

PANGUIL BAY, PHILIPPINES - THE CAUSE OF ITS OVER-EXPLOITATION AND SUGGESTIONS FOR ITS REHABILITATION

by

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ABSTRACT

Panguil Bay, one of the richest fishing grounds in Mindanao, has been proven to be depleted of its fishery resources. Studies conducted showed the prevalence of immature fishes and macroplankton and revealed declining catches of various types of gears operating in the bay. Due to the unabated proliferation of various gears, fish stocks have decreased to make evident the depletion of the bay.

The concentration of filter nets or "sanggab" in the bay is attributed to sociopolitical, topographical and hydrological factors. The bay being bounded by three provinces makes it difficult for authorities concerned to implement an appropriate fisheries regulation for economic reasons.

The operation of the "sanggab" gear and its distribution are discussed and presented in this paper. With the promulgation of a fisheries administrative order, a development plan is proposed to ensure the effective protection and conservation of fishery resources and to provide alternative livelihood projects for the displaced fishermen of Panguil Bay.

1. Introduction

Panguil Bay (Figure 1) used to be one of the richest fishing grounds in Mindanao. It was the source of crabs, shrimps, prawns, mussels, fish and shellfishes priced high in the local markets. It also served as a natural breeding ground and sanctuary for fishes, crustaceans and molluscs.

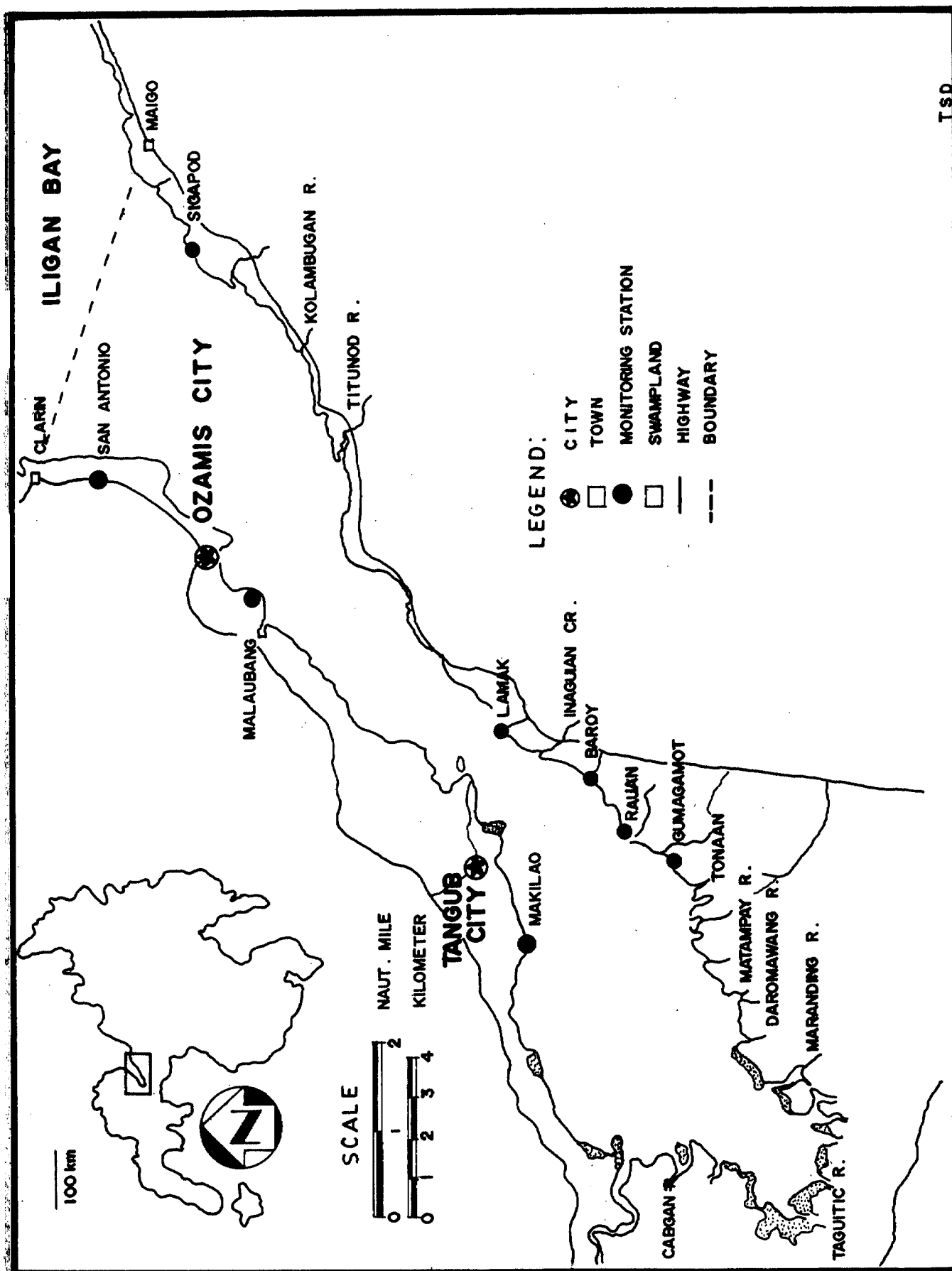
The bay's shape resembles that of a canine tooth, hence, the name "panguil". It is bounded by the municipalities of Clarin, province of Misamis Occidental, at Latitude 8°12' North and Longitude 123°51' East, and Maigo, province of Lanao del Norte, Latitude 8°11' North and Longitude 123°38' East. Its end point is Lalidongan Gamay River located at Latitude 7°57' North of Barangay Taguitic, Kapatagan, Lanao del Norte. Its total area is 299 square km. Situated along its whole 116 km length are two cities, 11 municipalities and 78 barangays (district subdivisions) of the provinces of Misamis Occidental, Lanao del Norte and Zamboanga del Sur (Annex 1).

Based on the trip report of Encina (1981), the bay is relatively shallow with an average depth of about 3 m in the southern portion and 10 m in the northern part. The peculiar characteristic shape and bottom topography are a contributory factor for the existence of strong tidal currents during high and low tides. Such strong currents which occur during the first and last quarters of the lunar cycle have been harnessed by fishermen to trap fish by installing giant and medium-sized filter nets "sanggab", along the entire stretch of the bay.

2. Source of Over-Exploitation

2.1 The Fishing Gear

A filter net or "sanggab" (local term) is a fixed stationary gear made of bamboo, cotton netting or synthetic materials with a fine screen at the cod-end forming a conical bag with "no return" valves. Measured from the



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Figure 1. Map of Panguil Bay

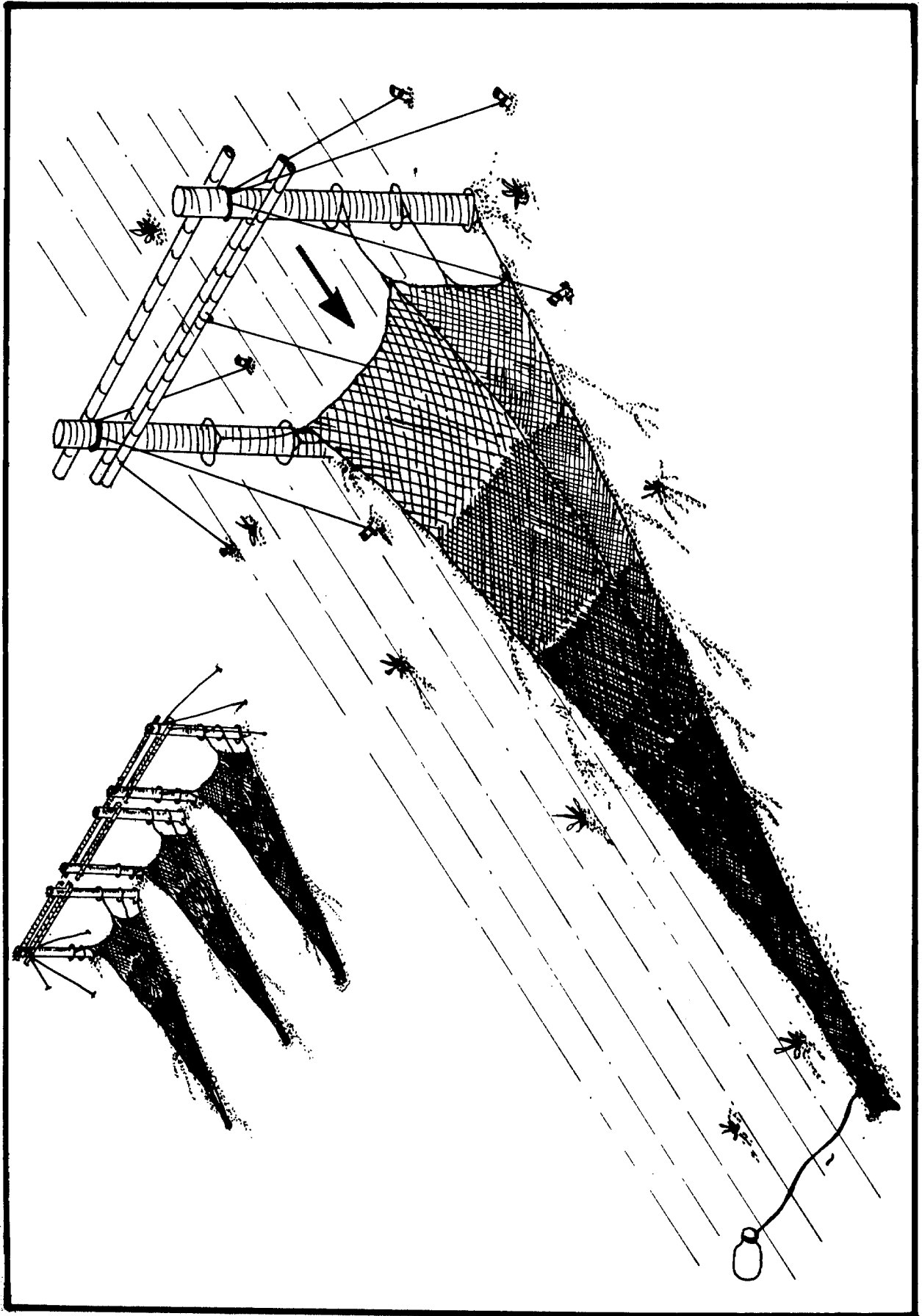
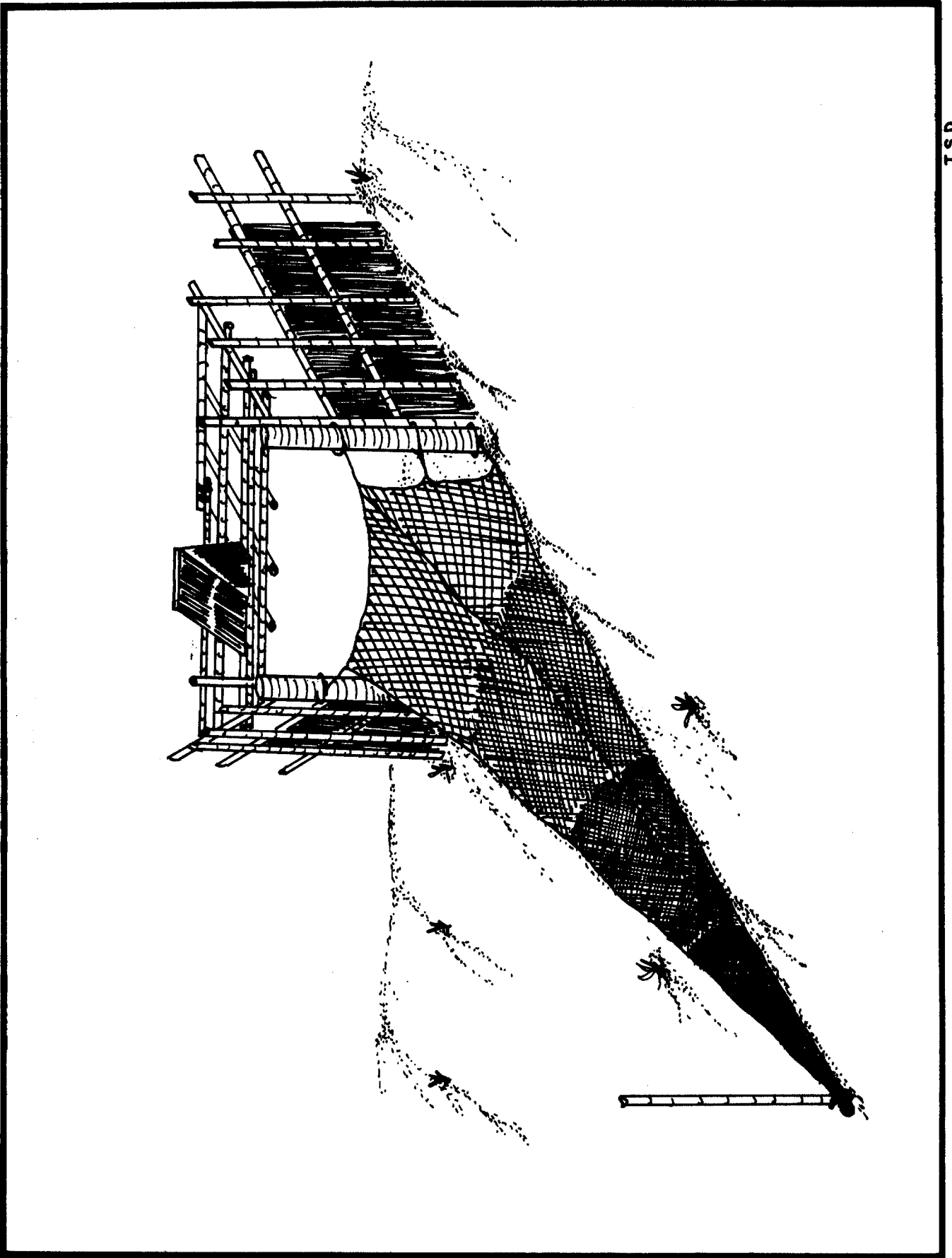


Figure 2. Illustration of a Giant Sanggab in Operation



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Figure 3. Illustration of a Medium-Sized Sanggab in Operation

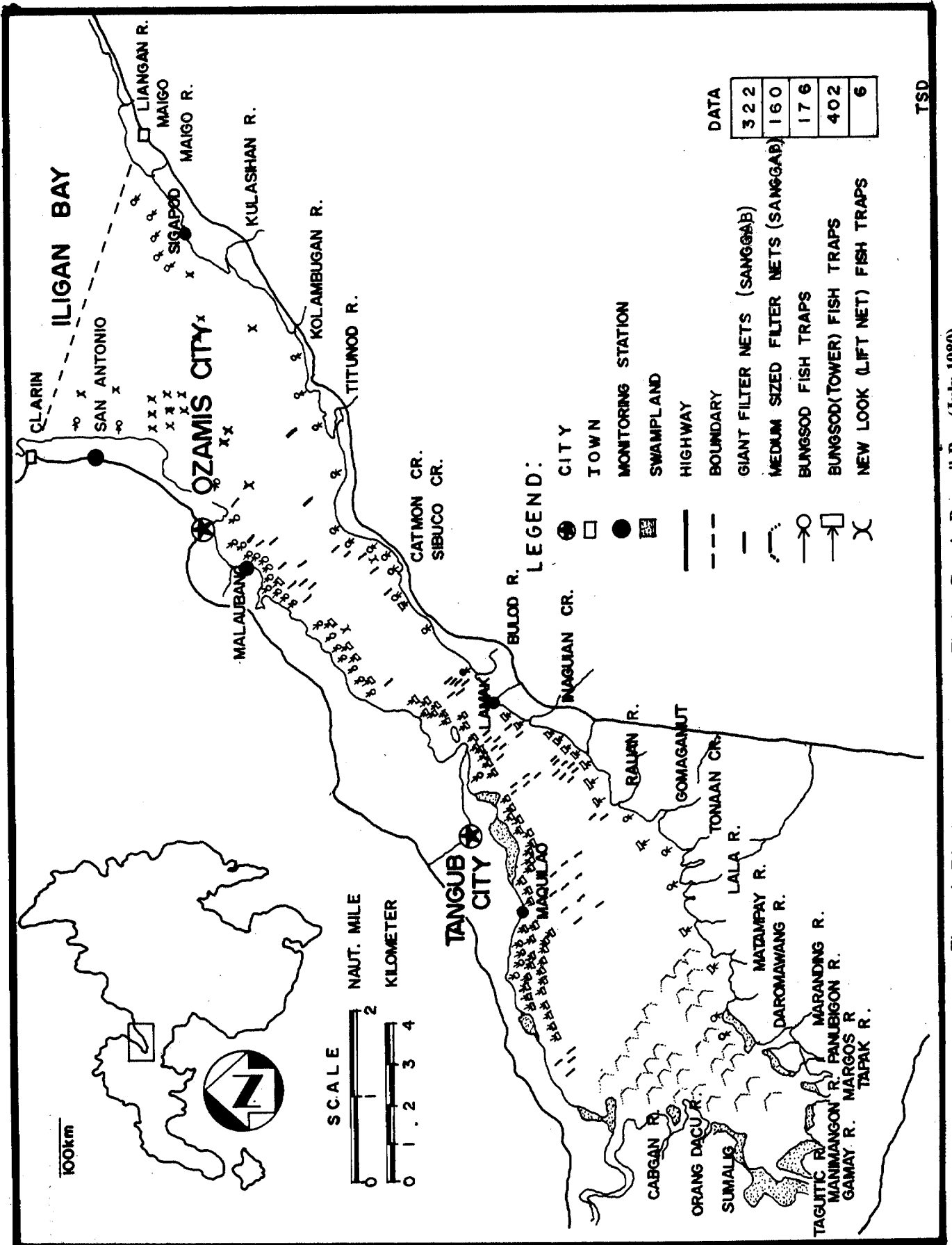
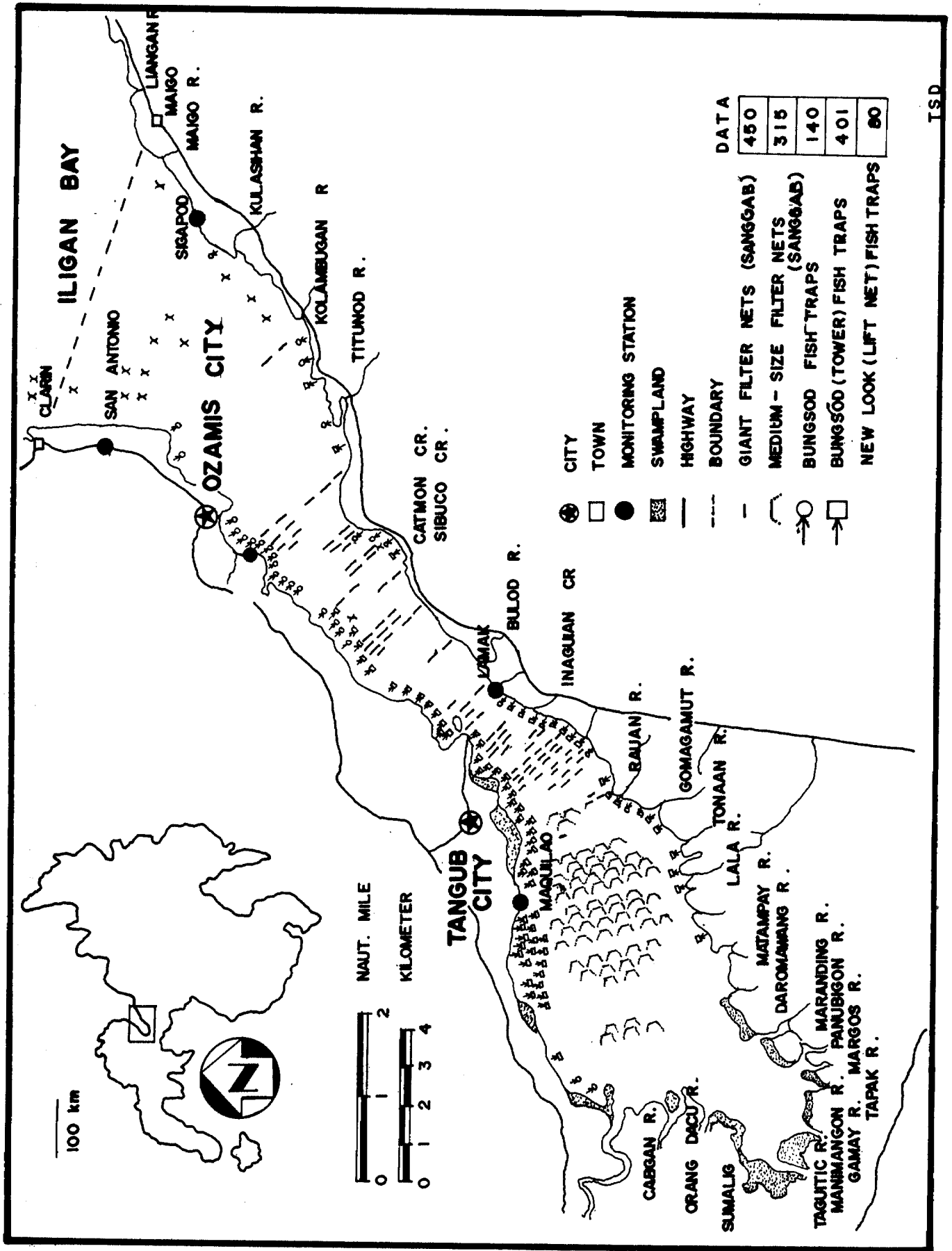


Figure 4. Distribution of Stationary Fishing Gear in Pangulilay Bay (July 1980)



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Figure 5. Distribution of Stationary Fishing Gear in Panguil Bay (July 1981)

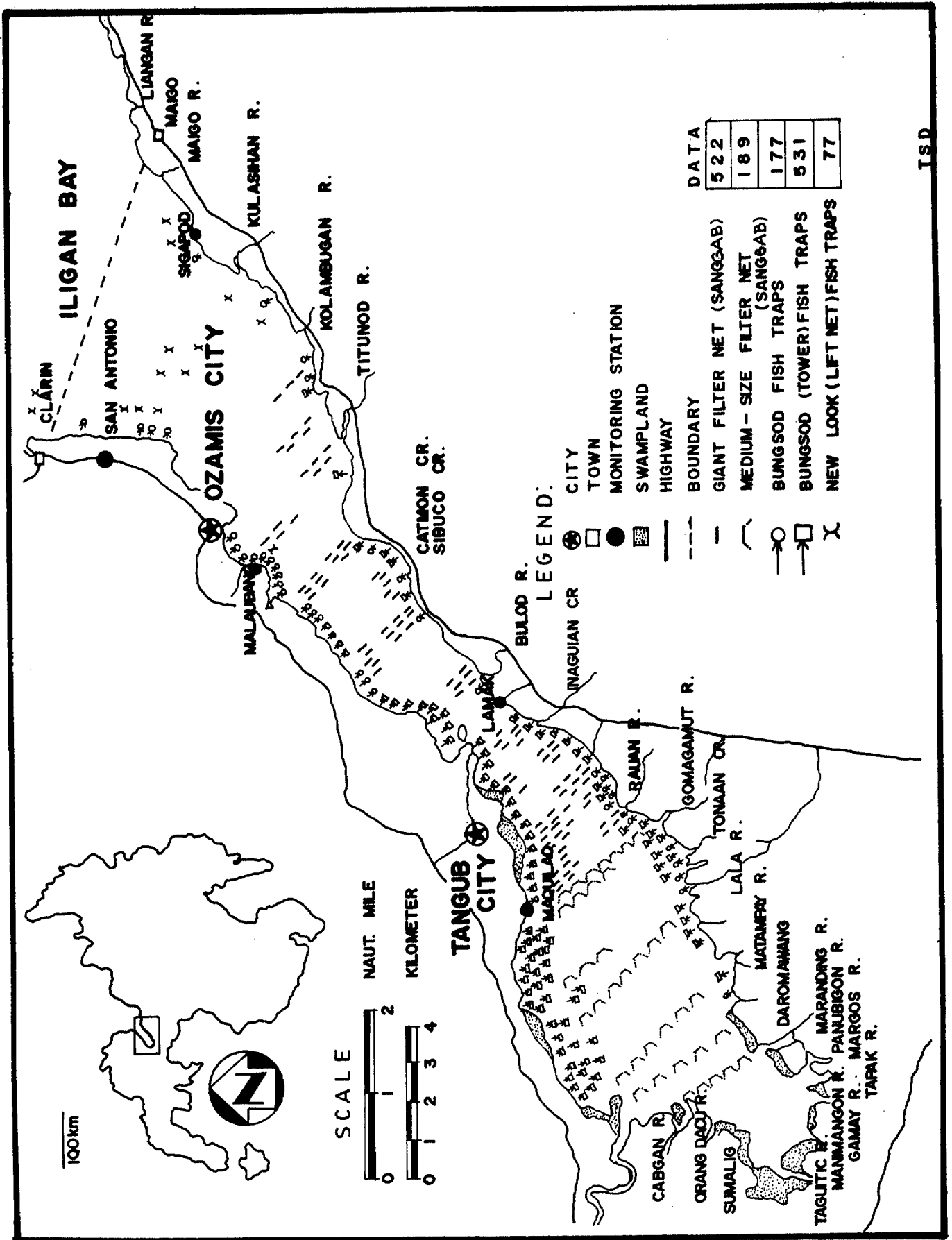


Figure 6. Distribution of Stationary Fishing Gear in Pangulilay Bay (June 1982)

Table 1. Major macroplankton species caught by giant "Sanggab".

Fishes	Crustacea
Flatfish larvae	Young crabs
<i>Stolephorus sp.</i>	Crab megalopa
<i>Sardinella sp.</i>	Crab zoea
Slipmouths	Masked crab
<i>Caranx sp.</i>	Spider crab
Puffer fish	<i>Charybdis cruciata</i>
<i>Acanthocephala sp.</i>	Prawn and Shrimp larvae
Hairtails	Crayfish
Elvers	Sand Lobster (<i>Thenus sp.</i>)
Sea Horses	Young mantis
File Fish	<i>Acetes sp.</i>
<i>Centriscus scutatus</i>	Portunus larvae
<i>Anchovies</i>	
Cephalophoda	
Young cephalopods	
Cephalopods	
Polychaeta	
Polychaetes	
Echinodermata	
Ophiuroids (Brittle stars)	

mouth to its tip, a giant "sanggab" (Figure 2) is about 36 m in length and 15 to 18 m wide at its mouth opening. It is installed at the deeper portion of the bay. A medium-sized "sanggab" (Figure 3) is about 15 m in length and 6 to 8 m at its mouth opening. It is usually provided with V-shaped leaders made of bamboo stakes adjusted to guide the fish when the tide recedes and water moves out of the bay (Francisco 1982).

2.2 Fishing Operation

The coconut trunks or bamboo poles to which the fishing gear is attached are linked together above the water surface by two horizontal braces which serve as a working bridge for the fishermen during the setting and hauling operation. In Panguil Bay, it is common to see a series of coconut trunks or bamboo poles interconnected by bamboo bridges. These represent several units of giant filter nets (10 to 20 units) put together by a group of fishermen referred to as "sanggaberos".

The fishing gear is set at the slackening of the tidal current where no water resistance is usually encountered. The mouth of the filter net is adjusted to face the current flow and is opened by dropping a pair of sinkers from each post down to the bottom. The sinkers pull down the attached yokes stretching the mouth of the net wide open. A buoy is tied to the top of the net for proper horizontal alignment.

To haul the catch, the ropes carrying the sinkers are pulled up either manually or with the aid of an improvised winch during the slackening of the tidal current. The winch closes and brings the mouth of the net to the horizontal bridge where the fishermen can slowly pull up the net until the cod-end is just below the bridge where a pumpboat is waiting. The tie of the cod-end is loosened and the entire catch is poured into the hull of the pumpboat. The net is then set again in the reverse direction facing the oncoming or the receding tide. Since there are two tidal cycles that occur in one day, a fisherman can operate his "sanggab" twice a day during the ebb and flood tides.

2.3 Catch Composition

Fishes, mollusks, crustaceans and other marine organisms which are carried by the water current into the mouth of the "sanggab" are inextricably impounded at the cod-end of the net. As the current becomes stronger and the catch becomes heavier, the net is stretched out, reducing the mesh size even further. Thus, even tiny organisms or macroplankton are efficiently filtered out from the water. It is not surprising, therefore, to witness large quantities of macroplankton (which play an important role in the food chain in the bay) being harvested needlessly with the commercial fishes. Macroplankton oftentimes constitute the greater bulk of biomass caught by "sanggab". The strong pressure caused by the on rushing water current often leaves both small and bigger planktonic organisms dead before they are retrieved and collected.

Table 1 shows the common macroplankton species caught by giant "sanggab".

2.4 Distribution of "Sanggab"

Based on the study conducted by the Mindonao State University in Naawan, Misamis Oriental in July 1980, July 1981 and June 1982, stationary fishing gear installed in the bay in 1981 had increased by 29.8% (Tumanda and Adan 1981) and by a total of 40.07% since the start of the survey in 1980.

Figures 4 to 6 show the distribution of "sanggab" within Panguil Bay in 1980, 1981 and 1982. The figures indicate the popularity of "sanggab" compared to traditional fishing gears like fish corrals and liftnets. Being effective this fishing gear has attracted more fishermen to venture into it. The concentration of giant "sanggab" is in the middle portion and across the bay, while the medium-sized ones exist in the shallow southern portion of the bay.

3. Rationale in the Banning of "Sanggab"

The diversity of species caught by "sanggab" as compared to the other types of gear indicates its efficiency and effectiveness as a fishing method. Being non-selective in the size of fish it catches makes it the most destructive fishing gear employed by fishermen in the bay.

Based on a study conducted from March to October, 1981 (Tumanda and Adan 1981), one liter of macroplankton samples contains an average of 3,000 pieces of macro-plankters. If this is related to the number of "sanggab" units installed in the bay, the collective destructive effects in the bay are quite staggering.

Realizing the effects of "sanggab" and other illegal fishing methods on the fish stocks based on the scientific surveys conducted by the National Economic Development Authority and the Bureau of Fisheries and Aquatic Resources (BFAR) from 1973 to 1974, in 1977 and in 1980, the Minister of Natural Resources promulgated on January 13, 1981 (BFAR 1981) and which took effect on June 5, 1981, Fisheries Administrative Order (FAO) No. 133, establishing a closed season of five years in Panguil Bay for the operation of all kinds of fishing gear, particularly filter net ("sanggab") (Annex 2). The primary reasons for the issuance of this regulation were the growing concern over the depletion of the bay and the pressing need for conserving and protecting its fisheries and aquatic resources as mandated by Presidential Decree Nos. 704 to 1015.

4. Panguil Bay Integrated Fisheries Development Plan

The full enforcement of FAO No. 133, however, will mean the eventual demolition of all “sanggab” units in the bay and the subsequent socio-economic displacement of affected fishermen. To rehabilitate them, assistance is required to have them shift to other livelihood activities.

Set against this situational backdrop, the *Panguil Bay Integrated Fisheries Development Plan*, formulated in 1972, was activated as a comprehensive and methodical approach for ensuring effective protection and conservation of Panguil Bay resources and providing alternative livelihood projects for the displaced fishermen in various municipalities and barangays (BFAR 1972).

The components of the Panguil Bay Integrated Fisheries Development Plan are:

4.1 BFAR Implemented Support Programs

The Bureau of Fisheries and Aquatic Resources will intensify the implementation of its existing programs and projects in the area.

4.1.1 Existing Project

4.1.1.1 Municipal Fisheries Extension Services

Assistance will be given to targeted survival fishermen in the acquisition of appropriate fishing gears for a particular fishing area. Redesigning of current gears to minimize if not to eliminate their destructive effects will also be done. Another activity is the organization of fishermen’s *samahang nayon*, cooperatives or associations.

4.1.1.2 Extension Services in Aquaculture Development

The extension services in aquaculture development will be geared towards: disseminating the latest farm management techniques; extension services on fishpen and cage culture; identifying suitable areas for fishpond development; encouragement of investors to engage in fishfarming; assisting fishfarmers to obtain needed inputs and credit assistance; and utilizing existing strategic demonstration training centers for field testing of new technologies.

4.1.1.3 Fish Processing Extension Services

Extension services in fish processing are basically aimed to encourage the private sector to adopt newly developed technologies, conduct information drives on fish handling and quality control, render technical assistance and conduct demonstrations on fish nutrition, processing and marketing.

4.1.1.4 Municipal Fishermen’s Training Program

Training of municipal fishermen will be undertaken in conjunction with extension services. Training will be based on the surveyed needs of fishermen in the locality.

4.1.1.5 Deputation of Barangay Captains

The training and deputation of barangay captains is to reinforce the available manpower in law enforcement.

4.1.1.6 Establishment of Mariculture Demonstration Projects

Culture of fish and other aquatic products such as mussels, oysters, shrimp, algae and crabs and in inland waters and impoundments using fish cage, fish pens, fish nets and other culture methods.

4.2 Fishery Industry Projects

These are the alternative livelihood projects to be undertaken by the displaced fishermen themselves upon the demolition of their “sanggab”, with the technical assistance of the government agency concerned. The identified projects are: gill net, long line, *bangus* culture, tilapia culture, prawn culture, *bangus* fry collection, *sugpo* fry collection, mussel culture, oyster culture, seaweed farming and kroeck making.

Some 2,900 fishermen affected by the implementation of FAO No.133 will benefit from engaging in these livelihood projects.

4.3 Projects Supported by Other Line Agencies

Realizing the need for an integrated approach to solve the anticipated social problem as an aftermath of the dismantling of the "sanggab", the other line agencies in each region have named some projects which the displaced fishermen can avail of, based on their preferences. These agencies and projects are:

- A. National Manpower Youth Council (NMYC)
 - Manpower Skills Development Training
 - Skills Upgrading Training
- B. Ministry of Social Services and Development (MSSD)
 - Food for Work Program
- C. Ministry of Agriculture and Food
 - *Bakahan sa Barangay* (Cow-fattening in the Barangay)
 - *Kambingan sa Barangay* (Goat raising in the Barangay)
 - *Itikan sa Barangay* (Duck raising in the Barangay)
 - *Babuyan sa Barangay* (Piggery in the Barangay)
 - Poultry
 - Home Management
 - Rural Youth Development
 - Farmers' Class
 - Organization of Fishermen/Samahang Nayon/Cooperative
- D. National Cottage Industry Development (NACIDA)
 - Shellcraft
 - Coco-midrib Basket Making
 - Rattancraft
 - Bamboocraft
 - Coircraft
 - Garment Production
 - Marketing Assistance
 - Financial Assistance

5. Constraints in Implementing FAO No. 133

Initial moves in systematizing and ensuring effective implementation of FAO No. 133 had been programmed to require the following:

- Active involvement of local officials in the planning stage;
- Giving to those who will voluntarily dismantle their units priority in availing of credit loans;
- Conducting an intensive information drive involving interagency efforts;
- Organization of the affected fishermen into a *samahang nayon*/cooperative for possible projects;
- Training in substitute livelihood projects;
- Immediate provision of livelihood projects;
- Establishment of a fish sanctuary.

With this on hand, the Regional Task Forces and the "sanggab" operators met in August 1981 to discuss the mechanics of the implementation of the integrated plan. The dialogue resulted in a moratorium on the demolition of "sanggab" in view of strong social pressure prevailing in certain fishing communities where the main occupation is "sanggab" fishery. Should the government push the projects through, the various constraints and impediments in the demolition of "sanggab" would be the economic dislocation of certain fishing families, its implications on the peace and order situation, the provision of immediate alternative livelihood projects and whether or not these projects are acceptable to the displaced families.

Due to socio-political and multi-province vested interests affecting the Panguil Bay controversy, FAO no. 133 was not pushed through so that the bay is continuously being depleted of its once-rich fishery resources. The effectivity of FAO No. 133 expired on June 5, 1986 and has not been renewed pending the submission of the findings, comments and specific recommendations of the three assistant Regional Directors for Fisheries in Regions IX, X, and XII on the effects of the 5-year ban. This will serve as basis for the action of the Committee on Fisheries Administrative Orders on whether to completely terminate, renew, or modify this regulation.

References

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Fishery Resource Profile

Panguil Bay is bounded by three provinces of three regional areas, viz: Zamboanga del Sur of Region 9; Misamis Occidental of Region 10; an Lanao del Norte of Region 12.

The fishery and related fishery resources of these provinces are enumerated hereunder:

1. General Information

A. Population

1) Provincial		1,585,206
Lanao del Norte	461,049	
Misamis Occidental.....	386,328	
Zamboanga del Sur.....	737,829	
2) Coastal Municipalities/Cities ^{1/}		344,769
Lanao del Norte.....	131,113	
Misamis Occidental.....	160,615	
Zamboanga del Sur.....	53,041	
3) Coastal Barangay ^{2/}		166,997
Lanao del Norte.....	52,935	
Misamis Occidental.....	60,676	
Zamboanga del Sur.....	3,386	

B. Province Municipalities, Barangays along Panguil Bay area

Region	Municipality	Barangay
Zamboanga del Sur Region IX	Aurora	Sumalig
		Cabigan
	Tambulig	Gubaan
		Balas
		Anonang
		Losno
Misamis Occidental, Region X	Clarin	De la Paz
		Lapasan
		Lupagan
		Poblacion
		Ozamis City
	Ozamis City	Carmen
		Catarman
		Dimoluan
		Embargo
		San Antonio
		Maningcol
		Dona Consuelo
		San Roque
		Sta. Cruz
		El Triunfo
Tinago		
Malaubang		

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^{1/}, ^{2/} Affected Coastal Municipalities/Barangay along Panguil Bay.

Region	Municipality	Barangay
Lanao del Norte, Region XII	Tangub City	Sulot
		Tabid
		Linusa
		Balatasan
		Bocator
		Lorenzo Tan
		Maloro
		Mantic
		Marsos
		Maquilao
		Migkanoway
		Panalsalan
		Pangabuan
	San Apolinario	
	Silanga	
	Bonifacio	Migpangi
	Maigo	Baybay
	Kolambugan	Balagtas Labuan
		Liangan West
		Segapod
		Claro M. Recto
		Simbuco
		Tabigue
		Rebocon
		Poblacion
		Baybay
		Titunod
Mukas		
San Roque		
Riverside		
Muntay		
Manga		
Libertad		
Kurasihan		
Tubod	Pigcaragan	
Baroy	Taguiguiron	
	Bulod	
	Cam 5 (Aloha)	
	Poblacion	
	Poblacion	
	Sagadan	
	Raw-an Point	
Baroy Daku		
Bagong Dawis		
Riverside		
Lala	Daromawang	
	Camalan	

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Region	Municipality	Barangay
		Matampay Bucana
		Pacita
		Raw-an
		Tuna-an
		Bucana Daromawang
		Matampay Ilaya
	Kapatagan	Lapinig
		Taguitic
		Margos

C. Area..... 299 sq km

D. Climatic condition - Type IV - Rain is more or less evenly distributed throughout the year.

E. Tidal Fluctuation - Occurs twice in every 24 hours.

Republic of the Philippines
Ministry of Natural Resources
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Arcadia Bldg., 860 Quezon Avenue, Quezon City

FISHERIES ADMINISTRATIVE)

ORDER NO. 133 : 1981-01-13
Series of 1981 X

**SUBJECT: ESTABLISHING A CLOSED SEASON OF
FIVE (5) YEARS IN PANGUIL BAY FOR
THE OPERATION OF ALL KINDS OF
FISHING GEAR, PARTICULARLY FILTER
NET (SANGGAB) EXCEPT THOSE PROVIDED
HEREIN**

Pursuant to the provisions of Sections 4 and 7 of Presidential Decree No. 704, as amended, otherwise known as "Fisheries Decree of 1975", and Section 1 of Presidential Decree No. 1015 the following rules and regulations are hereby promulgated for the protection and conservation of fisheries and aquatic resources in Panguil Bay:

SECTION 1. *Definition* - For the purpose of this Administrative Order, the following terms shall mean:

- (a) *Filter Net (Sanggab)* - a fixed stationary gear made of natural/synthetic materials with a fine screen at cod-end forming a conical bag with "no return" valves. Its mouth can be held open by sets of anchors and floats or by tying two (2) lateral sides of the rib lines to a set of rings attached to two (2) vertical post and bottom line pulled down by sinkers and set against the tidal current, both ebb and flood.
- (b) *Fish Corral (Bunsod)* - a stationary wire trap or device to intercept and capture fish, consisting of rows of stakes of bamboo or other materials, fenced with split bamboo mattings or wire/synthetic nettings, with one or more enclosures usually with easy entrance but difficult exit, the size or dimension of which shall not exceed thirty (30) meters in length for its leader, ten (10) meters in diameter for its playground and five (5) meters in diameter for its catching chamber or impounding area.
- (c) *Troll Line (Subid-subid)* - a long-line, fixed horizontally with a hook at the free end, baited with either a natural bait or an artificial lure, and the whole gear drawn or towed behind a motorized boat.
- (d) *Multiple Handline (Bira-bira)* - a single vertical line with a series of small baited hooks attached to it by "spreaders" at regular intervals.
- (e) *Longline (Palangre)* - a drifting or set line with a series of baited hooks attached to it which requires periodic attention at more or less fixed intervals of time.
- (f) *Cast Net (Laya)* - a vertical net with heavy sinkers/weights around the base with a retrieving line attached to the apical portion of the net and operated by throwing over to capture the fish.
- (g) *Stationary Bag Net (New Look)* - a conical or cubical bag net made of natural/synthetic fiber nettings, which is set by means of regularly-spaced stakes or posts as enclosures for the bag net.
- (h) *Crab Lift Net (Bintol)* - A framed shallow net which is baited and sunk to the bottom by line and weights and operated by hauling suddenly the net to the surface which requires periodical attention.
- (i) *Gill Net (Pante)* - a curtain-like net in which capture of fish is effected by actual meshes of the net. The length of such shall not exceed eighty (80) meters.
- (j) *Fish Pot (Bubo)* - a baited enticing device made of bamboo/rattan or lumber/chicken wire/synthetic nettings and other materials in the form of regular receptacles with a "non-return" valve which provides easy entrance but difficult exit..
- (k) *Pole and Line (Bingwit)* - a handline attached to a pole or ploes and operated with any kind of bait.

SECTION 2. *Area* - As used in this Administrative Order "Panguil Bay" shall mean the body of water bounded in the North by the the coastlines of Misamis Occidental, on the West by the coastlines of Zamboanga del Sur and on the East by the coastlines of Lanao del Norte and enclosed on the North-East by the imaginary straight line drawn from Clarin River, Barangay Iliangan, Maigo, Lanao del Norte.

SECTION 3. *Prohibition.* - It shall be unlawful at all times during the five-year closed season established herein starting from the effectivity of this Administrative Order, for any person, partnership, association, cooperative, institution or corporation to conduct fishing operation in Panguil Bay with the use of all kinds of fishing gear, particularly filter net (sanggab), except as otherwise provided hereunder.

SECTION 4. *Exemption.* - (a) sustenance fishermen using fish corral (bunsod), gill net (pante), fish pot (bubo), troll line (subid-subid), multiple handline (bira-bira), longline (palangre), pole and line (bingwit), cast net (Laya), stationary bag net (new look), crab lift net (bintol) and fishing gear used for the gathering of bangus and sugpo fry shall be allowed to operate in Panguil Bay, provided that the fishing boats to be used shall not be more than three (3) gross tons; (b) the Director of Fisheries and Aquatic Resources may grant free of charge, a permit to any government research and educational institution, to catch or take aquatic life in Panguil Bay, or use of fishing gear otherwise prohibited in this Administrative Order, only for scientific and educational purposes, subject to such conditions as he may deem proper to impose.

SECTION 5. *Grace Period.* - All owners/operators of fishing gear not included in the exemption mentioned in Section 5 of this Order shall be given a grace period of three (3) months from the effectivity of this Order within which to phase out their gear or remove all existing filter nets (sanggab) together with all its accessories. Should the owner/operator fails to remove the same, the Bureau of Fisheries and Aquatic Resources with the assistance of the PC/INP shall cause the removal thereof at his expense.

SECTION 6. *Penal Clause.* - Violation of any provision of this Order shall subject the offender to a fine of not less than Five Hundred (P500.00) Pesos to not more than Five Thousand (P5,000.00) Pesos or imprisonment from six (6) months to four (4) years, or both such fine and imprisonment in the discretion of the Court. Provided that the Director of Fisheries and Aquatic Resources is hereby empowered to impose upon the offender an administrative fine of not more than Five Thousand (P5,000.00) Pesos including the confiscation of the filter net (sanggab) and all the fishing paraphernalia used therein.

SECTION 7. *Repealing Clause.* - All existing Administrative Orders, rules and regulations or parts there of which are inconsistent with the provision of this Order are hereby repeated or amended accordingly.

SECTION 8. *Effectivity.* - This Administrative Order shall take effect fifteen (15) days after its publication in the Official Gazette and/or in two (2) newspapers of general circulation.

(SGD.) JOSE J. LEIDO, JR.

Minister of Natural Resources

RECOMMENDED BY:

(SGD.) FELIX R. GONZALES

Director

Bureau of Fisheries & Aquatic Resources