Bay of Bengal Programme

Development of Small-Scale Fisheries

HAULING DEVICES
FOR BEACHLANDING CRAFT

BOBP/WP/51

SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY

FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS

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HAULING DEVICES FOR BEACHLANDING CRAFT **BOBP/WP/51**

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This paper describes mechanical hauling devices for beachcraft developed and tested by the small-scale fisheries project of the Bay of Bengal Programme (BOBP) in India and Sri Lanka. The paper records the project's experiences with beach-hauling devices from 1980 till 1985. A diesel engIne-driven winch capable of hauling boats up to a weight of about 1500 kg was introduced and is now manufactured commercially. A problem that still awaits solution is that of suitable rollers underneath the hull to reduce friction drag. The trials have shown that for larger craft and rough conditions, more complicated multi-speed winches are required.

Besides the authors, those who took part in the work included Mr. Oyvind Gulbrandsen, Naval Architect (Consultant), who designed and tested the manually operated capstan; Mr. R. Ravikumar, Naval Architect; Mr. S.O. Johansen, BOBP Naval Architect (Associate Professional Officer); Mr. S.B. Sarma, Inspector of Fisheries, Andhra Pradesh; and Mr. E. Srinivasan, Inspector of Fisheries, Tamil Nadu Numerous fishermen also participated in the trials.

The work on beachhauling devices, and this paper describing the work, were sponsored by the small-scale fisheries project of the BOBP. The project is fulided by SIDA (Swedish International Development Authority) and executed by FAQ (Food and Agriculture Organization of the United Nations), and covers five countries bordering the Bay of Bengal — Bangladesh, India, Malaysia. Sri Lanka and Thailand. The main goals of the project are to develop, demonstrate and promote appropriate technologies and methodologies to improve the conditions of small-scale fisherfolk in member countries.

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1. INTRODUCTION

Most traditional fishing craft on the east coast of India are operated from the beach. The craft used are mainly kattumarams (log raft), navas and vallams (planked boats) and the Masula (used exclusively for beach seining when the sea permits). The traditional method of bringing the kattumaram up the beach is to untie the ropes that hold the logs together and then carry each log by suspending it at each end on loops from a pole that is supported at the shoulders of two men. By this method, four men can handle a kattumaram of any size, though the effort may be time-consuming.

The larger nava or vallam requires 15 to 20 men to bring it up the beach. One end is lifted and turned, then the same procedure is repeated at the other end. In this way the boat, weighing up to 2t, is "walked" up the beach. This handling procedure. is possible only when the keel of the craft is rockered in profile. The Masula is handled in the same way.

Another manual method employed to pull up the craft uses planks and rollers. The craft is moved on wooden rollers placed on planks to prevent the rollers from sinking in the sand. Normally the mast or another wooden log is tied across the craft in front of midships to get a firm grip for pushing. Where beaches are well protected, not steep and of hard enough surface, a manual winch or capstan is used to haul up motorized boats of up to lit on a wooden cradle. This is usually done for periodic maintenance and repair work.

The main problems encountered when handling craft on the beach are the steepness and softness of some of the beaches. There is also often a hump between the beach and the plateau to which the craft must be pulled. In many places it is not possible to "walk" or pull up medium-sized or large craft in the traditional manner. Another problem is to control heavy craft that are tossed about in the breakers and in the undertow and sideway currents before they are pulled out of the water. Manpower alone may take quite some time to get a heavy craft out of the risk zone. A third problem is that the required manpower may not always be available when needed.

It was considered essential that BOBP-developed beachlanding craft (BLC) should be handled on the beach by some appropriate hauling device. The problems faced by country craft would also be faced by BLCs, perhaps even more so since the craft may be heavier and expected to work under more unfavourable beach and surf conditions.

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2. MANUAL HAULING DEVICES

Several devices exist to enable man to lift or pull loads beyond his capacity. Of these the most common manually operated ones are a block and tackle,a chain pulley block, a capstan and a hand cranked winch.

For hauling boats up a beach, the rope tackle and chain block are perhaps the simplest devices. However, both suffer from the drawback of low pulling speed. This is a penalty one has to pay to gain mechanical advantage. One point in their favour is that both are portable. The chain block however has to be protected from sand which may jam the gear wheels.

Devices that convert torque to linear pull ore a capstan and a winch. Both can be either mechanically driven or manually driven. Pulling speed can be increased within limits by increasing the diameter of the drum and pulling power by providing large spokes on the capstan or high reduction gears in the winch.

Between the two, a wooden capstan is preferable to a metal winch, both in terms of cost and in terms of service life in a corrosive atmosphere.

A prototype of a wooden *capstan* was therefore designed, constructed and tested during the BOBP's initial trials with BICs in 1980 (BOBP/WP/7). A picture of the wooden capstan in operation is seen on page 10.

The capstan functioned well during the trials; but some technical improvements to the design were considered necessary before promoiing the device.

The improvements are:—

- the use of stainless or copper sheets with grease in bearing area to reduce friction and wear
- shaping the drum like a warping head or providing spooling control to avoid the rope walking up or down the drum
- providing a ratchet mechanism to prevent dangerous backlash, specially for the use of synthetic rope
- placing the rope drum as low as possible to make it easy for the operator to jump over the stretched rope running between the capstan and the boat.

A more compact design using galvanized pipes and steel profiles would reduce the weight and size of the capstan but the repair facilities — for welding, for example — may be a problem with such a design in remote areas. A steel capstan would also be costlier than a wooden one and prone to corrosion.

Although the capstan worked well and could be improved further, its usefulness would continue to be hampered by low pulling speed. The seriousness of this handicap increases with larger craft and rougher conditions. In the presence of large breaking waves and a strong longshore current it is important to get the craft quickly out of the water to prevent it from being carried violently sideways. The latter will also move the craft away from the best hauling position and further complicate the operation. It is very difficult to handle craft (even small ones) in rough surf conditions by manual power alone.

Another drawback with the capstan is that several people are needed to operate it. In case of the prototype eight persons are required to fully utilize the pulling power (about 2 tonnes) and at least one person is needed to handle the rope spooling.

It was concluded from the trials that a capstan of the type tested is a suitable device for hauling small BLCs under light-to-moderate surf conditions.

3. AN ENGINE-DRIVEN WINCH

The problem with manual hauling devices as described earlier was the reason for experimenting with mechanical hauling devices. The need to attain a higher pulling speed to get the craft out of the breaking waves before it gets damaged or drifts away was indeed pressing. This problem was aggravated during the trials of second generation BLCs. These craft were generally bigger than those in the first series. It was also felt that a mechanical engine-driven winch would be more effective and safer in handling larger craft on surf beaches. A final consideration, particularly with respect to Sri Lanka, was the need to handle an assorted size and variety of beachcraft much larger than the prototypes for India.

An engine-driven winch would of course be much more expensive than a manually operated capstan. But some of these costs could be offset by using the winch for several craft. The winch component cost per craft would then be only a small fraction of the total cost of craft, engine and fishing gear, easily compensated for by increased earnings on days when fishing would be impossible without a winch.

In close cooperation with a winch manufacturer in Madras, a winch was developed, using a reduction transmission, spooling arrangement and a wire drum, all mounted on a steel frame (See drawing in Fig. 1).

To reduce problems of servicing and supply of spare parts, the same engine as used in the BLCs was used for the winch. It is a 8 hp Indian manufactured air-cooled diesel engine, developing a torque of 5.1 kgf.m. at 3000 r.p.m.

A rubberized wheel of 125 mm diameter is mounted on the output shaft of the engine. The engine is mounted on a pivoting bracket, and so positioned and balanced that the revolving rubberized wheel clears a 400 mm diameter flywheel mounted to the reduction gearbox input shaft by 25 mm. Under the flywheel a brake shoe was mounted onto the pivoting bracket.

By pressing down the operating handle fitted to the pivoting bracket of the engine, the rubberized wheel is pressed on to the flywheel of the reduction gearbox and functions as a clutch, transmitting power from the engine to the reduction gearbox. The engine is balanced in such a way that by disengaging the handle, the engine tilts to its upper position, and automatically engages the brake since the brake shoe now touches the flywheel. By putting the operating handle in a neutral position a free-wheeling effect is obtained, allowing slow and safe release of the wire. (The first prototype built used a flatbelt drive with a jockey pulley as clutch. It did not work satisfactorily. The clutch did not allow full disengagement of the flatbelt, hence the flatbelt broke too often).

A rubberized wheel of 125 mm diameter and a reduction gearbox flywheel of 360 mm diameter on the prototype winch resulted in maximum pulling power of 1200 kgf. On the final version the flywheel diameter was increased to 400 mm, resulting in an increase of pulling power by 200 kgf to a maximum of 1400 kgf.

The wire drum, which can take lOOm of 12mm diameter galvanized steel wire, is connected to the reduction gearbox by a double jaw clutch (dog clutch), essential for disengaging the drum and hence releasing the wire. Trials were first conducted with a 20 mm diameter synthetic rope wrapped three times around a warping head. This method was abandoned because the rope stretched and also because the heat generated by friction damaged the rope. A simple hand-operated spooling arrangement is mounted in front of the wire drum. By lowering or raising the handle, the wire is guided onto the drum If the Iongshore current is not taken into account by the helmsman, the craft may reach the beach 10-20 m away from where the end of the wire with hooks is placed. Hauling a craft from this position will result in a strong side force, making the operation of the spooling handle difficult, if not impossible.

A steel base plate with bevelled-up sides was welded under the steel frame to allow it to slide on the sand towards the direction of the craft. However, since the pull from the winch is directed towards the

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craft which is at a lower level than the winch, together with the side force, the winch will lean on one side, get stuck in the sand and not adjust its direction towards fhe craft.

To anchor the winch, a 3m long palm tree log was buried 1.5 m into the sand with two ropes secured to it. The distance from the winch to the log was about 6 m. The ropes were tied to eyes on the frame of the winch.

The winch described above was commercially manufactured for BOBP and some State Governments in India for use during demonstrations of BLCs. The selling price was the equivalent of US $ 2,200 early 1986.

Trawl winch with gear box and frame	US $	1,165
8 hp air cooled engine		885
60 m galvanized wire and hook		150
Total	US $	2,200

In Sri Lanka, where experiments with larger BLCs (SRL-14) were conducted, the 8hp diesel engine (used in India) was not sufficient to haul this class of boat. The weight of SRL-14 is about 2.9t, about twice the weight of the IND-20 and IND-25 used in India. A secondhand engine (12 hp fitted with a reduction gearbox of 5:1 reduction ratio) available with BOBP and used earlier on experimental craft, was used for the winch. The maximum pulling power was thereby increased from 1400 to 3500 kgf.

4. BEACH ROLLERS

Beachlanding craft can be pulled straight up the beach by a strong winch with the keel sliding directly on the sand. The pulling power required can however be drastically reduced by using rollers under the craft.

Keel abrasion will also be very much reduced by using rollers — leading to savings in maintenance and repair cost of the craft. A most important advantage of using rollers becomes apparent during the launching operation. With a suitable roller system on a medium steep beach, the craft will run down the beach by itself.

Wooden rollers are commonly used, but only on hard beaches (high clay content). If used on beaches with wet soft sand, the rollers will sink.quickly into the sand under the weight of the craft. In most places in India and Sri Lanka the sand on the beach is very soft.

To avoid the rollers sinking into the sand, wooden planks can be used as a base for the rollers (Fig.4) Trials with hauling and launching the craft using rollers running on two wide planks worked in moderate surf conditions. The main problem is to prevent the planks and rollers positioned at the water's edge from being removed by the breakers and the sideways current. During monsoon conditions this method cannot be used — craft, planks and rollers will be washed away before getting the craft out of reach of the breakers.

What is needed for easy handling is a light roller with a large bearing surface against the sand. It was thought that large inflatable ship fenders could be used. Some inflatable fenders made of PVC were imported and tested as rollers. They functioned very well when used in pairs, closely tied together to stay in position on either side of the craft. Half-inflating the rollers provided a large bearing surface with no risk of the fender sinking into the sand. They rolled well even in this condition.

SIZES AND COSTS OF PVC FENDERS

Inflated size Diameter mm	Length mm	* Prices for double wall thickness US$	Suitable for
610	1270	46	2-3t boat
460	1260	40	2-3t boat
312	1160	30	1-2tboat

* Prices CIF Colombo 1984

Two of these rollers make one set (pair), and for beaching one boat four sets are required, i.e. eight rollers. Between fishing trips the craft is left resting on one set The other three sets can therefore be used for beaching or launching other craft at the same beach. Assuming that five craft operate from the same village and are not hauled or launched at the same time, a total of eight sets are required (16 rollers). In addition, a few spare rollers are recommended.

The durability of the standard quality PVC roller did not come up to expectations. The rollers were often punctured due to sharp edges on the craft or pieces of shells etc., lying on the beach. An additional problem was leakage through the air valve because of damage to the threads of the plastic plug. It is also believed that the rollers could not withstand exposure to the sun; however, this has not yet been established.

To protect the rollers, double canvas covers were tried but did not last long enough to justify the additional cost. To overcome these problems, the manufacturers of the rollers suggested that the wall thickness of the fender be increased by twice the standard thickness or that the rollers be filled with foam. Both suggestions were too expensive.

Enquiries made in India to get Indian manufacturers to fabricate PVC fenders for use as beach rollers did not yield any results.

5. POWER REQUIREMENT

As a rule of thumb, the power required to pull a craft up on the beach is equal to its weight.

The only way to determine the exact winch power required to pull a craft is the dynamometer test. A dynamometer is fixed between the craft's towing eye and wire hook.

The findings of dynamometer tests in India with IND-25 (which weighed 1,400 kg) are presented in the table below. The tests were undertaken from a beach with a slope of 5-10 degrees. There was a nearly vertical wall of about 0.5 m between the slope and the flat portion.

Condition	Hauling Power (kgf)
1. Boat directly on wet sand	900
2. Boat directly on dry sand	**640**
3. Boat on PVC roller	400

The same dynamameter test, done in Sri Lanka with the SRL- 14 (weight 2,900 kg), gave the following results:

Condition	Hauling Power (kgf)
1. Boat directly on wet sand 10° slope	2,000
2. Boat directly on dry sand 10° slope	1,400
3. Boat on PVC rollers 10° slope	1,100
4. Boat on rollers 35° slope	1,700
5. Boat on sand 35° slope	3,500*

* It was not possible to haul the boat at a pull of 3500 kgf.

6. HAULING AND LAUNCHING TECHNIQUE

During hauling and launching trials of IND-20, IND-25 and other craft of similar size in India at different places and under different surf conditions, no serious problems were encountered. The weight of these craft did not exceed 1,500 kg. Under rougher conditions it is advantageous to launch the craft with the bow first, for immediate take off from the beach. This can be facilitated by hauling up the craft by the stern; it can also be turned on the beach by manpower.

In Sri Lanka, however, serious problems have been encountered, the reasons being:

- the weight – 2,900 kg – of the croft(SRL-14)
- heavy surf breaking right on the beach during the monsoon.
- steep beaches as a result of the heavy surf.

The hauling operation requires a winch of relatively high speed to pull the craft out of the water before succeeding breakers hit it, turn it and cause it to drift sideways md away from the landing point. The winch also needs to be highly powered to pull the craft up bn the steep beach and over the sand wall which often exists during the monsoon.

The launching operation is even more of a problem. A craft of the size of SRL- 14 must be launched with the bow first in heavy surf conditions. It is too difficult and risky to turn it around. The crew must also be on board when the craft reaches the water for immediate departure to prevent it from being turned sideways and washed up on the beach.

In theory, the craft could be pulled out by the use of winch power, and having a block anchored at sea outside the serf zone. It is a very complicated method, not considered feasible for several reasons:

- A very heavy anchor is needed and this might get buried in the drifting sand – long wire cables will be required, which would corrode quickly and result in high maintenance costs,
- Only a very limited number of craft can be served by one block,
- The arrangement might be an obstruction on the beach – for beach seine operations, for example.

During beachlanding trials in Injambakkam (south of Madras city), an attempt was made to try out the rope launching system. The trials were not completed because of problems with the weight and position of the anchor and objections from fishermen in the village. Moreover, information came in about similar unsuccessful attempts by another project in South India. The trials were therefore not pursued.

An alternative method was tried out in Sri Lanka for SRL- 14. Three towing eyes were fitted to the hull – one in the bow and two at the transom. At the end of the winch wire, a bridle with eyes was provided for attachment to the boat with shackles.

When the craft lands on the beach during heavy surf, it is pulled bow first until it is clear of the wave action, and thereafter turned on the beach by changing the towing point from the bow eye to one of the transom eyes. Both hooks are then hooked onto the two transom eyes and the craft is pulled up transom first. Between fishing trips, the craft is left balancing on one set of rollers and secured by either the winch wire or by a separate rope tied to the nearest palm tree.

Before launching the craft, two sets of rollers are fitted under the front portion of the craft and tied to the gunwhale by coir rope. The entire crew then enters the craft and the engine is started. Thereafter the rope (or wire) that secures the craft is released and the helpers push off the craft which will run down the beach by itself. Once the craft tilts and bangs its bow portion onto the beach, the coir rope snaps off and the two sets of rollers are placed under the running craft without manual input.

The alternative is to place the rollers on the beach in a straight line below the craft. Two helpers are required to hold each roller set. This method is dangerous to the helpers since the craft might change direction and not follow the anticipated route.

After the last roller set floats up behind the craft, the propeller is dropped quickly and full throttle is given to cross the surf.

7. DISCUSSION

After three years of the trials in India with the diesel engine-driven winch, it can be concluded that iris adequate for handling the BLCs IND-20 and IND-25 and that handling is easy if inflatable PVC rollers are used.

For most of the trial operation, a winch was used for only one or two craft (a maximum of three craft). If more craft are to be hauled by one winch, two or more pulling points will be required. This could be arranged by placing the winch drum perpendicular to the shoreline and having blocks spaced out along the beach, guiding the wire down to batches of two or three craft. This has not been experimented with but no great difficulties are foreseen.

Although the *beach-hauling winch* works, there are some shortcomings which need further attention.

Due to strong side forces the *spooling arrangement* does not work when the winch is not directed straight towards the craft. This might be overcome by using wooden skids under the winch base. This would prevent the winch from getting stuck in the sand and facilitate change of direction of the winch towards the craft, allowing the present spooling arrangement to be used. The problem would not occur if the winch were turned to pull along the beach via blocks down to the craft.

The *rubberized wheel* fitted to the engine output shaft for transmitting power from engine to the winch is of a very special grade. Wheels coated with ordinary rubber wear out quickly but better quality material can probably be found in the future.

The main reason for developing an engine-driven winch was to attain a higher *pulling* speed to get the craft away from the breakers fast enough. Although the pulling speed (0.5 rn/sec.) on the diesel-driven winch is more than twice that obtained with.the wooden capstan, it is still not sufficient to get the craft away from the surf zone fast enough during the rough days of the monsoon.

The only way to solve the above problem is to use a winch with a variable speed and pulling power – one gear with low reduction for hauling the rope slack, and one gear with high reduction for pulling the craft up the beach. Such a solution is likely to push up the cost of the winch.

The *winch* **is anchored on the flat portion of the** beach *at a higher level than* the *craft.* During the low tide the difference in level between the craft and the winch can be as much as 3-4 m. Sometimes a ledge is also present between shore break and the flat beach. When pulling the craft, the winch wire digs into the sand at the hump in such a case. This increases the friction and reduces the actual pulling power. Secondly, the winch wire is not stretched in the direction of the craft movement, but points at an angle downwards, causing some of the pulling power to press the craft down, and generally increasing the friction between the craft and beach considerably. A "roller" placed on top of the slope for the winch wire to run over might be needed.

Inflatable PVC fenders make ideal rollers from *a* functional standpoint. However, their short lifespan, high cost and non-availability in the countries concerned render them infeasible as a final solution. It may be worthwhile to further investigate the feasibility of having similar rollers of stronger material made locally. No other solution has been identified, and the only alternative appears to be planks and logs.

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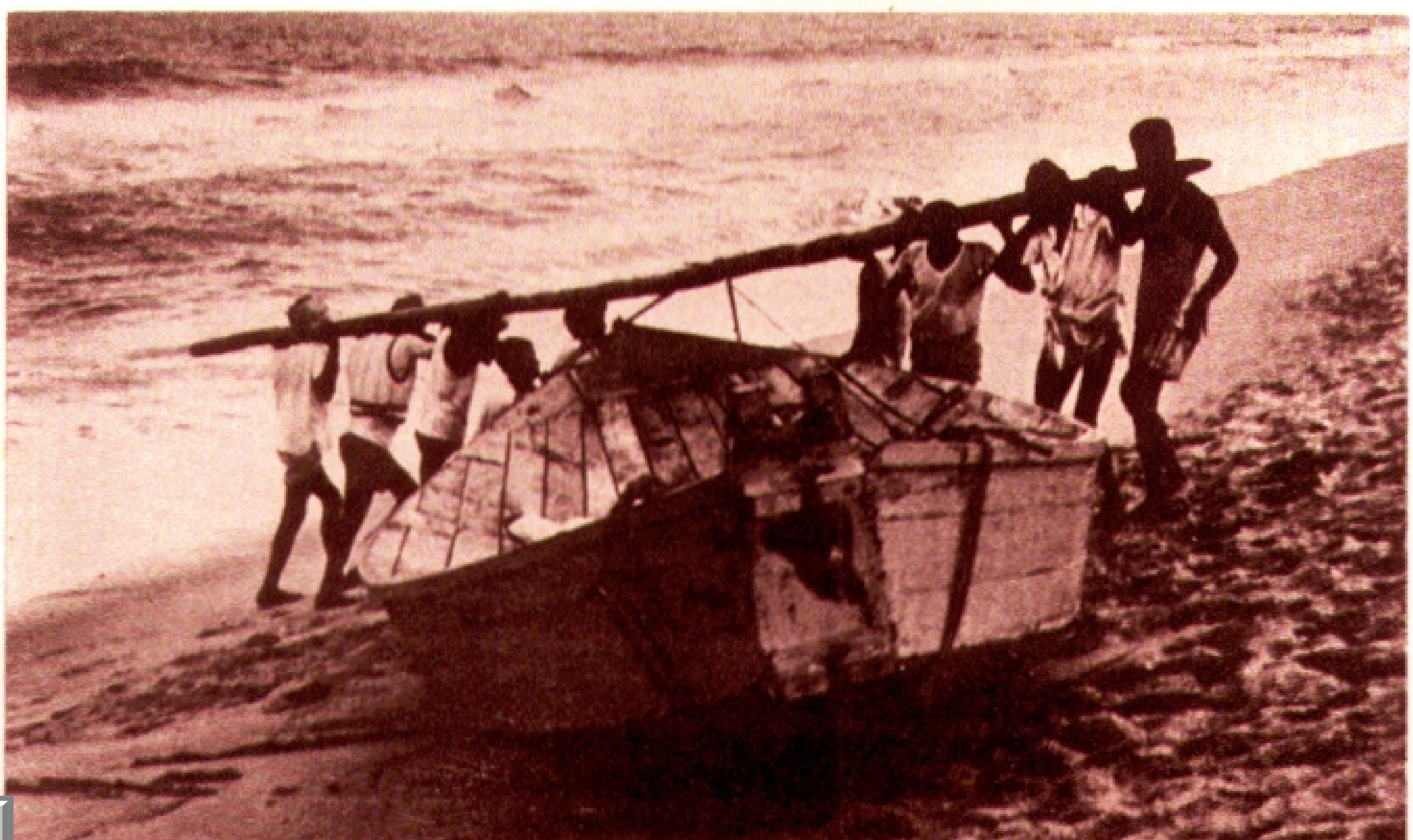
BOBP craft being turned and "walked" up the beach.



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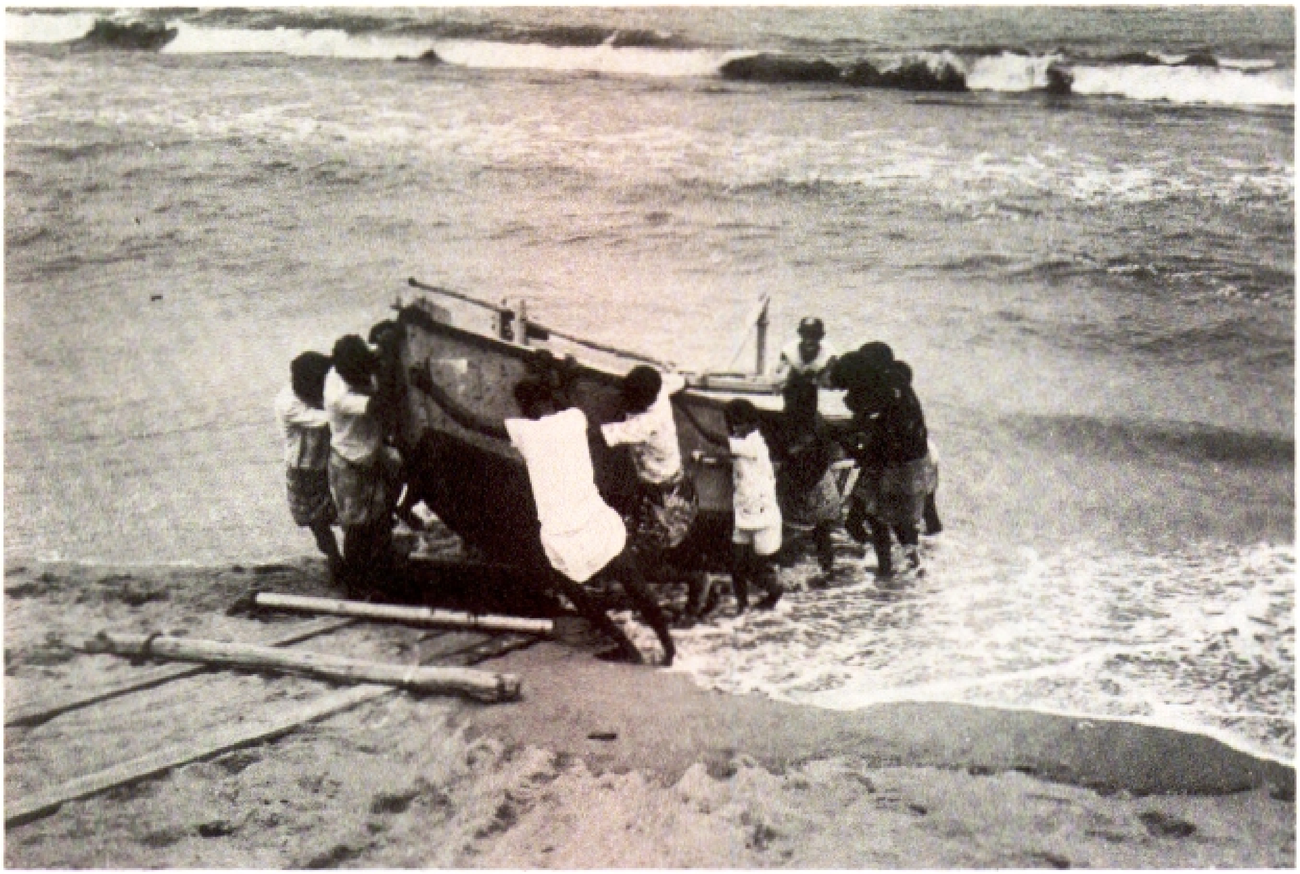
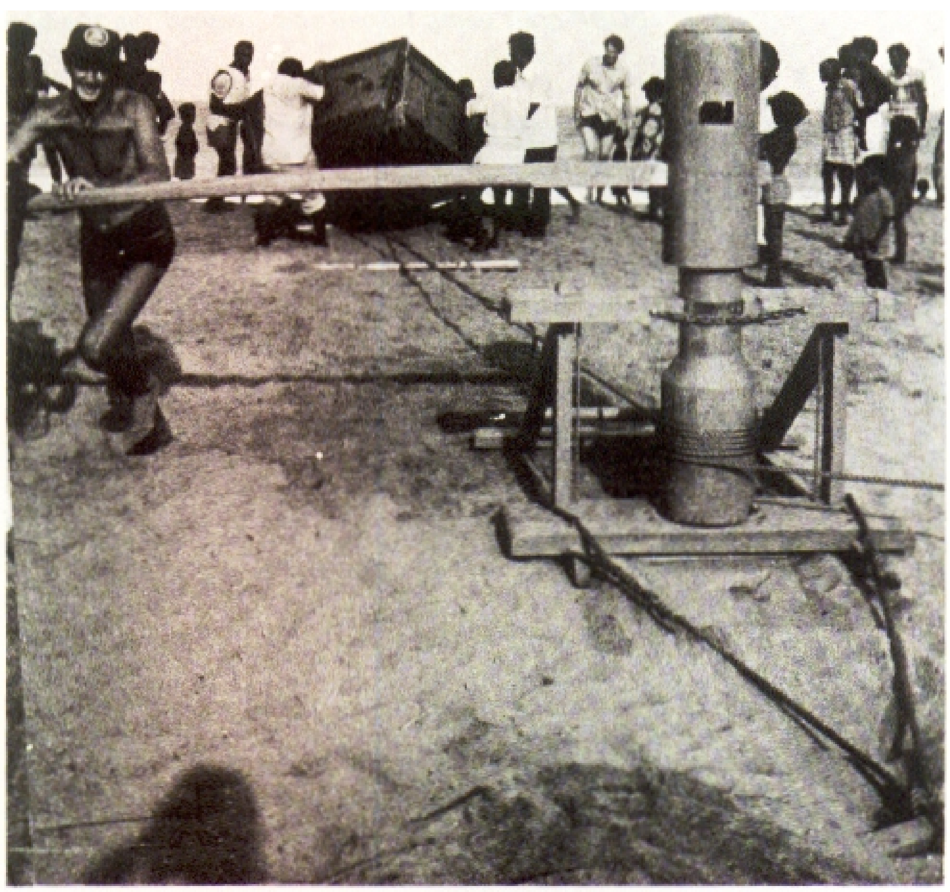


Planks and rollers (above) are placed beneath a BOBP craft for hauling. Note the steepness of the beach. Below: A capstan in operation.



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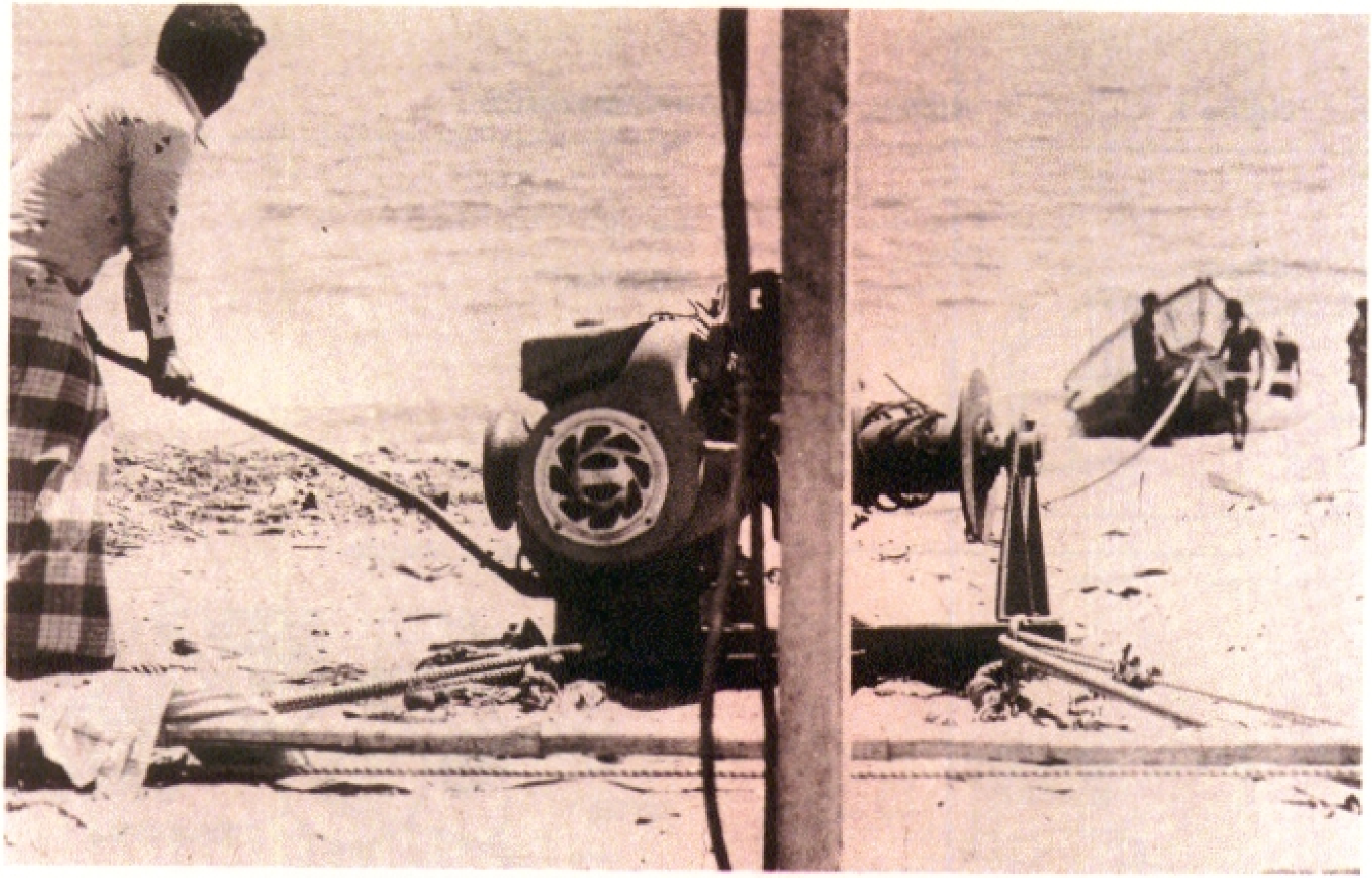

A winch being used in Injambakkam, Tam/l Nadu, to haul a beachcraft.

Below: Inflatable fenders used for hauling.

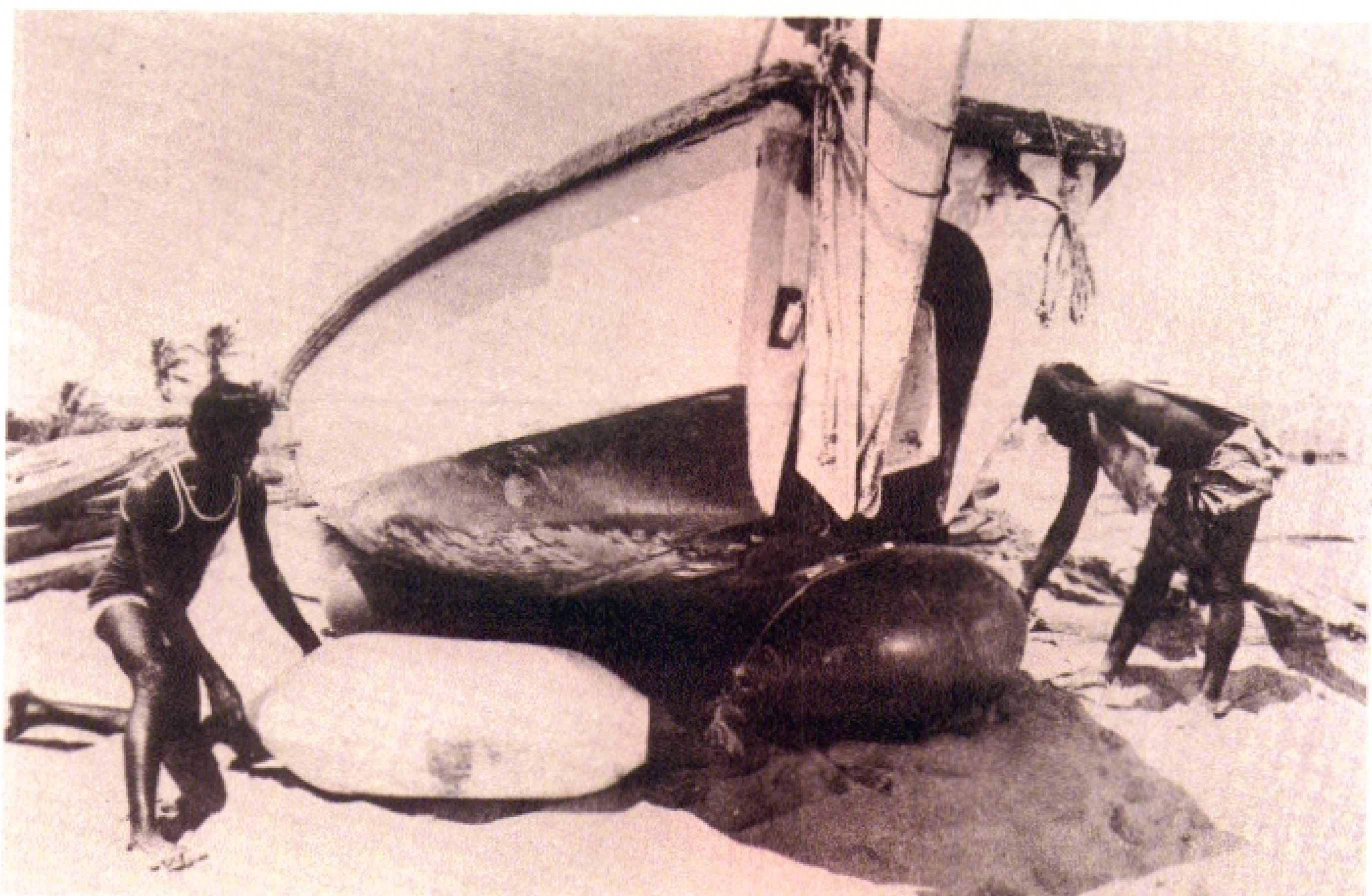

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Figure 1 **DIESEL ENGINE-DRIVEN WINCH**

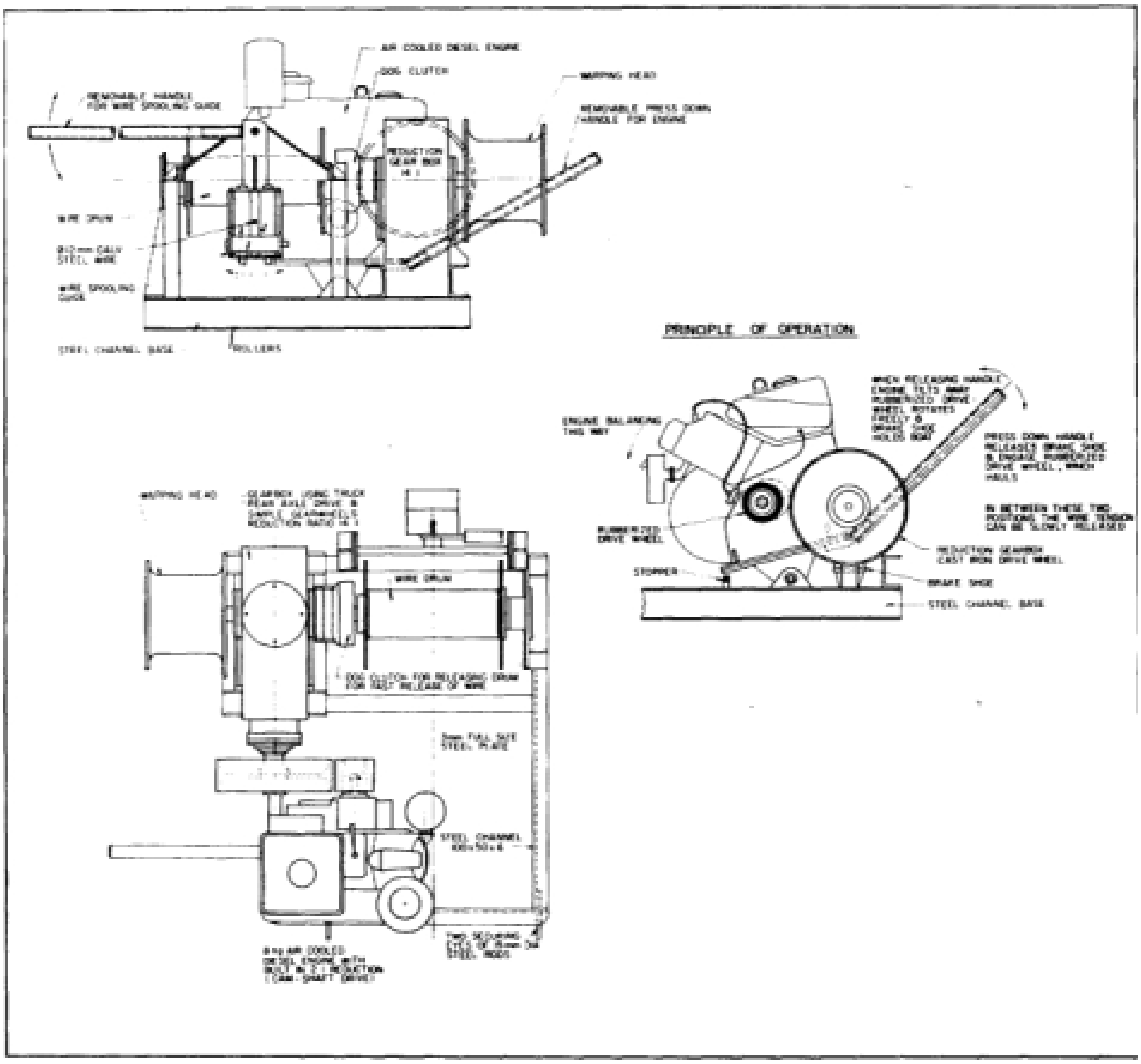

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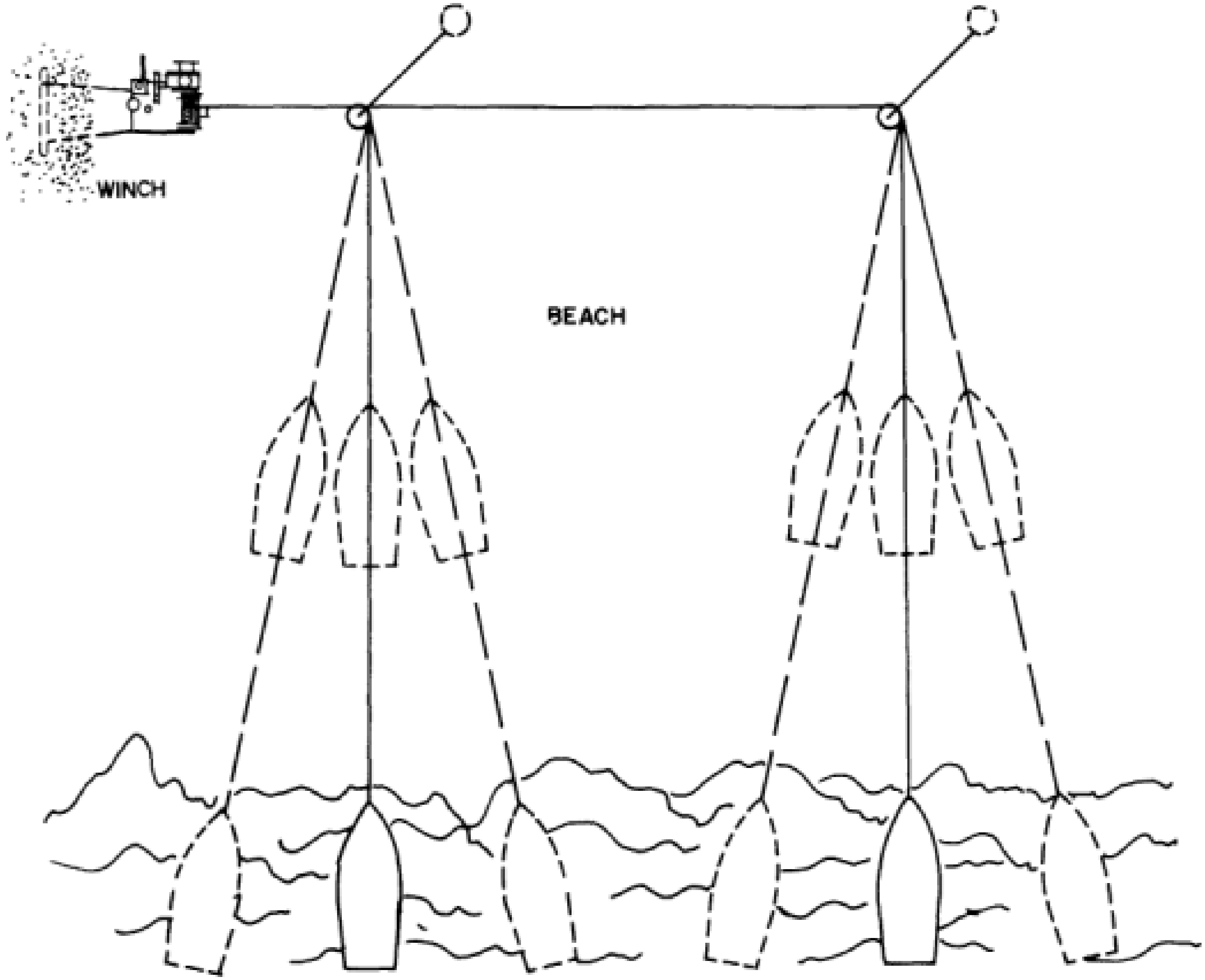
Figure 2 HAULING ARRANGEMENTS FOR SEVERAL BOATS



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Publications of the Bay of Bengal Programme (BOBP)

The BOBP brings out six types of publications:

Reports (BOBP/REP/....— describe and analyze completed activities such as seminars, annual meetings of BOBP's Advisory Committee, and projects in member-countriees for which BOBP inputs have ended.

Working Papers (BOBP/WP/....) are progress reports that discuss the findings of ongoing BOBP work.

Manuals and Guides (BOBP/MAG/....) are instructional documents for specific audiences.

Miscellaneous Papers (BOBP/MIS/....) concern work not originated by BOBP staff or consultants — but which is relevant to the Programme's objectives.

Information Documents (BOBP/INF....) are bibliographies and descriptive documents on the fisheries of member-countries in the region.

Newsletters (Bay of *Bengal News),* issued quarterly, contain illustrated articles and features in non-technical style on BOBP work and related subjects.

A list of publications follows.

Reports *(BOBP/REP/....)*

1. Report of the First Meeting of the Advisory Committee. Colombo, Sri Lanka, 28-29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
2. Report of the Second Meeting of the Advisory Committee. Madras, India, 29-30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
3. Report of the Third Meeting of the Advisory Committee, Chittagong, Bangladesh, 1-10 November 1978. Colombo, Sri Lanka, 1978. (Reissued Madras, India, September 1980)
4. Role of Women in Small-Scale Fisheries of the Bay of Bengal. Madras, India, October 1980.
5. Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development. Madras, India, 3-8 September 1979. Madras, India, April 1980.
6. Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries. Colombo, Sri Lanka, 8-12 October 1979. Madras, India, June 1980.
7. Report & the Fourth Meeting of the Advisory Committee. Phuket, Thailand, 27-30 November 1979. Madras, India, Fe6ruary 1980.
8. Pre-Feasibility Study of a Floating Fish Receiving and Distribution Unit for Dubla Char, Bangladesh. G. Eddie, M.T. Nathan. Madras, India, April 1980.
9. Report of the Training Course for Fish Marketing Personnel of Tamil Nadu. Madras, India, 3-14 December 1979. Madras, India, September 1980.

10.1 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16-21 June 1980. Volume 1: Proceedings. Madras, India, September1980.

10.2 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal, Chittagong, Bangladesh, 16-21 June 1980. Volume 2: Papers. Madras, India, October 1980.

11. Report of the Fifth Meeting of the Advisory Committee. Penang, Malaysia, 4-7 November 1980. Madras, India, January 1981.
12. Report of the Training Course for Fish Marketing Personnel of Andhra Pradesh. Hyderabad, India, 11-26 November 1980, Madras, India, September 1981.
13. Report of the Sixth Meeting of the Advisory Committee. Colombo, Sri Lanka, 1-5 December 1981. Madras, India, February 1982.
14. Report of the First Phase of the "Aquaculture Demonstration for Small-Scale Fisheries Development Project" in Phang Nga Province, Thailand. Madras, India, March 1982.

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15. Report of the Consultation-cum-Workshop on Development of Activities for Improvement of Coastal Fishing Families. Dacca, Bangladesh, October 27-November 6, 1981. Madras, India, May 1982.

16. Report of the Seventh Meeting of the Advisory Committee. New Delhi, India, January 17-21, 1983. Madras, India, March 1983.

17. Report of Investigations to the Kattumaram of India's East Coast. Madras, India, July 1984.

18. Motorization of Country Craft, Bangladesh. Madras, India, July 1984.

19. Report of the Eighth Meeting of the Advisory Committee. Dhaka, Bangladesh, January 16-19, 1984. Madras, India, May 1984.

20. Coastal Aquaculture Project for Shrimp and Finfish in Ban Merbok, Kedah, Malaysia. Madras, India, December 1984.

21. Income-Earning Activities for Women from Fishing Communities in Sri Lanka. Edeltraud Drewes, Madras, India, September 1985.

22. Report of the Ninth Meeting of the Advisory Committee. Bangkok, Thailand, February 25-26, 1985. Madras, India, May 1985.

23. Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka. Madras, India, March 1986.

24. Fisherwomen's Activities in Bangladesh: A Participatory Approach to Development: PatcFanee Natpracha. Madras, India, May 1986.

25. Attempts to Stimulate Development Activities in Fishing Communities of Adirampattinam, India, Madras, India, May 1986.

26. Report of the Tenth Meeting of the Advisory Committee. Male, Maldives. 17-18 February 1986. Madras, India, April 1986.

27. Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India. Edeltraud Drewes. Madras, India, May 1986.

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