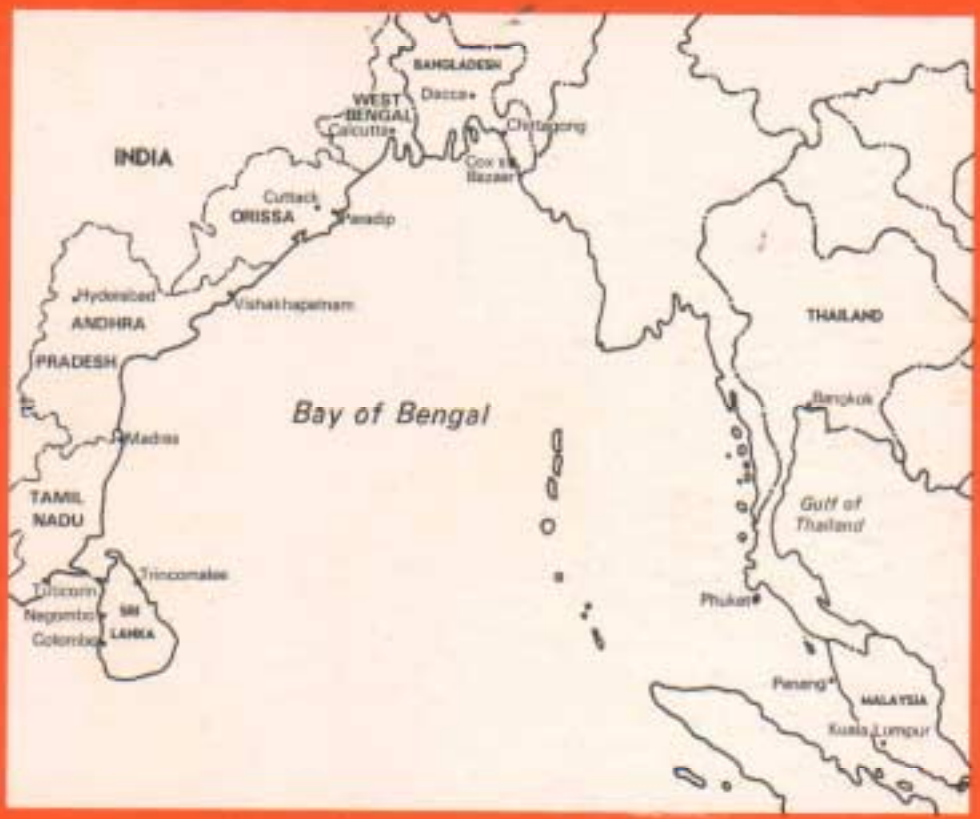
BAY OF BENGAL PROGRAMME
Development of Small-Scale Fisheries

BOBP/REP/17
(GCP/RAS/040/SWE)

Report of Investigations to Improve the Kattumarams of India's East Coast



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FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

BAY OF BENGAL PROGRAMME BOBP/REP/17
Development of Small-Scale Fisheries GCP/RAS/040/SWE

REPORT OF INVESTIGATIONS TO IMPROVE THE KATTUMARAMS OF INDIA'S EAST COAST

Executing Agency :

Food and Agriculture Organisation of the United Nations

Funding Agency :

Swedish International Development Authority

Development of Small-Scale Fisheries in the Bay of Bengal
Madras, India, July 1984

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This report gives an account of the various efforts made by the small-scale fisheries project of the Bay of Bengal Programme (BOBP) to improve the economic performance of fishing kattumarams within the constraints set by social and economic considerations outlined in the text. A wide spectrum of possibilities has been investigated and some of them have been tried out in physical trials. Many of the ideas put forward during the course of the work were however discarded as nonviable after consultations with experts in different disciplines.

During the work the best available experts have been engaged and consulted. They include, besides BOBP staff, counterparts and fishermen, Messrs P. Gurtner and J. Fyson of the FAO Fishery Industries Division; Mr. G. Eddie, fishery engineering consultant, UK; Mr. J. McKillop, sail manufacturer, UK; Mr. G. Gowing, surf-crossing expert, Australia; and Mr. O. Gulbrandsen, naval architect, Norway. But the responsibility for opinions, errors or misjudgements in this report rests entirely with the BOBP.

Parallel with the attempts to improve the kattumarams, extensive work was undertaken to develop motorized beachlanding craft. It is referred to in this report but the full account of these activities is given in other BOBP reports and working papers.

The small-scale fisheries project of the BOBP began 1979 from Madras. It is funded by the Swedish International Development Authority (SIDA) and executed by the Food and Agriculture Organization of the United Nations. Countries bordering the Bay of Bengal — Bangladesh, India, Malaysia, Sri Lanka and Thailand -are members of the Programme. Its main aims are to develop, demonstrate and promote technologies and methodologies to improve the conditions of small-scale fisherfolk and increase the production of fish from the small-scale sector in member countries.

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1. BACKGROUND

1.1 Kattumarams are the most widely used types of traditional craft on the east coast of India from Puri in Orissa all the way south to Cape Comorin. On this stretch of coast there are about 50,000 units, as against only 15,000 units of other types of traditional craft (vallams, navas and masula boats). Available statistics indicate that the kattumaram fisheries in the states of Tamil Nadu and Andhra Pradesh account for about half and two-thirds of the total marine fish production of the two states respectively. In terms of employment, the 40,000 units that are believed to be operational in these two states will directly engage about 120,000 fishermen, corresponding to some 500,000 fisherfolk family members depending for their livelihood on this fishery.

1.2 There are two basic types of kattumarams in use, the raft kattumaram (Fig. 1) and the boat kattumaram (Fig. 2). The former is widely used in Andhra Pradesh and in Tamil Nadu for fishing with gillnets (both set nets and drift nets), hooks and lines, and boat seines, and (in Tamil Nadu only) with scoop nets, mainly close inshore but also off-shore; the boat kattumaram is used also for gillnetting in Andhra, and for line fishing in the Tirunelveli and Kanyakumari districts of Tamil Nadu.

Raft types are all basically similar, but given different names according to the fishing gear used and the length of the centre log or logs. An intriguing feature of these units is their versatility; being built up of individually shaped log pieces, they can be transformed into bigger or smaller units overnight; and depending on the curvature of the logs used, they take on different longitudinal shape while the transverse section is also flatter or more curved depending on the number of logs used.

Thus it is probably not possible to speak of a distinct kattumaram, since owners generally own several sets of logs, and can therefore create differing units at will and as the fishing requirements dictate.

The boat kattumarams of the extreme south of Tamil Nadu are always made up of three logs only, and generally operate in pairs for line fishing as far off shore as the Wadge Bank. Their Andhra counterparts are bigger, made up of 5 or more logs, consequently with more beams for length and a flatter bottom shade; they are concentrated in the area around Visakhapatnam.

Fishermen on the Coromandel coast do not consider the boat kattumaram suitable for their operations, not least because of their obvious unwieldiness and weight and their reputedly inferior performance in surf.

1.3 Previous attempts at improvements in the design and performance of kattumarams included a programme of motorization conducted by the Kottar Social Service Society under the auspices of the Indo-Belgian Fisheries Development Programme, in which a number of kattumarams at Muttom, Kanyakumari District, Tamil Nadu were equipped with outboard engines. This project even included trials of trawling with a motorized kattumaram, with technically good results, but the trial period was too short to allow serious economic evaluation. Trials were also made with alternative types of craft including dories supplied from France.

The reports (1) and (2) of these attempts* contain much useful information, including guidance on likely local attitudes and other socio-economic aspects of such projects and indicating conditions for successful innovation. In short, these conditions were not completely met and from the technical and financial viewpoints the trials were inconclusive.

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* 1. Kottar Social Service Society: Report 5, Indo-Belgian Fisheries Development Programme.

2. Small-Scale Development Projects at Muttom, Kanyakumari District -A Case Study. P. Gillet in "Proceedings of Seminar on the Role of Small-Scale Fisheries in Integrated Rural Development," Madras, December 6-7, 1978; Central Marine Fisheries Research Institute).

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Other recent attempts at improving the techno-economic performance of kattumarams include trials undertaken by the Government of Andhra Pradesh, in collaboration with the forestry authorities, on application of preservative treatment to kattumaram logs.

1.4 The main developments in recent years have been improvements in the fishing gear, largely through the introduction of nets constructed from man-made fibres, which have been widely adopted by the kattumaram fishermen. They have also benefited to some extent from the development of the export market for prawns, although the main beneficiaries of this market have been the mechanized trawlers.

2. THE PROBLEM

2.1 Even in 1979, therefore, the kattumaram was still the craft best adapted to operating from surf-beaten beaches on the east coast of India. Its main advantages are :

- low unit cost
- ease of handling through the surf and from the beach
- low operational cost (including low or non-existent maintenance cost)
- high employment ratio in relation to production.

Its chief disadvantages are:

- limited operational range
- low carrying capacity (gear and fish)
- limited utilization in rough weather
- uncomfortable and ineffective working platforms
- lack of protection against sea and weather for both crew and catch.

2.2 Kattumaram fishermen produce a large proportion of the total catch from the east coast, but their productivity is low. A large number of people are therefore dependent on the kattumaram, but they live below the poverty line. It is imperative for any project aiming at developing small-scale fisheries to attempt at least a marginal improvement in the social and economic condition of the kattumaram fishermen and their families. Any technical improvement of the kattumarams, resulting for instance in higher productivity, would also appear to be easily acceptable in social terms.

2.3 The physical environment, i.e. the surf ridden beach, prevents the use of conventional fishing boats and the construction of harbours or other landing facilities at most places on the east coast. It might be possible to develop unconventional craft capable of operating under these difficult conditions. BOBP has made considerable progress in this direction which is reported elsewhere. But even with the successful introduction of motorized beachlanding craft, with few or none of the kattumaram's disadvantages, the kattumarams will continue to be the most important craft for the foreseeable future. It will take a long time to introduce new craft on a large scale; many problems such as financing, repair, maintenance and social barriers have to be overcome. Even in the very long term the kattumarams will probably continue to have a role in the nearshore fishery.

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3. APPROACH

3.1 Any attempt at improving the kattumaram should aim at reducing or eliminating the disadvantages outlined above, without seriously affecting the advantages, especially the low unit cost.

3.2 Before starting any practical work a review of the knowledge of the kattumaram fishery and an identification of possible avenues for improvement was undertaken. This was done with the assistance of a senior consultant from FAO Rome headquarters with considerable previous experience in the development of small fishing craft in India. The outcome was a tentative work programme of different activities grouped under five heads:

(a) preparation of a more adequate information base on the existing kattumaram fleets.

(b) attempts to reduce the initial cost of a kattumaram or, alternatively, to extend the service life.

(c) improvement of performance and range of operation of kattumarams.

(d) trials and demonstrations of improved fishing gears and methods on existing types of kattumaram.

(e) construction and trial of kattumarams of unconventional design or materials.

3.3 Tamil Nadu, with 33,000 kattumaram units along its coast, and a somewhat lower estimated productivity per unit compared to Andhra Pradesh (3.5 tons/year as against about 6 tons/year for Andhra Pradesh) was chosen as the area for implementation of the activities.

3.4 It was intended that, to the extent possible, BOBP would avail of the services of Central Government and State institutions as well as the private sector-to provide specific inputs, supervise demonstration activities, and monitor the performance of experimental craft entrusted to bona fide fishermen for extended periods of trial fishing. These inputs were to be obtained through agreements with appropriate institutions for specialised staff secondment to the project; through contracts with Government and private sector enterprises; and through special service agreements with individual fishermen.

4. INFORMATION BASE

4.1 An inventory of kattumarams and their fishing gear in Andhra Pradesh and Tamil Nadu was prepared between July 1979 and March 1980 by Mr. T. R. Menon, Chief Instructor (Craft and Gear) of the Central Institute of Fisheries, Nautical and Engineering Training (CIFNET), Cochin. It is published as BOBP Working Paper No. 2 (BOBP/WP/2, October 1980). It describes all the common types of kattumarams and the fishing gears used, and gives estimates, obtained by interviews with fishermen, of the service life, of the main components, and of average costs and earnings. An appendix by a consultant expert describes sail rigs and methods of sailing.

The inventory provides adequate information for those who are concerned with design, technical development and operational matters. The information might also be useful as background material for preparing development projects and schemes of assistance.

4.2 Detailed planning of such schemes would however require more detailed and up-to-date local information on costs and earnings, manpower, ownership pattern, etc.

4.3 The inventory is largely qualitative and there is a need for better estimates of the number of craft of different types in different regions. Such information is of course essential in order to predict the likely impact of any changes introduced in any substantial portion of the fleet and the scale on which resources would have to be provided. The availability of timber for instance is already a matter of concern and aggregates of the fleet are required for any remedial measures. Some data are available from catch and effort statistics but appear to be very approximate. The importance of the fishery warrants better regular statistics or more frequent censuses.

5. INITIAL COST AND SERVICE LIFE

5.1 The trend of availability and cost of timber suitable for making kattumarams of traditional design gives rise to some concern. What could be done? In order to investigate the possibilities of reducing the investment and extending the service life of the kattumaram logs the following activities were undertaken.

- **trials with species of timber now not used for kattumarams**
- **experiments with pressure-impregnation of logs**
- **considerations to use alternative materials.**

5.2 The species traditionally preferred for making kattumaram logs are *Melia dubia* and *Albizzia molluccana.* An effort was made to identify other species that might be suitable, and to subject them to practical trial. Although there are several species in the mainland forests that would be worth trying, they mostly occur in small quantities and are scattered throughout the forests. In the Andaman Islands, however, three species deemed worthy of attention occur in substantial quantities *: didu (Bombax insigne), papita (Piterocymbium tinctorium)* and *white dhup (Canarium euphyllum).* These timbers are utilised mainly in the manufacture of plywood and in the making of matches. Logs of *didu* and *papita* were obtained and six kattumarams constructed. Initial reactions on the part of the fishermen were that *didu* was too absorbent, making the logs heavy to handle up the beach after a fishing trip, whereas *papita* had more familiar characteristics. No methods of predicting service life, or of accelerated testing, have been devised, nor are such methods likely to be sufficiently reliable and convincing. More important is that while the abundance and cost picture of the substitute species in the Andamans looks favourable, the cost of transport pushes up the price, so that it is only marginally lower than the prices of species now in use. The freight and handling charges of a small quantity used for the trials raised the FOB cost by 150%. Besides, they are already in demand for other purposes.

The conclusion is that alternative timber species do not seem to offer any distinct advantages either in cost or in service life. No further trials were therefore conducted by BOBP. The conduct of any further trials of long-term nature should be undertaken by a permanent national institution.

5.3 The other approach under this heading was to subject logs to preservative treatment in an attempt to extend service life. Trials of the use of copper-chrome-arsenic compounds as wood preservatives were recommended by the consultant expert on timber preservation. Although several methods of application are possible, it was decided in view of the conditions of service of kattumaram logs that only pressure treatment was likely to give enough penetration to be successful. Some *papita* logs were thus treated and initial impressions are favourable, water absorption and formation of cracks and shakes being apparently reduced. Methods of predicting service life, or even of estimating durability compared with untreated logs of orthodox species, have not been developed, and it therefore appears that conclusive results cannot be obtained for several years.

The pressure treatment raises the cost of the initial investment by about 30%. (In estimating costs, one has to consider not only the treatment itself but also the transport of logs to and from the plant.) For the big kattumaram logs along the Coromandel Coast, the nearest treatment plant is located in Bangalore and the transport costs would be prohibitive. But even in other cases the economy is doubtful. It is believed that the increase in service life would not compensate for the cost of treatment. The logs are subject to abrasion when hauled in the sand and it is quite likely that treatment would have to be repeated to maintain its effect. As in the case of alternative species any further trials if needed should be conducted by a permanent national institution over long periods of time.

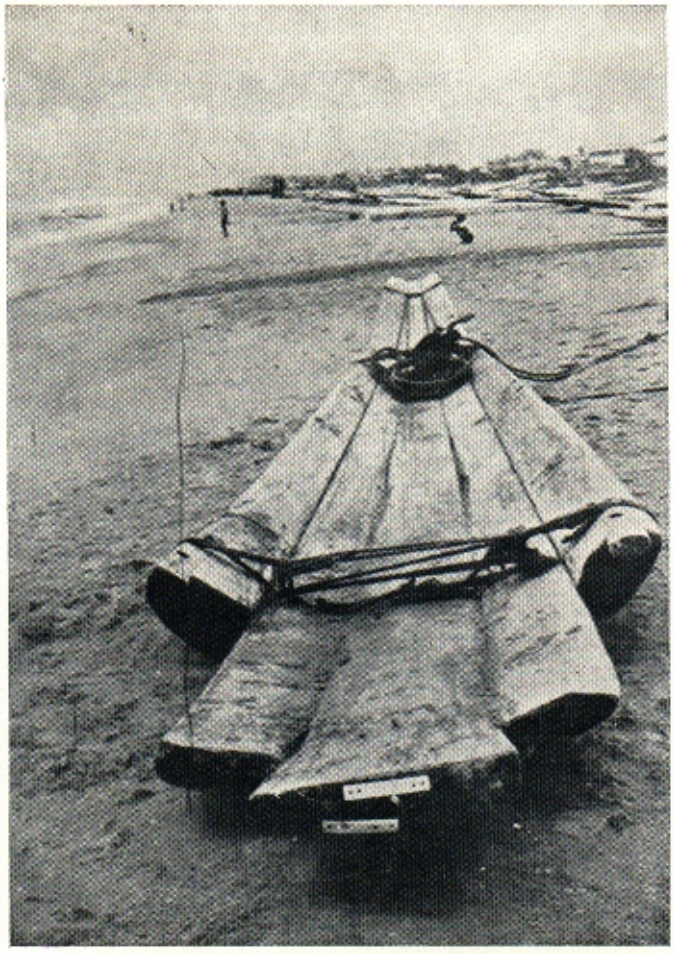

Fig. 1: Raft kattumaram

Fig. 2: Boat kattumaram

Fig. 3: Crossing the surf near the Marina, Madras

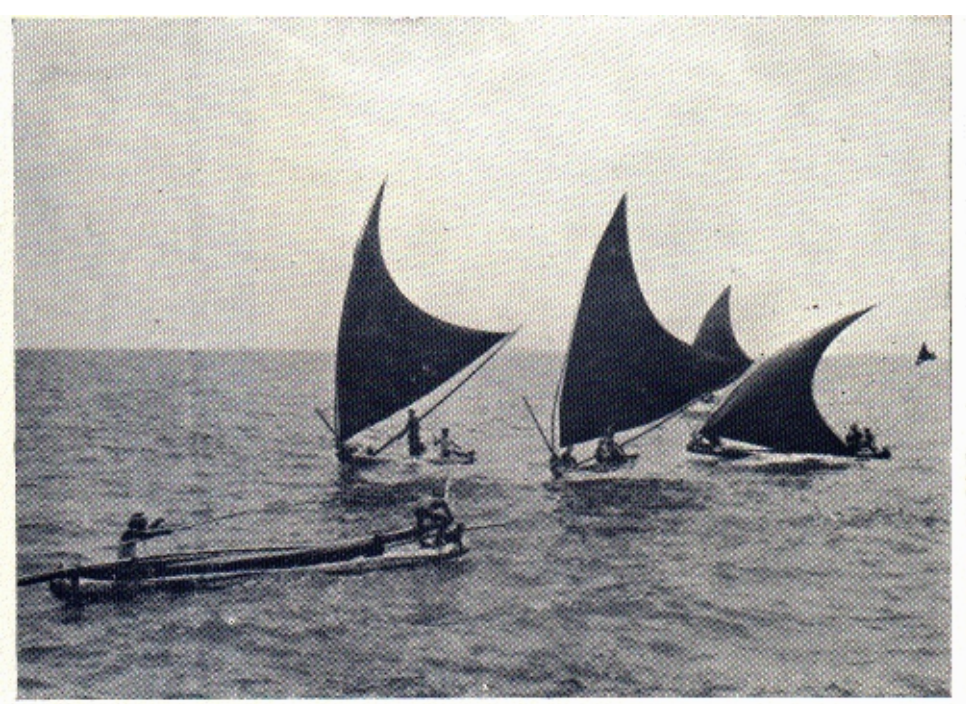

Fig. 4: Kattumarams under sail

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5.4 A third possibility would be to use other materials – either for waterproof sheathing of the logs to prevent water absorption, rot deterioration and mechanical wear and tear, or as substitutes for the wood. Fibre reinforced plastic (FRP), though suitable for sheathing of logs, must be discarded for cost and technical reasons. There would be a high risk of leakage through cracks or damages to the sheathing which would defeat the purpose and aggravate the water absorption and rot deterioration.

As regards the substitute of wood by other materials, FRP, aluminium and PVC might offer technical possibilities. At present the high costs would prevent economic solutions. However, the price of timber has in recent years increased at a higher rate than those of the other materials and perhaps one should not completely discard the latter for future kattumarams. New ideas are required to develop designs for adoption of new materials within the framework of the traditional kattumaram.

5.5 Relevant working papers published by BOBP are:

- "Investment Reduction and increase in Service Life of Kattumaram Logs" (BOBP/WP/2, February 1980), a report by Mr. R. Balan, of the Craft and Gear Division of the Central Institute of Fisheries Technology, Cochin.
- "Boatbuilding Materials for Small-Scale Fisheries in India" (BOBP/WP/9, October 1980).

6. OPERATIONAL PERFORMANCE

6.1 In what ways could the performance of existing kattumarams be improved so that they may lead in a higher return for the owners and operators? Five different areas have been looked into, namely :

- fishing gear and methods
- mechanical propulsion
- sail power
- surf crossing
- protection of catch (and crew)
- mothership operations

6.2 The main constraint limiting the fishing performance is the carrying capacity of the craft, both in terms of weight and space. This is further aggravated by the surf-crossing operation. The gear has to be secured to the logs so as not lose it in the event of a capsize which is not an uncommon happening. Bulky gear – like, for instance, traps – if there were space available, would probably pose unsurmountable problems during surf crossing (Fig. 3). During field studies it had often been observed that the kattumarams would be able to operate more gear than what they actually carry. The fishermen know very well the capacity of their craft; the reason for underutilization is financial. The value of the nets usually exceeds the value of the craft. Further, nets often get lost or badly damaged during fishing operations and the fishermen are too poor to obtain replacements and operate a full complement.

With regard to type of gear, a multitude of gears and methods are in use along the coast. The individual kattumaram also uses different gears during different times of the year. These practices have developed over long periods of time and are based on the fishermen's intimate knowledge of how the availability of different speciesvaries with the season. BOBP's investigations have not led to any practical ideas on how to improve the gear, on introducing new gear and methods, or on combining various gears in a better way. The kattumarams may already be taking what is available to capture within their radius of operation and other constraints. As in the case of the

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quantity of gear, however, there might be scope for improved performance if it were financially possible to acquire the optimum set of different gears.

6.3 A few attempts to motorize kattumarams have been made in the region. Outboard engines have been used in Kanyakumari district, Tamil Nadu, India, as mentioned in the background (1.3). Similarly, outboard engines were used on teppams (small kattumarams) in Sri Lanka some 15-20 years ago. Motorization has only been tried under relatively light surf conditions and nowhere on a sustained basis.

The disadvantage of fitting an engine to an existing kattumaram is that it may reduce its carrying capacity for fishing gear and catch to unacceptably low levels-a consequence of the comparatively low reserve buoyancy of the kattumaram which is the price paid for its great strength. Only the larger sizes of raft kattumaram and the larger boat kattumarams of Andhra Pradesh may be capable of carrying an engine together with adequate amounts of gear and a worthwhile catch. It also seems that the kerosene or petrol-driven outboard engine is the only technically feasible mechanical propulsion device now available.

The major technical problem of motorization is the surf crossing. In moderate-to-heavy surf with turbulent water that partially submerges craft, it would not be possible to operate the engine. The installation, which includes the fuel tank, would have to be carried in a watertight bag or some such gadget and be secured to the logs and only operated outside the surf. This might work but it would be very risky and its practicability is very much doubted.

The overriding problem of motorization is its economics. With the increase in fuel prices of recent years, the use of mechanical propulsion for kattumarams of traditional design has become economically unattractive. It will remain so unless there is a corresponding increase in the price fishermen get for their catch. The additional cost of investment, repair, maintenance and fuel cannot be offset by higher productivity because of the low carrying capacity and vulnerability to weather conditions (surf).

6.4 The conventional sailing rigs used by kattumaram fishermen and the materials used to construct sails have been examined with the help of consultant experts in the design and manufacture of sails and rigs and in their practical use. The rigs appear to be intelligent compromises between maximum efficiency of propulsion and manoeuvrability on the one hand, and on the other, the need to keep the limited area of “deck’ clear for the crew and for fishing operations, paddling and use of oars (Fig. 4). The sails used, usually made of polyethylene waste materials, are very cheap and effective but have a short life because of low quality material.

Although the sails and rigs could be improved by using better materials, the degree of improvement (in the performance of kattumarams of traditional design) would result in only small or insignificant increases in earnings that would not justify the extra cost.

6.5 When going out through the surf, one of the fishermen uses a pole to push the kattumaram and the others use paddles. During heavy surf conditions this propulsion is not sufficient and it is washed ashore by the waves. During monsoons, therefore, many fishing days are lost. Coming in through the surf poses no real problems but often ends up in a capsize.

To alleviate this problem experiments have been undertaken by mounting a rope perpendicular to the shore, anchored outside the breakers and fixed on the shore, along which the fishermen can pull their kattumaram. The trials indicate that such an arrangement would be helpful; the fishermen participating in the trials liked the idea. It has, however, been tried out only in light-to-moderate surf and even then the sand drift and the water current along the beach caused great problems both in firm positioning of the anchor and in keeping the rope in a useful position. Similar problems were experienced by the Indo-Belgian project in Kanyakumari which undertook experiments based on the same principle.

Another problem would be the ownership and responsibility for maintenance of such a system. Anchors and ropes would probably have to be replaced frequently. The communities do not appear to be capable or willing to collectively take the responsibility. The ropes might even be subject to sabotage and pilfering. BOBP is therefore not optimistic about future introduction of such systems.

6.6 Regarding crew protection and catch storage, no attempts have been made to develop improved means for the simple reason that no practical ideas on how to do so, in the conditions in which kattumarams have to operate, have been put forward so far.

6.7 In the vicinity of Madras one sometimes sees kattumarams being towed by the common small shrimp trawlers (32 ft. in length). During the scoop fishery season, when four kattumarams are engaged in the fishing operation, one can also observe a small trawler acting as a mothership which brings the kattumarams *to* the fishing area and back and carries the catch. No doubt this is also practised in other areas. It is reported though that the charges or the share demanded by the mothership are exorbitant. But since it is practised, the kattumaram fishermen must get a sufficiently high share to make it attractive.

There might be scope for wider application of such mothership operations, with the kattumarams serving as the catching units. It would, however, be limited to areas close to harbours or protected waters from which the larger motorized boats can operate. It is difficult to envisage in what way governments or public organisations could encourage the mothership concept. There are obvious organisational problems which can probably only be solved on a strict commercial basis between the professional fishing parties concerned.

7. UNCONVENTIONAL DESIGNS

7.1 We have already in the chapter on "Initial cost and service life" discussed the possibility of producing "logs" of materials other than timber, more durable and less water-absorbent. It is likely that the use of any new material would necessitate alterations in the design and such considerations could also be labelled "unconventional design." Among the proposals studied were hollow logs in fibre-reinforced plastic, filled with rigid plastic foam. The investigations indicated that while it is very probable that "logs" could be produced by modern technology from modern materials that are far superior to the existing timber logs, their cost would far out-weigh any possible advantages.

7.2 A better way of utilising the favourable properties of modern materials may be to produce a complete lightweight raft of shape similar to that of a kattumaram. One possibility that readily comes to mind is an inflatable rubber craft, but here again costs are high compared with the kattumaram, and there must be doubts about the operational suitability. A more trouble-free solution may be achieved by enclosing cheap, waterproof buoyancy material in a rigid structural shell which itself need not be watertight. For surf-crossing, a strong structure is needed.

A craft based on this principle was designed and constructed by BOBP. It has the symbol IND-15 and is shown in Fig. 5. The craft was made of a non-water tight shell of wood and the buoyancy was provided by low density foamed polystyrene in blocks. It was designed to resemble the kattumarams as much as possible. It was also made in two halves to simplify handling on the beach; like the kattumaram the two halves could be tied together by ropes. The main technical advantage of this craft was larger carrying capacity.

The experiment was not very successful. Problems were encountered in making the two halves sufficiently rigid to make it possible to put them together easily. In connection with long-term trials of larger craft based on the same buoyancy block principle, it has also been found that very high quality wood and fastenings are required to attain an acceptable service life. Poor wood and construction will lead to serious damages during the rough treatment the craft are subject to. Another disadvantage is that the larger craft needs more power to go out through the surf-this will reduce the number of fishing days unless the craft is mechanically powered.

There were initial doubts about the durability of the polystyrene material but this turned out to be a positive experience. Although the IND-15 was not tested for any long period of time, the same material has been used on larger beachlanding craft for several years without any significant signs of deterioration. The cost of polystyrene is on the high side, however, and investigations were made to identify alternative buoyancy materials -those made of synthetic fibre (poly-ethylene) and those made of light fibre. These did not lead to any positive results; polystyrene blocks were found to be the only feasible material.

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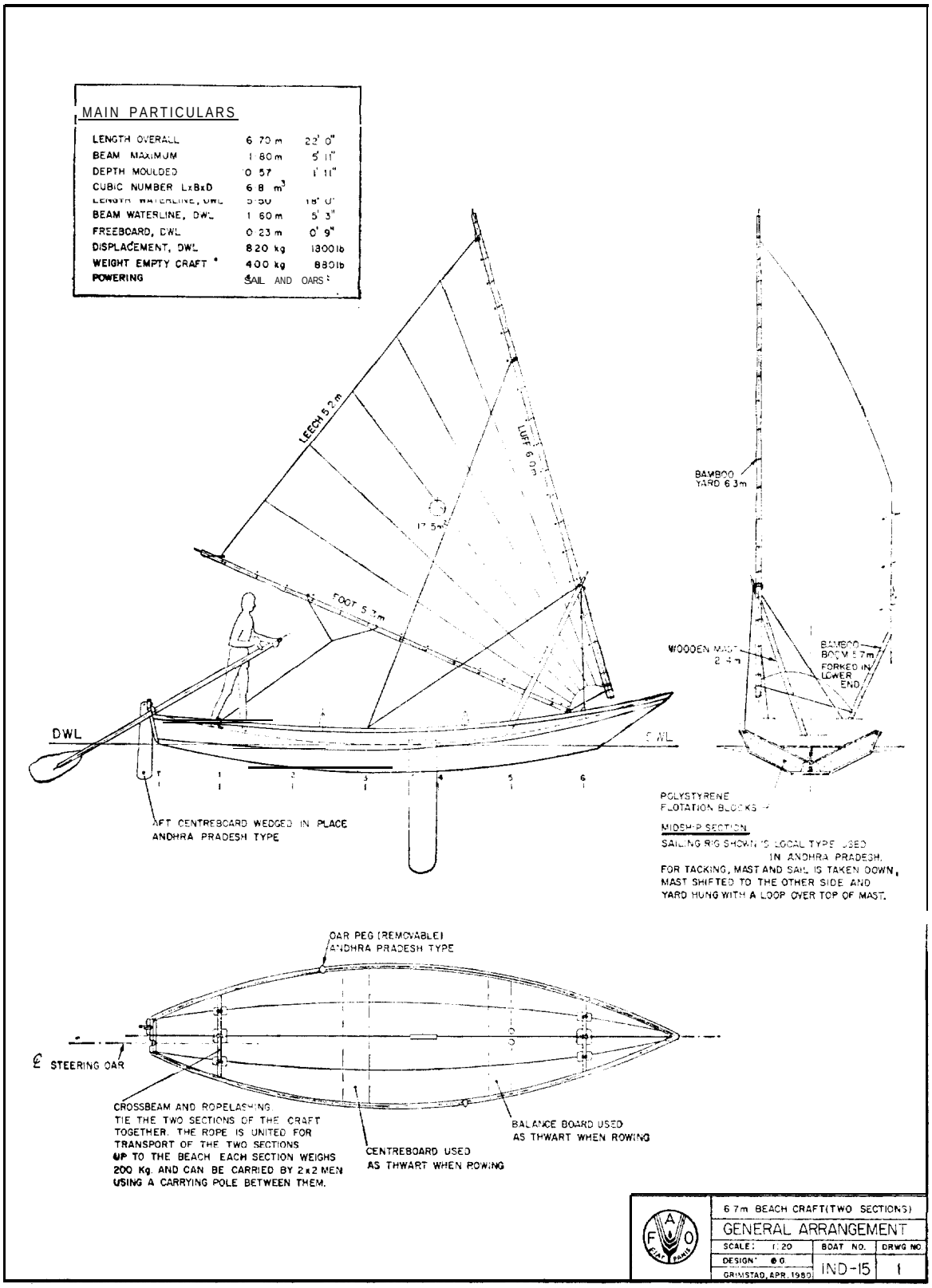
Figure 5

IND-15, AN UNCONVENTIONAL KATTUMARAM



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It might be possible to overcome technical problems; but as with other attempts to effect improvements, economics is the limiting factor. The IND-15 would cost about Rs. 15,000 against about Rs. 5,000 for a large kattumaram. Although it would offer larger carrying capacity, its surf-crossing ability, service life and need for repair and maintenance are negative factors which appear to rule it out as a viable alternative.

7.3 Consideration was also given to the design of twin-hulled craft (catamarans) with a working deck connecting the two hulls. In connection with BOBP's development of beach-landing craft, an experimental catamaran was designed and tested.

Such a craft is bound to be heavier and more expensive than a single-hulled craft with the same carrying capacity if it is constructed with the same materials and methods. It was hoped that the arrangement would allow rapid dismantling of the craft after beaching, to allow it to be carried up the beach in three or more parts, in the manner of the floating pontoon bridges used by armies; it was also hoped that the large raised working deck would offer advantages. This craft, IND-14, was a failure. It gave less protection to the crew than the single-hulled craft and was difficult to dismantle rapidly at the edge of the water. While these disadvantages might be overcome by appropriate design and development, there are further fundamental problems: the two hulls will often encounter different conditions, which will cause the craft to yaw; while this may be acceptable and controllable in a normal seaway, when crossing surf it may lead to more frequent loss of control, broaching and capsize than would be expected for single hulls, and the forces to which the twin-hulled structure will be subjected in rough water and in a capsize will be greater. (The trials of the twin-hulled IND-14 are described in BOBP/WP/7: "Technical Trials of Beachcraft Prototypes in India," October 1980).

The IND-14 experiment does not of course altogether rule out the feasibility of twin-hulled craft; but new designs or tests of such craft, as alternatives to the kattumaram, were not considered warranted.

7.4 The most promising prospect for improving the beach-based fisheries appears to be the development of motorized craft completely different from the kattumarams. These craft will of necessity be many times more expenive than the log rafts; on the other hand, they will not be affected by the many limitations of the latter. BOBP has done extensive development work consisting of the design and testing of several prototypes. All technical problems have by and large been overcome and several boats are undergoing long-term operational and economic trials. Since this work is well beyond the kattumaram level, it is reported separately in other working papers and reports.

8. CONCLUSIONS

8.1 Bringing about improvements in the economic performance of kattumarams of traditional design, through technical development of craft and gear, appears to be difficult. Centuries of evolution have led to a product that is next to perfect considering the environmental, technical and economic constraints within which it has to operate. None of BOBP's investigations and considerations had led to any good prospects for technical improvement that would lead to significantly better economic performance.

8.2 A few measures have been identified by which the qualities of the craft would gain in technical terms. They are for instance pressure-impregnation of the logs, better materials for sails and rigs, and hauling devices to aid the surf crossing. But they are all likely to be marginal gains, and the costs they entail will not be compensated by higher productivity.

8.3 The development of new designs, such as twin-hull configurations or craft of light buoyancy material, does not appear to be a viable proposition since the costs would considerably exceed those of the traditional kattumarams without corresponding increase in proceeds from fishing operations. It might be technically possible to produce "logs" of other materials such as FRP and aluminium with superior qualities. At the present cost structure, however, it is not economically viable.

8.4 Progress is more likely to be made through development of motorized craft of greater carrying capacity in relation to weight, which will have no more than adequate strength, but with a surf-crossing capability matching that of the kattumaram. Such craft have been designed, built and proved by BOBP. But this work concerns advanced supplements to the kattumaram rather than improved versions of it. Even if motorized beachlanding craft are successfully introduced, a rapid replacement of the existing fleet of kattumarams is neither practicable nor desirable. The new craft will exploit areas and resources inaccessible to the existing fleet. The traditional craft will continue to be in use during the foreseeable future.

8.5 Financial and policy measures seem to be the only means of improving the economic performance of the kattumaram fishery. Examples : Credits for fishing gear enabling the operators to make better use of their craft; ensuring the availability of kattumaram logs at reasonable prices. Subsidies for craft and gear might also be warranted, depending on the social objectives of the governments concerned.

In order to support the fishery and properly manage it, more detailed information about costs and earnings and numbers involved by area, season, etc., must be collected and analysed -more frequently and systematically than is being done at present.

Development of Small-Scale Fisheries (GCP/RAS/040/SWE)

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)**

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