanapeta are involved in fishing activities. They go as workers in the nava for riverine fishing or go for shrimp seed collection. Few other family members are also engaged in Shrimp seed collection. Few have some land on the other bank of Pedderu, where they take up some agriculture. Some do go for various labour works. There would be hardly 10 literate people. Only 3 children are going to the village school. 5 children study staying in SC Students hostel in Katrenikona.

2 men from this colony had died while on shrimp seed collection in November 6, 1996 cyclone.

Traditional Formal Leadership among Fisherfolk:

It is a 15 member leader group that takes decisions on general village matters, conflict resolution, etc. There are 5 leaders from each Peta. The formal leader ofcourse is the village Sarpanch (elected Head through Franchise) called President.

4.3 FACILITIES PROVIDED IN THE VILLAGE:

Education:

There is one Government school functioning in the village with about 200 students on the rolls. Classes from 1st to 5th standard are run by 3 teachers. The situation of managing 5 classes by 3 teachers and the still difficult situation if one or two teachers go on leave is unimaginable. All the teachers are from outside the village. There are 3 privately run schools having classes 1st to 7th standards. Around 200 children attend these schools. The monthly fee per student is Rs.20/-. The nearest high school is in Kandikuppa.

One major reason for less attention to schooling could be because of a considerable percentage of fisherfolk families from Balusutippa migrating for months together every year for fishing elsewhere, taking children with them.

Health:

There is no primary health centre or anything of the type in this village. One doctor may visit once a week or once a fortnight. One woman Multipurpose Health Worker (MPHW) visits quite often. The nearest hospital is at Pallamkurru, about 10Kms away. 5 to 6 RMPs (Registered Medical Practitioners) also visit and do regular practice in the village. Two medical shops are also located within the village.

The hygiene and sanitation condition in the village though better than Bhairavapalem is in no way appreciable. General drainage is bad. Tidal inundation is comparatively less in the village proper due to slightly higher elevation. Open defecation is common.

Drinking Water:

There are 3 drinking water tanks in the village, one large tank (90 x 60 x 1.8 meters) between Madyapeta and Kothapeta on the eastern side. Two smaller tanks (75 x 45 x 1.8 meters) closer to Paturu, one on the eastern side and one on the southern side of Paturu.

The large tanks get filled with Godavari water during southwest monsoon. The other two tanks depend on rainwater as well as on water from an underground pipe from a pumping source 2Kms away across Pedderu. The pumping units lift water directly from an irrigation canal. Potability of water in strict sense is highly doubtful. The drudgery of women to collect water for the whole household and the water shortage in summer are other major problems.

Cyclone Shelters:

There are 3 cyclone shelters in the village. 2 of the cyclone shelters are old (1981) and are in Madyapeta and Paturu. Both these shelters are very much in dilapidated condition and no one did take shelter in these shelters during the cyclone. It was surprising to find that the ground floor of one of the shelters was housing a temporary liquor shop.

Condition Of Cyclone Shelter at Paturu, Balusutippa Plate VII

We have seen earlier that 95% of the houses in Paturu are thatched and now that the only cyclone shelter in Paturu is in a dilapidated condition.The third cyclone shelter in Kothapeta was built in 1988 and is in a better condition. Some fisherfolk did take shelter here during the cyclone.

Electricity:

The village has electricity supply since 1975. But still the number of electrified houses is still only 36%. The supply was cut off on November 6, 1996 well before the cyclone. The electric poles fell off during the cyclone and it took considerable time before restoring supply.

Telephone Post Office:

There is one telephone at the post office in the village. The telephone connection was given 15-20 years back. The telephone got disconnected since November 6, 1996 cyclone and not repaired since then. The villagers believe that the telephone was working on November 6, 1996 and they did not get any message over phone on cyclone warning. The officials at MRO office Katrenikona reported that they had tried to contact the village over phone and it was not working.

Road Approach:

The approach road to the other bank of the village was laid in 1989.

Extension:

Hardly any extension work worth its name had been taken up in this village. This is known to be a conflict-ridden village, with factional fights leading even to murder occasionally. But it was felt that, fisherfolk of this village would cooperate and participate well in extension or development programmes, given that the approach is right.

4.4 FISHING OPERATIONS, CRAFT AND GEAR:

Balusutippa is a very active fishing village engaged both in marine and inland fishing. The various kinds of fishing operations conducted are as follows:

- Marine fishing using motorised navas.
- Working in mechanised boats, mainly operating from Kakinada.
- Short duration, usually day to day fishing in creeks and rivers using navas or dhonies.
- Migratory fishing in various parts of the Godavari estuary & riverine system for months together using dhonies or navas or both.
- Shrimp seed collection closer to estuarine creeks.

The details of various fishing methods are given in Annexure No.10

Balusutippa is however known for the migratory fishing. The number of families and the number of fishermen engaged in various kinds of fishing from the village Petawise is given in Table 4.5. Here again it may be noted that one family / fishermen may be engaged in more than one kind of fishing. Families or fisherfolk from all the petas are engaged in all the types of fishing. Some additional percentage of families in sea fishing could be seen in Pathuru, while families engaged in shrimp seed collection are more in Kothapeta. Details of various types of fishing craft available in the village as per the present survey are given in Table 4.3

Table 4.3 *Fishing Crafts In Balusutippa*

TYPES OF CRAFT	KOTHAPETA	MADYAPETA	PATURU	TOTAL
Nava - Small	190	38	226	454
Nava - Medium : Non Motorised	295	319	26	640
Motorised	29	46	8	83
Nava - Big : Motorised	26	23	24	73
Shoe Dhoni	100	224	30	354*

* Includes the ones lost in cyclone

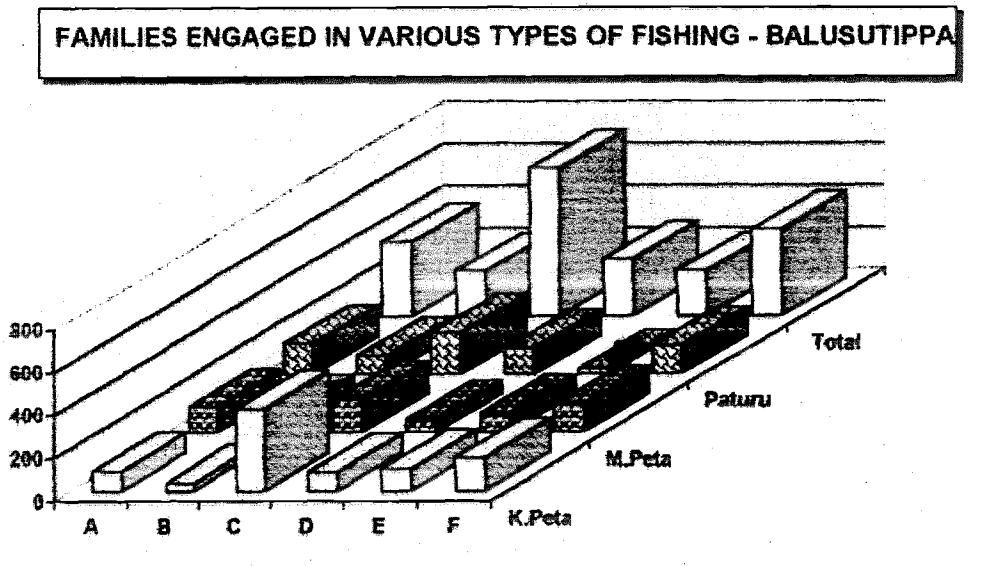
The Department of Fisheries estimated the number of crafts in the village is as follows:

Motorised Navas	61
Non-motorised Navas	1194 (1094 small and medium navas as per this study)
Non-motorised Dhonies	270 (Excluding the ones lost in cyclone)

The number of Non-motorised Navas almost tallies with a difference of 100.

The number of motorised Navas given as 61 would be the large ones doing sea fishing alone. There are many motorised medium navas too. Hence the total number of motorised navas would be around 156 as estimated by this survey.

Fig.4.5



A) Sea Fishing (Nava) (360)
B) Mechanised Sea Boat (Crew) (219)
C) Local Creek Fishing
Nava & S.Dhoni (709)
D) Migratory Fishing (River) (Nava) (275)
E) Migratory Fishing (S.Dhoni) (219)
F) Seed Collection (419)

The figure regarding shoe dhonies i.e. 270 Nos. given by the Department of Fisheries could be more or less true, because in this survey fisherfolk were given also number of dhonies which could

not have been replaced after the 96 cyclone. It was true that, because of the high investment required for building shoe dhonies, many have replaced it with navas.

Major Areas of Migratory Fishing:

The Balusutippa fisherfolk move to distant places along Gautami river, stay there in dhonies or navas for months together. They do fishing operations at these places and sell the products locally. They come to local villages close to the place of operation for their day to day needs. The whole family cooks, eats and sleeps in dhonies and navas.

The main areas of operation by the Balusutippa fisherfolk are listed below (Annexure 5)

G. Moolapalem	Baryallanka	Kota	Yedurulanka	Odarava
Golla Karuvu	Kamidi	Dangeri	Duryaldippa	Masanitippa
Mokalatippa	Yelkallanka	Maskapalli	Salla Kaluva	Sangam
Gollavaripeta	Mutheswaram	Vempuru	Urukaluva	Kaluva
Palamkuripeta	Kothapalli	Govalanka	Chinteri	Sheelanka
Kesankuripeta	Sundarapalli	Chollangi	Pothu	
Chintapali Lanka	Kapileswaram	Yanam	Kaluva	

Balusutippa Navas involved in Lunger veta at Edurulanka Plate VIII

Migratory fisherfolk family from Balusutippa at Edurulanka Plate IX

Shrimp Seed Collection:

As described in Bhairavapalem, shrimp seed collection became an important income source for many families since about 1991-92. The demand for wild seed had come down after the viral attack in shrimp farms (1994-95) setting up of many hatcheries and the stay on shrimp farming by the Supreme Court. Still it is found to be a low investment activity with comparatively good returns. The whole family including children are involved in this.

The main centres for shrimp seed collection by the Balusutippa fisherfolk are Masanitippa, Turalamunti and Chilkanpara (Annexure 5). The fisherfolk families stay there with families.

At Masanitippa the main collection centre is the Masanitippa creek, opening to sea. They stay in temporary hut on The sandy beach or creek side. Both Turalamunti and Chillanpara are on either side (North & South) of the Gautami (Vrudha Godavari) river mouth. The sandy beach strips are the place where they camp. The gears used are the shooting net and push net. To reach all the three places it may take about 1 hour trip by motorised nava, from Balusutippa.

Apart from the above main collection centres, shrimp seed collection along creeks are done by most of migratory fisherfolk also. In fact few of the shoe dhoni operators had even abandoned other types of fishing and taken to shrimp seed collection. The number of families who camp for long periods for shrimp seed collection have come down after the tragedy during 1996 November cyclone.

Shell Fish Collection:

Molluscan shell fishes like blood clam, window pane oysters and some gastropod seed collection was a major fishing activity for a group of the migratory fisherfolk who migrate to areas like Chollangi near Kakinada. They collected shellfish from the Kakinada bay as well as the creeks in the Coringa Mangrove forest. Now the shell fish collection is banned in this areas and these fisherfolk also had to shift to shrimp seed collection, crab fishing etc.

Table 4.4 **Seasonality Pattern of Fishing Operations (Balusutippa)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sea Fishing Nava												
Silkuvala												
Panduvala												
Kirvala												
Mech. Boat Fishing												
Migratory Fishing in river												
Shrimp seed collection												

It may be seen that the families engaged in migratory fishing are in the village for hardly 60 days in a year. these are during Shivarathri (February), Mariyamma Theeratham (June) and Mathaylamma Jatara (October)

4.5 LOSSES DURING NOVEMBER 6, 1996 CYCLONE:

The major losses during the cyclone were due to damage of houses, damage of craft & gear and loss of life. Balusutippa being a village with some cattle population, there was large loss of cattle also which was not estimated in this survey.

Damage of Houses:

The summarised details of the loss of houses in Balusutippa in the cyclone are as follows:

Table 4.5 *Number of Houses Damaged in Balusutippa During 6th Nov '96 Cyclone*

Extent of Damage	KOTHAPETA	MADHYAPETA	PATURU	TOTAL
Fully	331	581	342	1254
Partially	184	100	182	466
Rebuilt	514	543	472	1529

Most of the thatched houses were fully damaged, while many of the tiled houses were partially damaged roofs being blown off in the heavy winds.

This village in comparison with Bhairvapalem had lesser level of floods of about 1.5m to 1.6m due to its higher elevation. Most of the houses have been some how repaired and rebuilt in the past one year.

Loss of Craft & Gear:

The details of the loss/damage to Crafts as per this survey, during the 1996 November cyclone are as follows:

Table 4.6 *Crafts -Damaged & lost during 6th Nov '96 Cyclone (Balusutippa)*

Crafts Lost		KOTHAPETA	MADYAPETA	PATURU	TOTAL
Small	- Damaged	105	6	55	166
	- Lost	85	16	74	175
Medium – Non-motorised	- Damaged	129	75	4	208
	- Lost	160	245	12	417
- Motorised	- Damaged	25	12	3	40
	- Lost	4	14	1	19
Big - Motorised	- Damaged	12	3	0	15
	- Lost	16	6	2	24
Shoe Dhoni	- Damaged	52	66	16	134
	- Lost	48	131	11	190

As per the above details 635 Navas of various sizes including 43 motorised Navas have been lost. 190 Shoe Dhonies were also reported lost. Most of them have been lost while fishing in the rivers and estuaries. The practice of anchoring the nava with net (Lunger veta) in the river is one reason for the losses. Even some of the Dhonies and Navas used by fishermen fishing in various parts of the river have been lost in the tidal flooding, as many abondoned their crafts and took shelter in near by villagers. Quite a few Navas, in the river along with fisherfolk were drowned.

Many of the Navas anchored or tied near the village were also lost in the flood & wind - hitting each other, getting carried away, breaking down and sinking in the wind and tidal waves.

Most of the navas have been rebuilt or repaired. But many of the Shoe Dhonies lost have not been replaced due to the high cost of it (nearly Rs.1 to 1.2 lakhs if made in teak). Hence many of the Shoe Dhonies have been replaced by Navas with deck cover, which works out to be 1/3rd to 1/4th of the cost.

As mentioned in the case of Bhairavapalem here too estimation of the actual number of gears/tackle lost was not possible.

Loss of Life:

The maximum loss of life of fisherfolk during the November 6, 1996 Cyclone was from Balusutippa. The summarised details of the deaths in the village due to the November 6, 1996 cyclone as obtained through the present survey is given below:

Table 4.7 *Deaths During November 6, 1996 Cyclone in Balusutippa*

Place/Reason for death		Kothapeta	Madyapeta	Paturu	Total
House Collapse	- Women	1	0	0	1
River/Creek	- Men	5	10	0	15
	- Women	2	5	0	7
	- Boys	1	0	0	1
	- Girls	0	0	0	0
Sea	- Men	2	10	9	21
Beach Seed Collection	- Men	22	26	8	56
	- Women	33	42	8	83
	- Boys	31	47	10	88
	- Girls	54	47	3	104
Grand Total		151	187	38	376

There is only one death in Balusutippa due to house collapse. 23 people died while on river fishing of which 15 were men, 7 women and one boy. As reported, 21 men, working in mechanised boats, died in sea.

Fig.4.6

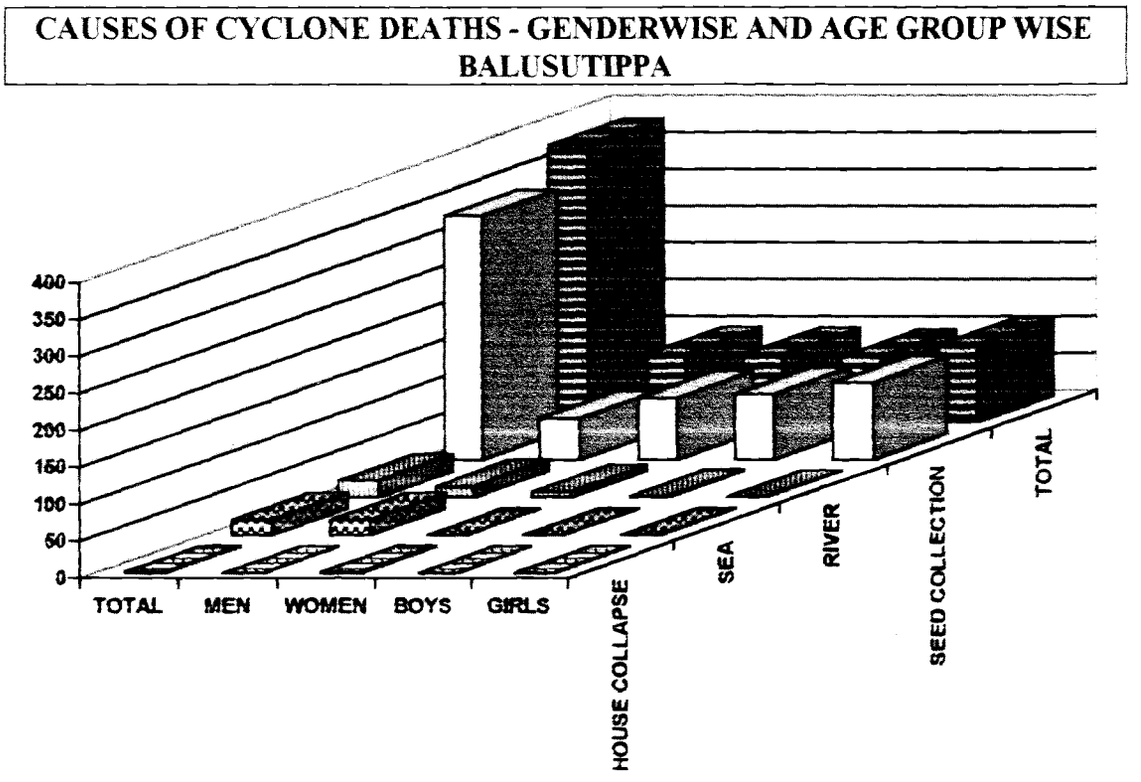
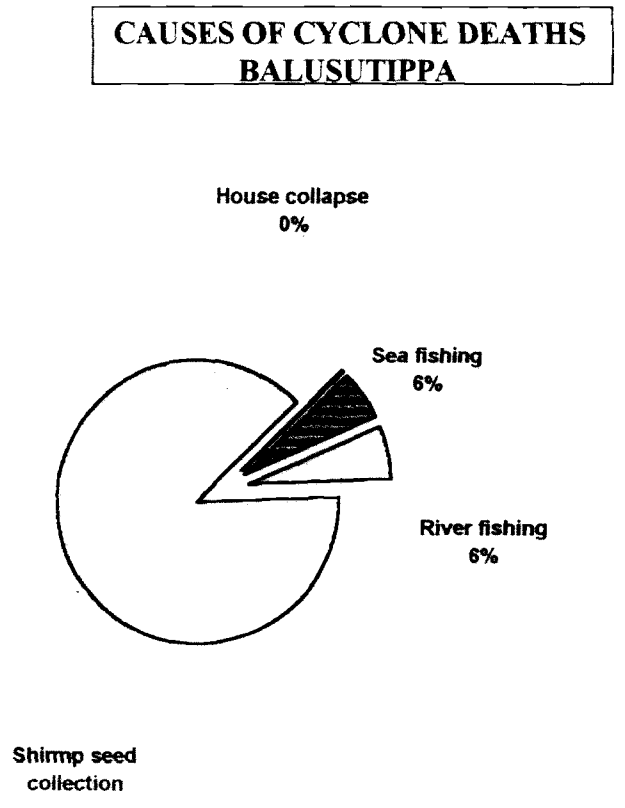


Fig.4.7



The maximum number of deaths in this village (331 ie, 88%), were among the shrimp seed collectors, who were camping at Masanitippa, Chilkanpara and Turalamunti, close to the sea. Of these 17% were men, 25% women, 27% boys and 31% girls. The large tidal waves had washed them away, especially during the receding tide. At the seed collection centre, off Masanitippa there is a coconut grove on the west side of the creek separating the sandy beach and Masanitippa. Many of those who survived were those who were able to catch hold of coconut trees. Similarly, the survivors on the other sites were those who got drifted to mangrove areas and caught hold of that.

The Dept. of Fisheries and Revenue authorities had confirmed 292 deaths (291 missing + 1 death). But the cases of another 137 persons were rejected by a committee, stating to be doubtful. But due to pressure from the people, it is being reviewed.

Survival strategies:

In the village as the tidal waves started flooding all had taken shelter in the existing concrete houses, and temples. Some did take shelter in the new cyclone shelter in Kothapeta. Many did keep their children on higher beams or on false ceilings.

While in river fishing most fisherfolk had abandoned their crafts and took shelter in the nearest villages. Those at the beach, collecting seed had little option but to be carried away in the tidal waves. But those who could get hold of some mangroves or coconut trees (Masanitippa), could save themselves.

4.6 CYCLONE WARNINGS TO THE VILLAGE:

Fisherfolk of Balusutippa confirmed that they did not get any warning about the cyclone on November 6, 1996 from the local authorities. The village extension officer Mr.Murahari stationed at MRO's Office in Katrenikona said that on hearing about the depression over Radio (AIR) on November 5, 1996 morning, he did go to the village and inform over tom-tom on the same day. Even after repeated enquiries in the village including the village Sarpanch, all denied to have got any information. May be the VEO got confused of the second cyclone in December 1996.

Some fisherfolk acknowledged hearing about the cyclone over Radio. But did not take it seriously. Few youngsters opined that the language and technicalities in the AIR cyclone bulletins were not very much understandable. They said that the seriousness of the different wind speeds and locations as indicated in the bulletins did not convey enough to their understanding. They require clear indications of how serious it could be and the probable areas the cyclone may hit.

However by 6th afternoon they did know from the bulletins and the water and weather conditions that a cyclone is likely to hit. Here too some attempts were made to reach the shirmp seed collectors near the sea mouth. But unfortunately they could not reach there in the rough weather.

The officials in MRO office in Katrenikona acknowledged that they did not have a wireless set in 1996 and they got official information only by November 6, 1996 afternoon. The village servants were sent to nearby villages, but not to Balusutippa for want of time and transport fecility. They did try to contact Balusutippa over phone. Unfortunately the telephone was not working. The cyclone hit the village between 8p.m. And midnight. Fortunately, the December - cyclone (1996), did not hit AP Coast seriously, local authorities did inform the villagers and evacuated them to Katrenikona.

Traditional cyclone prediction systems:

The fisherfolk acknowledged that they have some traditional prediction systems. They were:

- Unusual waves rising from the bottom.
- Appearance of yellowish green rings around the moon one or two days in advance.
- Unusual lightening in the southeast direction.
- Heavy winds from the northeast (This, they say, inevitably is followed by cyclone from southwest direction).

They did notice some of this indication before the November 6, 1996 cyclone. But did not take it seriously.

4.7 RELIEF WORK AFTER CYCLONE:

The village extension officer visited the village on 7th morning. It was only on 9th November, that any relief in the form of rice, kerosene and drinking water reached the village. The Chief Minister too visited on 9th.

From 9th November onwards, 9000-12000 Lt. of Kerosene and drinking water was supplied to the village. 25Kgs of rice were also given to each in the village.

Immediate exgratia of Rs.5000/- per person died or missing were given for 420 cases. Later after confirming 291 missing cases and 1 death case, remaining Rs.95, 000/- was paid, of which Rs.35, 000/- was in fixed deposit. However, for more than two deaths per family the total compensation was reported to be limited to Rs.2 lakhs.

There were initial objections by the people to receive the compensation as 137 missing cases were rejected. They received the amount after getting assurance that the cases would be reviewed.

Rs.1000/- for damaged houses, Rs.1200 for each craft lost and Rs.200/- for nets lost were said to have be paid.

4.8 TOPOGRAPHIC & HYDROGRAPHIC FACTORS THAT AFFECTED:

Balusutippa is situated on the eastern bank of Pedderu creek which splits from Vruddha Godavari, flowing north of Balusutippa, and flows further southwards to reach Sangam kaluva. The sangam kaluva makes its way to Vruddha Godavari flowing eastwards and ultimately joining in Bay of Bengal near Sacremento shoal. The village Balusutippa has a relatively elevated terrain adjoining the creek (western side) but has a low-lying area on the eastern side. The level of tidal inundation on the day of November 1996 cyclone was about 1 meter above ground level on the western side of the village, whereas it was about 1.5m on the low lying areas of eastern side of the village.

The eastern and partly southern part of the village is completely exposed to river mouth with very thin mangrove growth upto the river. This could have also have contributed to the direct impact of the cyclone. In the recent past many shrimp farms and salt pans have come up on the south and southeast part of the village, clearing whatever mangroves that were there earlier.

Here again closeness of Balusutippa to the river mouth-Sacromento shoal -with relatively a steeper contour ie.deeper water could have contributed to the tidal surge.

The shrimp seed collectors on the low lying sand banks close to the Sacromento shoal were hence the worst affected in the tidal surge.

CHAPTER 5

SOME OTHER CYCLONE AFFECTED VILLAGES

SOME OTHER CYCLONE AFFECTED VILLAGES

Visits were made to few other cyclone affected villages of Katrenikona, I.Polavaram and Talarevu mandals of East Godavari District to have a comparative idea of the affects as well as to understand about the cyclone warning systems.

5.1 MASANITIPPA (MAGASANITIPPA):

Masanitippa comes under the same Panchayat of Balusuthippa. But is located more remotely on the eastern side of the Gautami Godavari, closer to the sea. It is about 45 minutes trip by motorised nava to Masanitippa from Balusuthippa. The village is covered by creeks, rivers and mangrove forests on all sides.

Masanitippa is also one of the worst affected villages, in the Cyclone of November 6, 1996 due to the following reasons.

* Closeness to sea and Gautami river.
* Low lying area
* Remoteness of the village and hence inaccessible.
* No means of communication
* Good centre for shrimp seed collection, resulting in many fisherfolk from other villages also camping.

Village Details:

The village has 84 houses of which only 4 are concrete, 4 tiled and all the remaining are thatched. The village is known for the Bhairava temple. During Sivarathri thousands of people come in Navas, to worship the God. A very much dilapidated cyclone-shelter and school building, which were damaged during the November 6, 1996 cyclone, stand out as one enters the village.

Drinking water is a real problem. They depend on 2-3 shallow open wells, which go saline often. It became totally saline after the cyclone. The voluntary organisation CASA dug 2 shallow borewells with handpumps for the immediate use. The handpumps are defunct now.

Dilapidated Cyclone Shelter and Damaged School Building Plate X

Fishing Activities:

There are 4 motorised navas doing sea fishing, 150 navas and 50 dhonies going for river and creek fishing including lunger veta.

But off late this village is known for its shrimp seed collection activities on the creek close to the sea as well as on the beach side. Fisherfolk families from other villages, especially Balusuthippa also camp here for shrimp seed collection.

Cyclone Warning:

No message of any kind reached this remote village before cyclone. The usual indication of a storm was not taken seriously too.

Loss During Cyclone:

The village got completely flooded by the tidal waves of 2m height on November 6, 1996 and they had only 4 concrete houses to save themselves. All the thatched houses were badly damaged and about 43 people died of house collapse. The condition of the cyclone shelter or school building was not worth taking shelter.

There was large number of deaths among the shrimp seed collectors. About 33 fishermen died in sea. 30 motorised navas, 50 non-motorised navas and 25 dhonies were said to be lost.

Relief After Cyclone:

Relief after cyclone reached after 2-3 days. Apart from the regular reliefs, they remember the efforts of the voluntary agency CASA who provided borewells and handpumps the much needed provisions, clothes, etc. It was told that the AMG International proposed to build 30 houses in the village.

5.2 KOMARAGIRI (Fishermen Hamlet)

Village Details:

Komaragiri has a fisherfolk hamlet on the side of Yedrulanka - Mummdivaram road in I.Polavaram mandal, close to the Gautami Godavari. A low-lying village but with an embankment towards the riverside. Fishermen belonging to Agnikula Kshatriya (Pallekarlu) community stay in about 30 thatched houses here.

Fishing Activity:

They live by fishing in Gautami Godavari.. They are engaged more in local fishing using trammel nets and gillnets. If the catches are poor, nearly 50% of the families migrate to places like Kothapally, Balusuthippa, Muramulla, etc. Some families go to the Nilarava river mouth for shrimp seed collection.

Cyclone Warning (November, 1996):

They did not get any warning from official sources before the 6th November 1996 cyclone. But they anticipated a storm from the water and weather conditions. Some heard over radio by 6th afternoon. No one expected such a big cyclone.

Loss during Cyclone:

There were severe damages to houses due to wind and they lost few crafts. **There was no flooding due to the embankment.** Those who died were 8 shrimp seed collectors (all men) near Nilarava estuarine mouth and 1 Fisherman in mechanised boat

Relief after Cyclone:

After cyclone the authorities came and vacated them to Komarigiri Agriculture Cooperative Society. This was also repeated in December 1996. But food supply at the camps was not sufficient.

5.3 JOGGAMPETA OF GUTHINIDEEVI

Village Details

Juggampeta is a small fishermen hamlet in Guthinidivi village, quite close to Yedurulanka. Guthinidivi is famous for its shrimp seed stocking ponds and its trade. In this hamlet, there are 80 - 100 households of which 15-20 are concrete houses.

Fishing activity

The major activities are:

- ◊ Marine fishing using motorised Navas (about 30 navas).
- ◊ Nets used are various types of gill nets. Fishing is usually upto a depth of about 40-45m.
- ◊ River Fishing by Navas using gill nets & seine nets.
- ◊ Shrimp seed collection near the Nilarava river mouth.

Cyclone Warning

No information from any local authorities. They could however predict a storm from the weather conditions and from the radio bulletin at 4p.m on 6th November '96.

Loss Due to Cyclone

Except for the damage of thatched houses and some tiled houses during the wind there were no major losses. The flood embankment outside the village saved the village from floods.

5.4 PEDDAGADIMOGA

Village details:

Peddagadimoga is the major fishing village opposite to Bhairavapalem on the mainland. This is part of Talarevu mandal. This village has large stretch of land before Gaderu and Gautami Godavari river. There are mangroves on the side towards Gaderu, but on the southeastern direction of the village, it is mainly mudflats, degraded mangroves or shrimp farms. There are about 1000 houses of which 60 are concrete houses. All are fisherfolk belonging to Pallekarulu.

There is one cyclone shelter, but is in a very bad condition. A Government school with 300-400 students (Std.I to Std. V) functions in the village. There are 3 teachers. Another private school with 100 students also functions in the village.

Fishing activity

The major fishing activities are:

◊ Sea fishing in motorised navas (about 35 nos.) using gill nets.
◊ Working in mechanised boats.
◊ River/Creek fishing in Navas and Dhonies.
The major nets used are:

Stake Net (bag net), gill nets, lift net etc. They do not do Lunger veta.

◊ Shrimp seed collection in creek and near beaches.

There are about 35 motorised navas. 50 small navas and 30 Shoe Dhonies in the village.

Cyclone warnings

The villagers received message by 6-7 PM in the evening of 6th. Nov.96. It was too late by then.

Losses Due to cyclone

The village was flooded and many of the thatched houses damaged. The school building also got damaged. About 15 people died at beach side while on shrimp seed collection. About 30 fishermen working in mechanised boats also lost their lives.

Relief after Cyclone

The MRO and Government officials visited the village on the 7th morning. The roads were cleared by the people by 7th afternoon. Other reliefs came after clearing the road. The standard compensation on house, craft, gear and loss of life was paid in this village also.

5.5 PEDDAVALASA

Village Details

Peddavalasa is another important fisherfolk village 3.5 Kms. before Gadimoga on the Talerevu-Bhairavapalem road. Though there are small mangrove forests around, a continuous stretch (3.5Km. X 0.7Km.) Of land between Gadimoga and Peddavalasa is occupied by shrimp farms without any trace of mangroves. Peddavalasa has 250 - 300 houses.

Fishing Activities

There are few fishermen who go on sea fishing on motorised Navas. There are about 100 mechanised boat workers. Majority of the fisherfolk are engaged in river /creek and Kakinada Bay fishing. Shrimp seed collection is another major occupation, both in the mangrove creeks and at the river mouth. There are about 500 Navas and 2 Dhonies in this villlage.

Cyclone warnings

No one acknowledged any message or warning before the 6th. Nov '96 cyclone, though some heard it over the radio. They did notice the other indications like water currents, weather condition etc..But did not predict such a large cyclone.

Losses Due to cyclone

The village, which is at a lower level than the road, got flooded upto to 1 m in the tidal waters. Many of the thatched and tiled houses got damaged. They did lose few navas and dhonies. About 8 people died while on the mechanised boats, one person among seed collectors, and one woman because of house collapse.

Relief after Cyclone

The relief from Government source started coming by the 7th. evening. The compensation provided by the Government were the standard ones.

5.6 CONCLUSION:

From the visits of the above villages, it was clear that the worst affected were those closer to the river mouths or sea and with minimum protective cover like Masanitippa. Villages with protective embankments like Komaragiri and Joggampeta were less affected. Peddavalasala and Gadimoga though located farther from the main river, the effect of cyclone appears to have been more due to less protective cover of mangroves or other natural barriers.

CHAPTER 6

CYCLONE WARNING DISSEMINATION SYSTEM

CYCLONE WARNING DISSEMINATION SYSTEM

6.1 STATE GOVERNMENT'S CYCLONE CONTIGENCY PLAN OF ACTION

The Government of Andhra Pradesh had brought out a "CYCLONE CONTINGENCY PLAN OF ACTION (CCPA)" in 1980 consequent to the 1977 cyclone disaster in Diviseema of Krishna District. The document, a 32 page booklet is available with Revenue Department.

There are 9 Chapters on the following topics.

I General Set up at State and District level

II Visuality of Natural Calamities, Cyclone Forecasting and Warning

III Action immediately before the occurrence of a Cyclone

IV Action after receipt of Second Warning

V Post Cyclone Measures

VI Community preparedness - Mass Publicity

VII Visuality of Natural Calamities, Flood Warning

VIII Measures to be taken by Government Departments

IX Establishment of Cyclone Stores

From the cyclone warning dissemination point of view we shall discuss the salient points of the concerned chapters I to IV and VI.

General set up at State and District Level:

The document envisages setting up of a high power standing committee, consisting of The Chief Secretary, Secretaries/Joint Secretaries of all related departments, Commissioner of Civil Supplies and Relief, Commissioner of Cyclone Relief, Regional heads of the three Armed Forces, Senior Officers of Railways, Telephones, Major Irrigation, Police, Roads & Buildings, Electricity Board, Directors of Agriculture, Medical & Animal Husbandry.

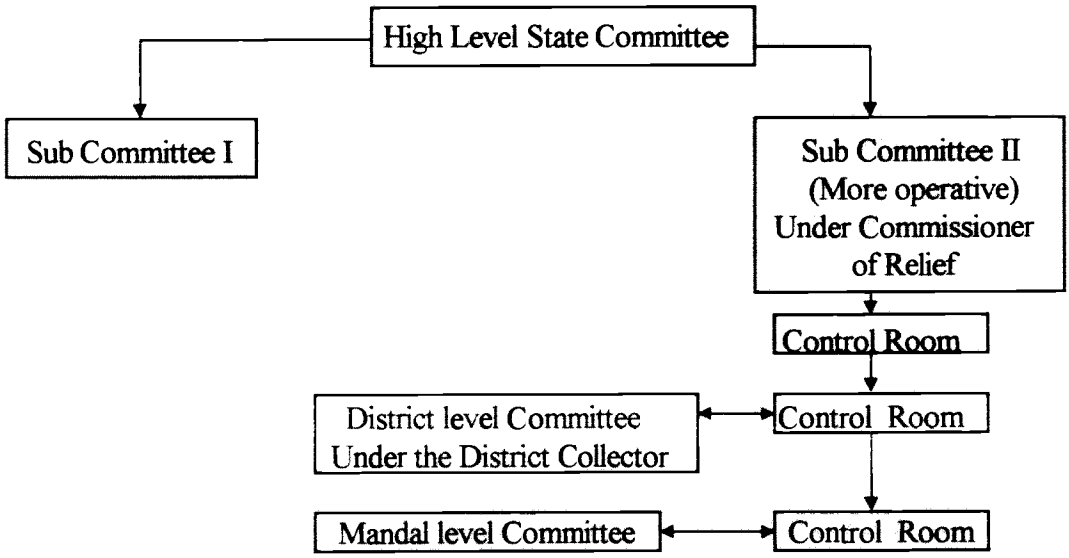
Two sub Committees, one consistuting the Chief Secretary and Secretaries and the other one headed by the Relief Commissioner (or Revenue Secretary) to coordinate the works of other agencies and relief works.

In practice the overall incharge of the warning dissemination and relief work is the Relief Commissioner.

The Commissioner of Relief liasons with all the other departments. There is a permanent cell and a control room to assist the Commissioner. This becomes a Joint Control Room and functions under the direct control of the Commissioner with a team of Officers from Revenue, Police and Army when a cyclone emergency arises.

Similar functional Committees are formed at the district level under the control of the District Collector and at the Mandal level under the Mandal Revenue Officers (earlier Tahsildars). (Fig6.1)

Fig 6.1: Set up at different levels during cyclone contingency



Visuality of Natural Calamities, Cyclone Forecasting and Warning:

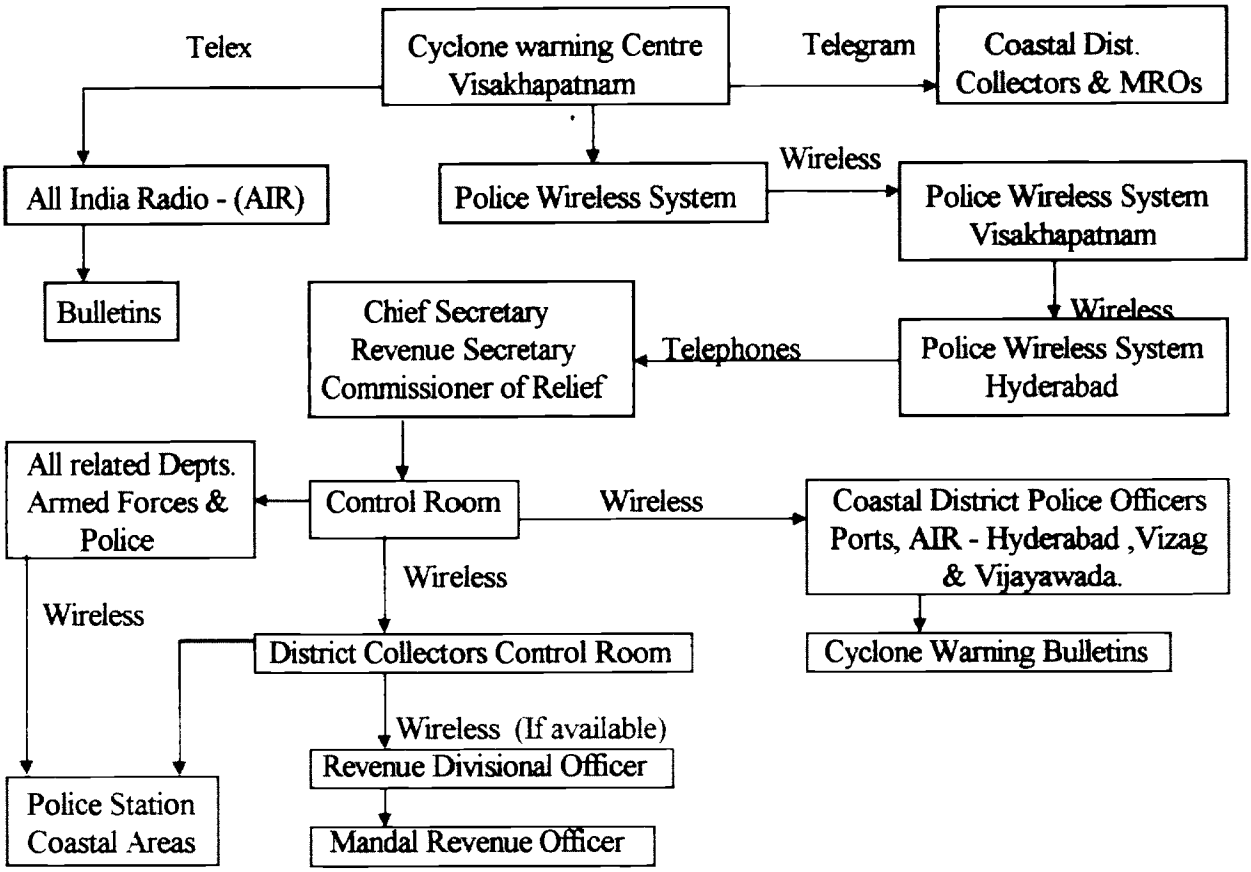
The information on the formation, path, intensity and speed of cyclones is detected and informed by the Cyclone Warning Centre, Visakhapatnam. This centre is directly under the control of the Area Cyclone Warning Centre (ACWC), Madras. The main path of the Warning System is shown in Fig 6.2. The stages of warnings are:

➸ First Stage: As the Cyclonic storm is located.

➸ Second Stage: - Cyclonic warning 60-90 Kmph
- Severe Cyclone 90-120Kmph
- Hurricane > 120Kmph

- The All India Radio will continue to give more frequent warning bulletins as the stages go upward. This will be broadcast by Hyderabad, Visakhapatnam and Vijayawada Stations.
- Ports to be informed by landline telegrams. Ports to hoist visual signs, during day and lights by night.
- Fisheries Officers of the Coastal district to be informed directly by the Storm Warning Centre by high priority land line telegrams.
- Priority channel advised is the Police Wireless System.

Fig 6.2 Path of cyclone warning dissemination



Action immediately before and during the Occurence of a Cyclone:

The Chapter III of the Cyclone Contingency Plan of Action (CCPA) describes more about the preparedness and further.

It envisages :

⇒ Convening the district committee and ensuring sufficient stock of emergency material, Vehicle provisions, equipment, etc.
⇒ Publicising the warning at village level.
⇒ Police to keep VHF sets ready
⇒ Electricity Dept. to cut supply
⇒ Storage of sufficient water by P.W.S.
⇒ Arranging diesel generators
⇒ Informing local voluntary organisations
⇒ Readiness of roads, irrigation control system
⇒ Stopping Public transport to avoid passengers getting standard.
⇒ To keep ready Trucks/Boat for supply of material.
⇒ The Asst. Director of Fisheries to arrange to inform fishermen villages.
⇒ Readiness of Health & Hospital services.
⇒ To alert army.

⇒ Mandal level Officers to act according to radio broadcasts, not relying solely on weather telegrams.

Action after receipt of Second Warning:

This Chapter envisages mainly the following:

- Alerting Air Force to keep Coastal Strip helicopters ready for assessment of damage after cyclone.
- Evacuation of people from low lying areas
- Relief to stranded Passengers
- Declaration of local holidays to educational institutions
- Stock of food grains
- Stoppage of traffic on National highways
- District Superintendent of Police to install mobile wireless sets
- All village Munisiffs to arrange ringing of bells in Temples and Churches in addition to tom-tom.

Community Preparedness - Mass Publicity:

The Chapter VI of CCPA describes various strategies of community preparedness (in non-cyclone times itself) especially before and during the cyclone prone seasons (i.e., April to May & September to December).

The means of communication and awareness building such as educational media, radio, press and films, posters hand bills, etc., are suggested.

A detailed account of the following are given

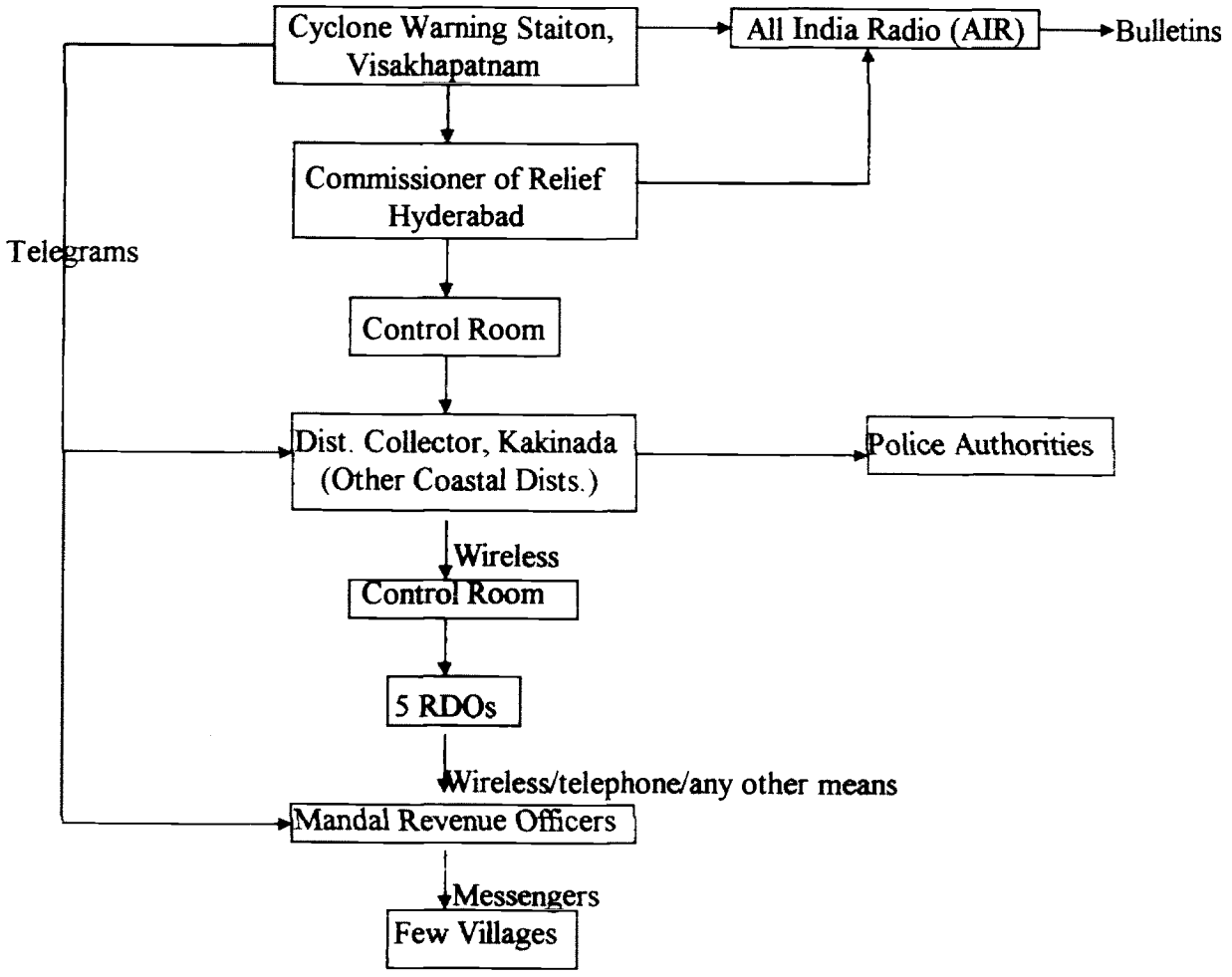
⇒ Dos & Don'ts during cyclone
⇒ Precautions to be taken
⇒ Principles to follow while evacuating
⇒ The precautions to be taken at port
⇒ MROs to communicate to vulnerable villages, especially to villages with telephone connections
⇒ Keeping community radio sets in the village in good condition, nominating a person to hear and communicate the messages accordingly to the villagers.
⇒ Local Inspector of Police to inform villages.
⇒ Divisional Engineer, telephones to communicate the warning to public call offices and ensure that persons in charge of the public call office communicate the same to villagers.
⇒ Asst. Director of fisheries to arrange communication to fishermen villages.

⇒ Communication to villages without any other facility to be taken by Police Constables or special messengers.

6.2 CYCLONE WARNING DISSEMINATION BEFORE NOVEMBER 6, 1996 CYCLONE

We shall try to look into the cyclone warning dissemination on 5th and 6th of November 1996, taking the case of East Godavari district and specifically Bhairavapalem, Balusutippa and similar areas. The major path of communication followed is given Fig.6.3.

Fig.6.3 Cyclone Warning Dissemination Path Followed on 5th & 6th November 1996



Messages to District Collector, Kakinada and RDOs/MROs:

The sequence of messages received by the District Collector and communicated to RDOs/MROs are summerised below:

It was noted that the first information on the depression in the Bay of Bengal, South east of Visakhapatnam was received by the District Collector, Kakinada, at 1020 hrs on 5th Nov 1996. The message was passed on to RDOs immediately.

By afternoon of 5th, message to hoist signal No.3 at Kakinada port was received. Control room was opened at Collectorate on the same evening.

Messages were again sent in the evening of 5th. Nov to RDOs for onward transmission to MROs to open control room and inform fishermen not to venture into sea. Few more messages from Relief Commissioner were also received and transmitted.

Auto fax message from CWC, Visakhapatnam that cyclone may cross between Visakhapatnam and Ongole (received 6-11-96, early hours).

Bulletin No.3 was received on 6th November at early hours before Bulletin No.2, which came by telegram late on 6th. The same was conveyed to RDOs.

Bulletin No.5 received at 3pm on 6th.

Clear instructions for evacuation reached the MROs only by 1615 hrs on 6th November 1996.

STORMY WEATHER SINCE 6PM & CYCLONE STRIKES AT 8PM.

Messages at MRO level and further action:

I.Polavaram MRO office:

Bhairavapalem comes under the jurisdiction of I.Polavaram mandal. But it is the farthest and the only village on the other side of Gautami. Geographically it is nearer to Tallarevu mandal. Hence the official understanding is that MRO Tallarevu informs the cyclone warning to Bhairavapalem. But the late message received by MRO Tallarevu could not be disseminated to Bhairavapalem. This office has a wireless set since March 1996. They received the first message by 5th evening. But it was taken as a regular message and control room was not opened in the night.

It was on 6th afternoon that a serious message was received by them through telephone from Mummidivaram. This message too came through the MDOs office asking for the schools to be closed and APSEB (Andhra Pradesh State Electricity Board) to cut off power supply. The telephone in MRO office was not working on that day. The Bulletins 2&3 from CWC Visakhapatnam, issued on 5th evening reached this office on 6th by telegram.

The warning dissemination to the villages got activated only by 6th afternoon. They did not attempt to inform Bhairavapalem. They sent village servants by bicycle to VAOs in the accessible villages. The villagers were informed by 'tom tom' not to venture into sea for fishing.

The control room functioned through out the night. But the wireless system also failed on 7th as the batteries got discharged. The police wireless too was not working, worsening the situation. Enumeration of losses began on 7th and the relief work too started on the same day.

The latest Disaster warning System Plate XI

But relief to Bhairavapalem could reach only by 9th.

During December 1996 cyclone (which did not hit Andhra Pradesh coast), preparedness was much better. Warning dissemination and evacuation were done with the balance amount of the relief fund of November 1996 cyclone. The warning for Bhairavapalem in this case was given by MRO Tallarevu.

I. Polavaram is one among the 3 MRO offices in which an advanced Disaster Warning System which is directly connected to Area Cyclone Warning Centre (ACWC), Central Madras through satellite link is installed. The device set up in the office with a dish antenna gives the warning starting with an alarm (siren) and followed by clear simple message in Telugu. This was set up only a few months back and its effectiveness is yet to be known.

Katrenikona MRO office:

The Katrenikona mandal covers some of the worst affected villages during November 1996 cyclone including Balusutippa and Masanitippa. This mandal did not have a wireless system (VHF) in 1996 and it was installed later. Hence they did not receive any message on the 5th evening.

On the 6th the MROs of Amalapuram division had a regular meeting at RDO office Amalapuram where they received the Bulletins 2 & 3 and were sent back to their respective offices for warning dissemination. Hence the warning dissemination from Katrenikona started only by the 1530 hrs on 6th afternoon. Village servants were sent for disseminating the message. Balusutippa and Masanitippa were among those far off villages, which could not be reached. The telephone in Balusutippa was reported not to be working at that time.

The officers started enumeration work on 7th. Relief work and relief materials started reaching village from 8th.

During the subsequent cyclone of December, '96 (this did not hit the AP coast) Warning Dissemination System was better and people were evacuated even from Balusutippa. This was because the MRO had sufficient balance under the November, '96 cyclone relief fund at his disposal.

Messages through All India Radio:

The All India Radio, Hyderabad, Visakhapatnam, Vijayawada, started giving continuous cyclone warning bulletins from 5th night onwards.

6.3 DISCUSSIONS ON THE EXISTING CYCLONE WARNING DISSEMINATION SYSTEM

The existing Cyclone Contingency Plan of Action (CCPA) as well as the main features of the Cyclone Warning Dissemination System (CWDS) followed in November 1996 was described above. In the background of the experience of the 6th. November 1996 cyclone both the strengths and weaknesses of the CCPA as well as the CWDS followed during the particular cyclone is discussed.

Strengths of the System:

- The CCPA had given a systematic plan of action with systematic structures at State, district and mandal level to handle the emergency situation, with the Revenue Department as a focal point.
- The control rooms at various levels and communication chain suggested are fine.
- The need, importance and methodology involving other departments have been given importance.
- Precautionary measures and preparedness at various levels too have been described
- The need of taking assistance from the Armed Forces for aerial surveys and wireless communication is specified.
- Evacuation of people from the low-lying areas and use of the Cyclone Shelters as far as possible are part of safety measures.
- The community preparedness at village level and the role of different departments/officials in warning dissemination system are emphasised.

Weaknesses of the system:

The major weaknesses of the present system as well as the drawbacks/limitations during the cyclone warning dissemination in the first week of November 1996 are discussed below.

We understand that in spite of the technical advancements there could be some limitations as far as the prediction system is concerned. The cyclone warnings from the CWS, quite often may not be able to correctly predict the possible path and the specific area likely to be hit. The ordinary storm may in short time develop into a severe cyclone or hurricane. In such cases the warnings and

actual occurrence of cyclone may be very close, leaving little scope for any time for sufficient warnings or precautionary measures.

In spite of the above limitations the system as well as the way it was handled on 5th & 6th November '96, needs a review from the following points of view.

- The chain of communication on warning dissemination is too long and follows a bureaucratic pattern. The need is for the message to reach the end user, i.e., the fisherfolk in the low lying villages in the coast and the fisherfolk in their fishing grounds (sea, isolated beaches, rivers including river mouths and creeks) at the earliest.

- The seriousness of the message got diluted down the chain.

- In spite of the advancement in the means of communication, it is not being used efficiently.

- Though the preparedness at state level and district level are satisfactory, the same is not true at the mandal and further downwards. For example, though control rooms were opened at the state and district levels on 5th November, '96, it was opened only by the afternoon of 6th November, '96 at the mandal office.

- Many of the coastal mandal offices do not have (or were not having) VHF or any other wireless systems. Those who had it, often faced problems with battery backup etc. The telephone in one of the mandal office was disconnected at that time. This points towards the need for updating and maintaining the communication system at the mandal officers.

- The means of Fast communication to the village and the infrastructure for the same are still very weak i.e.; **the most vital communication link to the village is the weakest.**

  The Mandal Revenue officers do not have motor vehicles. They may hire vehicles, but it was mentioned that they would be usually questioned if expenditures are made and if the cyclone do not hit at all.

  Sending messengers by walk or by bicycle to the remote villages, in an intricate network like the Godavari Delta and that too in the rough weather conditions are an unviable method.

  Some MRO's are given the fibre glass boats but without OBMs (Out Board Motors). These boats are kept at their offices, much far off from river or creek. Further there are no trained operators to handle the same.

- The CCPA envisages that the district and mandal level officers and the members of the committee should also hear the regular radio (AIR) bulletins and act accordingly, without waiting for the information through the formal links. But still there was no evidence of such activities during November '96.

- The CCPA is however silent on the use of Doordarshan (National network) and other Television Channels. This could be because CCPA was prepared in 1980, when the Televisions were not very popular.

- The only communication link to some of the remote villages is the village telephones. The telephones are quite often not used or are non-operational for most part of the time. For example the Bhairavapalem telephone was not used to communicate the warning and it has been defunct since the '96 cyclone. The telephone in Balusutippa has been defunct well before November 1996 and is yet to be repaired. This shows total apathy to these vital links of communication even after a bitter experience.

- The police were informed, but their role in warning dissemination to the village was not clear.

- Though the CCPA envisages an important role for the Department of Fisheries Officers in disseminating the warnings to fishermen villages, the November, 1996 experience shows that they were hardly involved at the warning dissemination stage. They played a role only in the post cyclone scenario, i.e., the enumeration of losses and relief.

- Even if the Fisheries Department had been given a role, it would have made hardly any difference, because the infrastructure and facilities available with the local Fisheries Development Officer (FDO) (not even a telephone), is much minimal than the MROs. Moreover the number of fishermen villages under the jurisdiction of an FDO is very high and far widely placed.

- The CCPA envisages an important role for the **Armed Forces Helicopters**, in case of post cyclone survey and relief. **Nothing is mentioned of their role in cyclone warning dissemination by some means to the vulnerable fishermen at Sea.**

- As severe and fatal cyclones do occur only at the frequency of few years and that too not at the same place or district, the Officials as well as the public (including fisherfolk) forget the seriousness of reacting and take warnings lightly. This is also because, even after warnings, many cyclones turn out to be weak or change path.

  Even the compulsory district level committee meeting twice a year, then becomes a formal routine, without much seriousness.

- Motivational and updating measures to keep up the seriousness and alertness to put the action plan into practice at short notice effectively is found lacking.

- The chapter VI of the CCPA gives various steps of community preparedness at village level. In none of the villages surveyed under this study, we could see evidence of any such regular extension activity or community preparedness. This seems to be one of the weakest parts of the follow-up of the CCPA guidelines.

  Public Radios /TVs/address system was not found in the villages.

- In areas like the Godavari delta, a very intricate network of rivers, creeks, canals, backwaters, and bays separate village from village and make accessibility difficult. In such case a very clear and detailed map is required at all levels in general and at the mandal level in particular, to clearly plan cyclone warning dissemination and relief services to the remote villages. It is surprising to find that the quality, clarity and details of the maps available at mandal level, may be at district level also, is very poor.

CHAPTER 7

SUGGESTIONS

SUGGESTIONS

We shall start with suggestions at the most important level i.e., the fisherfolk-village level and then upward to Mandal, District and State level.

7.1 FISHERFOLK VILLAGE:

The fisherfolk villages along the Coast, near river mouths and in the low-lying areas of delta are vulnerable during cyclones. Even the villages on higher elevation, but closer to rivers are important from the viewpoint of cyclone warning dissemination, because fisherfolk from these villages or from other villages would be fishing in the river nearby. Priority should be given to the most inaccessible and remote villages. The fastest and the most direct link is required to such villages.

The November, 1996 experience in Bhairavapalem and Balusutippa shows that the majority of deaths were among the shrimp seed collectors, just "one to two hour" away across the river. If a serious advance warning at least 12 hours before was given, all of them could have been saved.

Message:

The message on Cyclone Warning, reaching the village should be

- In local language
- Clear, simple, direct and specific. It should clearly indicate how serious is the cyclone, the intensity should be described in simple terms as to what could be the effects, where the cyclone is likely to hit, naming the likely areas rather than vaguely giving a range. Specific warning to the fishermen (of which areas should be specified) should also be given.
- It could also be a visual message (not just in writing) covering the above points.
- It should possibly be conveyed 24-48 hours before the possible cyclone.
- The message should be repeated as many times as possible depicting the increasing threats to make sure that the fisherfolk take it seriously.

Channel:

This is the most critical factor as far as cyclone warning dissemination to villages is concerned.

The message should reach even the remotest village through as many channels as possible. Multiple channels are required because many channels are likely to fail before or during a cyclone. The channels should be as far as possible direct to the village from the source of information. (In this case the CWC or Relief Commissioner). The time wasted on a bureaucratic chain with all the limitations of men, equipment and machinery, often results in a very late message or no message at all to the village. The cyclone never follows this chain, but hits the village directly.

The more conventional and popular channels should be made use of fully. In addition, more direct channels such as VHF or any satellite-linked channel should be used to send the message directly to the village.

Radio:

We have seen that the number of households with radio is very less, in the villages. In fact with the advent of cassette players and TVs, Radios have taken a back seat. Still it is one of the popular and important channels. The content of the message should be as described above. The bulletins should be given, cutting the most popular entertainment or information programmes, the fisherfolk are more likely to hear. Bulletins have to be repeated frequently.

The Radio reception during rough weather is likely to get bad. Some technical solution could be thought off, such as stronger signals, etc.

Television:

Television is becoming more popular in the villages. Both in Bhairavapalem and Balusutippa, we have seen that the number of TV sets is more than the Radios. Apart from the Doordarshan (National Network), Satellite channels like ETV, Gemini, etc., are seen as these villages have installed few Dish Antennae to receive such channels.

So the message has to be beamed not only through Doordarshan, but also the popular satellite channels during the regular news or weather forecast programmes. But more so by cutting the very popular entertainment or informative programmes. If separate programmes for fisherfolk on various socio-economic and technical aspects related to them could be beamed by these channels at fixed times regularly, the cyclone warning messages can also be given as part of this programme.

Telephone:

Village telephones, usually kept in community institution or in the house of any recognised person in the village is an important communication link to the village. Keeping this in continuous working condition and using it effectively during emergency is most important. Rechecking and maintaining the telephone before the cyclone months are important.

Public Address System:

The CCPA envisages publicity of cyclone warning through tom-tom in the village. Apart from this, the village public address system may have to be maintained in good condition and some committee or responsible person should be kept In-charge. This should again be ensured just before the cyclone prone months.

VHF System or Satellite based Communication System:

November 1996 experience shows that the weakest link of communication was between Mandal office and the village. In such a situation the most efficient and direct link would be through Wireless (VHF) or any Satellite based system, which would be relatively more reliable even in rough weather conditions.

VHF could be placed in the village at the houses of village head, or recognised leaders. In villages such as Bhairavapalem and Balusutippa where there are clear divisions such as sub hamlets (2 in Bhairavapalem and 3 in Balusutippa), One set each could be placed in each sub hamlet also.

The system installed in a fishermen village should be a modified/simplified version of the existing system usually found in the MRO office or Collectorate. In the regular set one has to continuously pay attention to the messages to make out which message is addressed to them. Some clear audible signal should precede an emergency warning.

In the village situation the satellite based system with a siren, followed by a message in Telugu would be advisable. Such units, which are satellite, linked (with dish antenna) to the Area Cyclone Warning Centre. Madras have been installed at some of the MRO offices recently (e.g. Mummidivaram, I.Polavaram and Amalapuram). If it is economically unviable for each village to have one, at least one such system can be installed for a cluster of villages.

Such systems need continuos maintenance backup.

Other Official Channels:

The existing system of villages being informed by the Mandal office could be continued. But this message should reach the village through the fastest and safest mode. Village telephone and mainly VHF are viable propositions.

Preparedness and Precautions at the Village:

Preparedness and alertness at the village level are most important, for them to receive the warning, to take the cyclone warning seriously and act accordingly. Apart from the general guidelines given in CCPA the following measures are essential.

- An efficient emergency committee consisting of village Sarpanch, village elders and Volunteers from the youth have to be formed. They will continuously oversee the systems installed, its maintenance and manning the system, especially during the cyclone prone months. For this, a participatory approach possibly through some local voluntary organisation is required.

- Trainings to manage, maintain and use the equipment should be given to the committee and specifically to them who are to man it.

- Community preparedness has to be created through time to time awareness, motivational programmes using audio, visual and other media especially before the cyclone month. The television channels too can play an important role.

  Motivation to keep transistors in all the fishing crafts they use, and hear it regularly are important.

- A group of young volunteers from each sub hamlet, or from each group of families doing specific type of fishing (e.g., Sea fishing in Nava, Shrimp seed collection, local riverine fishing) may have to be selected and given special motivation trainings, so that they can

take the risk of informing those at various fishing grounds. Such volunteer groups should have motorised navas in good condition (Possibly with a portable VHF set). These groups are to be provided with special life saving devices such as life jackets and life buoys to save their own life if they happen to be caught in the storm. These volunteers should be covered under some additional insurance protection.

- They may also have trainings on visual signals. They can carry portable loud speakers or some other more audible devices to warn fisherfolk.

The above measures are suggested from the point of view that, if sufficiently advance warning reaches the village, it is quite possible to inform the fisherfolk in the near vicinity of 2 to 3 hours from the village. The fisherfolk they inform may also include those from other villages fishing in that area.

- Cyclone shelters if at all built should be of good quality construction, should be used for some community needs such as school or community centre and maintained well, possibly under the supervision of the committee discussed above.

- Permanent houses (concrete) are the need of these villages, which even in the November 1996 could save lives. Housing schemes with sufficient people's contribution and even as repayable loan would be suggested.

- Apart from the above alternatives, evacuating villagers, during each cyclone threat, may not be practical.

- Protective embankments around the low-lying villages had proved to be much helpful during the recent cyclone. Hence flood protection embankments maybe considered around all low-lying villages.

- Conservation and regeneration of mangroves where ever the soil and tidal conditions permit or plantation of shelterbelts of casuarina or coconut in sandy areas could serve as lifesavers.

- Taking benefit of the Marine Fishing Regulation Act (MFRA) of the State Government, compulsory registration of all types of fishing crafts, including catamarans, and annual licensing system may be introduced. This helps in keeping track and identity of the crafts available in each village. The registration and annual licensing fee should include comprehensive insurance premium.

- At least biannual survey of fisherfolk households on demographic and fishing activity details and maintaining village wise records would help.

7.2 FISHERFOLK AT SEA:

The cyclone warning dissemination to fisherfolk at sea has to be separate, from the villages because, in a cyclonic situation informing the fisherfolk at deep sea may not be possible by the fishermen in the village.

The details regarding the nature of message and motivational needs are the same as in villages.

There is clear need of direct communication to the mechanised boats and navas in sea especially on the possible track of the cyclonic storm.

Here again the suggestions are in addition to the points in CCPA.

- Carrying transistor radios is highly necessary for all sea going vessels (except may be catamarans where it is not possible). Enough motivation should be given to the fisherfolk to hear the transistor/radio at least at the time of regular weather bulletins and any programmes for fisherfolk.

- The mechanised boats should be driven only by trained and licensed drivers. (Though this is mandatory, the general practice is to show the certificates of a trained driver for records sake and the boat would be driven by any untrained person).

- The possibility and viability of installing wireless sets (VHF) at least in selected mechanised boats and navas could be explored. The boats and navas in which the sets have to be installed shall be decided by finding the groups which usually go for fishing together in the same fishing grounds. One boat in such group shall be installed with the same. But the practicality of its maintenance and use in the marine atmosphere and possible protective measures may have to be thought off.

- There were clear suggestions from the fishermen that all the lighthouses within the visibility may use additional means of signals for cyclone warnings.

- The armed forces helicopters/planes could fly over the usual fishing areas under the cyclone threat giving some visual/audio signals.

- Keeping sufficient number life jackets and life buoys in the mechanised boats may be strictly enforced. At least the longer navas may be motivated to keep these life saving devices. It is however not practical to insist it on small navas for want of space.

7.3 MANDAL LEVEL:

- The responsibilities of CWDS at mandal level as specified in the CCPA have to be followed meticulously.

- All MRO offices should be installed with VHF sets and possibly the satellite linked cyclone warning dissemination device.

- All villages with telephone or VHF sets should be informed directly.

- MROs should have clear maps of the areas under their jurisdiction. Such maps can be provided by the AP State Remote Sensing Application Centre (APSRSAC), State Governments Shore Area Development Agency in addition to Survey of India (Detailed topographical maps of Survey of India for Coastal belts are restricted). MRO staff should be trained on map reading.

- MROs and other mandal level officers of different departments should have sufficient funds/infrastructure (including vehicle or vehicle hiring facility) at their disposal to effect speedy dissemination of cyclone warning to all the villages (including the remotest)

- There should be good coordination with the local Fisheries Department Officers to inform fishermen & fishermen villages. Hence grass root level fisheries officer too should have minimum infrastructure/facilities including VHF sets.

- MROs and Fisheries Department Officers could also involve local voluntary organisations from the warning dissemination stage onwards.

- The Officials/non-officials should be encouraged to take motorised navas or boats on hire from fisherfolk (operated by fisherfolk) to reach village across rivers and canals. There should be sufficient provision (at MRO's office) of life saving devices for the use of officials/non-officials using such modes to reach villages. There should also be special insurance protection to those who take such risks.

- The officials at Mandal level from Revenue and Fisheries Department have to ensure cyclone preparedness of communities at villages, including maintenance of equipment, dissemination system, etc. They should arrange for periodical awareness and motivational programme at the village.

7.4 DISTRICT LEVEL:

The CCPA is more or less a detailed one with respect to the responsibilities at district level. Few additional suggestions in this regard are given below:

- More coordination with armed forces and police maybe required.

- Help of voluntary organisations should be sought.

- More power and emergency fund utilisation facilities should be given to MRO.

- Help of the Dept. of Fisheries Officials in cyclone warning dissemination to fisherfolk may be sought.

- Speedy transmission of the messages directly to the MROs and to the villages or fisherfolk in the sea should be ensured.

7.5 STATE LEVEL:

The CCPA is more clear on the responsibilities of officers at the state level. Some additional suggestions would be:

- To consider and ensure implementation of the suggestions made for various levels of CWDS and precautionary measures (village, fisherfolk at sea, mandal level and district level).

- Cyclone warning dissemination to be ensured through all possible channels (AIR, Doordarshan, Private Satellite TV channels and Press) in addition to Wireless and other communication systems.

- The latest and the speediest means of communication to be adopted.

- Apart from the messages to the district, as many messages to be sent to MRO, village level or fisherfolk at sea directly where ever possible.

- The help of the helicopters of the armed forces may be sought for cyclone warning dissemination to fisherfolk at sea.

- To arrange with port authorities to give coloured signals from lighthouses.

- Ensuring a very effective network with CWC, Visakhapatnam, ACWC, Madras and various other stakeholders.

7.6 CONCLUDING RECOMMENDATIONS ON SELECTION OF BENEFICIARIES FOR THE PROJECT (TCP/IND/6712):

The various points regarding the distribution of radio communication equipment and life saving devices have been discussed under relevant heads of this chapter. However, for ready reference the concerned points are repeated below:

- VHF could be placed in the village at the houses of village head, or recognised leaders. In villages such as Bhairavapalem and Balusutippa where there are clear divisions such as sub hamlets (2 in Bhairavapalem and 3 in Balusutippa), One set each could be placed in each sub hamlet also.

- A group of young volunteers from each sub hamlet, or from each group of families doing specific type of fishing (e.g., Sea fishing in Nava, Shrimp seed collection, local riverine fishing) may have to be selected and given special motivation trainings, so that they can take the risk of informing those at various fishing grounds. Such volunteer groups should have motorised navas in good condition (Possibly with a portable VHF set). These groups are to be provided with special life saving devices such as life jackets and life buoys to save their own life if they happen to be caught in the storm. These volunteers should be covered under some additional insurance protection.

- The possibility and viability of installing wireless sets (VHF) at least in selected mechanised boats and navas could be explored. The boats and navas in which the sets have to be installed shall be decided by finding the groups which usually go for fishing together in the same fishing grounds. One boat or nava in such group shall be installed with the same. But the practicality of its maintenance and use in the marine atmosphere and possible protective measures may have to be thought off.

- In case of riverine & estuarine fisherfolk the best informer could be the fisherfolk of the nearest village. Still possibility and effectiveness of VHF sets to groups could be explored.

ANNEXURES

Annexure 1.

History of Some Major Cyclonic Storms that affected the Andhra Coast

Date	Area affected	Nature of damage Caused
13 October, 1679	Machilipatnam and the neighbourhood.	Storm surge of sea water was 6m deep. No. of ships and boats as also roofs of all houses blown away.
1706 (according to Mr.M. Toppings' - Astronomer to Madras Govt. - testimony in 1979) (Date not mentioned)	Port of Coringa in the East Godavari dist.	Storm surge and cyclone; large number of people are killed. in numerable trees uprooted and paddy fields ruined.
15 April. 1752	Visakhapatnam and the surroundings	No. of villagers ruined on the fort and its buildings suffered greate damage.
20 May 1787	Ingeram region in the East Godavari Dist.	Storm surge inundated the whole country all around and destroyed almost every thing. The whole town of Coringa and all the little villages around with the inhabitants carried away. Dead cattle and fallen trees sterewn all over the country side and the number of vessels were broken to pieces. Death toll was estimated "with moderation" at 10-12 thousand.
December. 1789	Coringa town and environs (East Godavari District)	Tidal wave swept the area; 20 thousand people perished and vessels at the mouth of Godavari carried away to Yanam also greately damaged.
11 October. 1795	Srikakulam and around (In the present Srikakulam Dist.)	Cyclone and flood of a calamitous nature; 1000 people lost their lives. Srikakulam town was a mass of ruin and not one house belonging to the inhabitants had escaped. Of the two weaving villages, nothing but the wells remained.
28 October. 1800	Guntur District in Central Andhra	Under the tremendous cyclone which brought untold devastation in its trail, several coastal villages were swept away and many lives lost; many people and cattle in the saltpan village of Chinnaganjam perished; sea water came upto a Pogoda situated on high ground but flode back itself.
10 May 1832	East Godavari District.	Sea broke in at Coringa and the water rose so high as to break open the Sea Customs House and destroyed all the records. Houses, trees, boats, etc., were destroyed. It appeared to have also extended upto Rajahmundry town which too was greatly damaged. Large numbers of cattle were destroyed and the loss of life in the villages near the sea was extensive.

Date	Area affected	Nature of damage Caused
1839 (Date not mentioned)	Coringa in the East Godavari Dist.	Cyclone and storm surge killed about 30,000 people. 'The number of vessels from 100 to 200 tons that werre high and dry, miles inland, some bottom up gave the country the appearance of having been visited by a party of gigantic demons who had been throwing the huge hulls at one another.
19 November. 1879	Krishna District	Disastrous cyclone and storm surge caused immense destruction of life and property in Bapatla, Reepalle and Vijayawada taluks. The country was inundated for miles, the Commamur canal breached in every direction and wet crops were entirely destroyed.
6-8 December 1879	Visakhapatnam andd Godavari Dists.	Cyclone and floods; 1414 human lives were lost, 500 cattle perished and 9000 houses destroyed. Damage to roads and irrigation works was very heavy.
1 November 1864	Machilipatnam in Krishna Dist.	One of the worst cyclones in histroy the associated storm surge rose 4 metres high. affesected 130Km of coast andd penetrated 28Km inland. 30,000 fell victim to the catastrophe. Innumerable cattle were destroyed and damage to roads, buldings and trees indescribable.
1 November 1927	Nellore region	The cyclone was most severe 40 to 50Km north and south of Nellore. Almost all buildings suffered damage, 629 people were killed and 50,000 heads of the cattle wer destroyed. Cuddapah district was also badly damaged
28 October 1936	Guntur District	Bapatla taluk was worst affected by the cyclonic storm; 233 lives were lost and 32.746 families were rendered homeless.
27 October 1949	Machilipatnam of Krishna District	Cyclonic storm and storm surge 4 mts. high went 15Kms. inland; 800 people died and million acres of paddy were ruined.
17 May 1969	Guntur, Kirshna and West Godavari Districts	Severe cyclone and heavy rain. Death toll was 608. Five coastal villages of Divi island were wiped out by a storm surge. Loss of paddy crops in Krishna and East Godavari Districts was estimated at Rs.20 crores.
7-8 November, 1969	East Godavari, West Godavari, Krishna and Visakhapatnam Districts	Devastating cyclone and surge that rose to 3 metres affected the entire coastal region; water spout occurred in the Kolleru Lake; 250 people were killed, 35,000 livestock lost and 400,000 houses damaged. 18 lakhs acres of paddy land ruined causing loss of Rs.65 crores.
19, November, 1977	Diviseema (Krishna Dist.)	6m storm surge killing 10,000 people in 60 villages over an area 80Km X 60Km.

Dr.K.L. Rao Committee's Recommendations

Following the Andhra disaster, an Expert Committee headed by Dr.K.L. Rao, former Union Minister of Irrigation and Power, made a study of the causes of large scale devastations, and has made several suggestions for preventive measures. Among the recommendations made by the Committee, those of meteorological importance are: (1) development of casuarina an other plantations upto 3Kms wide along the sea coast to check the ferocity of winds and consequently reduce the effect of the tides, and (2) establishment of a research laboratory at Andrha University, Waltair to supply timely information and general literature to the coastal people regarding the formation, movement and other significant features of cyclones so that steps canbe taken promptly to mitigate distress. In its recommendations for protective measures, the Committee has accorded primary importance to collection and dissemination of cyclone data and has suggested the immediate establishment of an 'S'-Band radar station at Machilipatnam. It has suggested setting up of self-recording rain guages and anemometers at selected places along the Andhra Coast, for the measurement of winds, comunication of this data at different times should also be arranged. The Committee has also suggested the setting up of two special organisations, one based at machilipatnam and the other at Visakhapatnam, for taking systematic action against cyclone havoc and for the provision of special aircraft with necessary meteorological instruments for reconnaissance flights at the centre of cyclonic storms to report the direction and speed of winds and related features.

Source: Subramaniyam, 1978

Annexure 2.

TOR Base Line Survey - Duration 4 Weeks

A. Desription of Activities/Services

In preparation for the implementation of TCP/IND/6712 and to increase its effectiveness, AFPRO will, in collaboration with the DOF officials designated to the project, and other concerned authorities, be responsible for carrying out a study of the area: Locations Bhairavapalem and Balusutippa and near by villages. The study will specifically cover the following:

- investigate with the assistance of topographical maps, the reasons for the effect being more severe on these villages rather than others; and determine to what extent has coastal development effected the natural resistance of the topography to cyclone damage.

- obtain a demographic profile of the villages, with population detailed by gender, age, education, wealth and occupation; and specify numbers, sizes and types of fishing craft & gear (not necessarily operated from craft), whether or not motorised. Describe major distinct population groupings, normal survival strategies, effects of motorisation, and traditions of weather forecasting.

- describe services provided to the villages - education, health, water, electricity, phone and extension, etc.

- investigate the nature of fishing operations, types of damage which occured, fishing vessel crew profiles, fishermen responses to crises at sea and on land, survival strategies, and their perceptions of strategies for increased safety.

- identify the gender, age and occupation of those dead or missing, as well as a general description of the exact circumstances of their deaths.

- investigate the current procedures for cyclone warning dissemination and subsequent actions which should take place in respect of remote villages; describe the constraints to evacuation, and evacuation versus protection.

- investigate the warnings actually received in the villages, the channels through which the warnings were received, the resultant reactions to these warnings, and the number of persons evacuated.

- describe the rescue and assistance services put into place following the cyclone, and their effectiveness.

- present recommendations concerning improvement of CWDS and measures to decrease the loss of life in these and similar villages.

- put forward recommendations on choice of beneficiaries (and appropriate terms) and concerning distribution of equipment provided by the project.

The report will include a 3 page summary, and will be provided to the NPD and to the RAPA Operations Branch on hard copy (3 copies) and on disk on Word 6 format.

B. Output

The final product to be delivered by 31st December, 1997 will include a detailed report of the entire study, including all background documentation and data of the field appraisals.

C. Duration & Timing

The study will be completed by over a period of one month, from the date of agreement, and completed not later than 15th December, 1997.

Annexure 3A.

QUESTIONNAIRE USED IN BHAIRAVAPALM

INFORMATION ABOUT ONE COLONY (PETA)

NUMBER OF HOUSES :

CONCRETE :

TILED :

THATCHED :

NAME OF THE PETA:

NUMBER OF HOUSES DAMAGED IN NOVEMBER 6, 1996 CYCLONE			
TYPES OF HOUSES	FULLY	PARTIALLY	REBUILT
THATCHED			
TILED			
CONCRETE			

AVERAGE FAMILY SIZE					
TYPES OF HOUSES	TOTAL NUMBER	MEN	WOMEN	BOYS	GIRLS
THATCHED					
TILED					
CONCRETE					

NUMBER OF FAMILIES ENGAGED IN		
TYPES OF FISHING	CRAFT	TOTAL NUMBER
SEA	NAVA	
	MECH. BOAT	
BAY	NAVA	
CREEK	NAVA	
	SHOE DHONI	
SHRIMP SEED COLLECTION		

TOTAL FISHING CRAFTS IN THE COLONY				
TYPES OF CRAFT		NON-MOTORISED	MOTORISED	FIBRE
NAVA	SIZE			
	18'			
	24'			
	Above 24'			
SHOE DHONIES				
SORRAH BOAT				
SONA BOAT				

TYPES OF GEARS USED BY THE FAMILIES IN THE COLONY		
S.NO.	FISHING OPERATION	TYPES OF GEAR
a.	NAVA IN CREEK	
b.	SHOE DHONI IN CREEK	
c.	NAVA IN SEA	
d.	NAVA IN BAY	
e.	Directly in Creek without Crafts	

CRAFTS LOST/DAMAGED DURING CYCLONE				
TYPES OF CRAFT		NON-MOTORISED	MOTORISED	FIBRE
NAVA	SIZE			
	18'			
	24'			
	Above 24'			
SHOE DHONIES				
SORRAH BOAT				
SONA BOAT				

CYLCONE DEATHS IN THE COLONY				
	HOUSE COLLAPSE	IN CREEK	IN SEA	IN BEACH
MEN				
WOMEN				
BOYS				
GIRLS				

Annexure 3B.

QUESTIONNAIRE USED IN BALUSUTIPPA

COLONY (MUTTHA) INFORMATION

COLONY (MUTTHA) HEAD: MUTTHA:

NUMBER OF HOUSES

	TOTAL	With Migratory Fishermen Families	ELECTRICITY	RADIO	TELEVISION
CONCRETE					
TILED					
THATCHED					

NUMBER OF HOUSES DAMAGED IN NOVEMBER 6, 1996 CYCLONE			
TYPES OF HOUSES	FULLY	PARTIALLY	REBUILT
THATCHED			
TILED			
CONCRETE			

AVERAGE FAMILY SIZE					
TYPES OF HOUSES	TOTAL NUMBER	MEN	WOMEN	BOYS	GIRLS
THATCHED					
TILED					
CONCRETE					

NUMBER OF FAMILIES ENGAGED IN			
TYPES OF FISHING	CRAFT	No. of Families	No. of Fishermen
SEA	NAVA		
	MECH. BOAT (Sona/Sorrah)		
CREEK/RIVER			
One Day Fishing	NAVA		
	SHOE DHONI		
Migratory Fishing	NAVA		
	SHOE DHONI		
SHRIMP SEED COLLECTION			

TOTAL FISHING CRAFTS IN THE COLONY				
TYPES OF CRAFT		NON-MOTORISED	MOTORISED	FIBRE
NAVA	SIZE			
	18' (Small)			
	24' (Medium)			
	30' (Big)			
SHOE DHONIES				

TYPES OF GEARS USED BY THE FAMILIES IN THE COLONY		
S.NO.	TYPES OF FISHING	GEARS USED
a.	NAVA IN CREEK/RIVER	
b.	SHOE DHONI IN CREEK/RIVER	
c.	NAVA IN SEA	
d	Directly in Creek without Crafts	

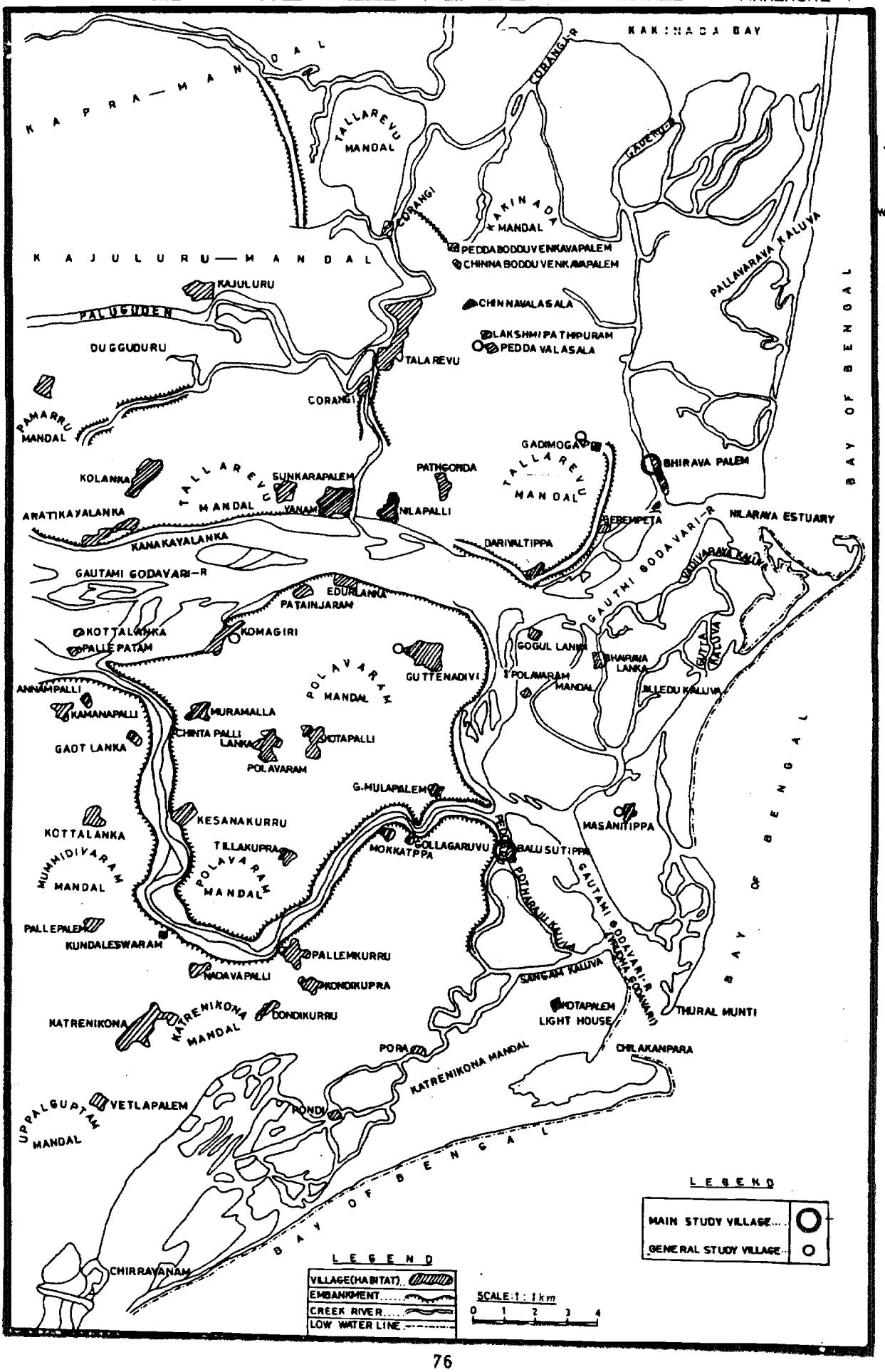
CRAFTS LOST/DAMAGED DURING CYCLONE							
TYPES OF CRAFT		NON-MOTORISED		MOTORISED		FIBRE	
		LOST	DAMAGED	LOST	DAMAGED	LOST	DAMAGED
NAVA	SIZE						
	18' (Small)						
	24' (Medium)						
	30' (Big)						
		LOST		DAMAGED			
SHOE DHONIES							
ANY OTHER CRAFT							

CYLCONE DEATHS IN TH COLONY				
	HOUSE COLLAPSE	IN CREEK/RIVER	IN SEA	IN BEACH (Seed Collection)
MEN				
WOMEN				
BOYS				
GIRLS				

LITERACY

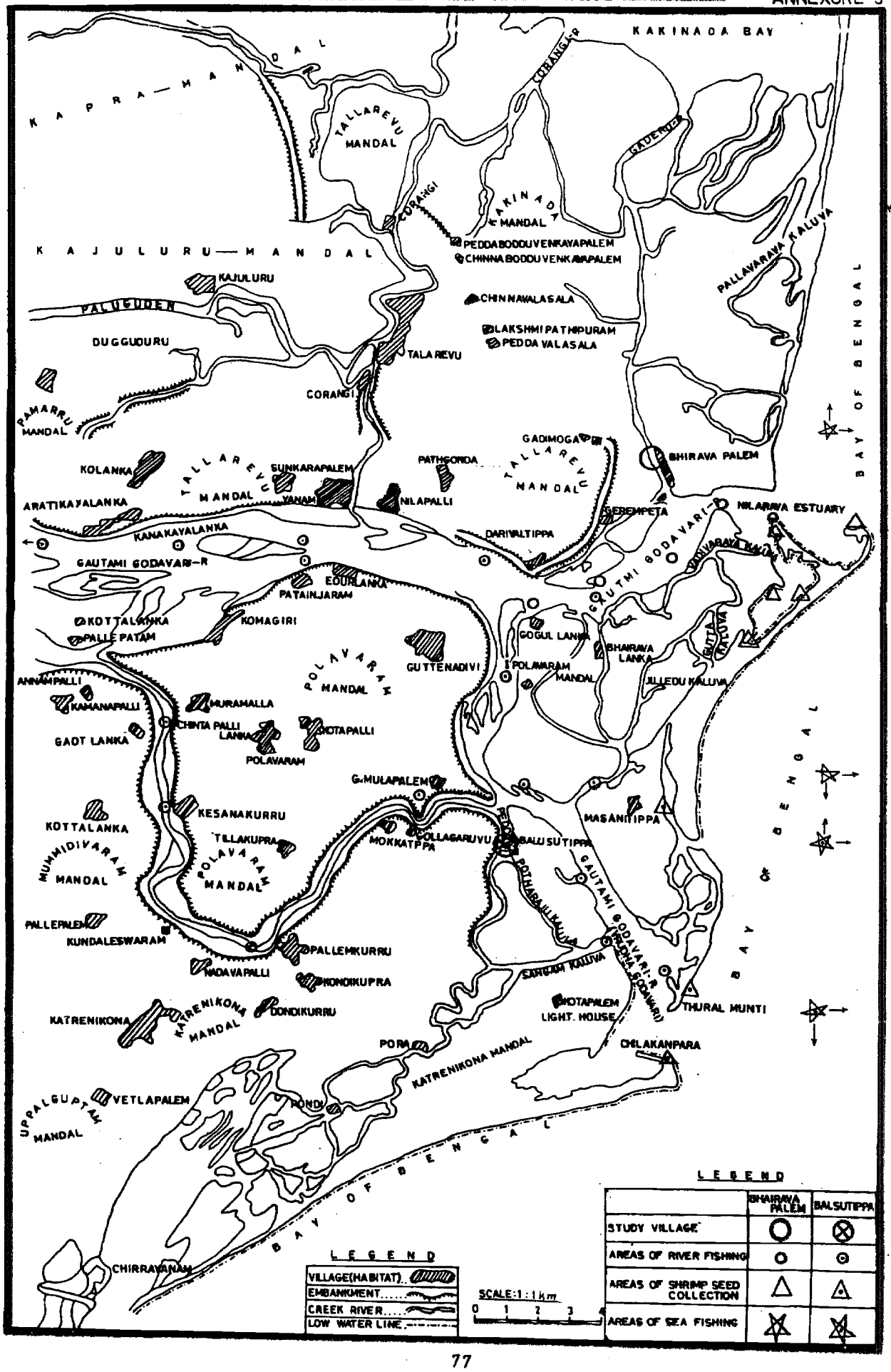
	MEN	WOMEN	BOYS	GIRLS
NUMBER				

STUDY VILLAGES SHOWN UNDER
AREA COVERING GAUTAMI GODAVARI ESTUARINE SYSTEM
WORST AFFECTED DURING 6 TH NOVEMBER 1996 CYCLONE ANNEXURE-4



FISHING AREAS OF STUDY VILLAGES SHOWN IN AREA COVERING GAUTAMI GODAVARI ESTUARINE SYSTEM WORST AFFECTED DURING 6 TH NOVEMBER 1996 CYCLONE

ANNEXURE-5



LEGEND

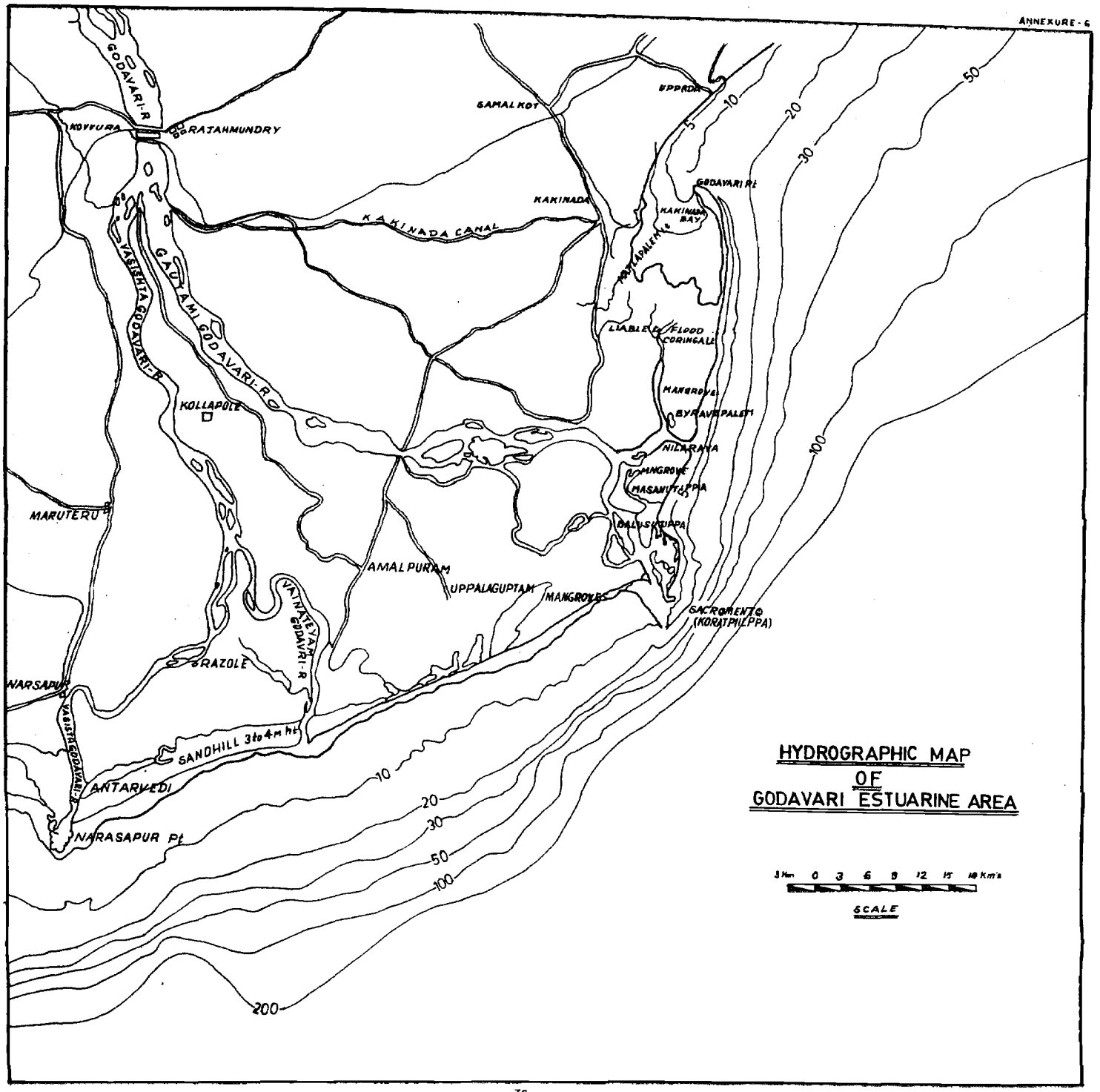
	BHAIRAVA PALEM	BALSUTIPPA
STUDY VILLAGE	○	⊗
AREAS OF RIVER FISHING	○	⊙
AREAS OF SHRIMP SEED COLLECTION	△	⊿
AREAS OF SEA FISHING	✡	✡

LEGEND

VILLAGE(HABITAT)	
EMBANKMENT	
CREEK RIVER	
LOW WATER LINE	

SCALE: 1 : 1 km

0 1 2 3


GODAVARI-R
KOVVURA
RAJAHMUNDRY
GAMALKOT
UPPADA
KAKINADA
KAKINADA BAY
KAKINADA CANAL
GODAVARI PT.
VASISHTA GODAVARI-R
GAUTAMI GODAVARI-R
KOTIPALEM
LIABLE TO FLOOD CORINGALI
MANGROVES
BYRAVAPALEM
NILARAYA
MINGROVE
MASANITIPPA
BALUSUTIPPA
KOLLAPOLE
MARUTERU
AMALPURAM
UPPALAGUPTAM
MANGROVES
SACRAMENTO (KORATIPILPPA)
VAINATEYAM GODAVARI-R
RAZOLE
NARSAPUR
VASISTA GODAVARI-R
SANDHILL 3 to 4 m ht
ANTARVEDI
NARASAPUR PT.
10
20
30
50
100
200
HYDROGRAPHIC MAP
OF
GODAVARI ESTUARINE AREA
3 Km 0 3 6 9 12 15 18 Km's
SCALE

ANNEXURE 7.

CONSOLIDATED DATA OF BHAIRAVAPALEM

	TEERTHALAMUNDI								BHAIRAVAPALEM														TOTAL
PETA	1	2	3	4	5	6	7	S.T	8	9	10	11	12	13	14	15	16	17	18	19	20	S.T	
No. of houses	75	68	56	53	50	47	52	401	59	35	25	31	30	23	21	59	50	15	60	50	70	526	927
Concrete	5	8	4	3	0	2	2	24	2	1	1	0	0	4	3	0	1	2	1	3	6	24	48
Tiled	15	20	12	15	5	5	10	82	7	2	4	1	1	4	5	7	4	3	10	1	8	57	139
Thatched	55	20	40	35	45	40	40	295	50	32	20	30	29	15	13	50	45	10	49	46	56	445	740
Electrified	50	43	41	43	25	29	27	258	10	3	4	3	5	12	9	7	10	7	21	0	57	148	406
With Radio	0	0	0	0	0	0	1	1	2	4	0	6	3	4	0	0	0	0	0	2	9	30	31
With TV	5	5	20	7	2	5	2	48	5	1	0	0	1	3	2	27	3	5	1	0	6	54	102
Damaged Houses																							
Thatched																							
Fully	40	35	35	35	40	40	35	260	50	32	0	30	29	15	13	50	45	10	30	46	56	406	665
Partial	15	5	5	0	5	0	5	35	0	0	20	0	0	0	0	0	0	0	0	0	0	20	55
Tiled																							
Fully	10	15	10	10	3	3	7	58	0	0	0	0	0	0	1	0	1	0	0	1	0	3	61
Partial	5	5	2	5	2	2	3	24	7	2	3	0	1	3	4	7	3	3	10	0	4	47	71
Concrete																							
Fully	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Partial	1	1	0	1	0	1	1	5	2	0	0	0	0	0	3	0	0	2	1	3	6	17	22
Family Size Average																							
Concrete																							
Male	3	3	3	6	0	3	6	87	4	3	4	0	0	4	4	0	2	5	4	3	6	104	191
Female	3	3	3	6		3	6	87	3	3	4	0	0	4	3	0	1	5	5	2	3	78	165
Boys	6	7	7	6		7	10	159	5	4	2	0	0	1	1	0	1	1	3	1	3	50	209
Girls	6	7	8	6		5	10	166	5	1	6	0	0	1	2	0	1	5	4	1	4	69	235
Tiled																							
Male	2	2	2	3	2	2	2	179	2	3	4	4	2	2	3	4	3	1	2	4	7	188	367
Female	2	2	2	3	2	2	2	179	2	3	4	2	1	3	3	4	3	1	3	3	4	174	353
Boys	4	5	6	5	4	4	5	397	3	0	5	2	0	1	1	3	3	5	2	4	2	141	538
Girls	4	6	7	5	4	4	5	429	3	1	4	0	3	1	1	1	2	3	2	2	2	113	542
Thatched																							
Male	2	2	2	2	2	2	2	590	2	5	2	2	1	2	4	3	2	3	2	4	2	1135	1725
Female	2	2	2	2	2	2	2	590	2	5	2	3	1	3	5	3	2	6	1	3	2	1128	1718
Boys	4	6	5	4	4	5	5	1380	3	1	3	2	3	1	1	4	3	7	2	4	1	1160	2540
Girls	4	6	6	5	4	4	3	1413	3	3	2	1	1	3	1	3	2	3	2	2	2	877	2290

Teerthalamundi

1. Kaladi
2. Sorrahvaripeta
3. Geethalupeta
4. Yerravenkaiahpeta
5. Sangadipeta
6. Karripeta
7. Avudadipeta
8. Prishingipeta
9. Rekadipeta
10. Kamadipeta
11. Chintavanipeta

Bhairavapalem

12. Sangadipeta
13. Penmadipeta
14. Revupeta
15. Oletipeta
16. Penmadipeta
17. Rekadipeta (II)
18. Karripeta
19. Kamadipeta (II)
20. Rekadipeta (III)

	TEERTHALAMUNDI								BHAIRAVAPALEM														TOTAL
PETA	1	2	3	4	5	6	7	S.T	8	9	10	11	12	13	14	15	16	17	18	19	20	S.T	
No. of Families engaged in																							
Sea Fishing																							
Nava	40	30	35	30	40	30	60	265	30	25	20	24	3	6	21	57	50	15	60	50	40	401	666
Mech.Boat	15	35	40	15	25	25	10	165	10	0	0	6	0	2	0	0	5	0	0	0	20	43	208
Bay Fishing																							
Nava	10	2	2	5	5	5	10	39	0	0	0	0	0	0	0	0	0	0	0	0	5	5	44
Creek/River																							
Nava	2	5	3	0	5	5	10	30	20	25	20	24	27	8	0	57	0	15	60	0	0	256	286
Shoe Dhoni	1	0	0	0	0	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Seed Collection	60	40	40	50	50	40	50	330	10	10	0	6	27	5	5	0	0	0	0	50	10	123	453
No. of crafts																							
Nava																							
Small Mech.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non Mech.	0	5	5	0	0	0	5	15	10	25	0	24	27	10	24	150	25	20	30	60	25	430	445
Medium mech.	0	0	0	0	20	0	0	20	0	2	2	0	3	6	7	50	0	10	10	10	30	130	150
Non Mech.	30	30	30	30	25	30	30	205	6	0	15	0	0	0	0	0	0	0	0	0	0	21	226
Big Mech.	20	15	20	20	15	25	10	125	0	0	0	0	0	0	0	0	0	0	0	0	30	30	155
Shoe Dhoni	1	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Mech. Boats																							
Sorrah	10	12	12	10	7	5	2	58	0	0	0	1	0	1	0	0	0	0	0	0	12	14	72
Sona	4	8	6	5	7	3	3	36	3	1	0	0	0	2	0	0	0	0	2	0	0	8	44
Cyclone Loss/Damage																							
Nava																							
Small	0	5	5	0	0	0	5	15	0	0	0	10	20	16	24	50	15	20	25	60	10	250	265
Medium mech.	0	0	0	0	15	0	0	15	12	2	2	0	0	4	7	10	0	10	10	10	25	92	107
Non Mech.	20	30	30	25	20	25	25	175	0	20	15	0	0	0	0	0	0	0	0	0	5	40	215
Big Mech.	20	15	20	15	15	20	7	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
Shoe Dhoni	1	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Mech. Boats																							
Sorrah	7	10	10	7	7	4	2	47	0	0	0	1	0	0	0	0	0	0	0	0	10	11	58
Sona	3	6	5	5	3	3	3	28	0	0	0	0	0	0	0	0	0	0	2	0	0	2	30
Cyclone Deaths																							
House Collapse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	6	6
In Sea	11	5	4	0	3	0	0	23	1	3	0	6	2	0	8	2	0	10	1	0	5	38	61
In River	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	4	0	7	7
Seed Collection																							
Men	0	0	0	0	0	0	3	3	7	0	0	0	0	0	0	0	0	0	0	0	0	7	10
Women	0	0	0	0	0	0	3	3	11	0	0	0	0	0	0	0	0	0	0	1	10	22	25
Boys	0	0	0	0	0	0	4	4	9	0	0	0	0	0	0	0	0	0	0	0	2	11	15
Girls	0	0	0	0	0	0	4	4	0	10	0	0	0	0	0	0	0	0	0	0	2	12	16

ANNEXURE 8

CONSOLIDATED DATA - BALUSUTIPPA

KOTHA PETA								
MUTTHA		1	2	3	4	5	6	Sub Total
No. of Houses		70	90	120	80	58	100	518
Concrete		20	8	15	1	3	5	52
Tiled		10	15	10	11	1	2	58
Thatched		40	67	95	68	54	93	417
Electrified		50	90	35	12	4	4	195
With Radio		10	13	25	4	11	0	63
With T.V		6	1	0	3	0	1	11
Migratory Fishing		51	20	35	10	26	50	192
Houses Damaged								
Fully		40	40	60	68	30	93	331
Partially		30	50	60	12	25	7	184
Rebuilt		70	90	120	79	55	100	514
Average Family Size								
Concrete								
Men		2	4	2	4	4	2	128
Women		2	4	2	2	3	2	123
Boys		2	2	2	3	3	2	108
Girls		2	3	1	3	1	4	105
Tiled								
Men		1	3	2	2	1	2	102
Women		1	3	2	2	1	1	100
Boys		2	2	2	1	1	4	90
Girls		1	2	2	2	3	4	93
Thatched								
Men		2	2	2	3	2	2	902
Women		2	2	2	2	2	2	834
Boys		2	2	3	2	3	4	1169
Girls		2	2	3	3	2	4	1183
Fishing Families								
Sea Fishing								
Nava	No.	30	80	40	10	20	60	240
	Families	15	20	20	5	20	15	95
Mech. Boat	No.	20	0	10	20	10	40	100
	Families	10	0	4	5	10	8	37
Creek Fishing								
One Day fishing								
Nava	No.	20	10	50	40	25	25	170
	Families	10	10	20	30	20	6	96
Dhoni	No.	30	30	20	40	10	40	170
	Families	15	10	10	30	4	10	79
Migratory Fishing								
Nava	No.	30	30	50	60	30	60	260
	Families	10	10	20	30	30	20	90
Dhoni	No.	40	30	30	70	30	90	290
	Families	15	10	15	30	5	30	105
Seed Collection	No.	100	50	100	0	120	80	450
	Families	40	25	40	0	30	20	155

KOTHAPETA Contd.

MUTTHA		1	2	3	4	5	6	Sub Total
Fishing Crafts								
Nava								
Small		40	0	0	50	50	50	190
Medium Non Mech.		0	100	80	30	65	20	295
Medium Mech.		20	4	0	5	0	0	29
Big Mech.		5	0	1	3	2	15	26
Shoe Dhoni		20	20	20	20	10	10	100
Crafts Lost '96 cyclone								
Nava								
Small	Lost	30	0	0	20	10	25	85
	Damaged	10	0	0	30	30	25	105
Med. mech	Lost	4	0	0	0	0	0	4
	Damaged	16	4	0	5	0	0	25
Non mech.	Lost	0	80	60	5	5	10	160
	Damaged	0	20	20	25	54	10	129
Big	Lost	0	0	0	0	6	10	16
	Damaged	3	0	1	3	0	5	12
Shoe Dhoni	Lost	15	10	15	3	0	5	48
	Damaged	5	10	5	17	10	5	52
Cyclone Deaths								
House Collapse		0	0	0	1W	0	0	1
River/Creek								
Men		1	2	0	1	0	1	5
Women		0	0	0	1	0	1	2
Boys		0	1	0	0	0	0	1
Girls		0	0	0	0	0	0	0
Sea								
Men		0	0	1	1	0	0	2
Seed Collection								
Men		4	10	0	3	0	5	22
Women		9	12	1	6	2	3	33
Boys		9	12	2	3	1	4	31
Girls		20	15	3	9	4	3	54
Literacy								
Men		1	10	15	20	25	4	75
Women		0	0	0	10	10	2	22
Boys		20	6	10	50	10	4	100
Girls		10	6	5	30	10	4	65

1. Oleti Ranganaikudu & Pemmadi Pattabhi
2. Oleti Sathiraju & Thadi Sriramulu
3. Oleti Paraiah
4. Pemmadi Ramudu & Malladi Suryanarayana
5. Pemmadi Satyam
6. Sangani Sagar & Pemmadi Veera Raju

BALUSUTIPPA

		MADHYAPETA																							
MUTTHA		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	s.t
No. of Houses		16	20	50	30	24	11	40	30	40	30	77	60	40	35	40	40	35	30	4	15	14	15	20	716
Concrete		1	0	3	1	4	5	1	1	1	1	4	2	3	0	4	0	0	0	0	0	0	1	3	35
Tiled		2	0	3	6	4	2	1	2	3	0	8	8	2	3	6	6	4	2	4	1	0	0	0	67
Thatched		13	20	44	23	16	4	38	27	36	29	65	50	35	32	30	34	31	28	0	14	14	14	17	614
Electrified		3	10	26	15	18	5	34	3	29	26	30	60	30	33	38	19	4	2	4	1	1	2	4	397
With Radio		1	1	2	1	0	2	0	0	0	0	12	6	0	0	0	0	4	2	1	2	0	0	0	34
With T.V		2	3	1	3	5	1	0	0	0	0	3	0	0	0	0	0	4	0	1	0	0	0	2	25
Migratory Fishing		1	1	0	0	0	0	8	0	1	0	32	6	5	4	0	21	35	17	4	15	5	7	0	161
Houses Damaged																									
Fully		14	20	45	23	17	4	31	25	32	29	71	51	37	34	34	37	31	3	0	2	14	10	17	581
Partially		1	0	2	6	3	2	5	4	1	0	4	7	0	1	7	1	4	27	4	13	0	5	3	100
Rebuilt		7	15	28	19	13	2	36	22	33	20	57	53	17	33	29	29	35	30	4	15	11	15	20	543
Average Family Size																									
Concrete																									
Men		2	0	2	2	2	2	3	2	3	2	3	3	2	0	3	0	0	0	0	0	0	2	1	79
Women		2	0	2	2	2	2	3	1	2	2	3	3	2	0	3	0	0	0	0	0	0	2	1	77
Boys		3	0	3	2	3	3	4	2	4	1	4	6	3	0	4	0	0	0	0	0	0	1	1	109
Girls		3	0	3	2	3	3	4	1	4	1	4	6	3	0	4	0	0	0	0	0	0	1	1	108
Tiled																									
Men		2	0	2	2	2	2	2	2	2	0	2	2	2	2	2	2	3	2	1	1	0	0	0	133
Women		2	0	2	2	2	2	2	2	2	0	2	2	2	2	2	2	3	2	1	1	0	0	0	133
Boys		3	0	3	3	3	3	3	2	3	0	2	3	2	2	2	2	4	1	3	1	0	0	0	172
Girls		3	0	3	3	3	3	3	2	3	0	2	3	2	2	2	2	2	2	1	1	0	0	0	158
Thatched																									
Men		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	0	1	2	4	1	1243
Women		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	1	1	3	1	1183
Boys		2	1	2	3	2	2	3	2	2	3	3	3	3	3	1	3	5	3	0	1	2	1	4	1611
Girls		2	1	2	3	2	2	3	2	2	3	3	3	3	3	1	3	2	2	0	3	2	1	2	1480
Fishing Families																									
Nava	No.	10	0	10	0	10	6	0	60	0	6	20	20	8	0	0	15	60	3	12	10	9	12	0	271
	Families	2	0	6	0	4	1	0	30	0	4	10	20	5	0	0	8	10	2	2	4	6	6	0	120
Mech. Boat	No.	0	10	10	8	5	6	10	0	10	8	10	5	5	6	10	10	8	4	0	0	0	8	3	136
	Families	0	2	10	4	3	4	10	0	10	6	2	5	5	3	5	8	6	3	0	0	0	5	2	93
Nava	No.	20	10	30	30	20	15	15	0	30	15	30	30	15	20	30	15	30	10	0	0	6	0	16	387
	Families	15	10	25	15	20	10	10	0	20	10	4	25	12	12	20	8	10	4	0	0	4	0	16	250
Dhoni	No.	15	20	10	30	0	0	25	5	12	18	15	20	6	10	50	18	30	10	0	0	5	0	0	299
	Families	5	10	8	15	0	0	19	3	6	8	2	8	4	6	10	9	10	4	0	0	5	0	0	132
Nava	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	60	12	30	12	12	0	186
	Families	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	2	10	5	6	0	63
Dhoni	No.	0	5	0	0	0	0	5	0	0	0	112	15	5	28	50	0	50	25	0	15	10	0	0	320
	Families	0	1	0	0	0	0	1	0	0	0	28	6	2	4	10	0	15	10	0	6	5	0	0	88
Seed Collection	No.	10	0	10	0	0	10	10	15	15	8	10	0	20	10	50	6	50	25	0	20	0	12	16	297
	Families	5	0	2	0	0	5	5	6	3	8	5	10	8	4	10	3	15	8	0	5	0	6	16	129

Madhyapeta Contd.

Fishing Craft																									
Nava																									
Small		0	0	0	0	0	0	0	0	0	15	16	0	0	0	0	0	0	2	0	2	0	0	3	38
Medium Non Mot.		15	5	30	10	10	5	20	15	0	0	0	80	20	15	25	10	10	6	2	10	6	9	16	319
Medium Mot.		0	0	0	2	0	0	0	3	1	0	26	1	1	0	0	0	10	0	0	2	0	0	0	46
Big Mot.		1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	10	4	2	0	1	1	0	23
Shoe Dhoni		5	10	5	1	5	0	20	6	8	15	30	40	15	10	10	20	10	3	0	6	3	2	0	224
Crafts Lost																									
Small	Lost	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	3	16
	Damaged	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	2	0	0	0	6
Med. mot	Lost	0	0	0	1	0	0	0	2	0	0	0	0	1	0	1	0	5	2	2	0	0	0	0	14
	Damaged	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	5	2	0	2	1	0	0	12
Non mot.	Lost	10	3	25	9	8	2	15	15	0	0	0	70	5	13	20	8	5	1	0	6	3	10	16	245
	Damaged	5	1	5	1	2	1	5	5	0	0	0	10	15	2	5	2	5	5	0	4	2	0	0	75
Big	Lost	1	0	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6
	Damaged	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3
Shoe Dhoni	Lost	3	7	4	0	4	0	15	4	7	10	0	30	10	8	8	15	1	0	0	4	0	0	1	131
	Damaged	2	3	4	1	1	0	5	2	1	5	0	10	10	2	2	5	9	2	0	2	0	0	1	66
Cyclone Deaths																									
River/Creek																									
Men		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	10
Women		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Boys		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Girls		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea																									
Men		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	4	10
Seed Collection																									
Men		0	1	1	1	5	0	2	2	0	1	4	3	1	1	0	1	2	0	0	0	0	0	1	26
Women		2	2	2	4	5	0	3	0	0	1	3	2	3	0	0	4	5	1	1	0	0	2	2	42
Boys		2	0	6	1	5	0	5	0	0	0	3	0	5	0	0	3	4	1	2	0	0	5	5	47
Girls		1	2	1	3	5	0	1	0	0	2	4	0	5	2	1	4	3	2	0	0	0	4	7	47
Literacy																									
Men		10	1	4	5	1	1	1	10	5	1	10	25	1	1	5	1	10	10	6	2	0	2	2	114
Women		5	2	2	2	1	2	2	3	2	1	10	10	0	1	1	1	0	4	2	0	0	0	0	52
Boys		5	3	15	13	4	4	3	2	5	2	5	30	3	5	2	5	20	6	2	1	0	2	6	143
Girls		5	4	9	10	4	3	3	2	8	2	5	20	3	3	2	3	10	3	0	0	0	0	4	103

1. Barre Bhairavaswamy
2. Meda Ramaswamy
3. Tirumani Satyanarayana
4. Tirumani Sattiraju
5. Ponnadi Galaiah
6. Damabina Veera Raju
7. Dandubrolu Durgaiah
8. Oleti Dharmarao
9. Sangani Arjunarao
10. Sangani Gangadhara Rao
11. Malladi Samudrudu
12. Kamadi Gangadhara Rao
13. Sangani Peddamasariah
14. Dandubrolu Veera Raju
15. Presingi Chinna Satyaraju
16. Palepu Dharma Rao
17. Meda Ramaswamy
18. Potabottula Sattiraju
19. Oleti Sattiraju
20. Meda Bhagawan
21. Tirumani Gangadhara Rao
22. Oleti Devaraju
23. Paleti Anaparthi & Karri Veeraraju

BALUSUTIPPA

		PATURU														
MUTTHA		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
No. of Houses		52	55	34	39	34	26	30	25	48	26	39	36	40	25	509
Concrete		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tiled		2	1	0	1	4	2	0	0	1	0	2	0	5	3	21
Thatched		50	54	34	38	30	24	30	25	47	26	37	36	35	22	488
Electrified		3	5	5	1	4	2	3	0	3	1	1	2	4	3	37
With Radio		2	0	4	2	5	3	4	3	3	0	1	0	1	6	34
With T.V		0	0	1	0	1	0	0	0	1	0	0	0	0	2	5
Migratory Fishing		0	0	8	29	10	26	0	5	21	17	22	0	0	10	138
Houses Damaged																
Fully		50	54	3	6	15	3	6	25	27	15	3	36	35	10	342
Partially		1	1	31	33	4	24	15	0	21	10	36	0	5	3	182
Rebuilt		50	54	32	39	19	25	11	25	48	25	38	36	40	13	472
Average Family Size																
Concrete		NIL														
Tiled																
Men		5	6	0	4	4	2	0	0	5	0	5	0	5	2	81
Women		4	8	0	4	2	2	0	0	5	0	3	0	4	3	72
Boys		1	5	0	3	1	3	0	0	4	0	4	0	4	2	58
Girls		3	4	0	4	4	3	0	0	2	0	1	0	3	1	58
Thatched																
Men		3	2	4	1	2	5	3	2	4	4	4	5	4	5	1622
Women		4	4	5	1	4	5	3	3	2	3	2	2	4	2	1531
Boys		2	2	1	2	1	1	1	2	2	2	4	4	2	2	1004
Girls		2	2	2	2	1	2	1	1	1	2	1	1	1	1	744
Fishing Practices																
Sea																
Nava	No.	45	42	16	30	30	0	7	0	100	16	16	10	20	15	317
	Families	30	6	4	15	15	0	5	0	20	8	4	3	20	15	145
Mech. Boat	No.	25	10	3	10	14	2	0	0	6	0	0	20	20	0	110
	Families	20	10	2	10	14	2	0	0	6	0	0	5	20	0	89
Creek/River																
Daily Fishing																
Nava	No.	0	0	60	30	30	0	45	20	8	0	16	6	15	14	244
	Families	0	0	22	15	15	0	30	15	6	0	4	3	10	10	130
Dhoni	No.	0	0	0	0	0	0	0	0	20	0	6	0	20	0	46
	Families	0	0	0	0	0	0	0	0	10	0	2	0	10	0	22
Migratory Fishing																
Nava	No.	36	100	12	25	30	48	0	15	120	26	40	0	0	30	462
	Families	12	20	3	6	10	15	0	3	15	8	20	0	0	10	122
Dhoni	No.	12	12	25	0	0	20	0	0	0	36	10	0	0	0	115
	Families	3	2	5	0	0	5	0	0	0	9	2	0	0	0	26
Seed Collection	No.	100	30	25	20	10	13	0	15	0	45	4	10	25	30	327
	Families	50	10	10	10	5	5	0	4	0	15	1	5	10	10	135
Others		0	0	0	0	0	0	0	0	0	0	8	0	0	0	8

1. Oleti Apparao
2. Dandubrolu Babaiah
3. Oleti Danishta
4. Palepu Apparao
5. Oleti Kameswara Rao
6. Vaideni Surya Rao
7. Dandubrolu Poturaju
8. Oleti Veeraraju
9. Palle Sattiraju
10. Ponnadi Nageswara Rao
11. Darmadi Meeraiah
12. Molladi Nagabhushanam
13. Kola Swamy
14. Vaideni Apparao

PATURU Contd.

Fishing Craft																
Nava																
Small		0	25	31	20	20	22	25	0	10	18	19	0	30	6	226
Medium Non Mot.		12	0	0	0	0	0	0	4	10	0	0	0	0	0	26
Medium Mot.		0	3	2	0	0	0	1	0	0	1	1	0	0	0	8
Big Mot.		1	0	2	0	10	0	0	0	1	0	0	0	10	0	24
Shoe Dhoni		5	1	5	4	0	3	0	0	2	8	2	0	0	0	30
Craft Lost																
Nava																
Small	Lost	0	15	4	10	5	2	10	0	5	10	3	0	8	2	74
	Damaged	0	8	0	10	0	10	15	0	10	0	0	0	0	2	55
Med. mot	Lost	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	Damaged	1	0	0	0	0	0	0	0	1	0	1	0	0	0	3
Non mot.	Lost	10	0	0	0	0	0	0	2	0	0	0	0	0	0	12
	Damaged	2	0	0	0	0	0	0	2	0	0	0	0	0	0	4
Big	Lost	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
	Damaged	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shoe Dhoni	Lost	0	4	2	0	0	0	0	0	0	5	0	0	0	0	11
	Damaged	5	0	0	3	0	3	0	0	2	0	3	0	0	0	16
Cyclone Deaths																
Creek/River		NIL														
Sea																
Men		1	3	0	0	0	1	2	0	0	0	0	2	0	0	9
Seed Collection																
Men		0	0	3	0	0	2	0	0	0	3	0	0	0	0	8
Women		0	0	3	0	0	1	2	0	0	1	0	0	1	0	8
Boys		0	0	8	0	0	0	0	0	0	0	0	0	2	0	10
Girls		0	0	2	0	0	0	0	0	0	0	0	0	1	0	3
Literacy																
Men		15	20	9	10	10	4	6	0	6	0	8	5	30	5	124
Women		6	10	3	0	15	0	2	0	2	0	4	3	5	0	50
Boys		20	20	10	6	15	3	6	1	10	6	10	6	10	5	128
Girls		10	10	5	4	10	0	4	0	5	3	8	4	10	10	83

CONSOLIDATED DATA . PETAWISE - BALUSUTIPPA

MUTTHA	KOTHAPETA	MADYAPETA	PATURU	TOTAL
No. of Houses	518	716	511	1745
Concrete	52	35	2	89
Tiled	58	67	21	146
Thatched	417	614	488	1519
With Electricity	195	397	37	629
With Radio	63	34	34	131
With TV	11	25	5	41
Migratory Fishing	192	161	138	491
Houses Damaged				
Fully	331	581	342	1254
Partially	184	100	182	466
Rebuilt	514	543	472	1529
Average Family Size				
Concrete - Male	128	79	4	211
- Female	123	77	8	208
- Boys	108	109	12	219
- Girls	105	108	12	215
Tiled - Male	102	133	81	416
- Female	100	133	72	305
- Boys	90	172	58	320
- Girls	93	158	58	309
Thatched - Male	902	1243	1622	3767
- Female	834	1183	1531	3848
- Boys	1169	1611	1004	3784
- Girls	1183	1480	1531	3407
Fishing Families				
Nava (Sea) - No. of Fisherfolk	240	271	317	828
- Families	95	120	145	360
Mech. Boat - No. of Fisherfolk	100	136	110	346
- Families	37	93	89	219
Local Creek/River - Nava - No. of Fisherfolk	387	244	170	801
- Families	250	130	96	476
Local Creek/River - S.Dhoni - No. of Fisherfolk	299	46	17	575
- Families	132	22	99	233
Migratory Creek/River - Nava - No. of Fisherfolk	260	186	462	908
- Families	90	63	122	275
Migratory Creek/River -S.Dhoni - No. of Fisherfolk	290	320	115	725
- Families	105	88	26	219
Seed Collectors - No of Families	450	297	327	1074
- Families	155	129	135	419
Others (Carpentary)			8	8
Fishing Crafts				
Nava - Small	190	38	226	454
Nava - Medium : non motored	295	319	26	640
: motored	29	46	8	83
Nava - Big : motored	26	23	24	73
Shoe dhoni	100	224	30	354

MUTTHA		KOTHAPETA	MADYAPETA	PATURU	TOTAL
Crafts Lost					
Small	- Damaged	105	6	55	166
	- Lost	85	16	74	175
Medium - Non-motorised	- Damaged	129	75	4	208
	- Lost	160	245	12	417
- Motorised	- Damaged	25	12	3	40
	- Lost	4	14	1	19
Big - Motorised	- Damaged	12	3	0	15
	- Lost	16	6	2	24
Shoe Dhoni	- Damaged	52	66	16	134
	- Lost	48	131	11	190
Cyclone Deaths					
House Collapsed	- Women	1	0	0	1
River/Creek	- Men	5	10	0	15
	- Women	2	5	0	7
	- Boys	1	0	0	1
	- Girls	0	0	0	0
Sea	- Men	2	10	9	21
Beach Seed Collection	- Men	22	26	8	56
	- Women	33	42	8	83
	- Boys	31	47	10	88
	- Girls	54	47	3	104
Literacy					
Male		75	114	129	318
Female		22	52	50	124
Boys		100	143	128	371
Girls		65	103	83	251

Annexure No.9

FISHING METHODS - BHAIRAVAPALEM

Marine Fishing:

In Bhairavapalem majority of the families are engaged in marine fishing. Fishermen from about 71% of the families are engaged in Sea fishing by Navas. Fishermen from nearly 22% of the families go for fishing by mechanised boats.

Sea Fishing by Navas:

Nava is a plank built boat and is a common fishing craft in the delta region of Andhra Coast. The Navas used for Sea fishing are the larger or medium types. The larger Navas are about 30' in length and now a days, motorised. Usually in board engines (10HP, 2 Cylinders or 1 Cylinder) are used. 20HP 2 Cylinders have been rarely used for very large Navas. The medium sized Navas are about 24' in length.. Usually only the motorised ones are taken to sea. It was indicated that atleast 80 Navas go for sea fishing regularly.

Usually overnight fishing or one day fishing is done. 8 to 10 people go by Nava for fishing. They fish to a distance of 10 -11 kilometers from shore(70-75m depth zones). The description of various gears used from Navas in sea fishing are given below.

Table A-9.1 ***Types of Sea Fishing Using Nava At Bhairavapalem***

Gears	Web No.	Mesh Size	Size of Net	Cost of net	Fishes obtained	Season
Chandavavala (Gill net)	2	6"	1200m x 11m	Rs.70,000 to Rs.75,000	Pomfret & Others	October - April
Panduvala (Gill net - bottom set)	24	6-7"	900m x 3.6m	Rs.30,000	Sea bass Croakers	Almost complet e year
Kivvala (Gill net)	1	6"	1000m x 11m	Rs.15,000	Various types	June - October

Hook and line or long line fishing is done occassionally.

The catch returns (after deducting operational costs) from the fishing are shared : 1/3rd. for the owner of the craft & gear and remaining among the crew.

Sea fishing in Mechanised boats:

As already seen in the earlier Table 3.3, there are considerable number of mechanised fishing boats operating from Bhairavapalem. The mechanised boats are basically small stern trawlers of mainly 2 types i.e., be Sona, Sorrah. Another smaller version Royya is also mentioned in Dept. of Fisheries records.

The specifications of Sona, Sorrah and Royya boats were reported as depicted in Table A-9.2.

Table A-9.3 *Classification of Mechanised Boats Bhairavapalem*

Type	Length	Engine Cap	Ice Capacity	Crew
Royya	10m	53.9-108HP	1.5 tons	7
Sorrah	11m	98-108HP	4 tons	8
Sona (or Dolphin)	Above 12m	108HP	10 tons	8-10

In the present survey 72 Sorrah boats and 44 Sona boats were reported from this village.

Most of the boats are registered in the Kakinada port and members of Kakinada based mechanised boat owners associations. Most boats anchor and land their catch at Bhairavapalem (i.e., on the Savithri Nagar side of Gaderu) and go to Kakinada for fueling etc.

Though the fishing duration by Sona boats are one week or more and sorrahs 3-4 days (Usually at Kakinada), most of the Bhairavapalem boats now go for short duration fishing of 1-2 days (that too especially during the cyclone prone months). Usually the Kakinada based boats move northward upto Paradeep or southward upto Machilipatnam. The peak fishing season for trawling by these mechanised boats are September to December which with the season of cyclones. The share for workers in the boat are 12% of total catch + Rs.20/- batta per day + Dry fish.

No life saving devices like life jacket or lifebuoy are kept in any of the boats. They may arrange it temporarily from somewhere when port authorities come for inspection. Most of them are not serious about keeping a radio in the boat. Usually the boats are not driven by certified trained drivers (with minimum navigation skills and knowledge on sea safety and crisis management).

River Fishing:

River fishing is another major occupation for Bhairavapalem fishermen. Unlikefishermen in Balusutippa, Bhairavapalem fishermen go for one day fishing that too mainly closer to Nilrava estuary or on main Gautami river, not very far from the village.The major fishing in the river is the lunger veta (Gidusu vala) followed by the Polasa vala veta in river mouth. Small and medium sized Navas are used for fishing.

Lunger veta (Gidusu vala):

This is basically a bagnet fishing taking advantage of the tides. The peculiarity of the fishing is that the bagnet is set against the tide with the side ropes extending from the Nava. The Nava is anchored on the opposite direction with one or two heavy iron anchors. Hence the name lunger veta (Anchor is called "lunger" in Telugu). The bagnet is called Gidusuvala. The nets used by Bhairavapalem fishermen have a length of about 27m and the mouth of the net is about 7.2m wide. The mesh size near the mouth could be 150 to 200mm and towards the cod end 10mm and less. The cod portion with the bag is connected to the Nava through a separate rope.

This fishing is done on the Nilarava river mouth. One can see row of Navas anchored, operating these nets. Duration of each net operation is one tide phase. When the tide changes, the net can also be tied on the opposite end of the Nava in opposite direction. Various types

of small prawn are the main catches. The nava used for this fishing is the medium sized one of 24'-25' length (usually non-motorised). The fishing season is from September to May with December to May as the peak. Please see Fig.A-10.2.

Polasa Vala Fishing:

This is a gill net fishing in the river mouth. The mesh size of the net is 100-120mm and the Webbing No.1½. This too is operated from Navas. and the main catch is Hilsa.The season is May to September.

Creek fishing:

Tarasuvala Fishing:

Tarasuvala is barrier net usually used in smaller creeks. The net is usually stretched across a creek, bank to bank with the bottom buried under the mud and the net held up with stakes. The mesh size is usually about 10-12mm. The maximum size of the net could be 9m long and 3m wide. This net can be operated with help of Navas in distant creek, or without Navas in creeks nearby the village. Only 2 or 3 fishermen are required to operate the net.

Shrimp seed collection:

Shrimp seed collection had become a major source of income for fishermen families since the early nineties when Shrimp farming took a fast pace in Andhra Pradesh. So is the case with Bhairavapalem. There was a peak demand for wild shrimp seed in 1992-94 when the tiger shrimp seed cost was upto Rs.2/- to Rs.3/- per piece. However after the widespread viral disease of shrimp called the white spot disease attack in 1994-95 and after setting up of a number of hatcheries and recently after the Supreme Court stay on Shrimp farming the demand for wild shrimp seed has come down. Hence the price too has come to 10 to 15 paise per piece. Shrimp seed collection is a comparatively low investment - fishing activity in which all family members including women and children participate. Bag type nets made of fine velon screen called shooting net is the main gear used. The mouth of the net is kept open against the tides with stakes. The cod end has a ring opening to a collection bag (called as Gumcha) also tied to a stake. The seeds are collected periodically from the Gamcha using ordinary tea strainers. The collection is usually an assortment of various fish and prawn seeds. The tiger prawn seed are than segregated out into separate buckets or basins. Another gear used for shrimp seed collection especially by the women and children is the push net, a triangle shaped gear with the same velon screen material (See Fig.A-9.1).

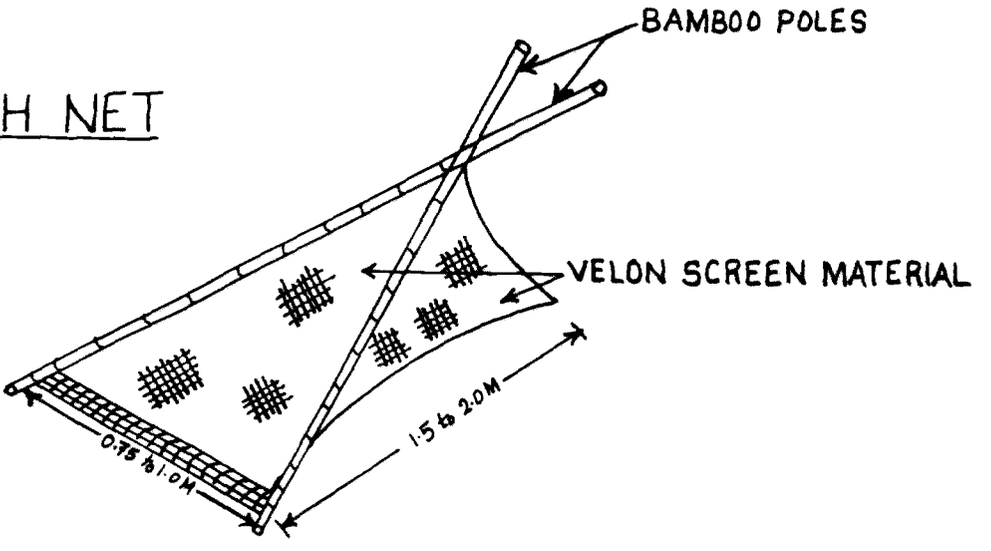
Godavari river mouth being very productive due to the mangrove ecosystem, shrimp seed collection is comparatively good here. There is an organised trade chain of agents buying the seed and pooling it up at selected centres like Gutindivi, Chollangi, etc., where the seed is grown for few days and sold out.

The main area for the Bhairavapalem fisherfolk to collect seed is the south east part of Nilarava estuarine mouth, where there is a sandy beach strip separated from the main land and mangrove forest on the western side by a creek and backwaters. It was told that at least 300 families used to camp there for 6 months in temporary huts and completely engaged in shrimp seed collection. The agents go in navas to them and procure seeds. The fisherfolk come to the village occasionally (on Sundays) to take their provisions. But after the large loss

of life during November, 1996 Cyclone in this place, many families could not pick up courage for long camps. Most of the seed collection is a daily or short term affair at present. Many families do collect some shrimp seeds in the creek near mangrove forest close to the village.

GEARS FOR COLLECTING SHRIMP SEED

PUSH NET



SHOOTING NET

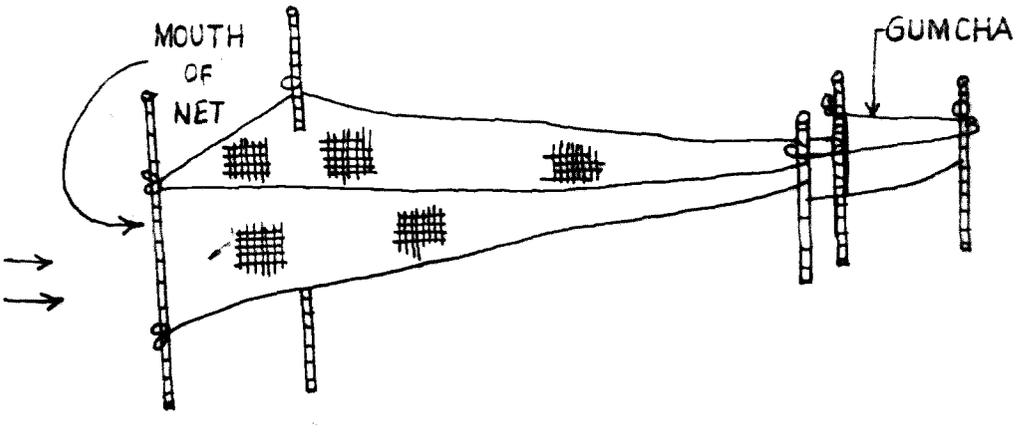


FIG A-9.1

Annexure No.10

FISHING METHODS - BALUSUTIPPA

Sea Fishing in Navas:

There are clearly 3 types of sea fishing done using motorised Navas. They are in the local terms.

(1) Nylon vala veta (silku vala veta
(2) Kivvala veta and
(3) Panduvala veta.

All are basically gill net fishing. Unlike in Bhairavapalem, in Balusutippa different navas go for separate fishing. Those working in the navas may interchange occasionally. The share for the crew are 1/2 the returns (after deducting expenses) divided among the number of crew.

Table A-10.1 *Details of Gill Net Fishing Using Navas (Balusutippa)*

Type of Net	Nava Type	Mesh Size (Webbing No.)	Size of Net	Cost of Net	Depth Zone	Fishes caught	Season	Crew Size
Nylon vala (Gillnet)	34' to 36' 20HP	0150mm (No.2)	2100m X 14m	Rs.50,000/-	50-70m	Pomfret, Shark, Moosefish	Jan.-May	10
Kivvala (Gillnet)	24' to 26' 10HP	90mm (No.1)	1250m X 7.2m	Rs.15,000/-	9-18m	Catfish, Tlisa, Mackeral, Pomfret Sword fish	Through-out the year Peak-Jan-April	8
Panduvala (Bottom set Gillnet)	24' to 26' 10HP	200mm (No.24)	800m X 7.2m	Rs.70,000/-	9-18m	Sea bass, Crabs	Jan.-May	8

Both Nylon vala fishing and Panduvala fishing are night fishing valas while Kivvala fishing is a day fishing one.

Marine Fishing in mechanised boats:

There are no mechanised boats within the village, though there are few boat owners from Balusutippa settled in Kakinada. There are large number of fishermen (346) from Balusutippa who work as crew in mechanised boats operated from Kakinada- a classical example of traditional owners of marine fish resources turning into wagers.

Riverine Fishing:

The riverine fishing in Balusutippa are of two types:

(1) Fishing operations in river or creek near the village moving up & down from the village by nava or various shoe dhonies.

(2) Migratory fishing in which fisherfolk families move in dhonies for months together to distant places within the Gautami river system or the estuary.

The fishing operations taken up by both groups are more or less similar. The main fishing activities are:

* *Lunger veta:*

This is the major fishing activity in the river and estuary. The operations as described in Bhairavapalem is a bag net operation from nava (plank built boats of medium size). The nava is anchored by one or two heavy iron anchors on one end and the net with its mouth kept open extends from the other end of the nava (Fig.A-10.2). The bag net used by Balusutippa fisherfolk are longer i.e., upto 36m and mouth opening 10 to 11m. The mesh size towards the cod end are much finer than 1mm. The nets are usually set against tides. The major catches are various types of small prawns including Acetes, some Penaeid Prawns and various non penaeid prawns. These are dried and sold.

Usually a set of at least two navas or one nava and one dhoni is used for lunger veta.

Shoe Dhoni:

The fishing craft locally known as dhoni and named "shoe dhoni" by Britishers is a very typical fishing craft used in the Godavari delta of Andhra Pradesh. Balusutippa may take the credit of having the maximum number of shoe dhonies.

The craft derives its name from the shoe shape, which is well described in an earlier literature as the Indian Boat Designs' by J.Hornell in early 20th century. This is a flat bottomed craft with a sharp stem, and broadening towards the first 1/3rd of the length and again narrowing towards the stern side, with almost a trapezoidal stern portion. The first 2/3rd part and some portion from the stern side are decked in completely. The remaining central length of the vessel has a slit opening, with some partial deck covering from either side. There is a vertical plank (resembling wind shield of a motor boat) just in front of the slit. The craft is made of teak planks nailed on ribs of some other wood. The hull of the vessel has a fin-keel in the front (Fig.A-10.1). The complete hull is coated with tar.

The shoe dhonies specific design is meant for the whole family to stay on long duration migratory fishing away from the village. As teak has become a costly wood and the design itself requiring more skill, the cost of the Dhoni is very high (Rs. 1 to 1.2 lakhs). Hence shoe dhonies are usually being replaced by ordinary navas (plank built boats). To facilitate accommodating the family, these navas are also decked at both ends.

* *Peetala veta (Crab Fishing):*

Quite common in mangrove creeks and also in rivers. Gill nets of mesh size less than 100mm (No.2 or 3) are used. Depending on the area of operation the net could be upto 600-700m in length and 5 to 8m wide. The net was reported to be set along the course of the creek (parallel to the banks).

- *Pandugappa veta:*

  As used by marine navas, gill nets of 200mm mesh size (No.18 to 24) are used often in the estuaries. The size of the net would be about 500m X 7.2m . Sea bass is the main catch.

- *Jarugu vala:*

  This is a river shore seine of length of about 500 operated along river bank.

Migratory Fishing:

The Balusutippa fisherfolk move to distant places along Gautami river, stay there in dhonies or navas for months together. They do fishing operations at these places and sell the products locally. They come to local villages close to the place of operation for their day to day needs. The whole family cooks, eats and sleeps in dhonies and navas.

SHOE DHONI OF EAST GODAVARI DISTRICT

SCALE : 2 CM = 1M

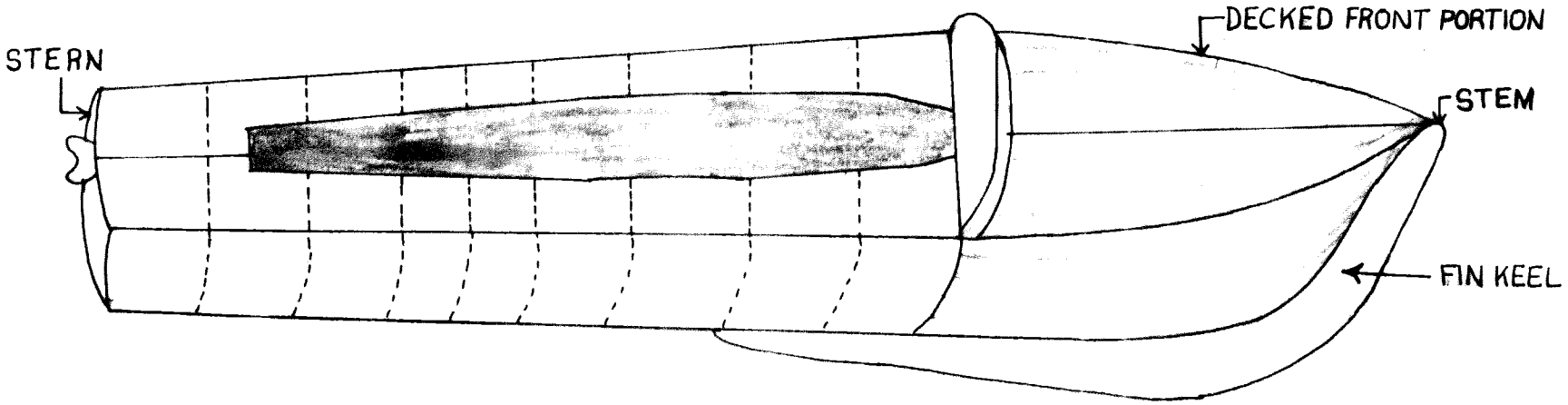
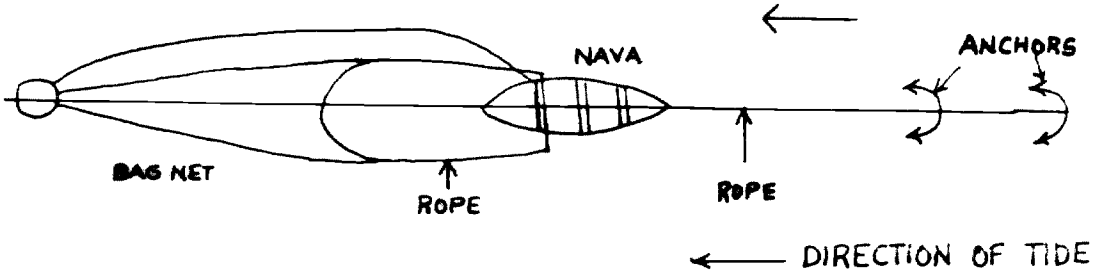


FIG A-10·1

LUNGER VALA OPERATION

(ASPER FISHERMENS DESCRIPTION)

NOT TO SCALE



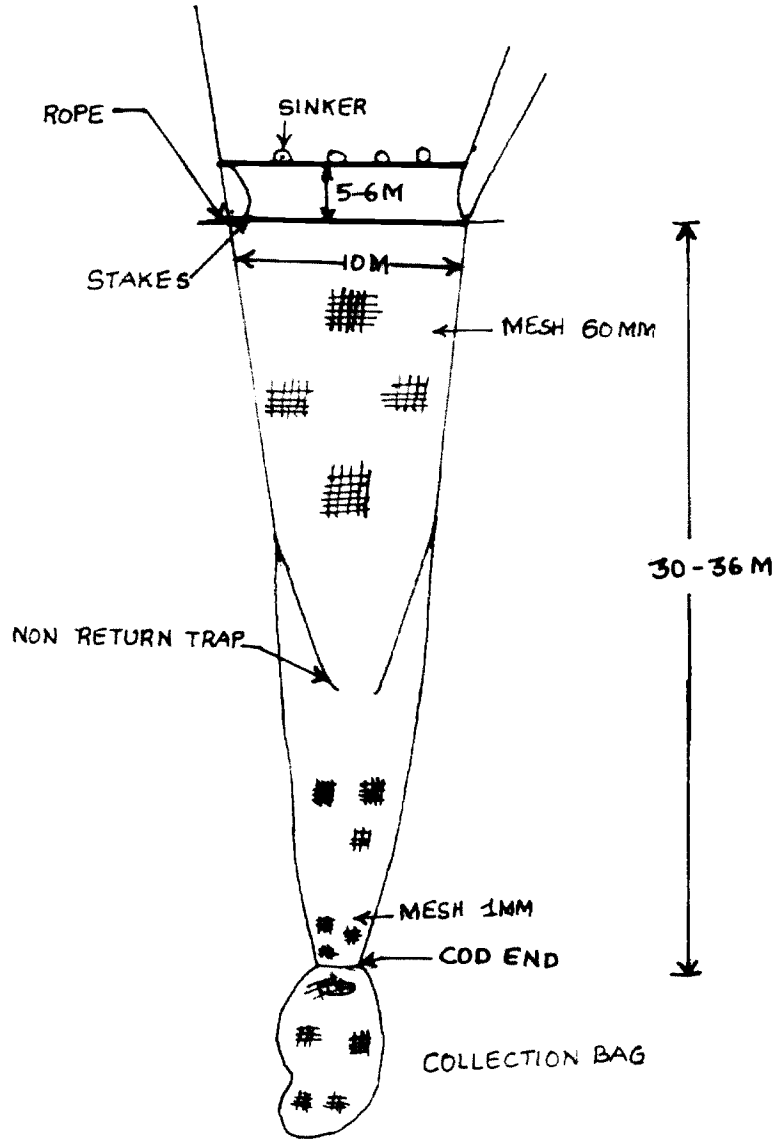


FIG A-10·2

ACRONYMS

1.	AFPRO	Action for Food Production
2.	AIR	All India Radio
3.	ANM	Auxilary Nurse and Midwife
4.	A.P.	Andhra Pradesh
5.	APSEB	Andhra Pradesh State Electricity Board
6.	APSRAC	Andhra Pradesh State Remote Sensing Application Centre
7.	BC	Backward Caste
8.	CCPA	Cyclone Contingency Plan of Action
9.	CWC	Cyclone Warning Centre
10.	CWDS	Cyclone Warning Dissemination System
11.	DOF	Department of Fisheries, Andhra Pradesh
12.	ETV	Eenadu Television
13.	FAO	Food & Agriculture Organisation of the United Nations
14.	FDO	Fisheries Development Officer
15.	KFW	German Funding Agency
16.	MPHW	Multipurpose Health Worker
17.	MRO	Mandal Revenue Officer
18.	PWS	Public Water Scheme
19.	RDO	Revenue Divisional Officer
20.	RMP	Registered Medical Practioner
21.	RRA	Rapid Rural Appraisal
22.	SADA	Shore Area Development Authority, Andhra Pradesh
23.	SC	Scheduled Caste
24.	TV	Television
25.	VHF	Very High Frequency

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