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**Mbegani Fisheries
Development Centre
Tanzania**

THE EVALUATION REPORT OF THE MBEGANI FISHERIES DEVELOPMENT CENTRE

Report from the joint Tanzanian/Norwegian
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1. SUMMARY

1.1. The Pre-History.

The Mbegani Fisheries Development Centre was established in 1966 as one of three educational centres within Fisheries Division. By 1972 Norway was requested for aid to develop the overall fishing sector, and MFDC as one of many projects.

After a study, conducted by the Norwegian firm of consultants; FIDECO, NORAD's Board decided to grant NOK 13.2 mill and 11 expatriate experts (August 1974). The final Agreement was signed in April 1976, stating that Norway shall provide financial assistance and appoint a firm of consultants to carry out the construction of the centre and later the training on Certificate and Diploma level.

After running the project for one and a half year, it became apparent that FIDECO was seriously delayed, partly because Tanzania had been unable to meet their obligations in terms of planning and constructions and partly because FIDECO had not been able to organize the training properly.

During 1978 discussions took place in NORAD as to how the project should be reorganized, ending up by sending an evaluation team to Tanzania (the Nore-commission). The Nore-commission found the project a failure and recommended urgent steps to be taken to improve the training, both in terms of expanding physical facilities, bringing in more qualified staff and by reorganizing the administrative set-up.

Due to a more realistic assessment of Tanzanian marine resources and lack of infrastructure, training should from now on be aiming also at artisanal fishermen. In 1980 a renegotiated agreement was worked out, striking a compromise regarding the course structure and in June, NORAD's Board made their decision to grant NOK 85 mill.

Two years later the major construction works were finished and MFDC was able to receive their first students for Diploma courses.

The official inauguration in June 1983, marked "the end of the beginning". Some minor construction works remained, but by the end of 1984 nearly all were finished, adding up to a total cost of NOK 150 mill, (including the FIDECO-period). In addition NORAD had to pay 75 per cent of the running costs each year and the costs of the experts over and above this grant.

1.2. Status of the Fisheries.

1.2.1. The coastal fisheries.

The coast of Tanzania is 800 km long and is characterized by a narrow coastal shelf. The fishery employs between 10-13.000 fishermen who mainly operate over 3500 outrigger canoes, dugout canoes and small dows. A limited number of vessels is mechanized, but their operation is limited by lack of spare parts and frequent shortage of fuel.

Industrial fishing for fish and shrimp is limited to Tanzania Fisheries Corporation (TAFICO) vessels and a few private companies, but total catches are less than two per cent of the total fish production in the country. Total marine fish catch stands at approx. 40.000 tons a year while the total shrimp production is estimated at 1.000 tons per year.

1.2.2 **The inland fisheries.**

80-85 per cent of the fish produced in Tanzania comes from the waters of Lakes Victoria, Tanganyika, Nyasa, minor lakes, dams, reservoirs, swamps and rivers.

The fisheries provide employment for over 57.000 fulltime fishermen and more than 100.000 occasional fishermen. Fishing is carried out by using about 18,000 small crafts which operate close to shore using gillnets, seines, purse seines lines and traps. Main fish species caught are sardines (dagaa), haplochromis species (furu), catfishes (nongwe) and more recently the Nile perch (sangora). Limited commercial fishing is carried out by purse seiners and ring nets on Lake Tanganyika and by small trawlers on Lake Victoria. Fish catches from the inland waters for 1984 stand at 237.000 tons.

In 1983 FAO has estimated the average total annual yields at 293.000 tons as guidelines for planning, management and development of the fisheries. This is probably a rather conservative estimate. Until reliable stock assessments have been undertaken in Lakes Tanganyika and Victoria, it is hard to predict the potential yields with some kind of accuracy. For marine waters acoustic surveys indicates that catches can be increased by at least 50 per cent.

As for aquaculture, there are over 800 fish ponds scattered all over the country raising tilapia species. Production from these ponds has been low due to poor management and lack of suitable seed. It is estimated that with better methods and management, up to 10.000 tons per year can be produced.

1.2.3 **Fish processing, consumption, marketing and distribution.**

The per capita fish consumption varies from 80 kg/person/year in Ukerewe and Kigoma areas to less than 1 kg/person/year in central Tanzania, with a national average of 12 kg/person/year. Fish marketing is under the control of fish traders who purchase the fish at the landing site auction and distribute it for wholesale or retail sales.

Processing methods are traditional, the fish is either sold fresh, smoked, sundried or fried. Small quantities of frozen fish is processed by TAFICO (formerly National Cold Chain Operations) and some private producers. It is estimated that post-harvest losses are between 20 and 30 per cent.

Prices may vary greatly from the one area to the other, depending on quantities available, means of transportation, species etc. Generally prices are high for all kinds of fish all over Tanzania. Dar es Salaam has the highest prices with an average of between 80 to 120 T.sh./kg good quality fresh fish.

1.2.4 **Fisheries administration and research.**

The Fisheries Division of the Ministry of Natural Resources and Tourism is responsible for issuing policy guidelines and ensuring that these are implemented throughout the country. The present administrative structure, where responsibilities for fisheries development and management are shared

with regional authorities as well as local governments, makes planning and implementation difficult, if not impossible. Consequently fisheries extension services have slackened and in some areas extension officers have failed to operate due to lack of motivation, equipment and transport.

Tanzania Fisheries Research Institute (TAFIRI) is the national institution responsible for carrying out fisheries research and providing advice for fisheries management and development. At present TAFIRI lacks proper housing and funds to operate according to its objectives.

1.2.5. **Socio-economic structure and framework for artisanal fishery.**

Fishing on the coast is often done by hired fishermen, and there is still considerable dependency on the "tajiri", the Big Man who assumes the role of a benefactor. He replenishes the equipment, gives out loans and sells fish on credit to women who are short of cash. Generally fishing takes place within a complicated sharing system, where remuneration depends on social standing, ownership of boat and gear, type of fishing etc.

Only fishermen with own boats are registered by name in Government records. This is an important fact to consider when entering into programmes like commodity assistance.

Earlier experiences of forming villages as fishing cooperatives have not in general succeeded. The groups were too large and with too many non-fishing members. At present some of the smaller fishermen's cooperatives function, but they need assistance, especially in terms of gear.

Women along the coast do not in general buy fish directly, but they buy from the fish mongers and process the fish, usually by way of frying. In the Lake region women are the main fishmongers and processors, and also in many cases take care of the transport to the markets. Women traders are quite often single supporters of their families, or they supplement the provision of their husbands to the daily upkeep of the families.

1.3. **Objectives.**

1.3.1. **Relevance to the main problems and needs within the fisheries sector in Tanzania.**

In the Agreement the objectives are of a dual nature, concerning internal activities at the centre as well as the centre's relations to the external fisheries sector and allied subsectors.

The operation of the centre is intended to concentrate on two types of activities; training and direct development work. Training is to be performed on three levels; Diploma and Certificate courses on specified subsectors and Short courses for artisanal fishermen. Relations to the traditional sector shall be the main concern for the content of the training, and Short courses shall form a substantial part of the same. So far the majority of Mbegani inputs have been directed towards the high-technology of fishing and very little towards the artisanal sector, even though more than 98 per cent of both fishermen and catch originate in the latter. Nearly all the inputs relate to training while negligible amounts has been used in direct development work and follow-up assistance.

According to the team, this deviation from the objectives has at least two reasons;

- I the surveying of the fisheries sector and fishing societies in terms of constraints, limits, opportunities and trends was never satisfactory.
- II the process of bringing the general objectives into a operative practical form was not carried out, at best this process has only been fragmentary.

With the dominantly high-technology oriented expatriate staff at Mbegani, project solutions have also tended to be high-technology oriented. In total, the solutions chosen resulted in a project biased relative to the receptive capacity of the sector. This is a serious shortcoming, since the majority of the decisions in a project like this are irreversible and carry consequences for and limitations to the kind of decisions it is possible to take on later stages.

Finally the Agreement states that MFDC should “develop ways and means in order to improve the artisanal sector.” This term should indicate more of a multiple activity programme, where **several constraints** to betterment should receive attention in timed and quantified order and that these activities, together with training, should bring about the desired impact.

1.3.2. **The role of MFDC in relation to the development of fisheries in Tanzania.**

Mbegani’s starting point as a joint Norwegian/Tanzanian project was not in line and level with fisheries in Tanzania. This is valid whether one sets 1977 or 1980 as the starting point. Some of the reasons have been stated above. The result was that the technology introduced was too complicated to be maintained locally, too expensive compared to the carrying capacity of the fishing sector and to a certain extent threatened the economic conditions of many artisanal fishermen, by disturbing fishing grounds. The technologies have later been “simplified”, searching for operative contacts with fisheries as they are. This has been an expensive but necessary strategy taking into consideration the point of departure.

As for the role of training, Norway and Tanzania seems to have had somewhat different ideas. The basic idea of the donor was to produce specialized manpower to serve the fishing industry through practical work, while the Tanzanian idea was that positive impact from the candidates was best secured through post-training engagement in the public and parastatal sector. Under the present economic conditions there seems to be little scope for further employment in the public sector, requiring a new approach both to the intake procedures and the types of courses to be performed at Mbegani.

As for the Diploma Courses, the team recommends that the demand is assessed and that high selectivity is used when candidates are admitted to these courses. The present situation calls for top quality candidates from these courses rather than for high quantity. This also applies for the Certificate courses.

The attendance of Certificate students of MFDC very much depends on demand from other sectors within fisheries, since there is no room for further public employment at present.

As for the Short courses, these now seem to be attractive. The critical factor here is **what** should be taught. At present it seems like the Short courses suffer from the lack of relevant teaching inputs, as the development work that should be the basis for this training was hardly started at Mbegani. It is therefore of utmost importance to start this work as soon as possible.

1.3.3. **Project implementation.**

The project agreement is generally in line with the national policy for fisheries development which is guided by the philosophy of socialism and self reliance, emphasizing increased fish production, increased earning of foreign exchange through export of surplus, ability to meet the national needs of manpower in the fishing sector and finally increased earnings of the fishermen.

The construction phase of the project has been implemented successfully, providing quality housing, training facilities and equipment. Furthermore the centre has trained one batch of students at Diploma level in all the fields, and these have joined the industry with some difficulties. Certificate

courses in the different fields have also been run, the first students graduating summer 1986. Short courses for training artisanal fishermen have been conducted in Bagamoyo and the Pangani Fishermen's Training Centre. Plans are under way to establish Short courses for fishermen in Musoma to cater for the Lake Victoria fisheries. The project has equipped the centre to cater for the needs of high technology fishing, but it has not prepared itself to attend adequately to the needs of the artisanal fishermen. Main reasons for this situation are;

- Lack of expertise on artisanal fishing techniques
- Limited time for the instructors to learn and develop improved versions of artisanal gears
- Training aids and equipment initially acquired by the centre did not fit in with the artisanal fishermen's requirements
- Lack of training in communicational skills and finally
- Inadequate motivation of the instructors to learn artisanal techniques, as boats and gears are considered of poor quality, resulting in a low level of productivity

Project reorientation is required to ensure that the trainees are conversant with artisanal techniques.

1.3.4. **Compliance with Norwegian principles for development cooperation.**

The main principles of Norwegian development assistance are of a general nature. In addition some more specific principles are stressed:

- Assistance should be aiming at basic needs of the poorest sectors of the population and designed to create as little dependence as possible on future assistance.
- If development projects negatively affect social groups of people with small resources, the project shall have to be reoriented or supplied by special compensating measures.
- Assistance should be aimed especially at women.

As for the main principles, the establishment and operation of MFDC, fit reasonably well into the general framework. As for the more specific principles one can hardly say that MFDC at present is helping the poorest sectors of the population. The project has also created a definite dependence on future aid, with very high running costs and a large degree of dependence on imported equipment, thereby requiring extensive use of foreign currency.

Training in order to increase the total output of fisheries in Tanzania, is naturally a part of a strategy directed towards basic needs. But a number of other factors can easily refute this objective, if not taken into consideration.

In planning MFDC little weight was put on the question of assisting women especially, even if some women attend courses or have graduated already. More can definitely be done in this field, especially by organizing special (short) courses for women.

As for the principle of not affecting local groups negatively, the evaluation team will point out that extensive trawling is bound to affect a number of local artisanal fishermen negatively, especially as long as zoning regulations and surveillance are not applied.

Even if the MFDC does not fulfill all the specific principles for Norwegian development aid, the evaluation team has the impression that the centre is moving in the right direction.

1.3.5. **The projects activities and achievements in relation to goals, production targets and inputs.**

The first batch of Diploma students graduated in 1985 and it is hard to evaluate their impact in the fishery and allied sectors at this moment. Employment of the graduates has not been as smooth as

expected, due to the economic difficulties Tanzania is experiencing at present, although it would be misleading to conclude that the need for this kind of graduates is saturated. It may still be of value to consider the output of students in the different fields from time to time. Most graduates have been engaged in the relevant fields, but some have experienced problems, due to lack of equipment, tools etc.

Since the Tanzanian fishery is mainly artisanal oriented, the Short courses will play an important part for many years to come, if properly performed. At present the Short courses receive too little attention and resources, as compared to their stated importance.

The development activities should receive credit, though carried out in a rather unsystematic manner. The programme of modifying local crafts e.i. mashua and n'galawa, could serve as a model for development work in other departments.

To the evaluation team it seems like the centre has concentrated too much of the training on trawling and neglected other fishing techniques like gillnetting, purse seining, hooks, nets and traps.

The centre has introduced the good policy of repairing engines from local fishermen and institutions, but at present expectations are running far ahead of the centre's ability to meet fishermen's demands.

A lot of expensive equipment has been purchased by the centre, of which some could have been avoided. Generally the students should be trained in using tools they are likely to encounter when they get employed. This also applies to the training vessel M/V "Mafunzo", which has limited capacity for using different gears. More smaller training vessels should be needed for other gears.

There is not adequate local staff at the centre, and some vacant positions should be filled. The staff development programme needs revision, as some staff are not getting adequate training.

1.4. Socio-economic Framework

1.4.1. Relationship between MFDC and selected coastal artisanal fishing communities.

The objectives of MFDC presume a worked-out relationship between the centre and the fishing communities, assuming that the effects of the training and development work conducted at and by the centre would reach the fishing population both directly and indirectly.

MFDC was placed in the midst of the fields and fishing grounds of the local population from the villages of Pande and Mlingotini and their satellite hamlets. The initial relations were coloured by the intrusion, but the effects of it could be assessed only after the centre became an area closed to outsiders, fully demarcated with wire fencing.

At present the indirect and extra non-fishing activities have brought to the fishing communities additional services and side benefits, but the impact as Fisheries Development Centre has been less effective. As per today none of the villages has been able to buy or be otherwise supplied with gear or vessels from MFDC. Fishing is carried on exactly in the same manner as before the start of the centre; the fishing activity has decreased/not improved over the years.

1.4.2. Activities of MFDC directed to surrounding communities.

Of late the relations with the fishing communities have been intensified and diversified, through a couple of workshops and a programme directed at improving the traditional crafts. During January

1985 a special women's research/training seminar was arranged in cooperation with the women from the local villages.

1.4.3. **Economic and social role of MFDC.**

Most of the economic benefits from MFDC to the local villagers come from the commodities and services available at the centre for the local people. In addition the centre provides employment for a number of villagers, both on regular and more casual basis.

The selling of fish from M/V "Mafunzo" to local villagers twice a week should also be mentioned among the important by-effects of MFDC. The significance of these fish sales must be counted both in terms of economic inputs into family income through the selling of processed fish at the local market and in relation to its nutritional value.

Socially the centre is at present rather isolated. A number of proposals for activities has been put forward in section 6.3.3, in order to break out of the isolation.

1.5. **Training and Manpower Development.**

1.5.1. **The relevance of the syllabi offered at MFDC.**

In general all the courses conducted at the centre have been well planned and organized within the accepted curricula. But at times some tutors teach the subjects or sections that either they know best and neglect areas that may be considered "unnecessary" or difficult for them to teach.

Concerning the Diploma courses, there has been considerable dissatisfaction especially with the Boat building course; teachers claiming that the graduates are not able to make good boats and graduates resenting the manner they are employed after the course.

The intake of Diploma students should be made in alternative years depending on the demand of such graduates. The centre should, as from now, emphasize practical training in boat building.

The Engineering courses offered at MFDC are quite relevant, even if a number of graduates are not employed directly in the fisheries sector (i.e. in fishing vessels or fish processing plants).

The Fish Processing and Marketing course should concentrate on fish and fish products, not trying to include other foods. Other foods are dealt with by other institutions in Tanzania.

As for the Certificate courses both the aims and the objectives are well spelt out in the respective curricula. In general the main aim is to train mid-level manpower with the right practical skills in the respective fields. The evaluation team got the impression that these courses are well performed, except for the industrial training, which is not functioning according to plans.

The curricula for the Short courses are also well prepared, with emphasis to meeting the requirements of the regions where the courses are conducted. This implies that the curricula has to be changed according to local needs and circumstances. For some of the courses conducted there seems to have been too much emphasis on trawling, to the neglect of other fishing techniques more applicable to the artisanal fishermen.

The examination policy for the centre has been scrutinized and suggestions for improvements are given in Appendix III.

1.5.2. **The recruitment of students to MFDC and the placement of students after training.**

The questions of recruitment and placement after training have to be discussed in relation to the objectives of the centre, the course structure, the possibilities of employment, manpower requirements etc.

The decision as to what kind of courses should be performed has to be a flexible one, able to meet the demands of the market. The evaluation team suggests that the decision to a larger extent should be based on the experiences of the graduates. MFDC should therefore try to establish closer contacts with former students, in order to support them and bring back information relevant for the course structure. To this end, manpower requirements will be of limited value, as they are based more on production **targets** and to a lesser degree on the actual economic situation.

Generally it seems like recruitment to the Diploma and Certificate studies has been weak from the fishing communities, although all students are supposed to have prior experience from fishing. In the long run MFDC cannot continue to educate students only for the extension service, parastatals and for employment at the centre. More graduates have to enter into actual fishing and fish producing operations. This is to a certain extent dependent on the sponsoring system, but also on the actual recruitment practise.

Short courses are facing some specific problems in this field. The most important is that older, established fishermen cannot afford to stay away from home for three months. A more flexible way of organizing the Short courses (e.g. in two terms) could possibly help to solve this particular problem.

At MFDC, like most other educational institutions in Tanzania, the cost of tuition is paid by the state, in this case, Fisheries Division. This applies for in-service students as well as preservice students. "Private" students have only been admitted twice. As long as the Government could cater for an increasing number of jobs, this system created only minor problems. But when financial shortages occurred, the number of in-service students increased from originally 50 per cent to 75 per cent at present.

This development towards an increasing number of in-service students shows several serious shortcomings, and the evaluation team recommends that one of two different solutions should be considered:

- I More students from the private sector should be encouraged to seek MFDC for education.
- II Allow more pre-service students at the centre, but without promising jobs afterwards.

1.5.3. **The adequacy of the development inputs and level of technology.**

What techniques are the most optimal are determined by several factors, such as the resources, the environmental conditions, the fishing methods that can be used, the economy of the technology and the sociocultural setting of the society. Taking these factors into consideration, Tanzanian fish resources will only yield a maximum when a multiple composition of fishing techniques are used with gears of smaller scale.

The present Tanzanian fishing methods show a clear dual structure based on artisanal and "modern" techniques. The artisanal techniques are based on traditional equipment and methods of small scale, with passive gear and boats locally built and dominantly propelled by sail. The "modern" techniques are based on larger scale operations, with active gear, imported vessels and propelled by modern engines. Breakdowns are common and constant operation has been difficult.

When considering these two sectors relative to the general aims of Tanzanian fisheries policy, there is no doubt that the artisanal sector is optimal, providing cheaper fish, higher incomes, larger employment opportunities and saving foreign exchange. However, also bearing in mind that if and when off-shore resources of significance are identified, these should also be utilized. At present the evaluation team recommends that Mbegani should concentrate its effort to increase efficiency in the artisanal sector and in the fish distribution structure.

The technology that dominates Mbegani today is of an industrial, capital intensive type, especially demonstrated by the training vessel M/V "Mafunzo". This vessel was brought into the project by the Norwegian management and planning consultant, and in later stages it has been difficult to abandon the vessel and the technique. Even if the commercial side of the fishing operation of this vessel now seems to be successful, this does not imply that the **development demonstration** side of the operation is positive or even adequate.

Training has been concentrated on trawling, and this resulting in a cadre of masterfishermen, engineers and extension personnel whose professional interest is concentrated in capital intensive, "modern" techniques of fishing.

However, lately MFDC has started to correct the original course. The Marine Eng. Dept. has included more work on outboard engines, the Boatbuilding Dept. has been working with the mashua and n'galawa construction programme, Fish Processing Dept. is working with improved, more unconventional preservation techniques and means of distribution etc. From being miles away from reality, MFDC is now "in touch" with Tanzanian fishing as it is dominantly carried out at present. But the process from "in touch" to "good contact" is still a long one which demands much work and careful consideration from those involved.

1.5.4. **The status and role of the extension service of MFDC.**

The extension services rendered from Mbegani are of different types; incidental emergency services, assistance to regions in running shorter practical training courses for fishermen, commodity assistance programme and direct development work.

As for the incidental services rendered to the fisheries sector, it is evident that Mbegani has over-estimated its capacity. Many liberal promises in terms of repair and spareparts purchase assistance have resulted in a heap of broken down engines from all over Tanzania, which the centre has no capacity to repair. This is serious since these promises have created false expectations from the fisheries sector and false impressions about the real tasks of the centre.

Short practical courses is the most recent line of assistance activity from MFDC. Courses have been held at Bagamoyo and in Pangani, while the centre plan to undertake Short courses at Mbegani and in Musoma from 1986 on.

The most pressing constraints that have been experienced through this period can be listed as follows;

- The Region has had difficulties in meeting its obligations with regards to recurrent costs.
- The centre has failed to obtain a wanted combination of more experienced and younger attendants, as older fishermen can not leave their families without compensation.
- Recruitment of teachers has been difficult due to lack of funds.

In general the courses are now in a real need of inputs from a development programme in order to have a more positive impact on fishing efficiency.

This applies especially to the centre now being planned in Musoma, where fisheries are in a state of good progress and hence it will prove more difficult to find meaningful training tasks that are appreciated as progress by the local fishermen. The course in Musoma should therefore not be rushed into a premature start. The negotiations between Mara Region and MFDC should end up in a clear and distinct agreement on the responsibilities to be undertaken by the parties.

As for the courses planned at Mbegani, the team recommends that they are carried out in Bagamoyo, in order to secure that the course attendants are trained in the relevant techniques and that they are not wrongly motivated in the direction of methods they will never practise upon the return to their villages.

As for the Commodity assistance the first consignment of gear and equipment is ordered, though the question of distribution is still in the planning phase. It should be noted that in relation to the present supply situation and the total demand, the assistance is small. Therefore the assistance should probably be concentrated, not only to certain regions but even to certain districts. The potential ill-effects of providing some fishermen in a village with gear and leave others unsupplied should be noted. At present commodity assistance is a most sensitive matter and should be handled with great care.

1.5.5. Relevance of the training and educational activities.

The industrial training provides 1/3 to 1/2 of the duration of the courses in order to familiarize the students with practical problems. Even though the intentions were good, the system suffers from lack of proper supervision and has proved very costly to the centre. In addition the "host" institution may not have the interest of training the students as earning revenue is their main concern.

Concerning the Diploma courses the team recommends some changes both in the industrial training and in the curricula in order to bring the students closer to the reality they will face after leaving Mbegani.

As for the Certificate courses the team considers the approach appropriate and will recommend close supervision and monitoring of the training to ensure optimum results.

The team considers that for the centre to be in a position to organize appropriate Short courses, field surveys should be conducted to identify the type of training required and how it will suite the community.

The success of the training, in terms of a combination of theoretical and practical training and its integration into the fishing industry, will depend on the centre maintaining the right course. This can be ensured if continuity of staff is maintained. As it appears difficult for NORAD to keep the experts at Mbegani for long durations, it is important that local staff are trained and given responsibility to take charge of training administration so as to reduce conflicts and ensure continuity.

1.6. Organizational Aspects

1.6.1. Organizational set-up

MFDC has today a highly developed hierarchical administrative system, with several different levels and with much power for decision making assembled on the top. All together there are 7 departments and 21 (22) sections, which gives an average of 7 employees per section. This structure

is very time consuming and not well suited for development work. The evaluation team has made a number of recommendations so as to improve the organizational structure, cf. section 1.8.6. The system of counterparts has not been functioning well, neither from the Norwegian nor from the Tanzanian point of view. The division of tasks and responsibilities has been unclear and some jobs have not appointed counterparts.

As for the staff development plan, the evaluation team recommends that the needs of the centre are more strongly scrutinized when sending Tanzanian staff abroad for further educational training. In this respect NORAD has to consider the Tanzanian scheme of service, as to what kind of additional education gives additional credit, also in terms of salary.

Even if MFDC has already established a number of general incentives, one should look carefully into the possibility of giving **personal** incentives in order either to keep valuable persons in their present jobs, or to promote more efficient work at the centre.

Sending Tanzanian staff abroad, English speaking countries should be more seriously considered, as problems and time spent on language training will be considerably smaller.

The evaluation team is not convinced that turning MFDC into a parastatal organization will solve the main administrative problems. On the contrary, it may bring the centre into a situation where it is locked up in a position where it must be able to bring about profits to meet the expenses. This may in turn lead to a situation where the income generating activities will have priority over other activities, included training. In addition the centre may face a lower priority in public allocations for running expenses.

The problem of use of income generated at MFDC is now "solved" through the establishment of the Revolving Fund. For the future it is important not to mix the economic responsibilities of recurrent spending on the one hand and responsibilities of the Fund on the other. Income generating activities of the Fund should not be allowed to interfere with the main objective of the centre, namely training.

In order to improve the situation for artisanal fishermen in Tanzania at present, MFDC has to enter into a broader development programme. So far, the centre has responded on a limited scale of operation, where by the commodity assistance programme from 1986 on is the most important. For the time being it looks like the centre has not given the necessary attention to the question of how to organize the sales of fishing gear.

1.7. Economic Aspects

1.7.1. The cost of development of MFDC

The NORAD grants for establishing MFDC during the period 1974-83 adds up to a total of NOK 150 mill. The point of departure was a grant of NOK 13.0 mill. in 1974, but this is not a history of a project expanding out of control. The escalation of the project was purposely decided, in order to rectify the former failure (i.e. the "old" Mbegani). Later NORAD had to give some additional grants, as certain elements from the construction period had been paid through recurrent spending.

The main problem is still not the aggregated costs of MFDC, even if they became far higher than originally expected, but the running costs of the centre. To cover the operational costs of MFDC for the period 1984-87, NORAD has granted NOK 36.0 mill and to cover the cost of expert personnel NOK 32.2 mill. The total cost of salaries is paid by NORAD, and does not affect Tanzania's ability to run the centre.

The running costs for the next financial year 1986/87 are close to 24 mill. T.sh. of which NORAD covers 75 per cent and Tanzania 25 per cent. If Tanzania was to pay **all** recurrent expenditures, this would occupy 50 per cent of total public spending in the sector. The evaluation team does therefore not recommend a rapid decrease of funds for recurrent spending, but a gradual scaling down from 75 per cent to 50 per cent as per 1992.

Certain elements of the recurrent spending have to be closely scrutinized, especially electricity, making up for 15 per cent of the total budget. Secondly the industrial training seems to be extremely costly at MFDC, both in terms of student allowances and the necessary follow up travels by teachers. Thirdly, some types of technology applied at the centre are rather cost consuming.

One solution close at hand to meet the increasing costs, will be to rely more heavily on the Revolving Fund, stipulated to approx. 4 mill T.sh. next financial year. The evaluation team does not recommend that income generating activities should be allowed to dominate the main tasks of training and development work. In this respect the idea that MFDC should become **self reliant** is quite farfetched, even if the concept is applied only to recurrent spending.

1.7.2. **Cost of project in relation to the general level of expenditure of other governmental training institutions.**

The cost of tuition per student at MFDC is T.sh. 40.000,-, cost of food per student T.sh. 70/- per day (April 1986) and cost of industrial training T.sh. 150/- per day.

The cost of tuition and food at Mbegani is approximately on the same level or lower than at the Kunduchi Fisheries Training Institute and the Ardhi Institute. The overall cost of keeping students on industrial training is considerably higher at MFDC, as industrial training takes up to one year for Certificate students.

The evaluation team recommends that industrial training to a larger degree should be conducted at the centre, and reduced to a maximum of six months, in order to improve training and reduce costs.

1.8 **Future Development**

1.8.1. **Future strategies and objectives.**

The evaluation team does not recommend any major changes in objectives for MCDC. However, the team is of the opinion that artisanal fishing and the running of Short courses should be given more importance as compared with the industrial sector and the Diploma and Certificate courses. Women's contribution and needs in the fishing communities should be given attention in the Short courses.

With reference to the artisanal sector, the Agreement describes the activities as "to develop ways and means". If possible, these "ways and means" should be made more exact and precise.

As for the future strategies, the team generally recommends that the process of linking the centre to the fishing community is more seriously considered. In order to reach this goal the channels of communication have to be further developed.

Concerning development work the centre should try to develop a more systematic attitude as to what kind of work should take place and in which fields.

The most pressing external constraint in the fishing sector at present is the poor gear supply situation. Action to straighten out this external constraint is a condition for any successful impact from the training at Mbegani.

A final step in the long term strategy will, according to the team's opinion, be a closer follow up of the Mbegani graduates, so as to see that they can use their acquired skills in their new jobs.

As for the extension service, the evaluation team does not recommend a general expansion of these tasks. The centre should take on service and repair work to an extent suitable for training purposes, on such items and places where assistance is most effective and within reasonable travel distances. The centre should take care not to raise expectations beyond what the centre can accomplish in terms of service work.

The team notes that there exists a potential for developing aquaculture as a rural activity in Tanzania. Concerning the prawn culture at Mbegani, the team recommends that the centre seeks expert advice so as to have a strong base for establishing the project. The activities of this project should be restricted to the already cleared area.

Generally the evaluation team is of the opinion that the centre needs time to consolidate the established activities before entering into new enterprises.

1.8.2 Cooperation with other educational institutions.

Dar es Salaam Maritime Training Unit (DMTU)

MFDC should not have any stated responsibility for training to the merchant marine. Even the practice of bringing students of Marine Engineering up to the level of class 3, should not be considered a part of MFDC's responsibilities.

DMTU has suggested that a closer cooperation with MFDC can take place, referring to the use of special equipment, the buying and stocking of textbooks from abroad etc. Even some courses e.g. refrigeration and electrotechnical could be run in close cooperation.

Nyegezi

At present there are no plans for merging Nyegezi and MFDC, as they concentrate on two different types of fishing and carry out different types of courses.

MFDC can offer Nyegezi some assistance in order to carry out e.g. practical work with marine engineering, while students stay at Kunduchi. On the other hand, Nyegezi can offer some assistance to MFDC when setting up the new centre for Short courses in Musoma, relying on Nyegezi's long-term experience with the lake fisheries.

University of Dar es Salaam (UDSM)/Tanzania Fisheries Research Institute (TAFIRI)

UDSM and TAFIRI have participated in the programme "Fishery Research at MFDC", undertaken as a follow up programme after R/V Dr. Fridtjof Nansens' surveys in Tanzanian waters in 1982-83.

The evaluation team recommends that this cooperation continues. The team does not, however, recommend that MFDC enter into more extensive research operations, diverting interest and

resources away from the main activities, namely training and development work. The final decision as to the use of M/V "Mafunzo" and other training vessels has to rest with the centre.

Kunduchi

The possibility of transferring Kunduchi training activities to Mbegani has been examined in 1985 by a task force committee, appointed by Fisheries Division. The committee ended up by recommending the transfer to Mbegani, primarily in order to give room for TAFIRI.

However, no thorough examination of the cost/benefits was done, neither of the consequences for MFDC. If the centre should accommodate the Kunduchi courses in addition to the established courses at Mbegani, new dormitories, classrooms and staff houses will have to be established.

The main problem is still the question of educational policy, bringing in an institution with a completely different, more theoretically oriented course. This will divert attention, interest and money from MFDC's main objective, giving **practically** oriented courses. On these grounds the evaluation team does not recommend merging the two institutions. The team does, however, recommend a closer cooperation, where MFDC can offer assistance in several fields.

1.8.3. **MFDC's future role in the local community.**

The centre performs a number of functions, not directly related to the fisheries sector, i.e. transport, repair work, running a dispensary and a social club etc.

The evaluation team will recommend that these functions are carried on also in the future. The service work to the local community is important for MFDC's reputation in the area.

The team suggests that direct community functions should be kept on about the same level as today, not interfering with the smooth operation of the centre.

1.8.4. **Future development of extension service.**

The general recommendations from the team concerning Mbegani's involvement in shorter practical courses are;

- One expatriate (expert or qualified volunteer) should stay in each region. His relation to the courses should be of advisory nature.
- Formal agreements should be made with the regions that stipulate clearly the sharing of responsibilities concerning the facilities, follow-up activities, provision of statistical data, expatriate housing etc.

In order to secure wanted impact from the Short courses parts of the commodity assistance should be directly related to the conduct and follow-up of these courses. The rest should be confined to districts and regions where Mbegani carries out courses for fishermen, i.e. Tanga, Mara and Coast Regions. A part of the commodity assistance should be reserved to be distributed on longterm loans to poorer fishermen. The paying back of the loans should be handled as part of the daily recording system whereby the fishermen and woman can pay back their debts following the system they are used to in paying the share for the boat and gear from every catch.

Finally, another aspect of the gear supply programme should be mentioned. In Tanzania there are two fishnet factories (Mwanza and DSM) that are now out of operation due to lack of raw

materials rising from the foreign currency situation. NORAD should investigate further the possibility of supplying these factories with relevant raw material through its commodity assistance programme.

The direct development work itself has to be carried out in phases, starting with the collection of information about the methods and equipment in use locally and ending up with the construction and testing of suitable equipment.

In order to secure that the work ends up with acceptable solutions, the potential users must take part in the whole process. Therefore, the strategy that has already been implemented at Mbegani, to involve local experts from the sector in the development process, must continue.

The evaluation team has made some concrete proposals on smaller projects that could be undertaken as part of a development programme (ref. section 10.4.3)

1.8.5. **The contents of a study assessing the future manpower needs of the fisheries sector.**

The evaluation team will not recommend a general study of manpower needs, in terms of manpower projections. Experience from the past has shown that simple forecasts have limited predicative value, when small sectors are involved. Therefore the evaluation team recommends a **study of the students**, who have been graduating from MFDC over the last years; where they are posted today, what kind of salary and working conditions they have, to what extent they can practise what they have been learning at the centre, what the constraints are etc. Such a study should be conducted during the late 1987, so that three batches of MFDC students can be considered. For the Short courses, the study has to rely on close cooperation with the District Fisheries Officers, in order to obtain information of the former students.

In addition the study should try to assess the relevance of the figures given in the new 5-year plan (1986-91) concerning the future manpower requirements in the different sectors. On the basis of these two sources of information rough estimates should be made as guidelines for the next planning period. Such a study could be undertaken as a jointly Norwegian/Tanzanian project.

1.8.6. **Alternative models for organizational set-up.**

As can be seen from the description of the MFDC-organization in section 8, there is a need for some modifications in the organizational set-up. Generally the evaluation team recommends a reduced number of sections and departments. To be more concise, the team suggests the following changes:

- a) The Economy Department and the Administration Department to be combined into one Administration Department.
- b) Short courses to be made a department of its own, as part of the Training division.
- c) In the Boatbuilding Department there is no need for two sections. Training is the main activity and "commercial" activities can easily take place as an integrated part of training.

The team recommends that the training coordinator should not be posted as Assistant Principal as long as the Principal has his own Tanzanian counterpart.

The centre should prepare for a **gradual take-over** by Tanzanian staff, starting immediately. By the end of the next four-year period (1987-91), the team recommends that the following posts are held

by expatriate experts: Principal, heads of Administration/Economy and Maintenance Departments, heads of Marine Engineering, Boatbuilding and Short Courses Department.

Nautical Science Department should keep one expert, either as the head of the department or in charge of the vessel.

In addition Marine Engineering Department should keep one or possibly two heads of sections, depending on the quality of local staff at that time. This reduces the number of expatriate experts at the centre from 15 at present to 8 or 9 plus one or two at the regional Short courses centres.

The evaluation team recommends that Short courses become more of an integrated activity within MFDC. To this end the team has proposed that Short courses constitute a department of its own, eventually with the regional centres as sections. The head of the Short courses department should have as his main responsibility to link up the other departments and their activities to the development and running of the courses. Experiences from the Short courses must in turn be channeled back to MFDC, to facilitate changes, modifications, new development ideas etc.

1.8.7. Recommendations on the conditions of women in fishing villages.

The team recommends, in accordance with the reports of the women's study group that

- MFDC should recruit female students, especially Std. 7 leavers, for its short courses. Their training could concentrate on netmaking and mending, fish processing, the giving of practical guidance in cooperative organization etc.
- MFDC should have more women on its staff, also among the expatriates.
- MFDC could employ a home economist or alternatively an adult educationist, preferably with some experience in fishing communities, to coordinate the activities of the women's group of MFDC and to act as a leader of other social activities suggested in this report.
- The attention of the MFDC staff members should be drawn to the women's role in fishing so that in their development activities they would consider also better means and ways for women's fishing and other activities in relation to fisheries.

1.8.8. Recommendations for further research in fishing communities.

Aspects requiring continued research are:

- Ownership of boats, gear and transport in relation to the fishing organization, sharing systems, dependency relations and the prices paid to the small-scale fishermen.
- Conditions for cooperative fishing organizations compared on the basis of negative or positive experiences.
- Structural and process analysis of the means and organization of fish production, marketing and utilization of profits.
- Investment patterns of profits made from the fishing sector.

Participatory/cooperative action research or any other research or training programme should include women's concerns but also incorporate women into the research process.

1.8.9. **The regional role of MFDC.**

FAO has suggested that MFDC becomes a “Focal Point for Training Programmes for Multidisciplinary Small Scale Fisheries Extension Teams for the English speaking African Countries”. Even if the idea is well conceived and the demand for such courses is well documented, the evaluation team still is of the opinion that some of the constraints in terms of capacity and economy, should be considered. At present an expansion of MFDC would have to be funded outside NORAD and Tanzania.

On the other hand, FAO certainly is an interesting partner for MFDC. The evaluation team therefore recommends closer contact with FAO, in order to conduct shorter courses, seminars etc. on a regional basis at Mbegani, to an extent not interfering with the ongoing training- programmes.

2. **TERMS OF REFERENCE FOR THE EVALUATION OF THE MBEGANI FISHERIES DEVELOPMENT CENTRE**

I *BACKGROUND*

Since 1976, Norway has been assisting Tanzania in construction, extension and running of a fisheries development centre, the Mbegani Development Centre (MFDC).

Following a project review undertaken by NORAD in 1979, an agreement was entered into for complete reconstruction and extension of the Centre's physical facilities. The main construction was completed in 1983, and the Centre then comprised classrooms, laboratories, workshops, fish processing plant, boat yard, moderne trawler, service buildings, maintenance facilities and staff and student housing.

The general aim of the project is:

- to train professional personnel for operative positions within Tanzania's coastal and inland fisheries. Included here are training activities more directly aimed at developing the country's traditional fisheries. As a sub-aim the Centre provides training for Tanzania's coastal fleet, up to the level of the lowest certificates required for deck and engine officers.

To achieve this aim, training has been planned and implemented on three different educational levels:

1. Diploma Courses
2. Certificate Courses
3. Short Courses

The first students for Diploma Courses were enrolled in 1982, and by the end of 1984, the Centre was running at nearly full capacity, covering all three different levels of training.

Tanzania and Norway have agreed to organize a joint evaluation of the project in 1985. The main objective of the evaluation is to assess project performance in order to give recommendations for future project development.

II *MODE OF WORK*

The participants in the evaluation team shall familiarize themselves with the activities carried out at the Mbegani Fisheries Development Centre and at the Pangani Short Course Training Centre. Former planning documents and reports have to be studied. The work will include interviews with Tanzanian and Norwegian officials, with personnel formerly and presently related to the project, as well as the artisanal fishermen population.

The evaluation shall be carried out in close cooperation with Tanzanian and Norwegian authorities.

The following persons have been appointed to carry out the evaluation:

Mr. Hersoug, University of Tromsø, Norway (team leader)
 Mr. Maembe, Fisheries Department, Tanzania
 Mr. Matwanje, Mbegani FDC, Tanzania
 Mr. Bwathondi, TAFIRI, Tanzania
 Mrs. Swantz, Institute of Development Studies, Finland
 Mr. Watten, Consultant, Tromsø, Norway

III *TASKS OF THE EVALUATION TEAM*

The team shall evaluate the development of the project covering the following main aspects in addition to other problems found relevant by the team:

1. STATUS OF THE FISHERIES

- a) give an overview based on existing information on the status of the fisheries in Tanzania, including production (according to location, organization and level of technology), marketing and consumption,
- b) describe and analyze various aspects in the socio-economic structure and framework within which the artisanal fishing take place,

2. OBJECTIVES

- a) discuss the objectives formulated for the project and their relevance to the main problems and needs within the fishery sector in Tanzania,
- b) assess the role of MFDC in relation to the development of fisheries in Tanzania in general, and in relation to other institutions within the fisheries and maritime sector,
- c) assess whether the project has been implemented in accordance with Tanzanian policies for development, and
- d) review the project's compliance with Norwegian principles for development cooperation,
- e) review the project's activities and achievements in relation to goals, production targets and inputs.

3. SOCIO-ECONOMIC FRAMEWORK

- a) assess the relationship between MFDC and selected costal artisanal fishery communities, with special regards to the actual and perceived benefits of the artisanal fishermen population from the training and services offered by the Centre,
- b) assess the economic and social role as well as by-effects of MFDC within the surrounding communities,

4. TRAINING AND MANPOWER DEVELOPMENT

- a) assess the relevance of the syllabi in relation to:
 - stated objectives of the project
 - the existing knowledge and level of technology of the artisanal fishermen,
 - the existing and projected requirements of Tanzanian needs for manpower development within the fishery sector,
- b) discuss the recruitment of students to MFDC and the placement of students after training with particular emphasis on the sponsoring system,
- c) assess the adequacy of the development inputs and level of technology at the Centre in relation to the general technological level of the fisheries in Tanzania,
- d) clarify the status and role of the Extension Service of MFDC, and possible constraints to the operation of this service,
- e) assess the relevance of the training and educational activities at MFDC in view of the students practical and theoretical background, with particular emphasis to integration of training,

5. ORGANIZATIONAL ASPECTS

- a) assess the present organizational set up of MFDC in relation to its objectives and the various activities performed. Discuss possible constraints in operation of the Centre related to the organizational set up,

6. ECONOMIC ASPECTS

- a) discuss the cost of the development of MFDC in relation to the economic carrying capacity of the fisheries sector in Tanzania, and the possibilities for the recipient country to carry the project's running costs, separated on training and other development activities,
- b) discuss the cost of the project in relation to the general level of expenditure of other governmental training institutions,

7. FUTURE DEVELOPMENT

With reference to the conclusions drawn from the above mentioned points, the team should present its recommendations for the future development of the Mbegani Fisheries Development Centre. Particular emphasis should be put on:

- a) giving recommendations as to future strategies and objectives for MFDC for becoming a resource centre for fisheries development, including the possibilities for and consequences of expansion of the Centre's service functions, marine and inland fisheries as well as aquaculture, with special consideration of the carrying capacity of the fisheries sector,
- b) giving recommendations for further cooperation and integration of MFDC with other educational institutions within the same sector, i.e. the institutions of Nyegezi, DMTU, UDSM and Kunduchi and assess the feasibility of conducting the Kunduchi Diploma Course at MFDC,

- c) discuss the future role of MFDC in the local community with special regards to functions not directly related to the fisheries sector,
- d) giving recommendations on the future development of the extension service provided by MFDC or other training of fishermen and women, with special regards to participatory approaches to training,
- e) giving recommendations on the content of a study assessing the future manpower needs of the fisheries' sector,
- f) discuss alternative models to the present organizational set up to ensure optimal administrative and economic operation. Special emphasis should be put on the possibilities and positive and negative consequences of turning MFDC into an organization with more autonomy including its own use of revenues (obtained by the sale of fish, repairing boats, selling gear and other equipment), as well as increased Tanzanization,
- g) on the basis of the completed study on the conditions of women in fishing villages, give recommendations as to how the report's proposals may be integrated into the activities at MFDC,
- h) giving recommendations on future research needed in the fishery communities to ensure training aimed at developing the coastal and inland fisheries and aquaculture,
- i) giving recommendations on the Regional role of MFDC.

IV *REPORTING*

The report must be drafted by the whole team and completed in Tanzania. The final report in the English language is to be submitted to the Tanzanian authorities and the Norwegian Ministry of Development Cooperation before 15th of June 1986.

Oslo, 14th April 1986

Jarle Hårstad

Ag. Head of 2. Planning Division
The Royal Norwegian Ministry of
Development Cooperation

3. THE HISTORY OF MBEGANI FISHERIES DEVELOPMENT CENTRE. ¹

3.1. The Prehistory

The Mbegani Fisheries Development Centre was established in 1966 as one of three educational centres within Fisheries Division. After running the Centre on a very modest scale for some years, Tanzania was asking for aid to develop the overall fishing sector, and MFDC as one of many projects.

3.2. The Planning Period

Norway was by that time willing to give assistance in the field of fisheries and in 1972 the Deputy Secretary in the Ministry of Fisheries was engaged to undertake a preliminary study. The study recommended that Norway should assist Tanzania in developing the MFDC, but before any final decision was made, a team of experienced fisheries experts should undertake a closer study of the whole project. This study was subcontracted to FIDECO A/S, a Norwegian firm of fisheries consultants, set up by twenty Norwegian companies working within the advanced sector of the fishing industry.

FIDECO recommended NORAD to build two training vessels in addition to an upgrading of the Centre, including building of a receiving station, a jetty and a mechanical workshop, altogether NOK 10,5 mill.

Based on this report Tanzania made their formal request and by August 1974 NORAD's Board decided to grant NOK 13,2 mill and 11 expatriate experts. Later NOK 4,5 mill. was granted for a ferroceement boat building project. Negotiations with FIDECO and the working out of an Agreement took quite a long time, but finally the Agreement was signed in April 1976. The Agreement states that Norway shall provide financial assistance on grant terms an amount of NOK 17,5 mill. and appoint a firm of consultants to carry out services described in the terms of reference.

3.3. The FIDECO Period

After signing the NORAD-FIDECO contract in May 76, FIDECO was made responsible for the future development of MFDC. After running the project on their own for 1 1/2 year, it became apparent that FIDECO was seriously delayed, partly because Tanzania had been unable to meet their obligations in terms of planning and construction. FIDECO for their part, had not been able to organize the training in a proper manner, while NORAD had not intervened as the project was considered to be a FIDECO responsibility. In addition, reports from the project had either been lacking or they were directly misleading as to the progress of the project. During 1978 discussions

¹ This section is a summary from the deskstudy: *The History of Mbegani FDC* by Abraham Hallenstvedt and Bjørn Hersoug. NORAD February 20. 1985.

took place in NORAD, Oslo as to how the project should be reorganized. The question ended up being sending a delegation (the NORE-commission) to evaluate the Centre. In the meantime Tanzania asked for extended support, both for investments and for the running of the Centre.

The NORE-delegation made a thorough examination of MFDC and the premises of the project, ending up by recommending urgent steps to be taken in order to get the training situation under control. The project was a failure, and according to the mission; if they had been free of any commitments, they would have recommended a complete stop for the whole project.

The Nore-commission found the potential for increased yield of Tanzania marine resources to be very moderate and furthermore that industrial fishing would call for a processing structure and distribution system largely non-existent in Tanzania. On this background, the commission proposed a structure, aiming at a) traditional fishermen, b) highly skilled administrative personnel, c) personnel with the lowest certificates for the merchant marine and the offshore fishing fleet. In order to accomplish these educational objectives, the Centre had to be expanded, both in terms of physical facilities and expatriate staff. Furthermore the Centre had to include training, construction and maintenance.

3.4. The Revaluation Period

After the NORE delegation had handed over their report, all participants in the project were asked to make their comments. Everybody agreed that the project so far was not a success and Tanzanian authorities blamed FIDECO, FIDECO blamed the Tanzanian authorities and NORAD blamed both. In the end NORAD took the full responsibility for the failure and set a project leader on the job of reorganizing the MFDC.

His first task was to work out a new set of objectives according to NORAD's intention of giving more attention to the traditional fishermen instead of working exclusively with both NORAD's own Resident Representative, who felt personal responsibility for the 1979 Agreement, and to Fisheries Division, Tanzania, where they were not willing to accept NORAD's new objectives overnight. After several meetings, a sort of compromise was worked out, where Tanzania definitely had the better of it, as the 3 year Diploma courses were defined to be the starting point of the new MFDC. NORAD however, succeeded in bringing the short courses into the renegotiated agreement, as the Centre was obliged to work out programs for one year Certificate courses for Extension Service officers and short courses (4-10 weeks) for artisanal fishermen. Finally, in June 1980, NORAD's Board made their decision to grant NOK. 85 mill. of which NOK. 15 mill. referred to the running costs of the Centre for the next 4 years.

By this time NORAD's plans included the building of dormitories for 120 students, student canteens, library, assembly room, offices, staff houses, classroom, laboratories and all the infrastructure needed. In addition the plans comprised a quay and the access road from Bagamoyo. The building of MFDC was in fact the building of a complete new little city, where the Centre had to cater of all needs of the students, teachers and workers and their families.

3.5. The Construction Period

From the time NORAD made their decision to start in June 1980, it took only two years before the Centre was able to receive its first students and three years before the main construction works were finished. These facts showed that NORAD had been able to turn the former FIDECO failure into an administrative success, with the assistance of NORPLAN, NOREMCO and the project coordinator.

The idea behind this particular planning process, was to split the construction works in a number of "packages" and let planning and construction take place simultaneously. To handle the major decisions in Tanzania, NORAD established a Steering Committee with representatives from all the partners involved, which was given the authority to make final decisions on all important matters. To get the project finished within the strict timelimits, NORAD decided to take on the responsibilities as employer and client vis-à-vis the contractors. By December 1980 Norplan A/S was made responsible for all planning and supervision on MFDC. The Norwegian owned firm of contractors; NOREMCO won all the main contracts out for tender, and started work by January 1981. NOREMCO did an excellent job concerning MFDC as a building/construction project, as they managed to keep the timetable so that courses could start on September 15, 1982 as planned.

The Centre's success as an educational institution was much more disputed, as NORAD had grossly underestimated the necessary educational planning. However, NORAD's primary target groups had finally started to receive the necessary attention. Economically the Centre turned out to be rather expensive, compared with the first cost estimates. This was much due to high inflation and an unfavourable rate of exchange. In addition several new items had been charged on the project account, while new needs had been developed all through the construction process. Neither the consultants, nor the contractors can be blamed for the rise in costs. NORAD knew all the way that certain items were not included and would have to be paid for later, this requiring a series of additional grants.

During September 1982 the first students on the Diplomacourses started their education at MFDC, while the planning of Short courses had to be postponed until later. For NORAD the running of the Centre had turned out to be costly, requiring NOK 15 - 20 mill. each year, on the basis that Norway was responsible for 75 per cent and Tanzania for 25 per cent of the actual running costs, with the costs of the experts over and above this grant.

3.6. MFDC in Operation

The official inauguration in June 1983, marked "the end of the beginning". By that time 90 per cent of the building work was completed and only minors works, including the maintenance manual had to be finished. During 1983/84 plans were developed for all the different kind of courses (Diploma, Certificate and Short courses), including a Teacher Training programme and a separate On-the-Job-Training Programme for each department.

By the end of 1984, the Centre was running at nearly full capacity with altogether 117 students, of which 97 were on the Centre and 20 on industrial training. They were divided into 11 classes and administrated by 31 tutors. In addition, MFDC started and implemented their first two 9 weeks courses for artisanal fishermen at the Regional Fisheries Development Centre of Bagamoyo and Pangani.

Practical problems continued to hamper the running of MFDC, referring especially to lack of manpower, problems with supplies from abroad, lack of local commodities (as e.g. timber for boatbuilding) and finally the problems of industrial training, where it has been difficult to obtain the necessary number of places within reasonable costs.

During 1984 MFDC started the work on becoming more of a development centre, making agreements with BAFICO and TAFICO on assistance in keeping their fishing boats operational. MFDC has also entered into a programme for improvement of traditional boats and gear. Regarding research the Centre has been host for two seminars on marine fish resources and fishprocessing. All these activities indicate that MFDC is on the way to become more than an exclusive educational institution.

In the Action Plan for 1984/85 the MFDC staff have made their priorities concerning the most important work to be done. Even if the practical problems connected to the buildings and infrastructure still were dominating, MFDC has put up important policy-oriented tasks regarding the educational content, the practical assistance to be given, the role of the Centre in research and finally; on how MFDC is going to be run most efficiently in the future. This part of the Action Plan shows that MFDC as a *Development Centre* never will be "finished" once and for all – changes will have to be made and new proposals put forth in order to adapt the Centre to the changing conditions both in fishing and in Tanzania in general.

4. STATUS OF THE FISHERIES

4.1 General Information

4.1.1 The Coastal Fisheries

The coast of Tanzania is 800 km long and is characterized by a narrow coastal shelf with the edge of the outer reef lying within one kilometre of the mainland coast and the eastern coasts of the off-shore islands. There are relatively extensive areas of shallow shelf within the islands of Zanzibar and Mafia which offer smooth trawlable substrates with frequent patch reefs and corobne islands.

The artisanal fishery is particularly concentrated in the area between the shoreline and the outer edge of the fringing reef and on the shallows of the Mafia shelf and the Zanzibar channel. The fishery employs between 10 - 13.000 fishermen who mainly operate over 3.500 outrigger canoes, dugout canoes and small dhows. A limited number of vessels is mechanized, but their operation is limited by lack of spare parts and frequent shortage of fuel.

Commercial fishing for fish and shrimp is limited to Tanzania Fisheries Corporation (TAFICO) vessels and a few private companies, but total catches are less than 1 per cent of the fish production in the country.

The main gear employed by coastal fishermen includes gillnets, shark nets, seine nets, cast nets, traps, handlines and longlines. The main fish species caught include a variety of demersal fish and pelagic fish like king fish, tuna, sardines and billfish. Total marine fish catch stands at over 40.000 tons. Relatively rich shrimp grounds exist in the areas around Rufiji Delta, Mafia Channel and around Pangani and are exploited by TAFICO and artisanal fishermen. The total shrimp production is estimated at 1.000 tons per year.

4.1.2 The Inland Fisheries

The bulk of the fish produced in Tanzania comes from the Tanzanian waters of Lakes Victoria, Tanganyika, Nyasa, minor lakes, dams, reservoirs, swamps and rivers.

The fisheries provide employment for over 57.000 fulltime fishermen and over 100.000 occasional fishermen. Fish exploitation is carried out using about 18.000 small crafts which operate close to shore using gillnets, seines, purse seines, lines and traps. Main fish species caught are sardines (dagaa), haplochromis species (furu), catfishes (nongwe) and more recently the Nile perch (sangora).

Limited commercial fishing is carried out by purse seiners and ring nets on Lake Tanganyika for "dagaa" with light attraction. Trawling for haplochromis is carried out on Lake Victoria using small trawlers. Fish catches from the inland waters for 1984 stand at 237.000 tons (Fisheries Division statistics).

Table 4.1 is a summary of the Fisheries statistics for the years 1972 to 1984.

Year	No. of fishermen	No. of fishing vessel	Total production	
			Wt. in m. tonns	Value in 1000 Thsh
1970	35936	15170	185993.0	120774.0
1971	41529	16500	185993.1	132644.0
1972	44013	17991	164125.6	154061.9
1973	47516	20162	161142.4	187916.6
1974	42466	18465	170927.3	241890.4
1975	45348	18800	191559.7	321939.1
1976	61108	27045	239275.0	541443.0
1977	45999	19645	260645.3	771938.9
1978	42701	16281	209481.3	627413.3
1979	52932	22555	177525.4	557866.9
1980	46419	16400	233414.1	938634.8
1981	53351	21414	256986.3	1138881.2
1982	50320	20896	198769.2	1761320.8
1983	55399	24898	240191.7	2204922.5
1984	57605	21656	278093.2	3835232.2

The Food and Agriculture Organization of the United Nations (FAO) has estimated the average annual yields as guidelines for planning for the management and development of the fisheries as follows:

<i>Name of water body</i>	<i>Estimated yield in tons</i>
Lake Victoria	63.000
Lake Tanganyika	100.000
Lake Rukwa	3.000
Lake Kitangiri	1.000
Nyumba ya Mungu	4.500
Other waters	61.000
Aquaculture	600
Marine	60.000
<i>Total</i>	<i>293.100</i>

4.1.3 Main Features of the Fisheries

The fishing industry has shown a slow growth pattern due to socioeconomic problems, limited technological innovations and lack of capital. The fishermen use poor gear and crafts and in most cases land their catch in numerous scattered beaches far from the main consumer markets. The fish is sold fresh at the landing site and its surroundings. It is estimated that close to 20 per cent of the landed catch is consumed fresh or distributed in fresh or frozen condition. Fish which cannot be sold fresh is processed by sundrying, hot smoking combined with drying, frying in oil and salting. The processed fish is sold to traders who transport it to distant markets, the main market being Dar es Salaam. In areas where road communication is good, fresh fish is distributed up to 200 km from the landing site. Frozen fish is transported by air or Tanzanian Railways Corporation refrigerated wagons to Dar es Salaam.

The Fisheries Act (1970) and its Principal regulations (1973) are the main instruments used to manage the fish stocks and ensure their sustainance. The act provides for:

- (I) Registration of fishing vessels.
- (II) Fishing licence.
- (III) Compliance with fisheries management regulations in the form of for instance limiting the mask size to be used, dectoring of closed areas, method of fishing to be applied in an area, closed seasons, control of polluting activities and submitting of catch landing data.
- (IV) Lincencing of fish traders for export and internal markets.

Presently the expansion of fishing activities is limited by lack of fishing gear, spare parts and shortage of fuel to operate powered vessels where they exist. The general shortage of reasonably priced animal protein supplies in the country has encouraged laxity in enforcing regulations, resulting in the overfishing of some of the popular fish species or the destruction of the ecosystem.

4.1.4 Fisheries Resources Potential and Exploration

Tanzania has substantial fish resources in the territorial waters of Lakes Victoria, Tanganyika, Nyasa/Malawi, Rukwa, Nyumba ya Mungu and Mtera dams, other inland small lakes, dams constructed for irrigation and water supply, numerous ponds scattered all over the country, rivers, swamps and the Indian Ocean. It is estimated that 58.000 km of fresh water are available for fishing while marine fishing covers 64.000 km. The declaration of an Exclusive Economic Zone (E.E.Z.) will increase this area substantially. Fish resources for the fresh-water lakes and the Indian Ocean have been estimated through fishing and accoustic surveys supported by FAO/UNDP and NORAD. Catch landings for 1984 stand at 278.000 metric tons.

4.1.5 Freshwater Fisheries

Freshwater fisheries account for over 80 per cent of the landed catch and supports over 43.000 fulltime fishermen and a large number of occasional/part-time fishermen.

Lake Victoria

Lake Victoria at an altitude of 1.000 m above sea level is the largest lake in Africa with a surface area of 68.000 km, of which 33.700 km is in Tanzania. The fishery is presently dominated by increasing quantities of Nile Perch (*Lates niloticus*) which was in Uganda, but has since 1979 spread to Tanzanian waters with large quantities being landed in Musoma and Mwanza. The Nile Perch catch is slowly displacing the naturally occuring Tilapiine and Haplochromine cichlids and non cichlids like catfishes, lungfish, carps, tigerfish, sardines (Dagaas) and other minor fish species.

Fish catch landings for 1984 reached 99.000 metric tons with a market value of over T. shs. 800 mill. Fishermen use gillnets, long lines, beach seines and light attraction with a ring net for exploiting the sardines. Traps are of limited use along river mouths. In addition to the traditional gillnet fishery for the "tilapias", catfishes, lungfish etc. Commercial trawling for haplochromines has been introduced to provide raw material for the fishmeal plant owned by Nyanza Fishing and Processing Company (NFPC) which is situated at Pansiasi in Mwanza and owns four trawlers and is planning to acquire another four if sources of financing can be secured. The company has a fishmeal plant with a capacity to process 72 tons of fish per 24 hours. Landings of Haplochromis species on the lake reached a peak in 1977 and have since been declining.

The decline in *Haplochromis* species is attributed to:

- a) Increase of the fishing effort in the same area which may have caused local overfishing.
- b) Predation by Nile Perch. The extent at which Nile Perch is responsible for the decline of other main fish species has so far not been determined.

The *Haplochromis* Ecology Survey Team (HEST) which is supported by the Dutch Government and works in collaboration with Tanzania Fisheries Research Institute (TAFARI) has studied closely stocks of *Haplochromis* in the Mwanza Gulf. The team has concluded that these fishes are not very mobile with great seasonal variation.

Earlier estimates of the stocks suggested that Nile Perch formed less than 0,1 per cent of the standing fish stock and was caught occasionally by traditional fishermen and trawling research vessels. Present catch data with the Fisheries Division, however, show that Nile Perch contributes over 50 per cent of the catch in Musoma and close to 40 per cent in Mwanza.

The initial appearance of the Nile Perch was accompanied by an outcry by consumers around the lake that it was responsible for the decline of the popular *Tilapia* species. No quantitative data are available to show the extent to which Nile Perch has contributed to the decline of *Tilapia* species, because even before the appearance of large quantities of Nile Perch in the catch landings the decline was already observed.

Consumers have quickly adjusted their eating habits by adopting a suitable preparation method for Nile Perch resulting in increased consumption. Processing of Nile Perch by frying and extraction of oil is on the increase and forms a main activity for women who seem to be earning an attractive income. Fried Nile Perch is transported for sale to Dar es Salaam, Dodoma, Arusha and other markets. Frozen Nile Perch is also finding a ready market in Dar es Salaam, Arusha and Moshi. Due to scarcity of fishing gear fishermen have been forced to purchase shark nets from the coast for use on the lake because the gillnets available are not suitable for the Nile Perch. Other fishermen have started to make their own nets by hand by using different types of materials.

Lake Tanganyika

Lake Tanganyika falls in the path of the Western arm of the great rift valley in East Africa and is shared with Burundi, Zaire and Zambia. Tanzania territorial water accounts for 13.120 km which is 41 per cent of the total area. The estimated biomass based on fishing and acoustic surveys carried out by FAO/UNDP from 1971 to 1977 varied between 500.000 tons and 2.600.000 tons. Later estimates of the maximum sustainable yield have varied between 22 kg/ha and 100 kg/ha.

Fishing is mainly in the hands of artisanal fishermen who in 1984 landed over 100.000 tons. Fish exploitation is limited to 5 km from the shore because of the craft and gear used. The open water of the lake may still be considered underexploited due to the limited range of the canoes used by the fishermen. The fish-resources show great variations probably due to changing limnological conditions, seasonal variations and their mobile nature.

The main fishing methods beside the liftnets (Msenga net) are beach seines, gillnets, traps and lines. The catch consists mainly of pelagic fish species (over 70) locally called dagaa (*Stolothrissa* and *Limnothrissa miodon*), migebuka (*Lusiolates stappersii*) and the Nile Perch (*Lates mariae*, *Lates angustifrons* and *Lates microlepis*). Fish species of minor importance in large scale operations but exploited by artisanal fishermen are catfishes, tilapias, tigerfish, carps etc. Dagaa is processed by sundrying while most of the minor species are marketed fresh and consumed close to the fishing areas.

Lake Nyasa (Malawi)

Lake Malawi is the third largest lake in Africa shared between Malawi, Mosambique and Tanzania, which has an area of 2.217 km (7 per cent). The lake is fed by a number of rivers with catchment areas in the riparian states. The lake is known to have a very diverse fish fauna. Productivity from the Tanzanian side of the lake is low due to:

- a) Poor craft and gear used which can only operate close to the shore.
- b) Low productivity of the area. Primary productivity is similar to that of Lake Tanganyika, but fish catches are very variable. Secondary production (Zooplankton) is consumed directly by the lake fly (*Chaoburns edulis*) instead of it being utilized as food for the sardines (*Engraulicypris sardella*).

The fish is exploited by gillnets, chilimila nets, longlines, purse seining with light attraction and trawling. Traps are in constant use at river mouths. The catch data show that the main fish species exploited are *Haplochromis* species, catfishes, carps and other minor species.

4.1.6 Marine Fisheries

The bulk of the marine fishery is exploited by over 13.000 artisanal fishermen. Catches are landed at numerous sites along the coast making it difficult to collect accurate fish landing data. Fish landings for 1984 reached 40.000 metric tons. Pelagic fish make up over 52 per cent of the catch. The catch is fished using non-motorized canoes and dhows which employ a variety of traditional and modern fishing gear.

Fishing for small tuna is undertaken by surface trolling which takes place towards the end of the north east nonsoon March/April to the beginning of the southeast nonsoon in May/June. Fishing for spanish mackerel (kingfish) is done mostly by drift gillnets during the southeast monsoon from April to August or September. Fishing for small schooling pelagics takes place through out the year, utilizing traditional and modern fishing techniques. The former include beach seines (juya), cast nets (kimira), stake traps (uzio or wando) and scoop nets (senga) while modern fishing methods are purse seine or ring net with light attraction. Trawling for prawns undertaken close to river mouths also yields a variety of small fishes.

The catch data for 1984 indicate that small schooling fishes like the sardines, Indian mackerel, anchovies and juveniles of large fish have the highest potential and are collectively referred to as "Dagaa". They are considered to have an annual yield of at least 40.000 tons. Based on the acoustic survey by the research vessel Dr. Fridtjof Nansen, the standing stock of marine fishes in waters of over 20 m depth is put at 94.000 - 174.000 tons. The variation is due to the season in which the estimates were made.

The current low yield is due to traditional fishing being limited to the shallow inshore waters (less than 20 m depth) because of the limited range of the vessels and gear used. Dynamite fishing may also have contributed immensely to decrease the catches in the areas where it is used continuously. Catches from purse seine units are encouraging. There are several purse seine units in Zanzibar, Dar es Salaam and in Tanga.

Trawlable grounds are limited by coral formation . Tanzania Fisheries Corporation operates eight of its ten operational vessels trawling for prawns and exports about 200 tons/year of prawn and sells 600 tons/year of fish in the local market. The corporation plans to get rid of the aging fleet and maintain vessels which are economical to run. The corporation's operations have been boosted by the acquisition of the fishing vessels "MAMA TAFICO" and "SADANI" as a grant from the

Japanese Government, supported by Japanese experts and adequate spares to keep the vessels operational.

Trawling for prawns in the area close to Bagamoyo and Sadani is suspected to interfere with passive gear used by the artisanal fishermen in depth lower than 20 m. It may also disturb the breeding and nursing grounds for important fish species. There are no data to indicate the extent of the conflict between trawlers and traditional fishermen, but research scientists of Tanzania Fisheries Research Institute are in the process of carrying out studies with a view of advising on legislation on trawling limits, especially if the number of trawlers is to increase.

Dynamite fishing is on the increase along the coast despite action taken by the Fisheries Division to provide higher sentences for offenders and making it an offence to be in possession of dynamite fish ashore. The main reason for the increase may partly be due to lack of fishing gear and the inability of the Fisheries Division to acquire patrol boats.

Trawl surveys indicate that the catches are made up of more than 30 per cent Leiognathidae, and in the shallow areas between 6 to 44 per cent of pelagic fishes. There is reason to believe that since large-scale trawling for fish is limited, most of the resources are not exploited. The catch presently landed by most of the vessels is the by-catch from the trawling for prawns.

The shrimp resources are located in shallow areas and mangroves of the Rufiji which makes it inaccessible to large vessels. The main species exploited are the tiger prawn (*Penacus monodon*), the white prawn (*Paracus indicus*) and (*Matapenaeus monocerus*) which are in high demand for the export market.

In an effort to gather data on the technical and economic base for exploiting the marine fisheries off the Lindi/Mtwara coast The Government of The United Kingdom has financed the Lindi/Mtwara Fisheries Resource and Technology Evaluation. The main objective of this project is to carry out a survey of the coastal fish resources between the Mozambique boarder and the Rufiji River Delta and investigate the appropriate fishing techniques.

The evaluation will cover the area between the Ruvuma estuary in the south and Kilwa in the north. Special attention will be paid to the near water fish stocks, mainly "red snappers" and other demersal species not currently exploited by traditional methods. One will also identify techniques for exploiting these fish stocks which would be appropriate for artisanal fishermen to use.

It is also intended to evaluate the pelagic fish stocks, especially the smaller surface schooling tunas and their vulnerability to capture by surface trawling and other simple methods. Areas and conditions which under light attraction methods of fishing can be used to exploit the pelagic fish species will also be investigated.

4.1.7 Other Fisheries

Lake Rukwa has an annual fish production of over 3.000 tons and engages 400 full-time fishermen. There have been limitations on the number of fishermen due to the increasing population of crocodiles on the lake which endanger fishermen's lives. The main fish species landed are tilapia (35 per cent), catfishes (32 per cent), carps (12 per cent) and others.

Nyumba ya Mungu is a man-made lake with a total catch of 5.000 tons/year. Its catch per unit area 353 kg/ha is the highest among the man-made lakes in the country and engages close to 2.000 fishermen.

Tilapia species form the bulk of the catch, but in recent years there has been a serious reduction of the size of fish landed due to stunting. The Mtera dam has reached its peak of production and there are indications of a decline in the size and quantity of the fish being landed.

Minor Waters

Tanzania has three important swamp fisheries and one major flood plain, namely Kibasira, Malagarasi, Balis and Rufiji river flood plain which contribute a total of over 10,000 tons/year and engage close to 3,000 full-time fishermen. The country is also dotted with numerous small lakes and dams which contribute about one per cent of the landed catch from the freshwaters. The actual catch may be greater than the recorded catch because a lot of the landing centres are not readily accessible.

Aquaculture

Aquaculture has long been recognized as an activity which could provide rural communities with employment, income and cheap source of protein as there are ample areas suitable for that throughout the country. There are over 800 fish ponds scattered over the country raising tilapia species. Production from these ponds has been low due to poor management and lack of suitable seed. With suitable fish seed, proper management techniques and utilization of areas in the country suitable for fish farming it is estimated that up to 10,000 tons/year can be produced.

Aquaculture can be intergrated with agriculture and animal husbandry to increase food output. British Government financial and expert assistance has been available to development fish farming in the Lindi/Mtwara regions under the Rural Intergrated Development Programme, resulting in production figures ranging from 1,064 kg/ha /year which can be raised to 3,000 kg/ha/year, if good management and use of organic fertilizers and supplementary feeding are applied.

The establishment of an aquaculture centre initiated at Morogoro under FAO/UNDP would have assisted in providing suitable seed and demonstrations on practical aspects of intergrated fish farming, but the centre remains uncompleted because of a shortage of funds.

4.1.8 **Fish Processing, Consumption, Marketing and Distribution**

Traditional fish processing on the fish landing sites is the main technique of preserving catch which cannot be sold fresh. The product so produced is of poor quality and results in increased postharvest losses of processed fish. It is estimated that between 20 to 30 per cent of processed fish is lost through insect damage, breakage and bacterial decay.

Fish consumption is very high close to the fish landing sites and diminishes as we move away from these sites. The per capita fish consumption varies from 80 kg/person/year in Ukerewe and Kigoma areas to less than 1 kg/person/year in central Tanzania with a national average at 12 kg/person/year. Increased consumption will depend on how readily fish reaches consumers far from the fish landing sites and on the willingness of the non-fish-eating population to accept fish as a source of protein. Fish marketing is under the control of fish traders normally referred to as "fish mongers" who purchase the fish at the landing site auction and distribute it inland for wholesale or retail sales. Small scale fish traders purchase small quantities of fish up to 40-50 kg at a time and distribute it on a bicycle. Some traders in towns purchase between 10-20 kg of quality fresh fish and distribute it on foot in the streets, at times visiting households known to prefer eating fish. Processed fish is sold at stationary fish stalls which are erected by the retail traders at strategic points.

The National Cold Chain Operations (N.C.C.O.) was responsible for purchasing and distributing fresh and frozen fish in selected major towns and Dar es Salaam, including catch from Tanzania Fisheries Corporation vessels. After closure of NCCO, Tanzania Fisheries Corporation has assumed full responsibility for marketing all its catch in Dar es Salaam. Private traders who purchase and distribute fish to different parts of the country have also increased.

Fish prices vary from the landing site to the consumer market and are dependent on the quantities available, species etc. Dar es Salaam has the highest prices of fish in the country with an average of between 80 to 120 T. shs./kg of good quality fresh fish.

Women's participation in the fishery is limited to fishing for low valued fish species close to the shore. The majority of women participate in retail sales of fish and processing. Fish frying seems to have been accepted as a women controlled activity all over the country.

4.1.9 **Fisheries Administration and Research**

The Fisheries Division of the Ministry of Natural Resources and Tourism is responsible for issuing Fisheries Development policy guidelines and ensuring that these are implemented throughout the country. The present administrative structure where responsibilities for fisheries development and management are shared with regions and the recently reintroduced local Governments, makes full accountability of the Fisheries Division for the planning for rational development and management of the fish resources difficult, if not impossible. Consequently fisheries extension services have slackened and in some areas extension officers have failed to operate due to lack of equipment, transport and motivation.

Tanzania Fisheries Research Institute (TAFIRI) is the national institution responsible for carrying out fisheries research and providing the advice required for equitable exploitation, management and development of the fisheries. Presently TAFIRI lacks the funding to make it attend to the numerous problems requiring investigation. The institute's head office remains housed in premises unsuitable for fisheries research.

4.1.10 **Zanzibar**

Zanzibar with a population of over 500.000 has between 16.000 to 18.000 artisanal fishermen who exploit fish resources close to the shore and the rich Pemba and Zanzibar Channels. Fishing is conducted with dhows and canoes which are propelled by sails. The use of motorized vessels for fishing is very limited.

In an effort to increase fish production the Government has encouraged the importation of fishing gear by removing sales tax and duty on imported gear and accessories. The Government also operates a T.sh. 4.5 million revolving fund to import and distribute gear to fishermen at subsidized prices.

Commercial fishing for sardines, mackerel and tuna is undertaken by the Zanzibar Fisheries Corporation which is a parastatal. The Corporation has recently received material and technical assistance from the Federal Republic of Germany worthy 6.4. mill. Deutsche Mark, to enable it acquire seven fishing vessel and rehabilitate the refrigeration facilities by making the icemaking-machine, cold storage and freezer operational. Through the grant the Corporation has been able to raise fish production from 1/2 ton/day to 3 tons/day.

In an effort to boost deep-sea fishing, negotiations are in process with the Italian Government for a grant that will provide a multipurpose vessel that can undertake gillnetting, purseseining, longlining and trawling.

4.2 Socio-Economic Structure and Framework for Artisanal Fishery

4.2.1 History and Geography as Background to Socio-Economic Structure

Coastal Fishing

The principal geographic features of the general area in which Mbegani Fisheries Development Centre is located, have played a major role in the historical development of the whole region. The seasonal winds – North East Monsoon, Kaskazi, in December-March, and South Monsoon, Kusi, in August-September – have affected the navigation patterns and set the seasonal rhythm for the economic life of the coast in general. The agricultural seasons have been patterned by the rains that follow kaskazi and kusi.

The environment affects the type and the structure of population. Kaole, Mbweni, Kunduchi and Msasani are ancient Shirazi settlements, older than Bagamoyo. Msasani was one of the original villages around which Dar es Salaam was built and Bagamoyo grew into neighbourhood of Kaole.

The inland people have often come to the coast either in search of food or employment. To begin with those with foreign contacts have been the “tajiri”, wealthy ones. The inland groups have become partakers in their wealth by adopting their social and cultural conditions. Gradually they have established themselves as people with an economic standing in their own right. To a certain extent the equalizing policy of Tanzanian ujamaa has been able to level such differences, but the “mwungwana” – “mtumwa”, noble man-servant relationship still lingers, influencing the social structure and the mode of economic activities. Locally it is referred to as the mentality of “umwinyi”.

Of the immigrant coastal groups the Baluchi (Bulushi, Sw.) from India are represented in all of the villages, which have been studied more closely prior to the evaluation, Pande, Mlingotini and Mbweni. Their entry to Tanzania is connected with their serving as soldiers for the Sultan of Zanzibar and the British Army. Arabs have an old tradition of migration which as a phenomenon has been a continuing process. The people who call themselves Shomvi, are considered a mixture of the Zamaro, the largest indigenous ethnic group around Dar es Salaam, and the mixed Shiraz or Arab population. Those who control the trade almost invariably secure their business by linking up with various socially, economically and politically significant networks. Also the contacts between the islands (Zanzibar, Pemba, Mafia, Lamu) and the mainland are significant in boatbuilding and trade as well as fishing.

Women’s situation in the coastal communities has structurally been shaped by intercommunication between the different ethnic and economic factions and the socio-cultural forces which they represent. Women have frequently become instruments in efforts to accommodate coexistence between different social groups. At times those of foreign extract have wanted to form liaisons with the local population in order to gain better acceptance or better channels for needed services, at times a socially and economically climbing upcountry newcomer or local entrepreneur gains his “nisabu”, pedigree, by linking up with a woman from a socially significant family.

Trade has been the main factor in creating the navigation and general marine culture, but all along fishing has been a significant sector in it. Fishing in earlier times used to be done by slaves, today it is often done by hired fishermen.

There is still considerable dependency on the “tajiri”, the Big Man who assumes the role of a benefactor. He replenishes the equipment, gives out loans and sells fish on credit to women who are short of cash. The Big Man creates dependency relationships while acting as a money-lender so that in the end many of the buyers and sellers are “watoto wake”, his children, as they sometimes call themselves. Very few formal arrangements have the same flexibility and the Big Men are aware of it.

4.2.2. The Social Structure in Relation to the Fishing Activities

The structure of fishing and marketing follows closely the historically developed social pattern, yet at the same time it in many ways is similar to sharing systems in other parts of the world.

There is a continuum from an agreement of sharing work between two or three people, often related to each other by kinship ties, to an operation based on pure hired labour in the service of a boatowner who is a trader or a businessman not otherwise connected with fishing. No cases have been found on the coast where a woman owns such a business, but such a possibility need not be excluded. The mode of organization of operation is directly related to the size of capital investment.

The types of fishing and sharing systems:

1. *Fishermen/women with no boats*

Fishermen and women who own no boats fish on foot wading in the water, collecting bivalves or flatfish, or equipped only with a stick or a rod and a basket they extract octopus from their holes or catch crabs or collect sea-cucumber, the latter in places like Mlingotini and Ununio and also in Tanga. Octopus is used as a bait to frighten lobsters out of their hiding places, which then are scooped out in a small net. Squid is caught for a bait to be placed in a trap, *dema*, a hexagonal basket trap. For laying the traps a fisherman borrows a *ngalawa* or *mtumbwi*. He may do this on a monthly agreement, paying e.g. 100 T.sh. a month, or he is dependent on available boats, paying usually 20 per cent of the catch for the loan of the boat.

Women fish during low water periods in teams of three to seven, depending on the number and size of the *tanzio* cloths which at present are made of plastic sacks or pieces of old sheets. From fishing shrimps or schools of small fish the women could nowadays make good income, but they lack proper material, black *kaniki* cloth which they traditionally have used, or cast nets, *kimia*, which could well serve for the same purpose.

The women share income equally between themselves or they fish for some common purpose. In North Zanzibar a group of women collected money in this way for Maulidi, celebration of the birth of the prophet.

Only elderly women are nowadays engaged in this form of fishing, but it could attract others as well if proper cloth was made available for them. The catch is sundried and sold in small portions. Small fish is also sold fresh in places where transport is available, e.g. in Mbweni.

2. *Fishing with Small Boats, Ngalawa and Mtumbwi*

Fishermen recognized by name in Government records own their own boats which must be registered. The number of men attached to each boat is not always recorded. For example, for Mlingotini the record shows 51 boatowners and 164 fishermen fishing from them. In Kondo the proportion is 31 boats to 94 fishermen. The most common team consists of the boatowner and two others, bigger boats have more men on board. On the other hand, in 1983 Government records show 55,399 fishermen and 24,898 boats.

When only hooks and lines are used each member of the team commonly has his own gear. The boatowner gets usually 20 per cent of the catch and the rest is divided evenly between the team, the boatowner included. The system is the same if the owner does not share in fishing, but then the share of the boat depends on the size of the boat and the catch. In addition, the owner and the fishermen always take fish for their own consumption.

For the purposes of distribution of fishing gear in the future, it is necessary to emphasize that many fishermen who are temporarily or permanently fishing without their own boats consider themselves full-time fishermen and not only hired labourers. Especially the small teams on the coast, fishing regularly from one boat, from closely knit units which work on the basis of sharing equally in the fishing tasks and would all also consider themselves equally as fishermen.

If fishing gear is distributed only to fishermen recognized by name as owners of boats, the poorest fishermen will share in the benefits only as dependents and workers. There will be an increasing concentration of property and capital in general in the hands of the non-fishing boatowners and moneylenders.

3. *Fishing with Boats and Nets*

Fishing with a net requires a larger boat. In the case of beach seining, often a long canoe, *mtumbwi* or a *hori* or *dau* type of a boat is used. It takes the nets and the crew to a suitable sanddune or a beach and transports the catch back to the landing beach. When using gill-nets or light-fishing, the *mashua* boat enables the fishermen to have more choice of their fishing grounds and to haul back larger catches.

Only a few of the observed coastal villages have a number of large boats and hardly any of them are engine-powered at the present time because of the lack of maintenance and spare parts and the shortage and expense of the fuel. Dar es Salaam and Tanga and to some extent Bagamoyo are exceptions. From them larger boats operate with a crew of 9-11 and a great many with outboard engines, reaching waters further away, following also the migrating fish (e.g. in the Pemba channel.) These boats carry ice on board and can keep the fish for several days.

In almost all the cases the owner of the boats also owns the nets and other needed equipment. An exception to this seemed to be the boats in Nungwi, Zanzibar, where nets had been distributed to the individual crew members, even when the boat was owned by one owner. This enabled the fishing crew to have an equal share of the income, after the share of the boat had been paid, which was said to be 20 per cent. No engines were in use.

When the boat, the gear and other equipment belong to the boatowner, the owner takes one half or two thirds of the proceeds, (1/3 for the boat, 1/3 for the equipment, 1/3 for the crew), the latter often in the case of an engine-powered, rather large boat. If the catch is large, it still leaves a handsome sum for each crew member.

The relationship between the owner and the fishing team is more and more developing into one of an employer and his workers. When the ownership is combined with a near monopoly of marketing, the ordinary fishermen have little to say. Investments derived from fishing are not returned to fishing to the extent they could be. The traders engage in fishing as another business enterprise, even as village residents they invest in city houses and diversify their business.

4. *Cooperative Forms of Fishing*

Earlier experiences of forming villages as fishing cooperatives have not in general succeeded. The groups were too large, the interests of non-fishing members of the village community interfered with the interests of full-time fishermen.

The forming of a cooperative in Sadani in the 70's proved to be a failure, due to inclusion of non-fishing villagers as members. They joined only in order to benefit from the

fishermen's labours but did not fulfill their own financial obligations. At the moment fishermen in Sadani are provided with nets and ice by companies which do the purchasing and transporting. No boats are used in fishing. The BAFICO (Bagamoyo Fishing Corporation) is privileged with the backing of the District authorities, but does not provide the fishermen with the best financial conditions. There is competition from private enterprisers who entice the fishermen with better payment and nets.

Mbegani centre stores and freezes the catches by BAFICO and two other companies in its cold-stores. At the moment bigger companies have priority over small enterprisers, who are also seeking for the same services in Mbegani. There is a need to look into the conditions that the different traders give to fishermen who do the actual work, so that Mbegani does not share in an exploitative enterprise. This is one of the many reasons why Mbegani should have a social science or cultural researcher attached to its operation, at least periodically.

The case study of the Pande Fishermen's Cooperative is given in *The Women Study Report* (Swantz, 1986). The last effort to restart the marketing cooperative in January 1986 was one of the outcomes of participatory action research.

Pande fishermen are ready to negotiate with MFDC the conditions on which they could gradually become the owners of some improved ngalawas and later a bigger boat. Their first dire need is to get hooks and lines and eventually nets.

The fishermen do not expect gifts. Their traditional sharing system gives them the means of daily payments for the share of the boat and the gear. By continuing to do so for the equipment they first use on a loan, they will have soon covered the total cost. It is essential that barely literate men are not burdened with bank loans and money debts but are given a chance to pay for what they use following a system which they are used to. This requires daily recording of payments and thus a simple book-keeping system which they themselves can manage. This way also the recording of the catches will be documented.

5. *Women's Cooperatives and Credit Groups*

Women's cooperative groups have in general fared somewhat better than village cooperatives. Their failure is due to lack of assistance and teaching of book-keeping and simple marketing or purchasing procedures. In all the villages there are struggling women's cooperative groups which the women can revitalize if new inputs are available, or women form new cooperative groups for the purpose, as has been the case after the women's research/training seminar. Such groups can be formed under the village cooperative, yet they can operate independently.

Women are used to sharing through informal credit groups, called **mchezo** or **upatu**. According to the study made, women in Mlingotini were estimated to save this way in one month T.sh. 85.000, in 13 separate savings clubs or credit groups with a membership of 650.

Each member gives to one of the group an agreed sum, for instance 100 shs. each week. The sums one woman receives per cycle ranged from 80 shs. to 3.000 shs. This keeps the earned money circulating and makes available at one time sufficient sums to invest or to buy commodities. The sums have become too big for the poorer women to be member of such groups. This indicates women's capacity to handle finances and to have considerable trust in each other, although problems of nonpayment by some members also occur (V. Bashemererwa, 1986).

Women should be left to organize themselves without any outside efforts, but once they are organized, they need consulting services to learn management procedures.

4.2.3 Lake-fishing

The organization of fishing in share-groups around Lake Victoria does not fundamentally differ from that on the coast. (Information is based on information from Mara and Mwanza Regions).

Some of the fishermen fish from the shore using beach seines, but even then they are attached to a team under the leadership of a boatowner who also owns the nets. There are five or six men to one boat. The sharing is done on the principle of daily income. Two days' catch is shared by the crew while the owner of the boat and gear, who also fishes, shares three days' catch. In another case, when the beach seining was done from the shore the division of benefits was by halving the catch between the owner and the workers and setting aside 100 shs. for the share of the boat. There were additional casual workers who pulled the net in order to get some fish in return.

The phrases used reflect the relationship; "Huyu ni tajiri wetu", "Hawa ni wafanyikazi wangu". "This is our rich man (owner)", "These are my workers". The owner or his representative receives the fishermen on the shore with their catch and negotiates with the buyers who buy in bulk. They then sell to the retailers or straight to consumers. Women are the main fishmongers and processors, in a much larger scale than on the coast. The women make use of fish fat with which they fry the fish before selling it on.

In Mwanza, businessmen were employing women in their homes for fishfrying in large quantities. Fish was frozen by one of the cold store companies. Also fresh fish was flown to Dar es Salaam daily. In the Mara region the marketing range of fresh fish is 5-50 km, depending on the mode of transport. Women carry the fish on their head and transport it further in busses and pick-ups, men transport it also on bicycles.

Women traders are quite often single supporters of their families, or they supplement the provision of their husbands to the daily upkeep of the families. Women also invest in houses. In Shirati the women had formed a marketing cooperative with the hope of being able to invest in a car, but the distance to the shore proved to be too long for continuing purchase of fish. Men in Tarime District considered investment in nets risky because of the frequent thefts.

The prices were lower than on the coast and the size of fish sold for food is larger than what can be seen consumed by ordinary villagers or town dwellers on the coast. Large slices of fried Nile Perch fillet were sold for ten shillings a piece, the pieces could be sold even cheaper.

When Mbegani starts extension service at Samora, in Musoma, it is of utmost importance that the effects of such training are considered when planning the courses. Fish processing is basically women's activity and should thus be primarily taught to women lest with the modernized methods men take over the women's business. Furthermore, when marketing is included as part of the curriculum, women should be part of that teaching programme, probably also of net mending and making. There is nothing, either, which prevents interested young women from learning mechanical skills.

5 OBJECTIVES

5.1 The Objectives Formulated for the Project and their Relevance to the main Problems and Needs within the Fisheries Sector in Tanzania

The general objectives of Mbegani FDC, as they are stated in *The Agreement between Norway and Tanzania regarding continued Assistance to the Project*, (Ref. Article 1, Annex 1, pt. 1) are of a dual nature:

1. Objectives concerning the internal activities at the centre and
2. objectives concerning the centre's relations to the exterior, fisheries and allied subsectors.

On the internal side the assistance shall cover three areas; further development, operation and maintenance of the centre. (Article 1).

Further development of the centre is here understood to be

- a follow-up of physical construction works and relevant equipment supply
- further planning and implementation of training and direction of development work.

Both these activities are now in a post-peak phase at Mbegani. The exception is direct development work which has not yet really taken off.

On the physical side further development might consist of construction adjustments and maintenance of equipment. Planning and implementation of training is also now in a phase of evaluation and modification according to Annex 1, pt. 2 b of the Agreement. It should be noted that also such alterations in syllabi and curricula must be approved by Tanzania, represented by The Ministry of Natural Resources and Tourism, before set in effect.

The operation of the centre is intended to concentrate on two types of activities:

- a) training
- b) direct development activities

of which training shall be the main concern.

Training is to be carried out on three levels:

1. Diploma courses on specified subsectors
2. Certificate courses, also on specified subsectors
3. Short courses for artisanal fishermen, covering areas where training is found to be necessary.

The Agreement states that relations to the traditional sector shall be the main concern for the content of the training, and that Short courses shall form a substantial part of the same. Generally the objectives regarding internal activities at the centre are fairly precise and adequate.

With reference to section 10.1, the team is of the opinion that the “coastal fleet” (e.g. merchant marine) should not be considered as a receptor of candidates from Mbegani in the future.

The above internally oriented objectives must be seen as having their basis in more general and externally oriented aims in Tanzanian fisheries policy. Even though certain areas – such as the artisanal sector – have been given special attention in the agreement, the general picture is that the project objectives towards the exterior are rather vaguely stated.

Since Mbegani is meant to serve the fishing industry in general, and since the activities performed at the centre will be evaluated as external impact, its relations to the fishery sector should be further clarified and emphasized.

The considerations that so far have taken place along these lines point to three distinct areas of impact for the project:

1. Public nutrition
2. Employment opportunities
3. Fishermen's income

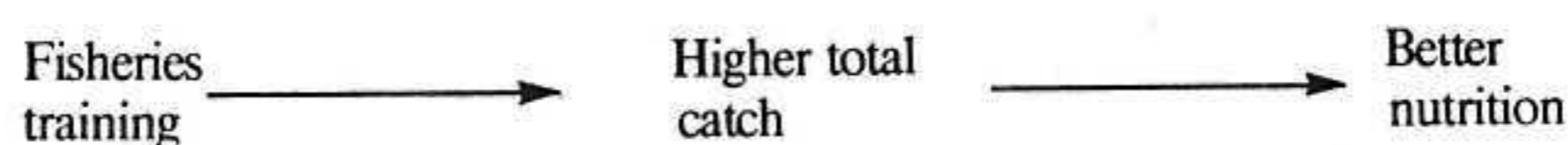
It is evident, however, that these aims may be conflicting. Indiscriminate emphasis on increase of fishermen's incomes may for example contradict nutritional considerations since the latter really calls for lower fish prices at present. Export of fish can in certain instances also conflict with nutritional aims. Such conflicting objectives should be jointly weighted against each other and decisions of priority taken.

The direct development assistance in terms of developing boats, gear, fishing methods, organization etc. is an important basis and a condition for successful training for betterment. It forms a natural part of the activities at Mbegani. According to the agreed policy this work shall be directed more towards the artisanal fisheries of Tanzania.

The Agreement describes these activities as “to develop ways and means in order to improve” the artisanal sector. This term should indicate that one has a multiple activity programme in mind where several constraints to betterment should receive attention in timed and quantified order and that these activities together with training should bring the desired impact.

This is a strategy that partly, but not fully, meets the existing situation in the sector which is also facing several constraints outside the influence of Mbegani. The most pressing of these at the moment is the poor gear supply situation. The long term remedy to the situation is a matter of political priority and administrative action. Action has recently been taken to secure the allocation of foreign currency for import of gear and gear material, but results are still pending. Action to straighten out this external constraint is a condition for any successful impact from the training at Mbegani. Commodity assistance in terms of gear etc. has an effect as long as it is given, but this – without local administrative action – lasts no longer.

The aims of employment, incomes and nutrition indicate a chain of effort/impact where each effect is dependent on positive contribution from the former; in visualized form:



This causal connection can be further elaborated and detailed.

Now, to get the desired impact or effects from activities along such a line of events seems to be very difficult. This has several reasons:

- a) External constraints prevent desired impact of the activity. Lack of gear and engines prevent impact from training in terms of more fish landed.
- b) Several activities or remedies must be joined in a “puzzle” approach in order to achieve the desired impact. Training must be based upon active development work and followed up through services like loans, better supplies etc.

Since Mbegani’s future impact on Tanzanian fisheries will be measured as employment opportunities and income and nutrition betterments rather than as a headcount of candidates from the courses, training must be accompanied by several types of support/assistance that together can bring the candidates into positions where they are able to use their skills in a real way.

Another aspect that has to be discussed in relation to objectives is the question of who shall be the main receptors of assistance and training from Mbegani.

More than 98 per cent of both fishermen and catch originate in the artisanal sector and less than 2 per cent come from the industrial fishing sector. So far the majority of Mbegani inputs have been directed towards the high-technology of fishing and very little towards the artisanal sector. Nearly all the inputs relate to training while negligible amounts has been used in direct development work and follow-up assistance.

This indicates that the activities actually carried out at Mbegani are not in accordance with the main objective of the project. The team believes that this has at least two reasons:

1. The surveying of the fisheries sector and fishing societies in terms of constraints, limits, opportunities and trends was never satisfactory. On occasions where such pilot studies were carried out (Tanga/Pangani) the results were not properly used in the planning and implementation phase.
2. A process of bringing the general objectives into an operative or practical form was not carried out, at best this process has been only fragmentary. Instead the specified objectives remained “good intentions”. As a consequence each expert and consultant was left free to develop his own field in whatever direction, mainly determined by his professional background.

With the dominantly high-technology oriented expatriate staff at Mbegani, project solutions have also tended to be hi-tech oriented. In total, the solutions chosen resulted in a project biased relative to receptive capacity in the sector and did not fall in line with the initial general objectives. This is a serious shortcoming, since the majority of the decisions in a project like this are irreversible and carry consequences for and limitations to the kind of decisions it is possible to take on later stages.

It is the opinion of the team that the surveying and the process of making the objectives operational should receive much more conscious attention than at present. This would help to keep the project activities “on rails” in relation to initial intentions and aims. The result of that work should be a set of practical measures – related and timed to each other in a comprehensive strategic plan – in keeping with the objectives.

Finally, in a development project or programme, the understanding of the process “development” has influence on the kind of objectives that will be laid down.

The more common – but less fruitful – understanding of the term is that development is synonymous with the transfer and adaption of a packet of technology, possibly also including its economy and organizational base.

Another, more realistic point of view, is that development should involve increased capacity to **master, make and adjust** the technologies in relation to changes in the environment. This brings about an understanding of development as being a process that takes place in man rather than with machines and equipment. Thus development is basically a human process, not only a technical one.

The practical result of viewing development in this perspective would be that creation of innovativeness and problem solving capacity should be an important objective in itself. Creation of these capacities is a condition for further progress.

5.2 **The Role of MFDC in Relation to the Development of Fisheries in Tanzania in General and in Relation to Other Institutions within the Fisheries and Maritime Sector**

Mbegani's starting point as a joint Norwegian/Tanzanian project was not in line and level with fisheries in Tanzania and the way they were carried out. This is valid whether one sets 1977 or 1980 as the starting point. The reasons for that can partly be read above (Cfr. 5.1). In short they were:

- Hardly any pilot studies.
- Unclear objectives – when they eventually were formulated, they were not broken down to practical measures.
- Little attention paid to developmental goals of the centre, only concentration on pure transfer of knowledge and on skills which were not adjusted to fit the existing situation within fisheries in Tanzania.
- Concentration on training in foreign methods and equipment, not considering whether these methods could be used or practised.

The result was that the technology introduced in many ways fell outside reasonable limits:

- It was technically too complicated to be maintained locally, thus fully dependent on import of repairing skills and spares.
- It was too expensive compared to the carrying capacity of the fishing sector in Tanzania.
- In addition it threatened the economic conditions of many artisanal fishermen, by disturbing fishing grounds.

In consequence, the technology introduced had little **replicative capacity**; it could hardly be copied by any fishermen at that time in Tanzania. Rethinking has taken place on both sides as to the level and type of technology.

Since then the technologies solicited have been "simplified" at Mbegani, the centre searching for operative contacts with fisheries as they are. On the fishing side the process has barely started. From M/V "MAFUNZO" one went to Training Vessel II, further to a large motorized mashua and finally to a ngalawa (canoe) programme. So far it seems that only in the last programme the three conditions above have been met in such a way that there is hope for replications, provided Mbegani does follow the programme by providing skills, tools etc. to future constructors. On the processing side there is a similar way from plate-freezer to a newly invented insulated basket for fish made from local material. On the fishing side the process has barely started, trawl is still the only gear in operation from Mbegani; use of other gears takes place only very occasionally.

One could, perhaps, understand that under the circumstances this "simplification" in order to come in operational contact with fisheries as they really are has been a necessary one. That may well be

the case, but it has been an expensive strategy, and much of the equipment brought into Mbegani during this process will hardly benefit Tanzanian fisheries. It must also be said, however, that through this process MFDC has been brought into a situation where it is able to render service in the form of training and direct development work to the whole range of technologies from the trawler to the ngalawa.

This is an asset, but it also carries responsibilities. Among other things it requires a conscious effort to balance the effects from the involvements in such a way that one technology does not strangle another.

While in the past the prevailing idea was that training alone was the remedy that should boost development, during the last 1-2 years increased attention has been paid to the idea that training must be supported by other activities as well, if at all it shall result in any betterment. There must be carried out development work as a basis for the training, and the training must be followed up through different kinds of support in the form of gear, loans, extension etc. – in other words a “puzzle” approach.

This new thinking already involves the idea of commodity assistance in the form of gear and is now breeding ideas of a more comprehensive and organized direct development assistance. This can give further inputs to the fisheries sector and can, in turn, be channeled out through the courses, particularly the short ones for artisanal fishermen.

When MFDC’s role in the development of Tanzanian fisheries shall be assessed, one must bear in mind a few facts that carry consequences for the way Mbegani can function:

- Tanzania covers a large area with few good communication lines.
- There exist many kinds of fisheries in the country; coastal, Lake Victoria, Lake Tanganyika, rivers, swamps, dams – all of which require special modes of involvement to develop.

We consider it a sound philosophy to think that Tanzanian fisheries as a whole is a too big cake to swallow for Mbegani in one bite. Therefore the centre has to concentrate on a certain number of regions – and types of fishery – at a time. In such a strategy, regional centres like Pangani are of great importance.

Besides being training sites, they will serve as valuable *channels of communication* both with regards to inputs from the sector to Mbegani and to outputs from the centre.

5.2.2 The role of training

The original idea was that MFDC should be a training centre that should “produce specialized manpower to fisheries and several of its allied subsectors”. While the basic idea of the donor was that these specialists could serve the industry through engagement on all levels, the Tanzanian idea was that positive impact from the candidates was best secured through post-training engagement in the public sector – as extension staff, skippers on governmental and parastatal training and fishing vessels, parastatal boatyards and fishprocessing units and as engineers on the same types of vessels. Originally the Fisheries Division decided the in-service/pre-service ratio to be 50/50. Because of economic difficulties the number of in-service students has been increased over the years. At present the ratio is 75 per cent in-service candidates and 25 per cent is pre-service. With the five years bonding system nearly all candidates from Mbegani end up in the public and parastatal sector. Under the present economic conditions there seems to be little scope for further employment in the public sector, so that this regulation has to be liberalized for students leaving Mbegani hereafter. This will of course make it easier for others to utilize candidates from the centre, but the real demand for specialists from Mbegani still remains to be seen. Another strategy is to reduce the training of specialists according to actual needs by running especially the Diploma courses less frequently. More resources could then be used on Certificate and Short course levels.

Another crucial question is to what extent the candidates actively should be trained to serve also other sectors than fisheries. There will always be a certain "leakage" of candidates to other sectors by for instance marine engineers and refrigeration engineers. This is probably another "security valve" when seen from the side of the students, but the question is whether this is correct use of Mali Asilis (Min. of Nat. Res.) limited budgets. In any case such "leakage" should not be so large that it affects Mbeganis commitment to fisheries to an unacceptable extent.

Diploma Courses

The team's observations indicate that the Diploma candidates from Mbegani generally, both in the public and parastatal sector, have met problems in finding jobs where they could utilize their specialization fully. This is often caused by the difficult gear and equipment supply situation and relates to boatbuilders as well as to master-fishermen and engineers. The team recommends that demand is assessed and that high selectivity is used when candidates are admitted to Diploma courses. The present situation calls for top quality candidates from these courses rather than for high quantity.

Certificate Courses

These candidates go almost exclusively into extension service on regional and district levels. In fisheries extension, transport is the main problem. The staff has problems in performing extension work due to lack of transport. This reduces the efficiency of extension considerably. The aspect of communication in extension work should be emphasized in the teaching. As transport by car will also be a constraint in the future as well, it is important that other means of transportation, e.g. bicycle and sailing boat, are utilized. Accordingly, sailing should be actively taught in the certificate courses. The attendance of certificate students to Mbegani now very much depends on demand from other sectors within fisheries, since there is no room for further public employment. Here too the present situation calls for top quality candidates than for high quantity.

Short Courses

From a rather modest start, in terms of attendants, these courses now seem to be attractive. Those who have taken the courses also seem to be wanted when they go for employment. The critical factor here is at present more **what** they should be taught.

Since engines are not in sale, maintenance of engines is a rather premature subject. Netmounting and mending is often a skill the candidates know already. In total it seems that the Short courses now suffer from the lack of relevant teaching inputs as the development work that should be the basis for this training, was hardly started at Mbegani. Furthermore, lack of gear limits the impact from the courses. It is therefore of utmost importance that all efforts are combined to start this work as soon as possible. Also certain follow-up courses should be planned, especially annual brush-up courses should be offered to former participants who have settled in the village with their own boats, and who have the confidence of their fellow fishermen. Apart from the newest fishing techniques they should learn how a fisherman takes care of his economy, how to apply for a loan, how to insure a boat and gear etc. This knowledge he should transfer to his fellow fishermen in the villages. For them he will be somebody who has the solution to problems. For Mbegani he will be an important channel of information direct to the fishermen, the most promising factor being that he has the confidence both of the fishermen and Mbegani.

Direct Development Work

Direct development work can be seen as two types:

a)	Development of equipment
b)	Reccarch and procurement of data

Some development work has already been started at Mbegani, but this part of the activities has never taken off as an integrated and important part of the activities. It is hoped that this will change if the activity is organized as proposed in sect. 8.1.

Nevertheless, all the other departments will have to do most of the work that in terms of equipment and skills falls under that department. Therefore each of the other departments should earmark a certain number of manhours for development work.

Development work is highly dependent on cooperation, imagination and interest from the involved. Acceptance of an innovation is dependent on motivation on the part of the receiver. The best way to acquire positive motivation is to let the receiver identify himself with the innovation, to take part in the development. Therefore development work must be done as much as possible in participation with fishermen and other users. This is the best guarantee that the innovation finds a way to practical use.

5.3 Project Implementation

According to the Agreement between the Government of Norway and the Government of Tanzania dated April 11, 1985, regarding continued Norwegian Assistance to the Mbegani Fisheries Development Centre, Mbegani is a training establishment in the fields of:

- a) Nautical sciences; gear and fish finding technology
- b) Boatbuilding
- c) Fish processing and marketing
- d) Marine engineering and refrigeration engineering

The centre is charged with the task of providing technically qualified manpower for the fisheries and allied industries. The training is to be provided in accordance with the needs of the fisheries sector in the country with emphasis on the practical aspects of the training. The centre is to provide training for officers to the fishing fleet and coastal fleet of Tanzania up to the level of the lowest certificates required for deck and engine officers to these fleets. Training is supposed to be the main concern of the centre and should have priority over any other activity. It is supposed to develop ways and means in order to improve the more traditional fisheries of Tanzania. The centre shall otherwise take part in the national development programme of the fisheries sector.

The project agreement is in line with the national policy for fisheries development which is guided by the philosophy of socialism and self reliance and emphasizes:

- a) Increasing fish production through the use of improved skills to meet the protein needs of the country by increasing the per capita fish consumption.
- b) Earning foreign exchange through the sales of surplus fish and crustacea.
- c) Strengthening the training facilities to meet the national need of manpower in the fisheries sector.
- d) Consolidating fishermen training so as to facilitate their full participation in fishing to increase their earnings.

The construction phase of the project has been implemented successfully and has provided quality housing, training facilities and equipment.

The centre has successfully trained one batch of students at Diploma level in all the fields and these have joined the industry with some difficulties. Certificate courses in the different fields have also been initiated to provide middle cadre personnel for the industry. Short courses for training fishermen have been conducted in Bagamoyo and the Pangani Fishermen Training Centre. Plans are under way to establish Short courses for fishermen in Musoma to cater for the Lake Victoria fisheries.

The project may have equipped the centre to cater for the needs of high technology fishing, but it has not prepared itself to attend adequately to the needs of the artisanal fishermen. Main reasons for this situation are:

- a) Lack of expertise on artisanal fishing techniques of the instructors recruited for the centre.
- b) Limited time available and inadequate motivation for the instructors to learn the artisanal fishermen's fishing techniques and develop an improved version applicable in the field.
- c) Poor quality and low level of productivity of the gear and craft used by the artisanal fishermen do not attract interest and participation of the instructors and trainees.
- d) Training aids and equipment initially acquired by the centre did not fit in with the artisanal fishermen's requirements. This implies that the artisanal fishing techniques could not be covered adequately in the training conducted from the centre. The graduates leaving the centre may consequently not have been adequately equipped and motivated to cater for the areas relevant to artisanal fishermen.

Project reorientation is required to ensure that the trainers are conversant with artisanal techniques. This will ensure that the training can cover all aspects of the industry including those areas relevant to artisanal fisheries.

The Boatbuilding Department has taken the right course by initiating the construction of improved "Ngalawas" and "Mashuas". These have to be put to use to show that they can be operated successfully for fishing. The cost of production and operation should be within the reach of the artisanal fishermen.

The centre should as far as possible avoid the use of the motor on these vessels so as to demonstrate the effectiveness of using sails. Trainees should be trained intensively on the operation of sails in order to develop the habit of making use of them when they are out in the field.

The development of artisanal containers for transporting fish by the Fish Processing and Marketing Department has to be followed by training and practical demonstrations so as to have such a container acceptable for field use.

In order for the centre to cater fully for the fisheries sector it will have to build up the expertise to cater for the artisanal fishermen in all fields of the courses to be conducted at or from the centre so that trainees from the Diploma and Certificate courses can go out well prepared for the industry. While the trainees should know how to carry out large scale fishing with the M/V "Mafunzo" using different fishing methods, they should also be able to utilize small craft to conduct fishing with the different techniques that the fishermen use. It is through the use of the artisanal craft and gear that they can learn the problems and develop improvements.

5.4 Review of the Compliance of the Project with Norwegian Principles for Development Cooperation.

In White Paper No. 36 (1984-85) from the Royal Norwegian Ministry of Development Cooperation the Government presents its views on certain important issues concerning assistance to developing countries. In this White Paper we also find the more general principles for development assistance as laid down early in the 1970's (see White Paper No. 94 (1974-75)). Briefly, the main principles of Norwegian development assistance should:

1. go to the poorest developing countries
2. be "recipient oriented"
3. be provided as grants

4. be untied
5. be distributed equally between multilateral and bilateral assistance
6. be concentrated on few main priority countries, selected by certain criteria.

In addition some more specific principles are stressed;

- I Development assistance must be used so as to achieve the greatest possible development effect for the poorer sectors of the population.
- II It should be designed to create as little dependence as possible on future assistance.
- III Development assistance should be based on a strategy directed towards basic needs, that is food, health, education and employment.
- IV Assistance aimed at improving the living conditions and work opportunities of women should have special attention.
- V If development projects negatively affect local groups of people with small resources, the project shall have to be reoriented or supplied by special compensating measures.

As for the main principles, 1 through 2, the establishment and operation of Mbegani FDC, fit reasonably well into the general framework. The principle of recipient orientation can be somewhat questioned, especially during the construction period, but this must be considered against the background of the troubled prehistory of this particular project (see section 3).

As for the more specific principles, I through V, the evaluation team will make some comments:

I *Development effects on the poorer sectors of the population*

From past and present performance, one can hardly say that Mbegani FDC is helping "the poorest sectors of the population" in Tanzania. The education of Diploma and Certificate students has so far had little influence on the working conditions of artisanal fishermen. The centre has been operating for a short time and the number of graduating students has accordingly been limited. But even in a longer perspective, it is not very likely that this kind of education will bring about changes in the poorest sections of the fishing villages. However, the Short courses are definitely a step towards *the main target group* for MFDC, namely artisanal fishermen. If Short courses are strengthened and certain parts of the present Diploma and Certificate system reduced, the performance of MFDC will be more in line with this particular objective.

However, as shown in section 4.2, even the Short courses will have problems trying to reach the poorest sections of the society, as the social structure of the villages to a certain extent favours those with some resources. If MFDC is to extend their efforts in the field of gear supply as recommended, great care should be taken in the organizational set up, so as to secure that the poorest fishermen really benefits from the project and not only the wealthier boatowners.

II *As little dependence as possible on future assistance*

From the short synopsis of the Mbegani history in section 3, it is evident that the centre gradually has been extended, both in number of buildings and equipment, so that the total costs today by far exceed the carrying capacity of the Tanzanian economy. Even if the cost of expatriates is not considered, the current expenditure will be in the realm of 24 mill. T. shs. per year (1986), of which Norway today covers 75 per cent and Tanzania 25 per cent. There is no possibility that Tanzania under the present economic conditions can take on the full financial responsibility for the centre, if the centre is going to be operated and maintained according to plans.

Therefore, by this project a definite dependence on future aid has been created, although the extent of it can be reduced somewhat in the years to come. It should also be mentioned that the operation of the centre to a large degree is dependent on *imported* equipment (spareparts, tools etc.), thereby requiring extensive use of foreign currency.

III *A strategy directed towards basic needs*

As a project aiming at increasing the total output of fisheries in Tanzania, MFDC is naturally a part of a strategy directed towards basic needs, namely a better nutritional standard for people in general. However, it should be pointed out that the two "links" involved are not simple, i.e.; from education to greater output of fish and from greater output to a better nutritional standard in general.

A better educational system within fisheries and related industries can hopefully result in greater output in the long run, but not necessarily. It depends on a number of other factors, over which the donor, in this case Norway, has very little control. The availability of other input factors like gear, the allocation of foreign currency, the use of Mbegani candidates within the administration, surveillance of the fish stocks, pricing policy etc., are factors which together with better knowledge obtained through education, **can** contribute to higher output. But the aim of higher output can easily be frustrated by some of these factors working in opposite direction.

The same applies to the next link, from increased output of fish to a better nutritional standard. This depends, among other factors, on the distribution and transport system, the pricing policy, the general level of income and so forth. It is to be feared that an increased output of fish not necessarily benefits the ones who really need it. So far however, only marginal quantities (of shrimps) are exported, thus leaving nearly 100 per cent of the fish for internal consumption.

IV *Development assistance aimed at women*

In planning MFDC little weight was put on the question of assisting women. This applies to the first years of performance as well, even if one woman has graduated from Diploma courses, and one from Certificate courses. (Four will graduate from the Certificate courses in the near future). So far no Short courses have been planned or performed especially for women.

In 1985 a women's group was established at MFDC to carry out different activities, like sewing, producing coconut oil, putting up a shop etc. As a result of NORAD's Research Programme for Women, a four day seminar was held in cooperation with MFDC in 1985, in which practical activities played a central role. Later on this has been carried further with a group of women attending a special course in netmending with the Nautical Department in charge.

More can definitely be done in this field, especially in terms of helping women in fishing villages to organize cooperatives within production and sales, shops etc.

V *Projects affecting local groups negatively*

There is clear evidence that trawling has affected artisanal fishermen, both in terms of losing gear and of reduced catches, due to damage made on the habitat of demersal fish. At present no regulations are applied as to where trawlers can fish on the coast. By

concentrating training and practical fishing mainly on trawling, MFDC contributes indirectly to the problems of artisanal fishermen along the coast. (In the lake fisheries, the situation is somewhat different, as regulations are applied but not actively followed up). Without zone regulations and a proper surveillance, it looks like trawling, especially for shrimps along the coastal waters, is bound to affect local artisanal fishermen negatively.

From this very brief discussion it is evident that the establishment of MFDC has been in compliance with the more general principles for Norwegian development aid, while as to some of the more specific objectives, the answer would be more negative, or at least more disputable. However, the evaluation team has the feeling that the centre in certain respects is *moving in the right direction*, i.e. according to the guidelines laid down for Norwegian development assistance.

The evaluation team would also like to stress that the shortcomings of MFDC as related to the more specific Norwegian principles are not unique. The recommendations put forward in section 10 will probably, if they are followed in the future, bring MFDC closer to some of the specific principles for Norwegian development assistance.

5.5 Review of the Activities and Achievements of the Project in Relation to Goals, Production Targets and Inputs

In discussing this topic one has to review the activities, achievements, goals and production targets that are intended to be accomplished by the project.

5.5.1 Activities and Achievements

The main activities of the project are the training of fishermen or fishing communities in the fields of nautical sciences (mainly fishing), gear and fish finding technology, boatbuilding, fish processing and marketing, marine engineering and refrigeration engineering. The activities also encompass extension services, development activities, research and maintenance.

On the relevance of training, reference is made to section 7.1 below. The centre has engaged itself in the training of students and Short courses for fishermen. On the whole, it can be said that, when it comes to training, the project has achieved the main goals or objectives intended for it. The first batch of the Diploma and Certificate students has already been produced and employed both in the fisheries sector and allied sectors. The impact of these students in the fisheries sector is not easy to evaluate since their number is small in the whole fishing industry. Besides, some graduates are engaged in non-fisheries activities.

Much has been discussed above on the achievements of the centre in training. Whereas we can accept the fact that employment of Mbegani graduates has not been as smooth as expected (this is true of all sectors in Tanzania, a factor which arises from the difficult economic conditions the country is experiencing at the time of the writing of this report), it may be misleading to assume or conclude that the employment in fisheries is **saturated**. Still it may be of value to consider the output of students in the different fields from time to time.

The Government of Tanzania is well aware of the problem and it is hoped that with the improvement of the economy more graduates will get employment. Besides, the Government is now encouraging people to join the private sector because they cannot all be absorbed in the civil service.

The question is whether the Mbegani graduates are employed in the relevant fields. Most graduates have been engaged in the relevant fields. But some of these relevant fields lack proper tools and hence are frustrating the graduates. This, however, should be considered a result of the difficult economic conditions the country is experiencing. With the increasing demands in the private sector in fisheries, the Mbegani graduates should be able to find employment.

Finally, there is great awareness among the artisanal population especially in the lake zones (inland waters) on the potential of fisheries in the country. This is now drawing young men, both literate and illiterate, into the fishing industry. It is therefore important to train this younger generation. But since the Tanzanian fishery is mainly artisanal oriented, it will not be possible to go industrial within a short period. For many years to come the artisanal fishery will still predominate; thus the short courses offered by MFDC will enhance the development of artisanal fisheries of Tanzania, if properly performed.

The development activities of the centre should also receive some credit. The centre has managed, through copying local crafts, to make modified mashua and ngalawa. Both vessels will be an improvement if they are built in large quantities and supplied to the fishery. The main problem here is that Mbegani as a training institution will not be able to build enough boats to meet the demand in the fishery. The value of the modified ngalawa and mashua may not be realised if none is produced and supplied to the demanding market. At the moment the centre has to turn down requests from outsiders for mashua and ngalawa. In the future the Boat Building Department should increase their efforts to produce especially prototype ngalawa and mashua in larger series in cooperation with the local boat-makers.

The centre has made a small start in copying the local traps, the madema. The technology in making the madema is rather simple but the centre had to engage a local fisherman for this. One would have expected that the students would have made more madema, but this has not been done. The collapsable traps introduced during the cruise of "Dr. Fridtjof Nansen" could have been made and supplied to fishermen.

Besides boat and gear development (ngalawa, mashua and madema) the centre has concentrated more on trawling and neglected other fishing techniques. In addition to the trawling, fishery also uses nets (purse seine in the case of Lake Tanganyika), hooks (in the rivers) and traps (in the rivers, lakes and ocean). Mbegani should concentrate on this area also. Other techniques are used for trial fishing. In Lindi/Mtwara, the British Government through ODA, is sponsoring pole and line tuna fishery. Mbegani could inform students on pole and line fishery so that the graduates would be useful in the coastal areas which will be using this method, or where it could be introduced.

In conclusion it would be fair to say that Mbegani has not fulfilled their objective of preparing the graduates for different fishing techniques that are deployed by artisanal fishermen.

On gear maintenance the centre has managed to maintain most of her gears and thus saved a considerable amount of money. The centre has also helped individuals and institutions in repair of engines and boats, which in itself is a good policy. The idea and motive were very good as the centre thereby was helping the development of fishery. But because the job is insurmountable, there is no end of defective gear in the country, the centre has been unable to meet people's demands.

The inputs at the centre can be considered in three parameters, namely funds, staff and equipment.

5.5.2 Equipment

A lot of expensive equipment has been purchased by the centre. Although all of the equipment is necessary in making work easy, some of it could have been avoided. The main aim of the centre is to train mid-level manpower with the relevant practical skills in their respective fields. This implies

that students should use the tools they are likely to encounter when they get employed. But the centre has been using, in some cases, very sophisticated tools which most of the students will not subsequently use.

Obviously such tools are ordered by the centre with recommendation of the expatriate head, whose technology is advanced and who thus finds it difficult to use simple tools that need too much human labour. It may be very difficult for NORAD to recruit expatriates that can use simple tools. *Alternatively*, NORAD could recruit experts from developing countries who would be more adept in the use of such tools.

The training vessel M/V "Mafunzo" has limited capacity for using different gears. They consist mainly of trawling, purse seining, trolling and possibly pole and line tuna fishing. Smaller training vessels would be needed for using other gears. Despite the limitations of M/V "Mafunzo," the vessel has been useful for training at the centre.

5.5.3 **Funds**

The level of technology at the centre is such that a lot of funds needed to keep everything running. There are, however, aspects where expences could be cut, at the centre. Savings could be made in electricity bills and in allowances for students on industrial training.

The team appreciates that the centre is offering good fringe benefits to the employees at the centre. This should continue as it motivates the workers.

5.5.4 **Staff**

There is not adequate local staff at the centre. The number could have been increased by more effective recruitment. The staff development programme of the centre needs revision as some staff are not getting adequate training despite the fact that some have gone to Norway as much as two times in five years.

6. SOCIO-ECONOMIC FRAMEWORK

The Mbegani Fisheries Development Centre has been built in Bagamoyo District within Coast Region. The centre is in the neighbourhood of Bagamoyo town and surrounded by a number of villages, Kaole, Pande, Mlingotini, Zinga, Kerege and Kiromo.

The new Mbegani as it is now called, began officially in 1982 when 75 per cent of the construction works was completed and thus enabled the centre to take the first batch of students. In the first two years a lot of efforts were therefore concentrated on the completion of the remaining works and, most importantly, in getting the training going according to plans. As a result of this, most of the activities were confined to the centre and very little was done outside Mbegani.

The centre has now been running for four years. It may be too early to determine and quantify the economic and social effect it has had on the surrounding communities.

The objectives of MFDC presume a worked-out relationship between the centre and the fishing communities. To quote: "The effect of the training and development work conducted at and by the centre will hopefully reach the fishing population both directly and indirect. Both direct and indirect actual and potential effects are thus in the following taken into consideration.

6.1 Relationship between MFDC and Selected Coastal Artisanal Fishing Communities

In this section brief descriptive case studies are presented of MFDC in relation to the artisanal fishing communities Pande and Mlingotini, which lie closest to the Mbegani Fisheries Development Centre. Attention is paid to those aspects in which MFDC plays a factual or has a potential role which may not yet have been realized. The villages selected for description are the same in which the women's situation has been previously studied, under the auspices of NORAD.

MFDC was placed in the midst of the fields and fishing grounds of the local population from the villages of Pande and Mlingotini and their satellite hamlets at that time scattered around the area. Part of the land belonged to a coconut farm then run by a foreign settler, later turned into a ranch of the NAFCO (National Food Corporation). The initial relationship was coloured by the intrusion, but the effects of it could be assessed only after the centre became an area closed to outsiders fully demarcated with wire fencing.

The ill effects of the segregation of the Mbegani residents from the neighbours on the other side of the fence were less damaging because of the restructuring of the whole area which followed soon after. The process of villagisation was carried out in 1974-1976, with a degree of forced action. Thus for the local people the moving of the houses located in the general area of what was to become MFDC was only one phase in the series of later movements to which the people of Pande were subjected.

The beach on which the Pande fishermen keep their boats and where they land their catches is within the walled area of MFDC, right below the head office. The fishermen as well as the

fishtraders and buyers have been permitted to continue to use the beach and have thus not suffered a loss of fishing grounds. Even then, complaints can be heard of restrictions that prevent the fishermen from coming and going as they would wish.

6.1.1 Pande Village

Before starting MFDC in its new form, a landing station had been built on the Mbegani beach to serve as a recording place and for weighing and selling the fish. The records 1977-1984 show an intensive marketing activity at the Pande/Mbegani "market". Boats fishing in the area even from Bagamoyo and Dar es Salaam, not to speak of the nearby villages, could come and sell their fish to traders who gathered to buy the auctioned fish at Pande/Mbegani. The weighing scale was in operation until 1978. Records show up to 55 boats at one time landing their fish at the Pande/Mbegani fishmarket.

Since then the place has completely lost its importance as a landing site. There has been a rapid decline in the size of the observed catches. No records of estimated catches are available since 1984, but the decline in the number of boats, which at the present time is as low as nine, gives evidence to its loss of significance. At present only one licenced local buyer is left to buy regularly from the artisanal fishermen.

The fishermen of Pande have been unable to obtain any gear, such as hooks, lines or nets, from MFDC. At present they own no nets. They fish with hooks and lines, but even the available line is too thin for pulling in larger fish. The paucity of gear greatly limits the fishing activities. One fisherman fishes with local traps, *madema*. One catches crabs and occasional lobsters with a rod. Women are only seldom seen with their cloths for *utanzi*, and netting. The village records the number of fishermen as 70. However, no more than 30 are actively engaged in full-time fishing. Besides the traditional fishermen, also young men in Pande would be eager to engage in fishing if only improved gear and vessels were obtainable. The decline in artisanal fishing activities on the Mbegani/Pande beach has not been accompanied with any new initiatives in motorized vessels or improved gear, although it could potentially have resulted in concentration on a fewer but more effective ways of fishing.

6.1.2 Mlingotini Village

Mlingotini is a wealthier village than Pande. It gained from villagisation an increased concentration of population, thus more labour force and a larger domestic market. The older stock of established residents has provided the village with bigger boats, a supply of nets and through their sons employment to a number of male youth in fishing, mending nets and marketing. In these activities they have gained from the presence of MFDC regular supply of ice, but they have not been able to buy or be otherwise supplied with gear or vessels, although there would have been readiness to obtain both. Two engines for the bigger boats are owned and operated by young men, who would have welcomed some assistance from MFDC in maintaining them.

The Mlingotini young fishermen complained about not being able to use the Mbegani shore for beach seining. According to them their fishing grounds were limited by the presence of Mbegani. Three of the young men in Mlingotini had attended the extension course held in Bagamoyo. They considered that they had not benefitted from the course since the things they learned about trawling and engines cannot be used where there are no motor boats or trawling equipment. Netmaking and mending was a familiar activity to them already before the course.

6.1.3 Other Services

The centre is providing other services not related to the fishing sector to the district and to the surrounding villages, ranging from occasional repair of vehicles, tractors and milling machines to the contribution towards various functions organized at village and district levels. The generally

recognized benefits that MFDC had brought to both Pande and Mlingotini people were the access road to Mbegani, the transporting of people regularly to and from Bagamoyo, quite often with good luck also to Dar es Salaam, and the services of the dispensary and mother/child clinic. These aspects have been widely appreciated, especially since the local dispensaries in Mlingotini and Zinga often lack medicine. The maintenance department of MFDC also keeps the water pipe in repair when it breaks along the way. Those villages linked to the same pipe also benefit from this. Also the hunting of wild pigs which destroy crops done by some of the expatriates in cooperation with the villagers from Pande, Mlingotini and Kondo, is much valued. It helps to break down the sense of isolation of the foreign staff.

The cooperation which the centre gets from the surrounding communities is a manifestation that the centre is playing a positive neighbourhood role.

To summarize, the indirect and non-fishing activities have brought to the fishing communities additional services and side benefits, but the impact as *Fisheries Development Centre* has been less effective, although of late the relations with the fishing communities have been intensified and diversified.

On the negative side one must count the costs in terms of lost opportunities. Development always brings along contradictory elements. The selling of cheap fish at Mbegani may have the effect of pushing the price of fish down also for the fishermen and reduce their possibility for marketing their fish locally. Also, if ice were not available, more fish would be marketed and processed locally, which would increase the local consumption. The decline in the intensity of fishing and decreased catches of the Pande fishermen have also decreased the nutritional impact of fish in the local community.

There has been a general reduction of artisanal fishing in the immediate area. It could be described as underdevelopment as a reaction to or a side effect of the simultaneous development of modernized fishing technology. As such, it serves as an illustration of technological break rather than continuity. Such a break could be avoided with a more purposeful linking up of the new development to the old.

Since the centre has not been able to improve in any way the local fishermen's means of fish production, then one is justified asking whether in fact the presence of a centre with another technological level of fishing does not negatively affect the artisanal fishermen's trade. More of the activities of the centre should be directly relevant to the artisanal fishermen and women from local societies. The students should be given a chance to relate to the local fishermen on the spot where they are present daily and thus also learn the much needed skill of intercommunication.

6.2 Activities of MFDC Directed to Surrounding Communities

6.2.1 Local fishermen's training

A nine weeks course was conducted in Bagamoyo town in early January 1984. A total of eighteen local fishermen participated in this programme. The fishermen came from the fishing villages of Sadani, Bagamoyo, Kaole and Mlingotini. After the course each fisherman was given one net which he made himself so that he could use it after the training.

A similar course of twelve weeks will be conducted in August this year at Mbegani. It will take fishermen from the same villages, but also from Pande which had no participants in the first course.

6.2.2 Workshop for fish traders

A two-day workshop for fish traders was organized in April 1986 by the Fish Processing Department. The purpose of this workshop was to enlighten the fish traders of the improvements made by the centre on the traditional fish handling, processing and preservation methods with particular reference to the insulated fish containers locally called **matenga**. A total of twelve fish traders from Bagamoyo, Pande and Mlingotini villages participated in the workshop. They were satisfied with what they learned, the insulated **matenga** would improve their products with a corresponding increase in prices and in income.

6.2.3 Women's workshop

In January 1985, the Centre cooperated with the women's research team and the district women officers in organizing a village women's research/training seminar. The participating village women from Pande and Mlingotini (two also from Moweni) were shown mending and making of nets and smoking of fish in a kiln made of local materials. As an outcome of the seminar 10-12 Pande women have continued learning netmaking two afternoons a week over a period of three months. Other women's activities in the three villages involved are still in planning with the support of the students and staff of MFDC.

6.2.4 Traditional fishing craft improvement programme

The centre has a programme for the improvement of the traditional fishing craft commonly used by the local fishermen i.e. ngalawa and mashua.

The Boatbuilding Department of MFDC has had contact with local boatbuilders. It has benefitted from the workmanship of one traditional boatbuilder from Bagamoyo who at the same time has improved his skills and applied the new methods also in building the traditional boats. The department has sent students to work in cooperation with Bagamoyo boatbuilders using traditional tools but improved materials and methods. Thus a profitable exchange of skills and methods is under way. A production of improved local boats, ngalawas, has been started.

Three ngalawas have so far been constructed. The first one is at Pangani, being used for training the local fishermen. The second one has been loaned to a local fisherman living in Pande, and the third one is intended to be used by the Nautical Science Department for the training of Certificate students. The second ngalawa was loaned to the local fisherman in order to provide the necessary feedback regarding its suitability as a fishing vessel. This would then give some indications as to where improvements are needed.

As a result of this the Boat Yard has the fourth improved version of ngalawa now under construction which a local fisherman from Pande is interested in buying. The Boat Yard is planning to construct these ngalawas in a series, estimating that each unrigged ngalawa will cost 15-20.000 T.shs., a price which is within the reach of many fishermen. The new ngalawa is bigger, stronger, easy to repair and maintain and it can also use an engine if needed.

The local **mashua** is another traditional fishing craft which the centre plans to improve. Two mashuas have so far been constructed at the centre. One mashua is at Pangani where it is used for training local fishermen. The second one is in the Nautical Science Department used for training the Certificate students.

A local boat builder was hired to construct the first mashua. He used his traditional tools and methods with some assistance by the Boat Yard. The purpose of this programme was for the centre to know how the mashua is constructed in the traditional way in order to make the necessary

improvements. This exercise was beneficial to both parties since the local boat builder also learned a lot of new things from the Boat Yard. This boat builder has now established a small shed at Bagamoyo beach where he is building a mashua. The Certificate students spent two months with him as part of their industrial training, and during that period they did 80 per cent of the construction work under his supervision.

As for the Boat Yard it has now completed making the necessary drawings of the improvements on the mashua. A series production plan has been made and two mashuas are under construction. A number of orders have already been received for buying them. The centre will try to identify more local builders around the area in order to assist them in proving their skills.

6.2.5 **The improvement of fishing gear and fish processing methods.**

The Nautical Science Department has plans to improve the traditional fishing gear and methods. Not much work has been done so far, except that one local fisherman from Pande village was engaged to make the local fishing traps called madema. This was intended to provide the basic training to the tutors on how to construct and use this gear with a view to making the necessary improvement. There is a need to do much more work along these lines.

The Fish Processing Department is doing some work on the improvement of traditional fish processing and preservation methods in order to minimize post-harvest losses, to improve the quality and thus increase the income of fishermen/traders.

For sundrying the fish some cheap local materials are used to construct drying racks instead of using chicken wire which is expensive. The purpose of this programme is to use locally available materials which are cheap but give just as good products.

For smoking, kilns constructed by using clay-soil bricks and sawdust as a source of low energy have been tried with excellent results. This is in contrast with the more expensive charcoal as a source of energy.

Insulated fish containers were developed by the department in order to extend the shelf-life or keeping-time of iced fish being transported to DSM for sale. Normally a fish monger would buy fish, small type, from the centre together with ice. He will then put the fish with ice in a big basket or container called **tenga**, which has a polythen lining to protect the ice from melting. Usually fish is bought either in the morning or afternoon and transported to DSM by road the next morning. This means that it takes more than twelve hours before the fish gets to the market. The department made some improvements on the traditional **tenga**. A bigger and stronger **tenga** was constructed and it was lined with two layers of polythene sheet to give it a higher insulation capacity. It was then given to a fish monger in Pande for use for some time. The feedback received from him was positive, his fish reached the market in a better condition than before and thus got better prices. It remains to be seen whether the innovation is replicated.

6.2.6 **The sale of ice and storage facilities**

The centre is also selling some ice to local fishermen, fish mongers and prawn traders at a very low price for preserving their products. When there is room, the centre also assists prawn traders in grading, packing, freezing and storing their prawns for export market to earn foreign currency. Approximately 60 tons of ice were bought by fishermen, fish mongers and prawn traders in 1985.

In conclusion, MFDC has a number of programmes which are directed to serve the local communities and to train local fishermen and women from fishing communities. However, only in the Boatbuilding Department is there a **systematic** effort to direct the activities toward the artisanal fishermen. In other programmes, that sector still remains marginal within the total inputs, yet steps toward that direction have clearly been taken.

6.3 Economic and Social Role and By-effects of MFDC's Economic Role

6.3.1 Mbegani as a Market

Since the population of Mbegani is approx. 500 it is reasonable to assume that they provide a market for local products, at least to the closest village in Pande and, via the Bagamoyo market, also to other villages. Since there is a regular bus service to Bagamoyo much of the shopping is done there.

Rationed commodities such as rice, sugar and oil which the residents ordinarily buy in the cooperative shop at Mbegani, are at times acquired in Pande, albeit through illicit trade. The main cattleowner also butchers meat on special festival days such as Idd-el-Fitr or Maulidi. It is purchased without delay by people of Mbegani, in competition with the villagers. Coconuts and milk are bought in Pande, especially when they are not available at the neighbouring coconut farm.

Potentially there could also be a market in Mbegani for village crafts such as cooking- and water-pots and mats as well as other utensils (e.g. brooms). Such crafts could be made available at the cooperative shop or exhibited and sold via the MFDC women's project. There could also be common procurement of materials with the women's group in Mbegani.

Most of the economic benefits from MFDC to the local villagers come however, from the commodities and services available at the centre for the local people.

The Mbegani centre employs at least twenty people on permanent terms from the surrounding villages. One of the Pande fishermen was temporarily employed as a maker of local traps in the Nautical Science Department, and ten others are working as casual labourers. In addition each expatriate employs at least two people, many coming daily from Bagamoyo town. About thirty local people are employed and their wages are normally higher than the legal minimum wage. Employment at Mbegani has not only given many families much needed additional cash income, it also has given the Pande people indirect benefits. They have had a possibility of buying flour, sugar and oil at the regular price in the Mbegani cooperative shop.

6.3.2 Local fish sales

The significance of fish sales at MFDC for the local societies must be counted both in terms of economic inputs into family income through the selling of processed fish at the local market and in relation to its nutritional value. In economic terms local distribution of fish is important as an input into the reproduction of labour force, or, in social terms, as an input into the welfare of the families.

Only small fish is sold to the local people at Mbegani. The bigger fish as well as prawns reported to have been sold through local sales go to visitors who come from elsewhere.

The selling to local villagers takes place twice a week. The amount sold to one buyer does not exceed 3 kg. The records show that in 1984 the fishmongers bought only one half of the amount sold to local people, whereas in 1985 the fishmongers' share doubled and the share of other local people decreased to less than one half of what it was the previous year. It may be that in recording it was not clear whether to put the buyer into the category of fish mongers or not, since the total sales of small fish did not change considerably (approximately 71 000 kg). Fishmongers sell outside the local market, thus reduction in the amount sold to local buyers means also reduced local consumption, reduced income, especially to women, and reduced nutritional value of local fish consumption.

Should the figures recorded for 1985 be taken as given, if divided between the five areas from which women come to buy fish, Pande, Zinga and Kerege, Kilomo, Chambezi and Kikongo, and

Mlingotini, it would mean that around 50 kg were sold to local buyers from each place each of the hundred times when fish was available.

One hundred families could get their relish each time (125 g processed fish per family). It means that at the present rate the fish sold at the centre does make some impact on the nutritional standard of the villages, especially considering that fish is also bought directly from the fishermen, and that those engaged in fishing all take home fish for their own families. However, the amount of fish consumed at one time in a family is very little and the nutritional value divided to each and every member from 250 g of unprocessed small dagaa fish is rather small.

It is likely that the same families buy regularly at least once a week. This means that in a village of one thousand families 900 may not buy any, or at least one half get fish very seldom. In Mlingotini the amounts sold locally are somewhat larger.

The final conclusion is that there is a need to intensify local marketing, but at the same time improve the quality of fish sold locally. At the moment it is not only of small size, it is at times in poor condition and cannot be carried any distances. Care must also be taken that the local sales at the centre do not reduce the local fishermen's market.

As a financial input into family income, most often to women who support their own families, the income per day is not much more than 100 T.sh. at most, depending on the amount sold. Coconut oil costs 60-100 T.sh. a bottle.

Assuming that the purchasing was a regular exercise it would mean that 16-17 women in an area would each get around T.sh. 10 000 per year by buying and selling fish, an average of T.sh. 165 000 net income per area, not counting the labour time spent in producing it.

There are about fifteen regular fish mongers who come from the same villages as the women. They buy different amounts but the total net income per year would be an estimated T.sh. 400 000 according to the 1985 figures, an average of T.sh. 27 000 per trader. Their profits are reasonable but not extensive.

6.3.3 Social role

The most significant social benefits that the local villagers get from the presence of Mbegani centre have been described in the previous sections (6.1 and 6.2). In addition to the services provided at MFDC there must be a certain amount of social interaction, for instance on the days of celebration, such as the reading of Maulidi on the day of the birth of the prophet, or at the end of the month of Ramadhani.

However, the fenced area creates a sense of social isolation so that the potential social interaction is limited. There have not been open days for fishermen or villagers to come and see what is done at the centre, nor any kinds of demonstrations, competitions or other kinds of social or educational gatherings. For example, film shows could serve as an educational attraction and at the same time provide an opportunity for intercommunication. There could be children's sports days, soccer or basketball matches for youth, etc. Pande has two soccer teams, as all the villages do.

The nearby villages such as Bunju have excellent ngoma groups; the primary schools compose songs and can put together choirs in a matter of few days, if not hours. In Kaole there is a technical school, on the way to Bagamoyo a Secondary School. Some demonstrations of fishing activities could be attractive to school classes from there, but also from the local primary schools. There are many ways in which the centre could socially break out of its isolation.

7. TRAINING AND MANPOWER DEVELOPMENT

7.1 Assessment of the Relevance of the Syllabi Offered at MFDC

7.1.1 Introduction

The agreement signed between the Governments of Norway and Tanzania on the development of MFDC demanded, among other things, that the training offered at the centre should produce technically qualified manpower for the fisheries and allied industries. The training should be in line with the Tanzanians' policy for fisheries development and should achieve the following goals:

- a) increase fish production through improved techniques
- b) earn foreign exchange through sale of surplus fish and luxury marine foods, such as prawns/shrimps
- c) produce the required manpower in the fisheries sector
- d) enable fishermen to increase their catches and improve their earnings.

To achieve the above requirements, the training programme or the syllabi should cover all the areas required, that is, nautical sciences, gear and fish finding technology, boat building, fish processing and marketing, and marine engineering and refrigeration engineering. The departure from any of these requirements will create a shortfall in the training programme and overall achievement of the centre.

Before assessing whether or not the training offered at the centre meets the national requirement, it is important to briefly give the expected national demands in the fishery. In section 4 above, we have given an overview of the status of fishery in Tanzania. It will suffice to mention that the country has over 57 000 fishermen (with a possibility of increasing this figure considerably if the gear situation improves), over 21 000 vessels and different types of gears (see table 1 of chapt. 4). It should also be noted that, despite the large proportion of artisanal fishery, there is a growing semi-large scale commercial fishery, especially in the Lake Victoria with more than fifteen trawlers (with additional trawlers in the pipeline), Lake Tanganyika with more than five medium size purse seiners, with potential to increase the number in the near future, and the Indian Ocean which has modern trawlers and purse seiners (from Zanzibar). The situation in the Indian Ocean is bound to change as the country is considering joint ventures with developed countries and also exploration of the EEZ. The general public is now aware of the potential in the fisheries sector and consequently many people are now joining the industry. Such people are not necessarily coming from fishing families or villages.

With the above account it is important that when evaluating the progress made over the years, it should be looked at from a broad perspective rather than artisanal fishery per se. With the improvement of technology and formation of village or fishing cooperatives, the present 98:2 ratio of artisanal catches to industrial catches will tilt towards semi-industrial fishery. Therefore in considering developments in the fisheries sector the growing semi-industrial fishery should not be overlooked.

7.1.2 The syllabi

The courses offered at the centre follow the agreed syllabi although at times some tutors only teach the subjects or sections that they either know best or find easy to teach and neglect areas that may be considered “unnecessary” or difficult for them to teach. Furthermore, there has been a tendency for some tutors to change or modify the curricula from time to time. This is particularly so when new tutors are taken in at the centre, as it seems that each one would like to make modifications as he thinks fit. Such constant changes or alterations will negatively affect the “unpopular” fields. In general all the courses conducted at the centre have well planned and organized curricula.

7.1.3 Diploma courses

a) *Boat Building*

The curriculum for the Diploma course in boat building has been revised from the one of 1982 in the light of some experience gained from the first batch of students who graduated in 1985.

The aims of this course are clear: “to train wooden boat builders with the right skills who will be able to build, repair and maintain traditional and modern fishing vessels suitable for fresh and marine waters”. The objectives of the course are very well spelt out. If the teaching follows the objectives, then the Diploma graduates should be equipped with enough knowledge to build cheap, durable and strong traditional and modern fishing boats, install deck equipment and other installations in the boat, carry out repair work on wooden and fibreglass boats, read and interpret boat plans, select suitable timber and fastenings which are used in boat buildings and finally be able to use and maintain all common hand tools, power portable tools and wood working machinery.

A Diploma graduate in this category should be able to build boats at any site (e.g. on the beach and in boatyards) without much difficulties.

There is some resentment among the Diploma graduates to the type of work they subsequently procure. Some complain that their boatyards do not have modern equipment etc. But if such students went through the course as outlined above, then they should be equipped to work with the simplest tools found in the boatyards. Some teachers are claiming that Diploma graduates do not make “good boats”. If this claim is true, then the situation should be scrutinized more closely.

As for the boat requirements, although there are over 21 000 fishing crafts being used by over 57 000 fishermen (which is about 1 craft to 3 people), there is great demand for more boats. When the team visited Tanga and Musoma, the issue of boat building was raised in both regions. This only shows how high the demand for boats is in the whole country. The intake of Diploma students should be made in alternative years depending on the demand for such graduates. This should be the task of Diploma graduates who should eventually build such boats when they finally graduate and take up employment. The centre should, as from now, emphasize practical training in boat building.

b) *Nautical Science*

The curriculum for nautical sciences was also revised from the one of 1982. The aims and objectives are very well spelt out and are in compliance with the aims and objectives of the project. If the teaching had followed the curriculum, then the centre would be producing first class fishermen. The team has, however, not been able to test either the students nor

the teachers as to whether the objectives are being implemented. For example, the centre has not demonstrated the use of several gears found in the traditional fisheries such as different traps, trolling, drifting, long lining etc. These are the gears commonly used in the area. For the one month or so the team has been in Mbegani, the major fishing technique observed was trawling using M/V "Mafunzo" and Mashua, and there was some gillnetting using mono-filament (this is not legal in Tanzania). The team would have liked to see more of local or modified local gears being used.

Another area which needs emphasis is the use of local craft. Students should be trained how to operate sail boats. From interviews carried out at the centre, it seems likely that most students and even staff do not know how to operate a sail. If the instructors teaching the students lack the knowledge of using these types of sails, then they could invite local fishermen to train them (the instructors) together with the students.

It is encouraging that the boatbuilders are modifying the local crafts which should be used by the Nautical Science Department in trying out different fishing techniques. Light fishing, for example, should be taught at the centre. TAFIRI, Kigoma centre, has qualified personnel for light attraction fishing technique. These people would be at the disposal of Mbegani on special request and nominal remuneration.

The present system of training skippers or navigation crew should continue although in the long run the vacancies for such personnel will be diminishing if no more boats are built. As to examination and performance in the course please consult Annex III (examination regulations and student performance).

c) *Engineering*

The engineering courses offered at MFDC are quite relevant and adequate for the needs of the country. Some of the graduates of the course may not be employed directly in the fisheries sector (e.g. in fishing vessels or fish processing plants). But still, demand for such personnel is high.

d) *Fish Processing and Marketing*

The curriculum for Diploma in fish processing and marketing has been examined. This course is designed to train fishery personnel who will serve the post-harvest sector of the fishing industry. On completion of the course, the graduate should be able to select the best quality raw materials for processing and marketing. There is the idea of modifying the curricula to include foods that are not related to fish products. It is the opinion of the team that the course should concentrate on fish and fish products. Other foods are dealt with by other institutions in the country, e.g. Tanzania Bureau of Standards, Faculty of Agriculture and Agricultural Institutes.

The theoretical parts of the course, i.e. basic arithmetic, physics and chemistry, are too elementary for form VI graduates in Tanzania. Some of these courses are taught in senior primary schools and lower secondary schools up to form IV. If the centre feels that the students need to revise what they had learned in the secondary schools, then the theory should last for only one month. There is need to do more advanced theoretical work.

7.1.4 Certificate course

Both the aims and objectives of Certificate courses are well spelt out in the respective curricula. In general the main aim is to train mid-level manpower with the right practical skills in the respective fields.

a) *Boat-building*

The main aim of this course is to train mid-level manpower with the right practical skills to enable him/her repair and maintain local fishing boats and construct small modern fishing crafts suitable for Tanzanian waters. The graduates of this course should be able to train local fishermen on how to maintain their fishing crafts. They should also know how to repair and construct small local and modern boats. This cadre forms the bulk of qualified fishing personnel in the fishing industry.

b) *Nautical Science*

The main aim of this course is to train mid-level manpower with the relevant practical skills to be able to advise local fishermen in order to enable them improve their catch efficiency by improving organization of fishing in different areas, train local fishermen in making, mending and maintaining gears, instruct local fishermen in short courses and refresher courses, and advise fishermen on how to organize cooperative fishing units.

After going through the course contents and the curriculum, it has become clear that if the teaching strictly followed the course, the graduates should be very useful in the fishing industry in Tanzania.

c) *Marine Mechanics*

The main aim of this course is to train mid-level manpower with the right practical skills so as to enable them improve the efficiency of the production units within the fisheries and allied industries and train local fishermen in how to operate inboard and outboard marine engines. The course is well planned and should produce graduates who should be absorbed in the fisheries sector.

d) *Fish Processing and Marketing*

This is one of the areas that needs more people especially in the inland waters. Most of the fish caught in the inland waters has to be processed and transported to the consumers. At the moment the most commonly preservation methods used in these areas are sundrying and smoking. Sundrying is only efficient during the dry season and not proper for rainy days. Smoking, on the other hand, can be used throughout the year. The constant use of smoking depletes the areas of wood and trees and as a result such areas become barren and prone to soil erosion. Graduates of this course should develop proper processing methods that can conserve fish with less damaging by-effects.

7.1.5 Short courses

The curricula for Short courses are also well prepared with emphasis on meeting the requirements of the regions where the courses are conducted. These courses have so far been conducted in Bagamoyo and Pangani. More courses are planned for Musoma. It is important that before Short courses are conducted, a survey of the fishery and the requirement of the area must be made so that the courses relate to them.

7.1.6 Examination policy and student performance for MFDC

The examination policy for the centre has been scrutinized and suggestions for improvement given in Appendix III. In general the policy is fair. It has been recommended that in order to be fair for

both the students and the instructors, a "moderation board" should be established in all departments. There should also be a change in the way of awarding point scores so that industrial training is given the necessary weighting. Finally there should be external examiners for every subject taught at the centre.

7.2 **Discussion of the Recruitment of Students to MFDC and the Placement of Students after Training with Particular Emphasis on the Sponsoring System**

The questions of recruitment and placement after training have to be discussed in relation to the objectives of the centre, the Course structure, the possibilities of employment, manpower requirements etc. If it is desirable to make changes in objectives and Course structure, recruitment and placement after training will have to change accordingly. In this section we are discussing the present procedures. As the procedures and outcomes for Diploma/Certificate courses and Short courses differ, they will be treated differently.

7.2.1 **Diploma/Certificate courses**

The intake procedure is very time-consuming, requiring more than 45 man days for the teaching staff in the academic year 1984/85. Today the number of days spent is somewhat reduced, following a standard procedure for the intake and the type of courses to be conducted. First the general background for the courses has to be taken into consideration, i.e.: manpower requirements in Tanzania, limitations at the centre in terms of classrooms, shops, equipment etc., the teaching staff available and the standard of curriculum development. Then various departments make their proposals, which are scrutinized by the training coordinator, before put for approval in an ID-meeting. Later Fisheries Division (and NORAD) approve the plans.

Finally Fisheries Division makes a decision on the distribution of pre-service and in-service students. Usually the distribution is 50/50, but this academic year the ratio is 25 per cent/75 per cent.

The centre then prepares information on the courses to all regional fisheries offices with special letters to all district fisheries officers. In addition the centre relies on newspaper advertising. Applications are returned to the centre, where they are scrutinized by the training coordinator and a list of all relevant candidates is prepared.

The candidates will then be asked to meet for tests and interviews, either at regional centres or at MFDC. Last year candidates had to report to Mbegani and only 63 out of 105 applicants turned up. This year tests and interviews are arranged at regional centres with a better turnout. After tests and final interviews, the Training Coordinator prepares a list of candidates for the MFDC Admission board, which selects the students to be admitted.

The evaluation team has not had the time to prepare a systematic account as to *where* all the previous MFDC students originate from, in terms of district, age, sex, parental background, own working experience, educational background etc. From last year, we have the following tables for the Certificate and Diploma courses.

Table 7.2.1 Candidates for the academic year 1985/86

<i>Regions:</i>	<i>Number of students:</i>
Arusha	0
Dar es Salaam	7
Dodoma	2
Iringa	1
Kigoma	2
Kilimanjaro	3
Lindi	1
Mara	2
Mbeya	2
Morogoro	0
Mtwara	2
Mwanza	6
Pwani	6
Rukwa	2
Ruvuma	0
Shinyanga	1
Singida	0
Tabora	0
Tanga	4
Kagera	0
Zanzibar	4
<i>Total</i>	<i>45</i>

One makes the observation that 13 candidates come from the region in which the centre is located and from the neighbouring Region of Dar es Saalam. Importantly Kagera and Mbeya regions which include significant lake fishing areas, have no representatives and Lindi in the south has only one candidate.

Table 7.2.2 Candidates for the academic year 1985/86

<i>Institutions/companies:</i>	<i>Number of candidates:</i>
Fisheries adm./RDD	21
District councils	11
Tanzania Railways Corp.	5
Zanzibar Shipping Corp.	2
Bafico	1
Tafico	0
Mbegani	2
Nyegezi FDC	2
"Private"	1
<i>Total</i>	<i>45</i>

As education and job are closely connected in the Tanzanian system, the number of pre-service students has been reduced considerably over the last years, due to the general economic difficulties.

After graduating from MFDC, all in-service students report back to their old jobs on district, regional or central level, or in parastatal companies, if not assigned to other jobs. Pre-service

graduates have to be allocated new jobs. The evaluation team has not been able to work out where all former graduates from Mbegani are employed as per today, but the posting of Diploma students completing their study in 1985 is shown in the following table.

Table 7.2.3 Posting of Diploma Students completing their study 1985

<i>Institution:</i>	<i>Number of students:</i>
Fishing companies	13
Research projects (TAFIRI)	4
Regional administration	10
District administration	0
Training institutions (incl. MFDC)	15
Other institutions	3
Shipping companies	3
<i>Total</i>	<i>48</i>

Only one of the graduates was rejected, due to financial problems. In addition the evaluating team has met a number of graduated students at different places of work, without meaningful work. This applies particularly to the boatbuilders, as many boatyards are left more or less idle, because of lack of inboard engines.

7.2.2 Short courses

For intake of students to the Short courses, the expert in charge of Short courses and the District Fisheries Officers have been responsible. They have visited the different villages along the coast in a particular region and announced the Short courses to village officials. From the names they have got, they later conduct interviews with the candidates. Generally the requirements are the ability to read and write and being no more than 35 years of age. The policy is directed so that at least three or four students should belong to the same village, in order to make them form a “nucleus” when they return from the course. To each course 24 students are admitted, in order to form three separate rotating groups, one doing gear technology, one boat maintenance and one practice at sea, one month on each. Unfortunately the number has been reduced considerably on some courses due to the running away of some students. When leaving the Short courses, each student receives the net he has been working on during the course. This is meant both to be an incentive for joining the course and to be the starting capital, when taking up fishing.

Upon returning from the Short courses, some students take up their old profession as fishermen, some fish together with family members or others, some are able to establish themselves as fishermen with their own boat (based on loans) and unfortunately some do not seem to have the possibility of getting started as fishermen. This is especially the case for younger boys, without economic means and the necessary connections.

7.2.3 Decisions on course structure

The decision as to what kind the courses should be, has to be a flexible one – able to meet the demands of the market. At present, however, the evaluation team will suggest that the decision to a larger extent should be based on the experiences of the graduates. Even if Fisheries Division knows **where** the students have been posted, it is also important to know **if** the students can do a gainful job, using their skills from Mbegani. MFDC should therefore try to establish closer contacts with former students, in order to support them and bring back information relevant for the course

structure. To this end, manpower requirements will be of limited value, as they are based more on production targets and to a lesser degree on the actual economic situation.

To obtain this kind of systematic information, the evaluation team will recommend a study during the late 1987, following three batches of students from the "new" MFDC (cf. section 10.5).

Also for the Short courses, MFDC needs information as to where the students have settled down if they do fishing and eventually what kind of fishing. This could easily be done by the adviser at the Short courses centres. Systematic feedback of this kind is a prerequisite for a successful planning of the courses.

At present the evaluation team has the impression that a certain number of graduates from Mbegani do not function according to their abilities within the fishing sector. From one point of view this does not cause any special harm, as marine engineers can be used in other sectors of the Tanzanian society as well as refrigeration engineers. Master Fishermen can even transfer to the ferries or to the merchant marine. But if MFDC is conceived more as a *fisheries* training centre, this situation should cause some concern.

7.2.4 Information procedures

As for the matter of information about different courses MFDC seems to have worked out a reliable system for the Diploma/Certificate courses, based on information through the Regional or District Fisheries Officers. In the longer run graduated students from the centre will themselves be an important channel for information on the different types of courses.

For the Short courses it seems like the information could be better organized, so as to reach a larger number of able candidates. Making contacts only with village **authorities** is evidently not satisfactory in some cases. In several villages potential students had not been aware of the courses, even if the proper authorities had got the information from MFDC. This is the case especially in recruiting female students. Here, there are no short cuts, except an extended contact with the villages in order to obtain the best candidates. This is a responsibility of the District Fisheries Officer. Especially for the Short courses it is important that the students actually enter into fishing, as their education otherwise will hardly be of any use in the village.

7.2.5 Actual recruiting procedures

Generally it seems like recruitment to the Diploma and Certificate studies has been weak from the fishing communities, although **all** students are supposed to have prior experience from fishing. The question is whether it is possible to recruit a larger number of students with some serious intentions of going into **actual** fishing, production or boatbuilding.

In the long run MFDC cannot continue to educate students only for the extension service, parastatals and for employment at the centre. More graduated students have to enter into actual fishing and fish-producing operations. This is to a certain extent dependent on the sponsor system (c.f. section 7.2.6), but also on the actual recruitment practice. One solution could be to recruit some of the best students from the Short courses and bring them further to the Certificate courses, which should be possible within the required standards for entry.

Short courses are facing some specific problems in this field. The most important is that older, established fishermen cannot afford to stay away from home for three months, because the family will have little or no income in the meantime. Therefore most students are younger men, many without much experience in fishing, without a boat and gear. Consequently they face problems of practising upon their return after the course. A more flexible way of organizing the Short courses (in

two terms) could possibly help to solve this particular problem. On the other hand, the centre should, as far as possible, try to stick to the established age limit of 35 years.

7.2.6 The sponsoring system

At MFDC, like most other educational institutions in Tanzania, approx. 40 000 T.sh. per student a year is paid by the state, in this case, Fisheries Division. This applies for in-service students as well as pre-service students. Private students have only been admitted twice, having to pay for food and accomodation themselves.

As long as the Government could cater for an increasing number of jobs, this system created only minor problems. But when financial shortages increased, the number of in-service students increased accordingly. Originally the ratio at MFDC was 50/50, today it is 25/75, leaning towards even more in-service students, as they are on the payroll already, creating no need for extra jobs and money.

This development shows at least three serious shortcomings:

- I Some of the best students theoretically (usually pre-service) are not allowed to enter.
- II Some in-service students seek MFDC only as means of promotion.
- III The courses at MFDC have no way of directly influencing the private sector of Tanzanian fisheries.

One of two different solutions should be considered:

- A: More students from the private sector should be encouraged to seek MFDC for education. Preferably the centre should grant scholarships for food and accomodation; in order to do this, a special fund has to be established.
- B: Allow more pre-service students at the centre, but without promising jobs afterwards. Instead, the centre should try to establish some kind of support for students willing to start on their own, either in the form of cooperatives or by way of private firms.

7.3 The Adequacy of the Development Inputs and Level of Technology at the Centre, in Relation to the General Technological Level of the Fisheries in Tanzania.

7.3.1 The technological situation

Contrary to more culture based harvesting activities, like agriculture and forestry, the total long-term output from fishery cannot be manipulated in order to yield more. Consequently all inputs, both in terms of economy and techniques, have to fit into the general expectations of output, profits and efficiency.

What techniques are the most optimal to use are determined by several factors such as:

- the resources
- the environmental conditions
- the fishing methods that can be used
- the economy of the techniques and the economic capacity to keep the particular method in operation
- the interference of the technology with the socio-cultural setting of the society.

These factors must also be considered in the process of developing Tanzanian fisheries.

The Resources

The fish resources of Tanzania consist of a large number of species. All with different habitats and habits, though also with some general features:

- The resources are relatively limited, but maximum long-term yield is fairly well assessed. There seems to be room for an overall increase in output in the range of 50-100 per cent, with larger internal variations. This requires that all stocks are harvested with a range of different methods.
- With few exceptions (sardines, dagaa), there are few shoalforming fishes. Therefore passive techniques that catch one or few fishes at a time will be more common than scooping or seining techniques, but not excluding the latter.
- Maximum yield depends on active gear selectivity in order to make growth potential contribute to catch rate.

This supports the view that the Tanzanian fish resources will only yield at maximum when a multiple composition of fishing techniques, that are adapted to the habits of the species, are used.

The Environment

Environmental conditions differ much, for instance between lakes and coastal waters in Tanzania. Some of these are important in forming fish habits and availability:

- Nutrient supply is dominantly river based and not based on upwelling systems. This gives highest fish density in estuarine and near shore areas. (Pangani Area, Zanzibar and Mafia Channel, on the coast and Speke and Mara Gulf in Lake Victoria).
- The off-shore resources are not thoroughly investigated. The surveys already carried out do not indicate large potentials so far. This view is supported by the low nutrient concentration in the off-shore water. Some lakes may have an even fish distribution (Lake Tanganyika) but in others (Lake Victoria) there are no indications of large fish stocks in central and deeper parts while coastal areas are rich in fish.
- Fish density is highest in shallow water areas.
- The fishable areas are limited. The coastal shelf area is narrow and small, widest being the channels.
- Rainy seasons form seasonal structures in fish availability.
- Calm weather conditions with stable and predictable winds well suited for sailing.

All these factors together indicate that gears of smaller scale will be more suitable to harvest the resources in the most optimal way.

The Methods in Use in Fishing and Subsectors

The present Tanzanian fishing methods show a clearly dual structure.

1. The artisanal techniques, based on older traditional or more recently adapted equipment and methods of small scale. The gear is most often of a passive type and the vessels are

locally built and dominantly propelled by sail. The techniques are not capital intensive and use little energy.

2. The “modern” techniques, recently introduced and of larger scale. The gear is of an active type depending on oil based propulsion. The vessels are usually relatively large and imported. Both running and maintenance depend on imports and are expensive. The ratio capital/labour is high. Breakdowns are common and constant operation has been difficult.

When considering these two sectors relative to general aims in Tanzanian fishery policy (better nutrition, more employment opportunities and better incomes to participants), there is no doubt that the artisanal sector is optimal. It provides fish in a cheaper way, it gives employment opportunities and it gives the fishermen higher incomes than in any other comparable sector in the society. Since it produces fish in the cheapest way, it also carries the best potential for survival even when prices go down. (The present supply/demand situation tends to skyrocket all fish prices, but this has nothing to do with the fishing methods as such.)

The modern, more capital intensive sector was also in the beginning established for the purpose of domestic fish supply. Later foreign currency earnings, through fishing and export of shrimps, have become an important objective. It seems, from TAFICO results, however, that all the foreign currency earnings, and more than that, had to be ploughed back to the operations in order to keep them going. The net export earnings from this fleet have therefore been negative.

In the existing situation, therefore, the most optimal solution for Tanzanian fisheries must be to concentrate on improving efficiency in the artisanal sector.

Fisheries in Tanzania are well served by using a range of passive, low energy consuming artisanal techniques, that will provide good employment opportunities, low costs and good chances of keeping the equipment in operation.

It should also be born in mind that **if** and when off-shore resources of significance are identified, these shall be utilized as well. Mbegani can now, at any time when it is feasible, render training services to the development of such fisheries.

However, our recommendation is that at present Mbegani should concentrate its effort to increase efficiency in the artisanal sector and in the fish distribution structure. This assistance should include development work, the results of which should be channelled through (short) practical courses carried out in and by the Regions.

7.3.2 **Development inputs and technological level**

The technology that dominates Mbegani today is of an industrial capital intensive type. It is based in the most capital intensive and largest scale techniques presently in use in Norwegian fisheries. Some of these techniques have been transferred to Mbegani without the least attempt of adaption to local conditions. This is valid for both the large purse seines and its accessories (skiff vessel) – and for the trawl equipment, though here some minor adjustments in otter-boards etc. has been done later. The training vessel M/V “Mafunzo” is a vessel that, because of its design, cannot be used for any other training than trawling and purse seining. The vessel has only been used for practical training in trawling.

The reasons why fishing instructions have ended up in this state of affairs go back to the very early stages of the project when the then responsible management and planning consultant was allowed to bring these large scale techniques into the MFDC. In later stages it has been considered difficult to abandon the vessel and the technique. So instead the technique has been further supported by providing infrastructure for its smooth operation (diesel tanks, large jetty etc.).

Another aspect that supported further operation of the vessel was that it was found to be able to harvest silverbellies, a small, low-price fish found in the sand-slopes of the Zanzibar Channel. This resource can only be harvested with trawl, and Mafunzo has proved to be efficient in this respect. The resource can be fully fished by a few trawlers.

But even if the commercial side of the operation of this vessel seems to have been successful, this does not imply that the **development demonstration** side of the operation is positive or even adequate.

The presence of this vessel has, over the years, created a training pattern that is dominated by trawl fishing. Even during the last years when vessels of local type were constructed and adapted to inboard engine use, training in trawl techniques continued at the expense of other known passive techniques.

In total this training has resulted in a cadre of master-fishermen, engineers and extension personnel that are familiar with, and whose professional interest are concentrated in, capital intensive "modern" techniques.

It is very important that Mbegani now is urged to concentrate the major part of its training on other gear than trawl. Even if M/V "Mafunzo" is contributing well to fish supply and revenue earnings, this should not allow training in all other fishing techniques to be suppressed.

The Marine Engineering Dept. has started to alter its instruction pattern to include also outboard engines in its syllabi. This line should be continued. The practical training in inboard engines should be held on a high quality level. The quality of inboard engine mechanics is now more crucial than the number of mechanics. Another line which the Marine Engineering Dept. should emphasize more is small scale fishing auxiliary systems like handwinches, hand-pumps, net and line rolls of suitable designs for the existing fisheries.

Boatbuilding Dept. is in a situation where both technological level and development inputs have been turned into a seemingly viable direction. We are here referring to the mashua and ngalawa construction programme. It would be beneficial for this work if the other departments were brought more in line in terms of techniques and development work.

But also in these programmes there is much work to be done both in training personnel in mashua and ngalawa construction, and in assistance to erect boatyards for the purpose. Efforts should be made in finding the right solutions or incentives to promote efficiency of this work.

Fish Processing, Marketing and Quality Control Dept. seems to demonstrate a level of technology that is within reasonable range when seen in relation to the situation within fisheries in Tanzania in general. An incoming line of work tasks seems to be development of improved, more unconventional preservation techniques and distributional means. (Heat preservation of Nile Perch – live fish storage).

The Refrigeration Section seems to search for viable techniques in many ways; improved block ice machinery is one of them. It must be expected that candidates from these courses to a large extent find occupation in other sectors than fishing. This should be considered a natural process. The main responsibility of the section is still within fish preservation and distribution machinery.

The conclusion of this assessment of development inputs and technological level at Mbegani when seen in relation to the situation within Tanzanian fisheries is that from a poor start things are now proceeding in the right direction. From being miles away from reality, the project is now "in touch" with Tanzanian fishing **as it is dominantly carried out**. But the process from "in touch" to "good contact" is still a long one which demands much work and careful consideration from those involved.

7.4 **The Status and Role of the Extension Service of MFDC, and Constraints to this Service.**

The extension services rendered from Mbegani are of different types:

1. Incidental emergency services rendered to fisheries and other sectors.
2. Assistance to regions in implementation of shorter practical courses to fishermen and others in the fisheries sector.
3. Commodity Assistance Programme.
4. Direct development work.

7.4.1 **Incidental Services**

a) *Services to the fisheries sector*

The centre has offered different types of service to institutions and ventures in the fisheries sector. These have mostly consisted of repairs of engines and equipment, often as small emergency measures. But the centre has also involved itself more fully in such services. Particularly this is the case with the Bagamoyo based fishing parastatal BAFICO, with whom the centre has entered into a comprehensive service contract. MFDC's duties in this contract are very extensive and may at worst bring the centre into a situation of excessive responsibility and expenses. The returns for Mbegani from the contract will be very small. In spite of the good and positive intentions that lie behind the contract from the side of the centre, it is of such nature that it should be renegotiated as soon as possible.

The centre has also involved itself in repair of outboard engines. Here Mbegani has clearly overestimated its capacity. Many liberal promises in terms of repair and spareparts purchase assistance has resulted in a heap of broken down engines from all over the country, which the centre has no capacity to repair.

This is serious since these promises have created false expectations from the fisheries sector and also false impressions about the real tasks of the centre. The reaction now seems to come as disappointment and loss of confidence in Mbegani.

The centre should be careful not to overstretch its capacity in this respect.

b) *Services to other institutions and ventures in the neighbourhood of the centre*

This consists mostly of smaller repairs of emergency nature. This work is mainly done by the Maintenance Department, which is quite loaded with work. Even though such services are necessary in order to keep good relations, these services should be kept within certain limits.

7.4.2 **Assistance to selected regions in implementation of shorter practical courses in fishing and related activities**

a) *Pangani, Tanga Region*

Short practical courses is the most recent line of assistance activity from MFDC. It started in 1983 with one course held for fishermen at Bagamoyo. Later Tanga Region was chosen as a pilot region for this work, and in 1984 courses started in facilities constructed for the purpose by the Region, with some finishing work from Mbegani. The agreement with the

region is that facilities, recurrent expenditure and staff are supplied by the Region, while Mbegani supplies the vessels, equipment and some teaching staff. The location, about one mile up Pangani River, is not the best for fishermen's training centre. Three courses each of 12 weeks duration have been held at the centre, and about 65 fishermen have been trained. No women were included in the courses. The most pressing constraints that have been experienced through this period can be listed as follows;

- The Region has had difficulties meeting its obligations with regard to recurrent costs. This had led to several problems, particularly in the catering sector. Because of poor dietary standards, about 40 per cent of the students left the last courses before completion.
- The centre has failed to obtain a wanted combination of more experienced and younger attendants, one reason being the elder fishermen can not leave families without compensation.
- Recruitment of personell (teachers) has been difficult due to lack of funds in the Region. More emphasis should be laid in obtaining and keeping a high quality teaching staff.
- Practical training has been dominantly in trawling. Training in maintenance of outboard engines seems to have been somewhat premature. Both these factors have had some negative effects since they did not meet reality in a satisfactory way. Considerably more emphasis should be laid on introduction of training in other gears. Due to low number of outboard engines, maintenance training should not be abandoned but perhaps somewhat reduced. Instead, special engine crash courses could be arranged upon demand.
- The courses are now in real need of inputs from the development programme in order to have a more positive impact on fishing efficiency. Therefore development work should now be strengthened at Mbegani.
- The course attendants are supplied with a self-made net after completing the course. More incentives such as loan possibilities for vessels and gear should be promoted. This is now in the planning stage at Mbegani.
- In order to get a clear impression of the impact of the courses, there is need for a greater care in selection of the candidates, and follow-up of the course attendants' performance in the village context after they have left the courses. More information about the courses and the development work should also be given to the villages. Regional authorities should be kept well informed about the various impact of the courses.

b) *Musoma, Mara Region*

Musoma is planned to be the next site for the short practical courses. The facilities in Musoma are far better than in Pangani. The interest of the Regional authorities was also clearly stated during the team's visit, though it was felt that expectations about the courses and the extent of the assistance from Mbegani were somewhat too high.

During the visit to the Lake Victoria Area (Mwanza, Ukerewe Musoma and Tarime) the team had the general impression that apart from the general gear shortage, fisheries were in a state of good progress, with good incomes, good employment opportunities, relatively cheap fish and relatively high nutritional standard caused by the good fish supply (Tilapias, Nile Perch).

To find meaningful training tasks, that are appreciated as progress by the recipients, will be much more difficult in Mara than in Tanga Region. The successful training there will depend on proper development work. The courses in Musoma should therefore not be rushed into a premature start that could result in setbacks in terms of confidence and interest in the courses.

The negotiations between Mara Region and MFDC should end with a clear and distinct agreement on the responsibilities to be undertaken by the parties. Mbegani should avoid investments in irreversible (unmoveable) assets at the Musoma training site. Mbegani's involvement in Musoma should be training and supporting activities.

c) *Mbegani/Bagamoyo, Coast Region*

There are also plans to start shorter practical courses at Mbegani. These courses will be carried out with less participation from the Region. The recommendation of the team is that the courses should be carried out elsewhere in the Region, e.g. in Bagamoyo. This is in order to secure that the course attendants are trained in techniques relevant to them and that they are not wrongly motivated towards methods they have no chance to practise when they return to their villages.

In Tanzania the allocation of funds for training purposes is considered a national responsibility. Therefore, regional authorities have few obligations to finance training through their own budgets. This affects directly the financing of the short courses in the regions. Even though a region may find a budgetary opening for an initial, short term financial support, it has few possibilities to enter into a long term agreement of cost sharing. However, this does not indicate that the region should not be asked to contribute to the costs on an annual basis. MFDC, on the other hand has possibilities to let the external contributions to the covering of the costs be one of the determinants when it comes to **where** it wants to extend its Short course services.

But if MFCD continues along the line of its objectives and concentrates its efforts on the artisanal fisheries through short practical courses in the regions, the centre must be prepared to cover more of the costs. The same may be the case concerning the expences of a more preparatory nature such as refurbishment of facilities or supply of equipment. Provision of suitable facilities will in any case be determinative in the choice of a region. But since this training is a national matter, national priorities, in case such are implemented, will have to be followed. As in the case of Mbegani, the Ministry of Natural Resources and Tourism is the responsible authority.

Even if Mbegani takes full coverage of all recurrent costs, it does not mean a dramatic increase in the expences. In a centre of the same standard as Pangani, operated with three courses of three months duration per year the increase in costs will be in the range of 200-250.000 T.sh. per year. Extension of activites over and above those carried out at Pagani will add costs correspondingly. Total costs will depend on the level of activities, the number of teachers, maintenance etc.. There could be a close cooperation with the Adult Education sector in the regions. The extension centres could serve in a manner of Folk Development Colleges which they could replace for fishing communities. This would mean some extension of general educational activities such as book keeping, budgeting, cooperative management, etc. besides practice in literacy skills.

7.4.3 Commodity assistance programme

The first consignment of gear and equipment is ordered, and the distribution programme is in the planning phase. The total value of the programme is NOK 3 mill. for 1986, consisting of an assortment of fishing gear and some outboard engines.

MFDC is now working on a distribution plan. The assistance is meant to be concentrated in the three regions where Mbegani at present is involved in direct assistance (Tanga, Mara and Coast).

The evaluation team recommends that fishermen that do not own boats should also have a chance to buy gear, provided they register as fishermen or can verify they actually perform fishing.

When seen in relation to the present supply situation and total demand in the three regions, the assistance is small. Therefore the assistance should probably be restricted to certain districts at a time rather than spread it over whole regions. The potential ill-effects of providing some fishermen in a village with gear and leaving others unsupplied should be noted. In order to measure the impacts of the commodity assistance, it is important that the districts can provide a proper recording system of the catch.

At present commodity assistance in the form of fishing gear is a most sensitive matter. The programme should therefore be handled with great care.

During its travel, the team has experienced that promises given have created expectations that are far beyond what is realistic from such a limited programme. If these unreal expectations are allowed to continue, it is feared that the final feedback from the programme will be more dominated by disappointment than by positive response. That may also affect the course and cooperation activities in the regions.

7.4.4 Direct development work

Mbegani sees development of new and more efficient equipment and methods as an important part of its efforts to contribute to increased efficiency in fishing and fish distribution. This is based on an understanding that training alone can not bring about the betterment, but that it has to be supported by improvement in techniques and methods.

Mbegani is in an early phase of this work. Some activities have started, but the process has not yet come far. The reasons may vary, but this kind of activity is by its very nature difficult to carry out and stands constantly against constraints such as;

- general scepticism and conservative attitudes regarding change
- lack of thorough information about the present techniques used locally and elsewhere
- lack of comprehensive strategy for the implementation of the work

Mbegani has up to now concentrated its efforts on the planning and implementation of training and has spent little time and effort for this kind of work. In particular, the involvement of local professionals in the boat construction programme seems to be viable and should be followed up also in other areas. Also the continuation of the work, to assist in the erection of boatbuilding sites where the results can be practised and brought into common use is promising and should be promoted. This kind of work is much dependent on motivation of the participants, both among those who organize it and those who finally use the results. Participation from the potential users in planning is therefore important.

7.4.5 Expatriate – counterpart relations

The contact between the expert and his counterpart is considered to be the most important channel for professional communication in development assistance projects. It is also the most decisive element concerning the effects and impacts of the cooperation.

Human relations are difficult both to establish and to maintain. They emerge in ways that are not easy to plan. At best, we assume that they are a product of interpersonal sentiments that originate in individual's nature and psychological and social background, attitudes and more or less casual experiences.

Expatriate – counterpart relations have both formal and more emotionally oriented sides. On the formal side, the instructions that the parties receive set fruitful cooperation as a basic condition for fulfillment of aims and objectives. To pave the way for this cooperation on the emotional level can be for them easy or difficult, but it always sets human capacities on trial.

The evaluation team has through its contacts with Mbegani staff, tried to get some insight into how counterpart cooperation functions at the centre. The final impression was one of great variations, from the positive to the negative. Some saw their situation as good and positive, others expressed deep frustration emerging from a counterpart relation which was described as “only a label to me”.

The team therefore draws attention to some relevant points which affect the relations. This matter has not received the attention it deserves, not even on the formal level. There is at present no established practice for the cooperation between the expatriate and his counterpart and for the exchange of experiences, nor any procedure for the replacement of the expatriate. Consequently practices differ throughout the whole organization.

Due to practical problems in conducting meetings with many participants, counterparts take part in interdepartmental meetings only when the head of the department is absent. A forum for discussion of projects matters among the local staff has been established and some meetings have been held.

On the departmental and section levels, where relations are more face to face, the team has noticed that the success or failure of the counterpart relation was dependent on several factors:

- The degree of cooperation and involvement in daily planning- and decision-making was the most visible determinant for the quality of the relation.
- The division of work in terms of lectures and practicals in relation to what the counterpart himself considered his speciality also determined job satisfaction.
- Some of the local teaching staff have been working at the centre for many years. They feel dissatisfaction when expatriates who are new and unfamiliar with conditions and have a different time perspective, find that time is not ripe for the counterpart. The counterpart loses the sense of personal progress, because lack of recognition of his competence, caused by frequent changes in expatriate staff.
- Lack of social communication between expatriates and counterparts or the local staff in general.

Some of the reasons for the dissatisfaction are reservation to enter into close cooperative relations arising from lack of confidence over abilities, doubts about one's own and others abilities and cultural differences. The team is of the opinion that the questions concerning counterpart – expert relations should receive more attention and be more openly discussed than is the case today.

7.5 Relevance of the Training and Education Activities at MFDC

7.5.1 Training activities at the centre

The training uses 1/3 to 1/2 of the duration of the courses for industrial training outside the centre to familiarize the students with actual practical problems. Students are posted to different institutions far from the centre. The system, though commendable, suffers from:

- a) lack of proper supervision to ensure the time is spent gainfully
- b) very costly to the centre as allowances have to be paid to the students and the centre has to incur expenses to send staff for regular checks
- c) the “host” institution may not have the interest of training the students as most production institutions are keen to earn enough revenue and may have no time to instruct students.

This situation can be very damaging to the morale of the students. The team recommends that the industrial training is reviewed, taking into account facilities available for practical training within the reach and control of the centre to ensure proper supervision of the students.

Diploma courses

The theoretical and practical training at the centre for the Diploma courses is made up of up to 60 per cent practicals and 40 per cent theory. The centre has the basic facilities to carry out the theoretical and practical training. The training at the centre is later followed by industrial training outside the centre.

In the past masterfisherman course students have in the third year been attached to coastal transport/passenger vessels, fishing vessels and on inland water vessels of the Tanzania Railways Corporation. The team is of the opinion that attachment to large vessels detaches the student from vessels of the size used by artisanal fishermen, who form the bulk of the fishing fleet.

The team has learned of the good intentions of the centre to reorganize so that industrial training is spread over the duration of the course, instead of having it for a full year in the second year.

The team will support this idea and will recommend that up to 50 per cent of this time is spent on a small craft operated by Mbegani at or from stations and boat-building sites supported by the centre. The students will have to participate in using different fishing methods during this period to ensure that they are able to transfer the knowledge gained to the field when they complete the course. It should not be in the interest of the centre to have students attached to transport vessels.

The Diploma in Boatbuilding should have its practical training reoriented to ensure that students are conversant with design, construction and maintenance of the small craft used by artisanal fishermen like the mashua and ngalawa. The instructor’s feeling now is that the students completing the Diploma course are not good in practicals. If this is so, the team will recommend that immediate action is taken to reverse this negative trend. The boatyard has accumulated adequate experience on construction of small craft and should be able to have the Diploma students practically trained to fit the requirements of the boat construction industry which uses hand tools.

The Marine Engineering and Refrigeration Diploma course should have students stationed at Mbegani for a greater part of their industrial training to ensure proper supervision. Students should be sharpened on the use of hand tools. Electrical training within the refrigeration course should be closely monitored since electrical components form an important part of the refrigeration systems.

The Fish Processing Diploma should concentrate on improving traditional methods of fish processing and reduction of postharvest losses in processed fish.

Certificate courses

The Certificate courses have a theoretical and practical training in the ratio of close to 80 per cent practicals and 20 per cent theory. The practicals are undertaken on small crafts for the Boat Building Department, outboard engines for the mechanics and "traditional" fish processing for the fish processing and marketing. The team considers the approach appropriate and will recommend close supervision and monitoring of the training to ensure optimum results. The Certificate courses are of practical value in providing technically equipped extension officers as the trainees come into contact with tools, vessels etc. that are available throughout the country.

Short courses

The Short courses are viewed as tailored to meet the immediate problems of the fishing community. There is limited theoretical training (less than 10 per cent) including practical demonstration. The team considers that for the centre to be in a position to organise appropriate courses, field surveys should be conducted to identify the type of training required and how it will suit the community. Based on this, adequate preparations should be made to ensure that the course is carried out successfully. Training in fishing should concentrate on the use of appropriate gear that the fishermen can readily acquire. Training in large scale fishing like trawling should be limited as very few fishermen can afford a trawling vessel.

7.5.2 Administration of the training

The success of the training in terms of a combination of theoretical and practical training and its intergration into the fishing industry will depend on the centre maintaining the right course. This can be ensured if continuity of staff is maintained, as new staff tend to disturb an otherwise satisfactory training programme. As it appears difficult for NORAD to keep the experts at Mbegani for long durations, it is important that local staff are trained and given the responsibility to take charge of training administration in order to reduce conflicts and ensure continuity.

8. ORGANIZATIONAL ASPECTS

8.1 Organizational Set-Up

MFDC has today a highly developed hierarchical administrative system, with several different levels and with much power for decisionmaking assembled on the top. All together there are 7 departments and 21 (22 with Short courses) sections. In view of the fact that the number of employees is 160, this gives an average of 7 employees per section, the heads of departments, Principal and Assistant Principal not included.

Furthermore, all jobs on departmental and sectional level are given a job description with clearly defined duties and responsibilities. There is a number of good reasons for the development of such an organization. Generally a bureaucratic model of organization is well suited when the surroundings are stable and the tasks can be easily routinized. As a starting point, teaching institutions can be seen to have well defined working tasks and reasonably stable surroundings. Hence, they may well be organized as bureaucracies.

As MFDC has turned into a rather bureaucratic model of organization, one must take into consideration some special features, like the failure of "old Mbegani" (1977-79) where responsibilities were confused. Furthermore the strict system of job descriptions can be seen as an adequate answer to a situation where the expatriate employees have a large degree of turnover.

However, from the present situation and from four years of experience, the centre evidently consists of too many departments and sections. The organizational set-up is very time consuming. Many working-hours are used for the administration of internal matters, with frequent meetings both on sectional and departmental levels. The main problem, however, is that the organization is not well suited for **development** tasks, as each employee, especially on departmental and sectional level, is eager to defend his/her position. Change is perceived as a threat to well established rights and benefits. In this respect there is an urgent need to review both the Norwegian and the Tanzanian salary system.

There is little reason to believe that we can achieve one ideal organizational set-up, once and for all. But to make MFDC function according to its objectives and the activities performed, there is a need for some changes, which are put forward in section 10.6.

8.2 The Counterpart System

Originally it was assumed that each expatriate expert should have his Tanzanian counterpart. In practice the system of counterparts has not been functioning well, neither from the Norwegian nor from the Tanzanian point of view.

Some expatriates do not have appointed counterparts, while others have. Some of the counterparts have been sent abroad for a longterm training. Even those who have a qualified counterpart, seldom have a clear-cut agreement on the division of tasks and responsibilities. Several Tanzanians feel that

they are treated as assistants for several years, in spite of having the necessary qualifications for a gradual take-over.

In an attempt to solve some of these problems, a staff development plan was developed in 1984, with the appointment of counterparts and the anticipated time for take-over. The evaluation team considers this practice of appointing heads of departments/sections several years in advance to be unfortunate. Some of the appointed counterparts may feel that they can relax in their work performance as they are already appointed, others may feel that they have no future at MFDC. Finally the result can be that more qualified applicants from outside MFDC are kept out of consideration, when the appointments finally are implemented.

However, the evaluation team looks positively at any plan which outlines **when** certain departments and sections can be taken over by Tanzanians. The ultimate goal must be a **gradual** take-over, and the evaluation team will recommend that the number of expatriates working at the centre should be reduced from 15 to 10, during the next four-year period (1987-91). (cf section 10.6 for further details).

Furthermore, it seems necessary to work out a scheme for the division of duties and responsibilities between the expatriate and his counterpart, which makes a gradual take-over possible. In a longer perspective, we find it natural that Tanzanians take over as heads of sections and departments while expatriates to a larger degree should be allocated to development tasks.

The schedule may roughly be outlined as follows:

- | | |
|-----------|--|
| Phase I | Expatriate head with Tanzanian counterpart in an under-study position. |
| Phase II | Tanzanian head with the expatriate in an advisory position. |
| Phase III | Expatriates in certain jobs allocated for development tasks. |

For certain jobs, phase I should by now have been finished, and it is high time to move on to phase II. The evaluation team recommends that during the next four-year period, more posts should be moved into phase II, with Tanzanians in full charge of all aspects of work. By the end of the period (1991/92), most of the remaining expatriates should be working exclusively with development tasks.

8.3 Staff Development Plan

Generally the evaluation team appreciates the staff development plan which has been developed in order to give the Tanzanian teaching staff the necessary education for taking over. However, it seems like some have been sent abroad more for the sake of going abroad or in order to get higher salaries, than from a careful consideration of the needs of the centre. The evaluation team recommends that the needs of the centre are more strongly scrutinized when sending Tanzanian staff abroad for further educational training. In this respect one also has to consider the Tanzanian scheme of service, as to what kind of additional education gives additional credit in terms of salary. NORAD does not seem to be fully familiar with the Tanzanian regulations on this domain, so that MFDC employees have returned after training with "more education", but with the same salary.

Finally the **content** of the education abroad should be more carefully considered. Some of the local staff sent abroad for training, found the experience of little educational value, as conditions were greatly different from the Tanzanian ones. An additional problem for all local staff sent to Norway for training has of course been the language. In this respect, English speaking countries should be more seriously considered, as problems and time spent on language training will be considerably smaller.

The dilemma of the staff development programme can be pin-pointed as follows: On the one hand, in order to get the necessary recognition and a higher salary in Tanzania, a diploma or a university degree is required; on the other hand, the main problem for the centre, according to the expatriate staff, is that many Tanzanian teachers lack the necessary *practice*.

8.4 Incentives

Lack of personal incentives is a general problem in Tanzania today. The Tanzanian scheme of service gives credit for education and the number of years on the job. In addition, a brief evaluation of work performance and abilities is given each year for every employee. On this basis salary and promotion are decided. Many employees at MFDC do feel that the system does not encourage hard work. However, MFDC has already established a number of general incentives, like good housing, free electricity, cheap fish etc., items which today account for large sums of money if they were to be paid according to the prices of the market. Still, the evaluation team feels that one should look carefully into the possibility of giving **personal** incentives in order either to keep valuable persons in their present jobs, or to promote more efficient work by the workers at the centre. Promotion of more efficient work is an absolute necessity if e.g. the commercial boatbuilding section is to develop production of n'galawas in series.

8.5 Parastatal Status

According to the former principal:

“it has proved to be increasingly difficult to meet demands from districts and regions within the present system. The rules and regulations for purely Governmental training institutions are not designed for the activities which actually take place at Mbegani”. (Future Policy document draft).

To solve these problems it has been proposed that MFDC is given status as a parastatal institution. This proposal has been raised several times over the last years, so far without a final decision.

The evaluation team is not convinced that turning MFDC into a parastatal organization will solve the problems mentioned above. Tanzania has already nearly 400 parastatals and experiences from these organizations do not easily support the view that a parastatal organization is the most efficient and proper way of organizing a training institution. On the contrary it may bring the centre into a spot where it is locked up in a situation where it must be able to bring about profits to meet the expences, if the planned activities shall continue. This may in turn easily lead to a situation where the income-generating activities will have priority over other activities, training included.

As profitability in fishing, production, boatbuilding, ice-making etc. may vary over the seasons and over the years, the centre can be brought to a situation where the quantity of training activities is determined by the profitability of the income-generating activities.

Finally if MFDC becomes a parastatal with its own income, it may face a lower priority in public allocations for running expences. Especially in a difficult financial situation this may turn out to be a very bad solution for the centre.

Since one of the main administrative problems, i.e. the use of income generated at MFDC, now is “solved”, through the Revolving Fund, the evaluation team does **not** recommend that MFDC is turned into a parastatal organization.

8.6 Revolving Fund

The Revolving Fund started operating in April 1986, after several years in the decision-making process. For the financial year 1986/87 the income for the Fund will approximately be in the range of Tsh. 4 mill., derived mainly from the sale of fish, ice and different services.

The Fund has been created in order to enable the centre to efficiently carry out its training, i.e. boatbuilding, fishing, fish processing and marketing activities. That means that the centre has been left with considerable powers as to the actual use of money. The evaluation team finds the administrative set-up of the Fund and the banking arrangement quite satisfactory, but will recommend some changes as to allowances connected with the extension work. (See section 10.6.)

For the future it is important not to mix the economic responsibilities of recurrent spending on the one hand and responsibilities of the Fund on the other. Income-generating activities of the Fund should not be allowed to interfere with the main objective of the centre, namely training.

8.7 Organizational Set-Up in Relation to Activities.

8.7.1 Short courses

The main shortcoming in this respect is that the Short courses are too loosely tied to the main organization. As can be seen from the organizational chart, Short courses are placed on the sideline, as a kind of a staff function. Even if it is specially stated in the Agreements that one of the main activities of the centre should be the running of Short courses, this can hardly be seen to be reflected in the organizational set-up. To a certain extent the Short courses have been "left alone", relying mainly on one person. This situation should be changed as soon as possible.

The evaluation team has proposed an organizational set-up where Short courses constitute a department of its own, eventually with the regional centres as sections. The present idea of combining the job as the head of Short courses together with the job as the adviser of the Pangani centre, is not considered to be viable. The head of the Short courses department should have as his main responsibility to link up the other departments and their activities to the development and running of the Short courses.

This applies to the development of fishing gear, boats, practical trial fishing, supplying the local centres with teachers, using the local centres for industrial training etc. Experiences from the Short courses must in turn be returned to MFDC, to facilitate changes, modifications, new development ideas etc.

Generally the evaluation team would like to see Short courses as much more of an **integrated** activity within MFDC.

8.7.3 Development activities

As stated in the Agreement, development activities are considered to be an important part of the centre. This particular aspect is much neglected today. Development activities take place, i.e. in boatbuilding, production, transportation, gear etc., but the activities are carried on unsystematically, relying on the initiative of certain persons. Most of the resources at the centre are tied to teaching and training activities, leaving little for development, both in terms of money and manpower.

The creation of a separate department for development work has been suggested to improve the situation. This solution is not recommended by the evaluation team, as long as most of the development activities must take place within the established departments and sections anyhow.

As suggested in the previous section, development activities should be one of the main responsibilities for the head of Short courses department. Such an organizational set-up will secure that development activities will be more in line with the level of artisanal fishing today. The main task in the future will therefore be to create improvements in existing gear, transportation, boats etc., a course which the centre recently has started.

8.7.3 Development programmes

The main constraint in Tanzanian fisheries today is the lack of fishing gear. Tanzania has a fishing gear industry with limited capacity, part of which has been idle because of lack of foreign currency to import the necessary raw materials. As a consequence fishing gear is nearly non-existent throughout the country, with extraordinary high prices for the little that is available. This situation should also be reflected in the operations of MFDC.

So far, the centre has responded on a limited scale of operation, i.e. through a) handing out the nets (one per fisherman) as part of the Short courses, b) by the commodity assistance programme from 1986 on, where a substantial part is allocated for fishing gear.

For the time being it looks as if the centre has not given the necessary attention to the question of how to organize the sales of fishing gear. The evaluation team will recommend that sales are limited to the three regions where MFDC today is actively working, i.e.: Coast, Tanga and Musoma. Furthermore, sales could be based in the extension centres in cooperation with Regional Fisheries authorities. It is recommended that not only licenced fishermen are allowed to buy a certain quota per year at fixed prices, but also genuine fishermen and women not formally registered.

A condition for measuring the effects of such a venture, is a proper working system of statistics. Today severe shortcomings of the recording system have been observed, i.e. lack of recorders, transport, scales etc. Sales of fishing gear should preferably be accompanied by a properly working recording system, this being a responsibility of the Fishing authorities of regions and districts.

8.7.4 Extension service

At present MFDC runs an extension service in certain selected fields, i.e. motor repair, service for cold-rooms, ice-making equipment, repairing of boats etc. The services are rendered in a rather unsystematic manner. Many proposals have been made in order to extend the range of services from the centre, e.g. setting up a service van with tools and spareparts etc. The evaluation team will not recommend an extension of these activities. MFDC should take on service and repairwork to an extent suitable for training purposes, on such items and places where assistance is most effective and within reasonable travel distances.

Some of the service contracts should be scrutinized in this perspective. The contract between MFDC and BAFICO on cooperation should be rearranged, as too many obligations are put on the centre with rather small returns.

As can be seen from the previous experiences with the boatyard, the repair-work is interfering with training, especially when it takes place on boats which are hardly used in Tanzanian waters (fiberglass). Even if MFDC is to act as a service institution, the centre cannot manage to service all kinds of fishing equipment all over Tanzania. The centre itself is much to blame for the creation of this (false) impression.

8.8 Tanzanian Take-Over

MFDC has for four years been in a reestablishment phase after the failures of 1977/79. As already mentioned, it is doubtful that the centre would have been established on such a large scale today, as we know more both of resources available, the nature of fishing, economic conditions etc. The centre has proved to be rather expensive, both in terms of establishment, expatriates required and running expenses. Maintenance has to be done on a number of buildings and necessary equipment and spareparts have to be bought, to a large extent abroad.

NORAD has since the start been aware that this is a long-term investment, and that the centre has to be supported for a long time to come, if it is going to function according to objectives. This should not, however, prevent the centre from adjusting both the organization and the running expenses to a level which can be carried by Tanzania alone, or at least, with reduced assistance both in terms of money and expatriate manpower.

The organization should therefore not be further extended, (except for the Short courses and direct development activities) as the recurrent spending is already too high. Reorganization and a more flexible organization will probably be one answer to the needs of more manpower.

9. ECONOMIC ASPECTS

9.1 The Cost of Development of MFDC

The NORAD grants for establishing MFDC during the period of 1974-1983 can be found in table 9.1.1.

Table 9.1.1 NORAD grants for MFDC 1974-83 (TAN-024)

<i>Document (SD nr.)</i>	<i>Grant (mill. NOK.)</i>
52/74	13.0
2/75	4.5
125/78	1.0
64/79	1.4
127/79	7.0
74/80	85.0
46/82	30.0
93/83	8.0
<i>Total NORAD grants TAN-024, 1974-83</i>	<i>149.9 mill</i>

These grants do not include the cost of expert personnel which for the years 1974-83 adds up to NOK 14.3 mill. In table 9.1.2 is shown a breakdown of the expenditure 1974-83.

Table 9.1.2 NORAD grants for MFDC 1974-83 – Breakdown

	<i>Mill. NOK</i>	<i>Per cent</i>
Before 1980	19.9	13.3
Building contracts	80.0	53.4
Planning/design	9.9	6.6
Educational planning	3.7	2.5
Project administration	8.9	5.9
Machines, equipment	14.1	9.4
Operational costs	13.4	8.9
<i>Total</i>	<i>149.9</i>	<i>100.0</i>

As can be seen from table 9.1.1 the MFDC was first and foremost conceived as a construction project, while the educational aspect to a large degree was neglected, (cf. 2.5 per cent for educational planning).

The history of MFDC is **not** the story of how a project of NOK 17.5 mill. expanded out of control, ending up at NOK 150 mill. (exclusive of running costs and the cost of expatriate personnel). It is however, the story of a project phase one, on which the sum of NOK 17.5 mill. was spent until 1979, which was agreed to be close to a complete failure, and had to be reconsidered. A phase two of the project was decided, with a redefined purpose for the project. This time the project was of another scale, signified by the NORAD grant to the project of NOK 85 mill. in 1981.

In conclusion, the escalation of the project was purposely decided. There is, however, little doubt that the failure up to 1979 was crucial for the decision to build the "new Mbegani". As shown in section 7.3 the type of technology already used at Mbegani (modern trawler) consequently added new, costly elements to the centre. And furthermore, when the expensive equipment already had been bought, it had to be maintained, which added even more expensive elements.

In 1985 the centre nearly came to a complete stand-still, as funds were running out, forcing the centre to stop all kinds of development work. This situation came about because certain elements from the construction period had to be paid through the recurrent spending. Altogether NOK 7.2 mill. had been charged the recurrent account. In order to get the centre going again, NORAD had to grant NOK 6.1 mill. for the rest of the period (1986/87). Even with this additional grant it is doubtful whether the construction phase is completely finished, as some of the items originally planned are still lacking.

The main problem is not the aggregated costs of MFDC – even if they became far higher than originally expected – but the running costs of the centre. To cover the operational cost of MFDC for the period 1984-87, NORAD has granted NOK 36.0 mill. and to cover the cost of expert personnel for 1984-87, NOK 32.2 mill. The cost of expert personnel has been kept within the budget because of several vacancies, but running costs had been underestimated, as inflation and unexpected expenses have resulted in higher actual spending.

As for the expatriate staff of 15 persons, the total cost of salaries is paid by NORAD, and does not affect Tanzania's ability to run the centre (Salaries are exchanged to T.sh., thus giving Tanzania a considerable amount of foreign currency). As part of the Tanzanian take-over programme, the evaluation team has recommended a reduction from 15 to 9 or 10 expatriates by the end of the next four-year period (1987-91). In this manner it should be possible to reduce the cost of expert personnel.

The running costs for the next financial year 1986/87 are according to the budget, close to 24 mill. T.sh. of which NORAD covers 75 per cent and Tanzania 25 per cent. Last year (1985/86) the running costs ended up with 21.3 mill. T.sh. as against 18.8 mill. T.sh. in the budget. There is doubt that Tanzania can afford to take over all running costs of the centre at present. To put recurrent spending in a perspective, the total spending of Fisheries Division last year was approximately 20 mill. T.sh., foreign assistance not included. Total spending on all levels in the fisheries sector (central, regional and district) was approximately 50 mill. T.sh., foreign assistance not included. If Tanzania was to pay all recurrent expenditures, this would occupy 50 per cent of total public spending in the sector.

NORAD has known, all the way since 1980, that MFDC was to be a long-term project, requiring assistance for many years to come. The evaluation team does therefore not recommend a rapid decrease of funds for recurrent spending. However, as part of a gradual Tanzanian take-over, the Norwegian responsibility should be somewhat reduced over the next four-year period. A gradual scaling down from 75 per cent to 50 per cent as per 1992, has been proposed in future recommendations (section 10.6).

Certain elements of the recurrent spending have to be more closely scrutinized. When MFDC is a comparatively expensive institution to run, the explanation has to be sought in several specific

conditions. Generally the inflation in Tanzania has been considerably higher than anticipated in the budget. Secondly, the centre has to rely on spareparts and equipment from abroad, thus requiring large amounts of foreign currency. Thirdly the rate of exchange has been fixed at an artificially high level, thus making local spending rather expensive in terms of Norwegian currency. At present Mbegani can do little to alter these conditions. On the other hand there are certain elements that can be looked more closely into. As for electricity, this alone makes up for 15 per cent of the total budget. A change of installations for the street lights is urgently needed in order to save electricity, at least during day time.

Secondly the industrial training seems to be extremely costly at MFDC, both in terms of student allowances and the necessary follow-up travels by the teachers. As recommended in section 9.2, the industrial training programme should be revised in order to save money **and** obtain more efficient training.

Thirdly, the type of technology applied at the centre is rather cost consuming. To take a recent example, the buying of a saw mill for nearly NOK 1 mill., will for a number of years to come require service and expensive spareparts from abroad. This saw has a capacity of 100 times the requirements of the centre. Other examples could be used as well, to demonstrate that an advanced state of "self reliance" can prove to be very costly for the centre.

Finally, maintenance of roads, estate and nearly 160 buildings counts for a considerable part of the total budget. It is not recommended that maintenance is reduced in the years to come, as this will seriously affect the smooth running of the centre. A larger part of the work could, however, be organized as part of the students' industrial training. Consequently the students would receive better and cheaper training and the centre would profit as well.

One solution close at hand to meet the increasing costs, will be to rely more heavily on the Revolving Fund. For next year the income of the fund is stipulated to approximately 4 mill. T.sh., with good chances of receiving even more, depending on fishing, service work, sales of ice etc. The evaluation team strongly recommends that the centre follows the rules that have been established for the Revolving Fund, not trying to mix with current expenditure. The Fund is supposed to enable the centre to efficiently carry out its training activities and extension service. The money acquired will be used for buying logs for the saw mill, paying for electricity, diesel for the fishing vessels, buying fishing gear, spareparts for engines, allowances for staff and fuel for cars when travelling to do repair work.

These income-generating activities should not be allowed to dominate the main tasks of training and development work. In this respect the idea that MFDC should become **self reliant** is quite farfetched, even if the concept is applied only to recurrent spending, the cost of expatriates not included. This does not imply that the evaluation team reacts negatively to larger income to the Fund – as long as the income-generating activities can be performed within the plans specified for training and development activities.

Finally the Development Fund should be considered. In view of the prevailing housing shortage it is considered necessary to have continued allocations of funds to enable the centre to construct new staff houses. For the next financial year (1986/87) 7 mill. T.sh. has been requested, against an allocation of 1 mill. T.sh. in 1985/86. The Development Fund is entirely a responsibility of Tanzania.

9.2 Cost of Project in Relation to the General Level of Expenditure of Other Governmental Training Institution

Building an institution the type and sophistication of Mbegani requires a lot of capital expenditures. The initial costs are very high and could never be recovered in a matter of a few years. Whereas it may not be fair to include the cost of expatriates when evaluating the total cost of the centre, it may only be proper that if the Tanzanian Government was footing all the bills, then this cost would have appeared as the direct cost of educating the students at MFDC. In trying to assess the cost of educating a student at the centre, two institutions were selected, namely Kunduchi Fisheries Training Institute and Chuo cha Ardhi. Both institutions award both certificates and diplomas, although their entry qualifications are higher than those at Mbegani.

- a) *Kunduchi Fisheries Training institute*
- (i) Cost of tuition per student = T.sh. 40 000/- p.a.
 - (ii) Cost of food per student per day T.sh. 100/-
 - (iii) Cost of Field training (industrial training)
 - 1. pre-service students T.sh. 1 050/- p.m.
 - 2. in-service students T.sh. 90/- per day.

- b) *Chuo cha Ardhi (Ardhi Institute)*
- (i) Cost of tuition per student
 - 1. Diploma T.sh. 50 000/- per student p.a.
 - 2. Certificate T.sh. 42 000/- per student p.a.
 - (ii) Cost of food per student per day T.sh. 138/-
 - (iii) Cost of field work
 - 1. If less than 30 days, T.sh. 150/- per day
 - 2. For longer periods, T.sh. 55/35 per day.

In view of the high costs in the country, Chuo cha Ardhi is trying to get extra funds so as to raise the allowances for field work to T.sh. 75/- per day.

- c) *Mbegani F.D.C.*
- (i) Cost of tuition per student T.sh. 40 000/-
 - (ii) Cost of food per student T.sh. 70/- per day for the month of April 1986 (for 80 students)
 - (iii) Cost of Industrial training T.sh. 150/- per day.

Since industrial training takes up to one year for Certificate students or six months for some other categories, MFDC is spending a lot of money in keeping the students in the field. With the present payment of T.sh. 150/- per day or T.sh. 4 500/- per month, the overall cost of keeping a student is much higher than at any of the two institutions considered above. Staff circular No. 4 of 1984 provides that in-service students are eligible to T.sh. 150/-, 110/- and 60/- per day depending on the station at which the officer is. It is being recommended that in order to reduce the cost of sending students for industrial training, the following should be adopted.

1. As far as possible the industrial training should be conducted at the centre and the students get the normal ration during term time.
2. Industrial training could be reduced to a maximum of 6 (six) months. Most institutions in Tanzania offer industrial training with a maximum of 3 (three) months.

Because of the high pay the centre is offering students during industrial training, the centre, for example in 1985, could not send the students out. When students get very high pay, e.g. T.sh. 150/- per day, they will usually complain if the industrial training is not offered. As the Training Coordinator suggests in the 1985 annual report,

“From my point of view it looks like it could be more the possibility of getting high allowances than the desire for field experience that is the background for their complaints. Definitely Mbegani can give the students their best industrial training”.

The evaluation team supports the Training Coordinator's view and expects the centre to save considerable amounts of money by adopting any or all of these alternatives.

10. FUTURE DEVELOPMENT

10.1 Future Strategies and Objectives

As can be seen from discussion on the objectives in section 5.1, the evaluation team does not recommend any **major** changes in objectives for MFDC. The Agreement states that relations to the artisanal sector shall be the main concern for the content of the training and that Short courses shall form a substantial part of the same. When the Agreement between Norway and Tanzania is going to be renegotiated next year, the team is of the opinion that artisanal fishing and the running of Short courses should be given more importance, as compared with the industrial sector and the Diploma and Certificate courses. Women's contribution and needs in the fishing communities should be given attention in the Short courses.

To the extent that by "coastal fleet" the Agreement actually indicates the merchant marine, the team does not consider this sector an important receiver of candidates from Mbegani.

When it comes to "objectives", the main problem is generally to make these operational, i.e. to transform the objectives into strategies and projects. This refers especially to the artisanal sector, where the Agreement describes the activities as "to develop ways and means". If possible, these "ways and means" should be made more exact and precise.

Finally, in a development programme, the understanding of the "development" process has an influence on the kind of objectives that will be laid down.

The more common – but less fruitful – understanding of the term is that "development" involves transfer and adaption of a package of technology. A more realistic point of view is that "development" is people's increased capacity to **master**, **make**, and **adjust** the technologies in relation to changes in the environment, – an understanding that possibly could be brought into the Agreement.

As for the future strategies, the team generally recommends that the process of linking the centre to the fishing community is more seriously considered. In order to reach this goal the channels of communication have to be further developed. The strategies can be the following type:

- a) direct development work
- b) a more comprehensive programme aiming at the constraints
- c) a closer follow-up of the graduates from MFDC
- d) extension work in terms of services offered to the fishing communities
- e) extension work which also serves women.

The centre has already started on the development work in several fields, but the work is carried out unsystematically, very much relying on the personal initiatives taken. In the next programme period, the centre should try to develop a more systematic attitude as to what kind of development work should take place, and in which fields. (The organizational aspects of this approach are further treated in section 10.6)

The most pressing external constraint in the fishing sector at present is the poor gear supply situation. Action to straighten out this external constraint is a condition for any successful impact from the training at Mbegani. The long-term remedy to this situation is a matter of political priority and administrative action. In the short run, Mbegani can contribute to improvement of programme where commodity assistance plays an important part. As for the organizational aspects of this programme, see section 10.4.

A final step in a long term strategy will, according to the team's opinion, be a closer follow-up of the Mbegani graduates, so as to see that they can use their acquired skills in their new jobs.

The possibility of distributing simple tools to the students leaving Mbegani, should be looked more closely into. On the other hand, this type of follow-up work will enable the centre to use the feedback to improve its own courses.

As for the extension service, many proposals have been put forward in order to expand these services in all fields, i.e. repair of engines, boats, coldrooms etc.

The evaluation team does not recommend a general extension of these tasks. The centre should take on service and repair work to an extent suitable for training purposes, on such items and places where assistance is most effective and within reasonable travel distances. The centre should take care not to raise expectations beyond what the centre can accomplish in terms of service work. If not, the fishermen and women will lose confidence in the centre, and Mbegani will have problems relating successfully to the fishing community.

Aquaculture Development

The team notes that there exists a potential for developing aquaculture as a rural activity in Tanzania as this will provide fish as a source of protein, employment and income. Hence small scale aquaculture projects should be encouraged. The team observes that Mbegani has made some preparations for carrying out trials on prawn culture close to the centre. The team discourages the practice of clearing mangroves for prawn culture as this may lead to deafforestation of the national forest reserves and damage to the ecosystem.

The team recommends that Mbegani seeks expert advice so as to have a strong base for establishing the project. The activities of this project should be restricted to the already cleared area.

Generally the team does not recommend that the centre to take up a range of totally new enterprises, diverting interest and money from the main objectives. The centre has taken on a large responsibility by the assistance and support promised to the three regions. Adding the development work, the programme of commodity assistance and a closer follow-up of the MFDC graduates, the evaluation team is of the opinion that the centre needs time to consolidate the situation, before entering into new enterprises.

This also applies to economic considerations. MFDC will for the coming financial year have a budget for recurrent spending close to 24 mill. T.sh., of which Norway covers 75 per cent and Tanzania 25 per cent. At the same time the total spending of Fisheries Division last year was approximately 20 mill. T.sh., while the total spending on all levels in the fisheries sector (central, regional and district) was approximately 50 mill. T.sh., foreign assistance not included. If Tanzania was to pay all recurrent expenditures, this would occupy about 50 per cent of total public spending in the sector. This should be considered when plans for the extension of Mbegani's activities are raised.

MFDC is already established as a resource centre with large capabilities for training, development work and extension services. What remains is to utilize these resources fully, in order to improve the conditions for fishermen and women all over the country.

10.2 Cooperation with Other Educational Institutions

The question of integrating other institutions with MFDC has been raised several times over the last years. Each time the answer is the same; for the time being it is difficult/not advisable to merge the institutions but a closer cooperation is recommended. The evaluation team does not see any possibility of merging other institutions with MFDC, but will recommend an extended cooperation in certain particular fields.

DMTU (Dar es Salaam Maritime Training Unit)

At present there is no interest whatsoever in integrating MFDC and DMTU. Each institution has its own specific objectives and tasks, and it would only bring confusion to merge the two. On the contrary, MFDC should not have any stated responsibility for training to the merchant marine. Even the practice of bringing students of marine engineering up to the level of class 3, should not be considered as a part of MFDC's responsibilities.

DMTU is at present educating 28 students within marine engineering and 30 students for deck officers. This is probably more than fulfilling the present demand from the merchant marine, the ferries etc. DMTU has, however, suggested that a closer cooperation can take place, referring to the use of special equipment, the teaching of certain subjects, the exchange of syllabuses, buying and stocking of textbooks abroad etc. Even some courses, e.g. refrigeration and electrotechnical, should be run in close cooperation, as these two fields are covered by both institutions. Also in the field of follow-up courses for former students, both institutions should look into the possibilities of joint initiatives.

Nyegezi

At present Nyegezi is running Certificate courses of two years' duration. For this academic year there are 42 students (28 + 14), 20 teachers and 60 additional staff.

The main problem for the centre is lack of foreign currency to buy spareparts and necessary equipment. Hence the technical equipment is in a poor operational state. In addition they are not able to obtain petrol for running the training vessel more than few days per month. Accordingly the practical training is limited.

Located outside Mwanza, the institution concentrates on the lake fisheries. In order to be familiar with marine fisheries the students train at Kunduchi for three months during the course. At present there are no plans for merging the two institutions, as they concentrate on two different types of fishing and carry out different types of courses.

It is quite usual that graduates from Nyegezi apply for courses at Mbegani, thus specializing in one particular field. However, among potential in-service students the two institutions draw from the same pool. (This academic year Nyegezi will have 85 per cent in-service students). If MFDC is able to extend its recruitment base, competition for students will not be a problem.

At present MFDC can offer Nyegezi some assistance in order to carry out e.g. practical work with marine engineering, while students stay at Kunduchi. On the other hand, Nyegezi can offer some assistance to MFDC when setting up the new centre for short courses in Musoma, relying on Nyegezi's long-term experience with the lake fisheries.

UDSM/TAFIRI

The project "Fishery Research at MFDC" was undertaken as a follow-up programme after R/V Dr. Fridtjof Nansen's fishery resource surveys in Tanzanian waters in 1982-83. In order to improve fishery statistics and obtain more information on important species, MFDC, Fisheries Division and Institute of Marine Research in Bergen, Norway, worked out a plan for regular research surveys. Four surveys were to be conducted each year with the training vessel M/V Mafunzo. UDSM and TAFARI were to participate in the programme and after some initial problems they joined the research trips. In this manner MFDC has established valuable contacts with important research institutes like UDSM and TAFIRI.

The evaluation team will recommend that this cooperation continues. The team does not, however, recommend that MFDC enter into more extensive research operations, diverting interest and resources away from the main activities, namely training and development work. TAFIRI has been given the task to promote, conduct and coordinate fisheries research within Tanzania, and there is no reason for establishing MFDC as a "research centre". If research institutions want to do investigations onboard of M/V Mafunzo, this should be granted if, and only if, the activities do not interfere with the training and the training programme. The final decision as to the use of M/V Mafunzo and other training vessels has to rest with the centre. The evaluation team assumes that any other institute carrying out research in return for services rendered by the centre, will be able and willing to bring back to the centre information that can be of value for the fishing operations and the training carried out by the centre.

Kunduchi

The Kunduchi Marine Fisheries and Training Institute started in 1967, offering a two-year Fisheries Diploma Course covering the fields of fisheries biology, marine engineering, food technology, fisheries management and nautical science. Since 1967 a total of 304 fisheries staff have received education at the institute. Of these less than 10 per cent are working in private or parastatal fishing companies, the rest being occupied as officers on different levels. The average annual student intake is 25, 22 males and 3 females, which means that the total capacity is 50 places. At present there are 43 students, 27 teaching staff (of which 10 are on training) and 30 additional staff. In 1984 the in-service/preservice ratio was 65/35, last year 100 per cent were in-service students.

The facilities of the institute include a small library, two lecture rooms, a laboratory, an ice plant and a cold room. The institute has no fishing vessel at present. As for the future plans, the institute intends to start a 9-month post-Graduate Diploma Course for fisheries staff and 3-year Advanced Diploma in fisheries science to replace the current 2-year Diploma course.

The possibility of transferring Kunduchi training activities to Mbegani has been examined in 1985 by a task force committee, appointed by Fisheries Division. The committee ended up by recommending the transfer to Mbegani, primarily in order to give room for Tanzania Fisheries Research Institute (TAFIRI). However, no thorough examination of the cost benefits was done, neither of the consequences for MFDC.

There is no doubt that TAFIRI by being transferred to Kunduchi will obtain better working conditions, at a cost considerably lower than by building a new headquarter. Still, the team is not convinced of the benefits, seen from the point of view of Mbegani FDC.

First there is a question of priorities: if a number of students (20-25 each year) should have to be accommodated at Mbegani within the existing set-up, the centre will have to reduce its own courses. If the centre should accommodate the Kunduchi courses in addition to the courses going on at present, new dormitories and classrooms will have to be established. In addition, a certain number of staff members (ranging from 4 to 27) will have to be transferred to Mbegani, requiring new staff

houses. The committee has estimated these additional facilities to cost T.sh. 4.5 mill., which is probably grossly underestimated.

The main problem is, however, the question of educational policy. Bringing in an institution with a completely different, more theoretically oriented course, would only divert attention, interest and money from MFDC's main objective, giving **practically** oriented courses. Experiences from other educational institutes do not substantiate the idea of more effectiveness the larger the institution is.

On these grounds the evaluation team does not recommend merging the two institutions. The team does, however, recommend a closer cooperation between the two institutions, where MFDC can offer assistance in several fields, e.g. access to M/V "Mafunzo" for the Nautical Science course and Engineering Workshops for the engineering practicals.

10.3 MFDC's Future Role in the Local Community

As can be seen from section 6.1.3 the centre performs a number of functions not directly related to the fisheries sector.

The following ones are the most important:

- a) Transport both regularly to Bagamoyo and more irregularly on special occasions, including emergency transports.
- b) Repair of tractors, cars, trucks and milling machines belonging to villagers in the neighbourhood.
- c) Repair on projects like the water pipe line, roads etc., which is supposed to be a Tanzanian responsibility.

The amount of time used for such tasks is stipulated to 10-15 per cent of the total workload of the Maintenance Department.

- d) In addition the centre is running a dispensary, offering services free of charge also to the people outside Mbegani.
- e) The centre is running a social club offering accomodation, drinks and entertainment. This is important for the integration of the centre in the area. If availed, it would favor mixing of local and expatriate staff.

The evaluation team will recommend that these functions are carried on also in the future. The service work to the local community is important for MFDC's reputation in the area. As a resource centre MFDC has the ability to do such tasks, and it will not be understood if the centre delimits itself to work inside the fence.

The evaluation team suggests that the following principles for "community work" are supplied also in the future, i.e.:

- a) Usually transport for others can be done as part of the centre's own transport operations.
- b) When repair work is done, the owner is responsible for spare parts and payment for man hours used.
- c) Both smaller and larger worktasks for the outside community have to be adapted to the general worktasks of the centre.

The team suggests that direct community functions should be kept on about the same level as today, not interfering with the smooth operation of the centre. This work will always require some additional costs, which have to be calculated as a natural part of MFDC's recurrent spending. In this respect service work for the surrounding communities is an integrated part of the general objective of making MFDC a centre that relates to the community. At the same time, failure in the fisheries sector cannot be compensated by showing the good results in other sectors. MFDC is still first and foremost a **fisheries** development centre.

10.4 Future Development of Extension Service

10.4.1 Short Practical Courses to Fishermen and Women.

The general recommendations from the team concerning Mbegani's involvement in shorter practical courses are:

- The centre should be conscious of the close relations between the direct development work programme, the commodity assistance programme and the running of the courses.
- Formal agreements should be made with the regions that stimulate clearly the sharing of responsibilities concerning the facilities, follow-up activities, provision of statistical data, expatriate housing etc.
- Cooperation should be limited to three regions at a time.
- One expatriate (expert or volunteer) should stay in each region. His relation to the courses should be of advisory nature. He should take care of communication and information transfer between MFDC and the region. He should collect and forward data regarding impact from the total cooperation programme. He should also assist in administering programmes such as the present commodity assistance in the region. His position should be under the head of Short Courses Dept.
- A Tanzanian with skills of communication, trained in aspects of fisheries, should be employed to cooperate with this adviser. In order to strengthen the capacity to register impacts from the courses, also on the female side, this should preferably be a woman with a social science background and experience in participatory research and training.

10.4.2 Commodity Assistance Programme

The planned commodity assistance in terms of fishing gear and accessories is directly bound up with the difficult gear supply situation in the country's fisheries and with the fact that the general gear shortage limits impacts from the activities carried out at Mbegani. The national demand for fishing gear is much higher than what can be covered through this programme. This fact must be taken into consideration when the distribution of the goods is planned. (cf. sect. 7.4.3).

In order to secure wanted impact from the Short courses, parts of the commodity assistance should be directly related to the conduct and follow-up of these courses. The rest should be confined to districts and regions where Mbegani carries out courses for fishermen, i.e. Tanga, Mara and Coast Regions.

The team also recommends that not only licenced fishermen are allowed to buy a certain quota at fixed prices, but also genuine fishermen and women not formally registered.

A part of the commodity assistance should be reserved to be distributed on long-term loans to poorer fishermen. The paying back of the loans should be handled as part of the daily recording system whereby the fishermen and women can pay back their debts following the system they are used to in paying the share for the boat and gear from every catch.

The larger items in the programme (nets, ropes etc.) should probably be distributed directly in cooperation between Mbegani staff and Regional Fisheries authorities. Information about times and places where sales are to take place should be spread in the actual villages.

If at all practicable and possible, some smaller items like hooks, some lines and mending thread should be stored in villages (with beach recorders) and sold to fishermen and women upon acute demand. Women's fishing cloths or kimia nets should be included in the assistance programme.

Finally, another aspect of the gear supply programme should be mentioned. In Tanzania (Mwanza and DSM) there are two fishnet factories that are now out of operation due to lack of raw materials rising from the foreign currency situation. The present Norwegian gear supply programme, that concentrates on what should be the products from these factories, does not promote a supply situation where the net factories form a natural part of the system.

It was not possible for the evaluation team to look into these operations in detail, thus it cannot at this stage give any comprehensive recommendations. But the team visited the Mwanza fishnet factory, which has been out of production last year due to lack of foreign currency. The factory could make yarn, lines, ropes and nets of all sizes. The factory would have within its capacity to cover about 30 per cent of the country's demand from a supply of raw material worth approx. 15 mill. T.sh.

NORAD should investigate further the possibility of supplying these factories with relevant raw material through its commodity assistance. Further investigations of how such assistance could be organized is necessary.

10.4.3 Direct Development Work

Since this work is expected to end up in equipment of a certain complexity, it must be administered in one department. The team finds it most natural that short courses and direct development work is combined. The other departments must then allocate a certain amount of man-hours for the purpose of development work. The head of the Short Courses Department prepares plans for the different development projects in cooperation with the staff from the other departments.

The development work itself has to be carried out in phases, starting with the collection of information about the methods and equipment in use locally and ending up with the construction and testing of suitable equipment.

In order to secure that the work ends up with acceptable solutions, the potential users must take part in the whole process. Therefore, the strategy that has already been implemented at Mbegani, to involve local experts from the sector in the development process, must continue.

As mentioned earlier, contact with other programmes, such as the Bay of Bengal Programme, would be of great value, and members of the staff should be given opportunity to visit that programme.

Finally the team feels tempted to make some concrete proposals on smaller projects that could be undertaken as part of a development programme:

1. *Vessel Development and Supply Programme*

- Based on the already launched mashua and ngalawa programme to include the designs in the training at Mbegani and to promote erection of boatyards for such boats.
- Contribute to supply of better nails for boats by supplying Mbegani with a small galvanizing unit for commercial use.
Search for improved caulking and proofing materials that can make boats more durable with less maintenance.
- Find tanning methods that can improve sail quality. Acasia bark is **one** alternative.

2. *Gear Development and Supply Programme*

- a) Improved trap techniques for shrimps.
- b) Fish attraction devices.
- c) Small scale (evt. sail propelled) pair trawling.
- d) Improved fish spearing techniques for bottom dwelling fish combined with development of device to increase underwater visibility (water glass). A water glass can improve efficiency in many techniques such as trap fishing, beach seining, scoop net fishing and handlining.
- e) Hooking devices to take larger fish onboard vessels.
- f) Develop equipment for live storage of fish (fresh water) for fishermen.
- g) Promotion of local production of gear and ropes (cocorope).
- h) Promotion of net mending and making as women's activity.

3. *Engine and Auxiliary Development*

- a) Adaption of the "propeller on bai" technique, originating from Thailand, which is well fit for motorized vessels in fresh water areas with much floating grass etc.
- b) Development of hand winches, blocks etc. for use in smaller vessels.

4. *Processing and Distribution Development*

- a) To master and improve the frying conservation methods and other means of treating fish, including the quality of oil.
- b) Continue the promotion of production and use of insulated baskets. Make them fit for side loading on bicycles.
- c) Develop live fish storage.
- d) Promote erection of kilns for smoking and heat treatment in villages.

- e) Provide guidance in marketing, record keeping and simple book-keeping and how to organize cooperatives.
- f) Instruction in how to obtain and repay loans.

The extension work should also include seminars of different types to different groups, such as information seminars to regional, district and local authorities as well as to fishermen and women.

Students should participate in such work. They could be given further practice in extension work by being given opportunities to go to local villages and assist both fishermen and women in practical projects. It is essential that extension work service becomes part of the students' training, especially because so many of the technical skills cannot at present be used due to the lack of facilities.

10.5 The Content of a Study Assessing the Future Manpower Needs of the Fisheries Sector

The evaluation team will not recommend a general study of manpower needs, in terms of manpower projections. Experience from the past has shown that simple forecasts have limited predicative value, when small sectors are involved. Such forecasts are based more on production **targets** than on a realistic appraisal of the economic situation.

At present Tanzania operates a very limited modern fishing fleet, consisting mainly of smaller trawlers. Within the next four year period (1987-91), there is little reason to expect a large increase in the number of modern fishing vessels. On the coast, the joint venture with Japan will probably produce some more modern shrimp-trawlers. In addition a number of private businessmen can be expected to operate smaller mashua with inboard engines. On the lakes more trawlers will probably be introduced **if** more foreign currency is made available for buying engines and **if** the supply of petrol/diesel improves. A number of plans exist, but actual realistic undertakings will be determined by the overall economic conditions. It will be a waste of money and time to undertake a comprehensive study of such plans, and on such a basis, make manpower projections.

Furthermore a study of future manpower needs will not take into account the fact that a large number of educated people in Tanzania make job transfers. This of course affects small sectors like fishing, as e.g. a number of educated marine engineers will find jobs in other sectors, thus interfering with the prognosis. At present we have very limited knowledge of the job transfers into and out of the industrial fishing sector.

Therefore the evaluation team recommends **a study of the students**, who have been graduating from MFDC over the last years; where they are posted today, what kind of salary and working conditions they have, to what extent they can practise what they have been learning at the centre, what the constraints are etc. Such a study should be conducted during the late 1987, so that three batches of MFDC students can be considered.

In addition, the activities of students of the short courses should be examined; where they stay, whether they practise fishing, what kind of fishing (boats, gears) etc. This could be combined with "brushing up" and consulting service to the former participants.

For the Diploma and Certificate graduates a questionnaire should be the most appropriate means of including all former students (from 1985 onwards). In addition a number of students should be chosen for closer interviews, in order to get a wider picture of their present working conditions. A number of employers should also be interviewed, so as to ascertain their evaluation of the students from MFDC. For the Short courses, the study has to rely on close cooperation with the District Fisheries Officers, in order to obtain information of the former students.

Such a study would give a more systematic feedback to the centre and to Fisheries Division, as to how the former students actually operate. This will be of importance not only for planning the courses, but also for the **content** of the courses. In addition the study should try to assess the relevance of the figures given in the new 5-year plan (1986-91) concerning the future manpower requirements in the different sectors. On the basis of these two sources of information, rough estimates should be made as guidelines for the next planning period.

A study like this could be undertaken as a jointly Norwegian/Tanzanian project, offering both parties involved an opportunity to evaluate the performance of the centre as to the relevance of training.

10.6 Alternative Models for Organizational Set-up

As can be seen from the description of the MFDC-organization in section 8, there is a need for some modifications in the organizational set-up. Generally the evaluation team recommends a reduced number of sections and departments. To be more concise, the team suggests the following changes:

- a) The Economy Department and the Administration Department to be combined into one Administration Department.
- b) Short courses to be made a department of its own, as part of the Training division.
- c) In the Boatbuilding Department there is no need for two sections. Training is the main activity and "commercial" activities can easily take place as an integrated part of training.

Thus, the number of heads of departments and sections is reduced by two, compared with the present organizational set-up. One head of department has been added (Short courses), which formerly was placed directly under the training coordinator. Finally the team recommends that the training coordinator should not be posted as Assistant Principal as long as the Principal has his own Tanzanian counterpart. A new work description should be worked out for the Principal's counterpart, making him responsible when the Principal is away.

The centre should prepare for a **gradual take-over** by Tanzanian staff, starting immediately. By the end of the next four-year period (1987-91), the team recommends that the following posts are held by expatriate experts: Principal, heads of Administration/Economy and Maintenance Departments, heads of Marine Engineering, Boatbuilding and Short Courses Department. Nautical Science Department should keep one expert, either as the head of the department or in charge of the vessel. In addition Marine Engineering Department should keep one or possibly two heads of sections, depending on the quality of local staff at that time. This reduces the number of expatriate experts at the centre from 15 at present to 8 or 9 plus one or two at the regional Short courses centres.

The team notes that the new adviser for the Short courses at Musoma is recruited as an expert. It is recommended that NORAD and Tanzanian authorities consider the possibilities of recruiting advisers from the Norwegian Volunteer Service to the regional centres. These should then work in close collaboration with the experts at the centre and the regional fishing officers.

As part of the gradual Tanzanian take-over, the Norwegian responsibility for recurrent spending should be somewhat reduced over the next four-year period. The evaluation team recommends a gradual scaling down from 75 per cent to 50 per cent as per 1992. Still the project will require assistance for many years to come.

The administrative system with counterparts does not work properly at MFDC at present. If counterparts are appointed, they are supposed to under-study the expatriate expert for a certain

period. In the next phase they must be in full charge of duties and responsibilities, while the expatriate serves as an adviser. In the final phase the expert should primarily be allocated development tasks.

When expatriates are changing all the time, it is important that local staff members are given more **administrative responsibilities**, so as to secure more continuity at the centre.

By the end of next four year period (1991-92) we find it natural that Tanzanians take over as heads of sections and departments in the Training division, while the remaining expatriates of this division should act as **advisers** or be allocated development tasks.

As for the staff development plan, the evaluation team recommends that the needs of the centre are more strongly scrutinized when sending Tanzanian staff abroad for educational training. However, the candidates already appointed for further education should be accommodated. NORAD is especially requested to consider the Tanzanian scheme of service, as to what kind of additional education gives additional credit, also in terms of salary. In some cases English-speaking countries should be considered for further educational training, as problems and time spent on language training will be considerably smaller.

Even if MFDC has already established a number of general incentives, like good housing, free electricity, cheap fish etc., the evaluation team recommends that one should look more carefully into the possibility of giving **personal** incentives, in order either to keep valuable persons in their present jobs, or to promote efficiency in the workers at the centre.

The evaluation team does not recommend that MFDC be turned into a parastatal organization. Even if such a change will make promotions and questions of salaries easier to handle, the centre will, on the other hand, be forced to bring about profits to meet the expenses. This may in turn easily lead to a situation where the income-generating activities will have priority over the other activities, training included. Finally, if MFDC becomes a parastatal with its own income, it may face lower priority in public allocations for running expenses.

The evaluation team does not see any possibility whatsoever of MFDC becoming "self-reliant". With the present recurrent expenditure, largely dependent on the educational plans for the centre, it is completely impossible to cover the expenses by way of income-generating activities.

The problem of the use of its own income has now been solved through the establishment of a Revolving Fund. The evaluation team finds the administrative set-up and the banking arrangement quite satisfactory. For the future it is important not to mix the economic responsibilities of the one hand, and the responsibilities of the Revolving Fund on the other. Income-generating activities should not be allowed to interfere with the main objective, namely **training**.

The evaluation team recommends that Short courses become more of an integrated activity within MFDC. To this end the team has proposed that Short courses constitute a department of its own, eventually with the regional centres as sections. The head of the Short courses department should have as his main responsibility to link up the other departments and their activities to the development and running of the courses. Experiences from the Short courses must in turn be channeled back to MFDC, to facilitate changes, modifications, new development ideas etc.

At present most development activities are carried out unsystematically, relying on the initiative of certain persons. More of the resources of the centre should be allocated for development activities, and the head of short courses department should have the main responsibility for this. Such an organizational set-up will secure that development activities will be more in line with the present level of artisanal fishing.

One of the main organizational problems at the centre is the large turnover by expatriate experts. With two-year contracts and some even on a yearly basis, each department will experience a number of changes in routines, working habits, goals etc., even if strict work descriptions are laid down. From this point of view, contracts for a longer period of time or the facilitation of extensions are to be preferred.

From the Norwegian point of view these long-term contracts are difficult to obtain, as the available work for spouses at Mbegani is very limited. If more tasks, even part-time jobs, could be performed by spouses, it would be easier to recruit expatriate experts for longer periods of time. In this respect, use of experts from other countries than Norway should be considered. For certain jobs, experts from other developing countries will be in a better position to adjust to the technology and equipment more commonly used in Tanzania.

Finally the expatriate experts should be given a "crash course" on the Tanzanian Government structure and administration, labour laws, staff regulations, financial regulations, Fisheries Act etc., matters of great importance for the smooth running of the centre. The evaluation team has the impression that these matters should be more seriously considered; preferably the crash course could result in a manual.

10.7 Recommendations Arising from the Completed Study on the Conditions of Women in Fishing Villages

- In order to enhance the women's capacity to strengthen fishing activities in local communities and to participate in them more fully, and
- in order to increase women's income and thereby improve their own and their families' welfare, especially the level on nutrition, the team recommends, in accordance with the reports of the women's study group, that
 1. MFDC should recruit female students, especially Std. 7 leavers, for its Short courses. Their training could concentrate on netmaking and mending, fish processing, the giving of practical guidance in cooperative organization, in marketing, in ordering of goods and materials, the writing of official letters, the recording of income and expenses and assessing costs in relation to potential income (budgeting). Students should be recruited also from the villages which were studied by the women's study group, of the University of Dar es Salaam, i.e. Mlingotini, Pande and Mbweni.
 2. MFDC should have more women on its staff, also among the expatriates. One woman teacher could be full time in charge of organizing teaching specially geared to women's requirements. She could also coordinate those aspects of training directed at women from local communities with other activities of MFDC. Such a staff member could be a contact person with the village women as well as with the District women's integration into the programmes of MFDC.
 3. MFDC could employ a home economist or alternatively an adult educationist, preferably with some experience in fishing communities, to coordinate the activities of the women's group of MFDC and to act as a leader of other social activities suggested in this report. She could assist the staff member (above) in keeping the contact with the surrounding communities. A home economist could also cooperate with women doing fish frying to improve the quality of processed fish and the mode of selling it and other products, for example by organizing the women to erect special stalls for their trade.

4. MFDC could integrate into its teaching programme guided student practice in extension work, thereby assisting the women's groups in net-making and fish smoking activities in which the women, after the research/training seminar, expressed interest. Also other aspects of teaching mentioned could be part of an extension work exercise.
5. The attention of the MFDC staff members should be drawn to the women's role in fishing so that in their development activities they would consider also better means and ways for women's fishing and other activities in relation to fisheries.
6. In order to increase the quantity and quality of nutrition in local communities, MFDC should sell better quality fish to the local women who come to buy fish at the centre and to make sure that at no time fish of low quality is offered for sale.
7. Short training courses/seminars for women should become an extension activity of MFDC and the regional centres.

10.8 Recommendations for Further Research in Fishing Communities

There is a need to develop participatory or cooperative action research approaches to a continuing research and training programme of MFDC. Thereby the link between MFDC, the regional ongoing centres and the local communities can be strengthened and a two-way communication facilitated. The fisheries extension workers and fishermen and women can be incorporated into such a research process.

Aspects requiring continued research are:

1. Ownership of boats, gear and transport in relation to the fishing organization, sharing systems, dependency relations and the prices paid to the small-scale fishermen.
2. Conditions for cooperative fishing organization compared on the basis of negative or positive experiences. Obstacles that bring cooperative action to halt should be continually observed. Ways and means for removing the obstacles should not only be suggested but also used in practice.
3. Structural and process analysis of the means and organization of fish production, marketing and utilization of profits.
4. Investment patterns of profits made from the fishing sector, with special attention paid to the degree that reinvestment into fishing takes place versus investments in other urban or rural sectors.

Participatory/cooperative action research or any other research or training programme should include a special concern for women's involvement but also incorporate women into the research process.

Effects and distribution of inputs from MFDC and regional centres should be closely followed. Research on the local level should be carried out in the light of general political and economic development in the country. Contradictions should be analysed also as an interactive process with the leaders concerned and the local population.

Utilization of research/training seminars on the local level is recommended. Research personnel could be attached to the centres periodically but on a continual basis.

10.9 The Regional Role of MFDC

The regional role of MFDC has been discussed several times over the last years. Three types of considerations seem to be present:

- I. Tanzania offers excellent possibilities for a broad range of fisheries training, including marine and inland waters, rivers, swamps and man-made lakes.
- II. MFDC appears to be well equipped with training facilities, including boats.
- III. Training of students from other countries will involve payment in foreign currency.

On this basis FAO has suggested that MFDC becomes a "Focal Point for Training Programmes for Multidisciplinary Small Scale Fisheries Extension teams for the English-speaking African Countries". Even if the idea is well conceived and the demand for such courses is well documented, the evaluation team still is of the opinion that some of the constraints should be considered:

Mbegani is built as a **national** fisheries training and development centre, with a number of specialized fields and a capacity adjusted to this purpose. With the greater number of future tasks towards Tanzanian Fisheries (and fish culture) in mind, it is difficult to see how Mbegani can have excess training and accommodation capacity available for international purposes, unless

- a) the nationally oriented activities are reduced or
- b) the capacity is considerably expanded.

As to a) the evaluation team does not recommend that the national activities are reduced, even if the resources are somewhat redirected. One possibility could be to localize the forthcoming Short course **outside** Mbegani, thus leaving 24 places free for accommodations. However, new internationally oriented courses will require more qualified staff and consequently more staff housing, altogether adding up to higher running costs.

As to b) the evaluation team does not consider it possible, under the present economic situation, to expand the facilities at MFDC, either in accommodations or in equipment. For NORAD the recurrent expenditure is already too high, and different proposals have been put forward to reduce spending on MFDC. For Tanzania, even the 25 per cent of the recurrent costs is a heavy burden, and in addition the country has to finance the present development program, supplying staff, housing, better roads etc.

An expansion of MFDC would therefore have to be funded outside NORAD and Tanzania. Even if this is possible, the evaluation team would like to point out that such a comprehensive structure will be difficult to organize and run in a proper way. As shown in this evaluation report, the more different the activities going on, the more difficult the coordination. It would be unfortunate to have attention once again diverted from the main objective of assisting the artisanal fishermen.

On the other hand FAO certainly is an interesting partner for MFDC. The organization has wide experience in small-scale fisheries development from several research programmes where the "Bay of Bengal Programme" probably is the best known. FAO has access to a considerable expertise in the field. Closer contact between MFDC and this expertise would undoubtedly benefit both the centre and Tanzanian fisheries. The evaluation team therefore recommends closer contact with FAO, in order to conduct shorter courses, seminars etc. on a regional basis at Mbegani, to an extent not interfering with the ongoing national training programmes. Especially during long vacations there is idle capacity at MFDC, which can be used for seminars, short courses etc.

As for admitting foreign/East African students to the established courses at MFDC, this could easily be done within the existing structure. For MFDC such a supplement could offer a wider

range of fishing experience. It should, however, be emphasized that the number has to be limited. Offering courses for foreign students, can easily run counter to the national demands for qualified students in the field of fishing and related industries. Furthermore, offering courses for foreign students could also be an easy solution, when courses are not fit into the Tanzanian state of fisheries. Again, the evaluation team will remind of the national demands, and the necessity of reorienting the courses rather than keeping them for "export purposes" only. It is recommended that MFDC work out a strategy for the international short courses/seminars that could be offered, as well as a plan for foreign students attending the established courses. Both have to be part of the total programme activity at the centre.

TRAVEL PROGRAMME FOR THE EVALUATION OF MBEGANI FISHERIES DEVELOPMENT CENTRE

Date	Activity
21/4-1986	- Arrival in Dar es Salaam of members of the team from Norway
22/4-1986	- Meeting with NORAD, Dar es Salaam; Resident Representative, Assistant Resident Representative. - Meeting with Ministry of Finance and Planning. Deputy Principal Secretary. - Brief meeting with Ministry of Labour, Manpower Development and Administration, Director of Training and Manpower Allocation.
29/4-1986	- Meeting with Ministry of Labour, Manpower, Development and Administration. - Meeting with the Director of Fisheries.
29/4-1986	- Travel to Morogoro, visit proposed aquaculture centre.
30/4-1986	- Meeting with Regional Development Directors Office, Regional Fisheries officer, Regional Planning officer. - Visit fish ponds. - Leave for Tanga.
1/5-1986	- May Day. Visit fish landing sites.
2/5-1986	- Meeting with regional Development Directors office, Regional Planning officer, Regional Fisheries officer, Regional Natural Resources officer.
2/5-1986	- Tour of Pangani Fishermen Training Centre, Visit to Kigombe villages.
3/5-1986	- Visit to Moa, Chongoliani and Putini villages.
4/5-1986	- Return to Mbegani.
5/5-1986	- Visit to Bagamoyo District Directors office. Meeting with District Executive Director, District Natural Resources officer, Member of Parliament. - Meeting with local boatbuilders and fishermen. - Visit to Pande and Mlingotini villages.
7/5-1986	- Meeting with the Director of Fisheries. - Meeting with TAFICO General Manager, Operations Manager.
8/5-1986	- Meeting with Ministry of Communication and works, Director of Shipping, Maritime Advisor, DMTU staff. - Travel to Musoma.
9/5-1986	- Meeting with Regional Development Directors office, Regional Development Director, Regional, Fisheries officer, Regional Planning officer and Regional Natural Resources officer. - Visit to Musoma Fishermen Training Centre site. - Visit to fish landing sites.
10/5-1986	- Departure for Mwanza and Torome.

Date	Activity
11/5-1986	- Visit fish landing sites and fish receiving station and local boatyard.
12/5-1986	- Meeting with Regional Natural Resources office and Regional Fisheries office.
	- Visit to Mwanza Wood Boatyard.
	- Visit to Preshwat Fisheries Institute Nyegezi, Mwanza Fishnets.
	- Visit fish land sites in Tarime and travel to Bunda.
13/5-1986	- Visit Nyanza Fishing and Processing company, Pansiasi Steel Boatyard.
13/5-1986	- Travel to Ukerewe.
	- Visit fish processing site and fish landing beach.
14/5-1986	- Meeting with District Executive Directors office, District Executive Director, District Natural Resources officer, District Fisheries officer.
	- Visit fish landing sites.
	- Travel to Musoma joining other members of team at Bunda.
15/5-1986	- Meeting with Regional Development Director.
	- Travel to Dar es Salaam.
16/5-1986	- Meeting with Ministry of Natural Resources and Tourism.
	Principal Secretary, Director of Planning, Director of Fisheries and Director of Manpower and Administration.
	- Return to Mbegani.
19/5-1986	- Travel to Zanzibar.
20/5-1986	- Meeting with Ministry of "Bahari, Misitu na Utalii", Principal Secretary, Director of Fisheries.
	- Visit Institute of Marine Sciences, Meeting with Director of the Institute.
	- Visit fish landing sites.
21/5-1986	- Visit Zanzibar Fisheries Corporation. Meeting with AG. General Manager, Production Manager, etc.
21/5-1986	- Travel to Mbegani.
28/5-1986	- Completion of report and travel to Dar es Salaam.

LIST OF PERSONS MET BY THE EVALUATION TEAM

Ministry of Natural Resources and Tourism

Mr. N.N. Kitomari	Principal Secretary
Mr. M.Y. Lumbonga	Director of Planning
Mr. A. Murasi	Director of Manpower Development and Administration
Mr. G.K. Libaba	Director of Fisheries

Ministry of Labour, Manpower Development and Administration

Mr. Nyahiranganii	Director of Training and Manpower Allocation
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NORAD Dar-es-Salaam

Mr. G. Føreland	Resident Representative
Ms. T. Jørgensen	Assistant Resident Representative

Tange Region

Mr. Maduma	Regional Planning officer and Ag. Regional Development Director
Mr. Rajabu	Regional Natural Resources officer
Mr. S. Makoloweka	Regional Fisheries officer
Mr. Mbunda	Assistant Fisheries officer
Mr. Dengo	Town Fisheries officer
Mr. Nwalipula	Fisheries Assistant (beach recording)

Pangani Fishermen Training centre

Mr. Meyengo	Officer in charge
Mr. Chomoka	Instructor

Bagamoyo District

Mr. J.J. Kasege	District Commissioner
Mr. G. Mbezi	District Executive Director
Mr. R. Mkombachapa	District Natural Resources officer
Mr. Mchanga	District Planning officer
Mr. Mhina	District Fisheries officer

Tanzania Fisheries Corporation

Mr. A.B.C. Killango	General Manager
Mr. N. Kimaro	Manager of Operations

Bagamoyo Fishing Company

Mr. G. Nayaro	General Manager
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Ministry of Communication and Works

Mr. P.N. Meghji	Director of shipping
Mr. A.S. Massawe	Shipping officer
Mr. J.R. Blazi	Shipping officer
Mr. Bjørn T. Stover	DMTU, Course leader Engineering sect.
Mr. E.G. Grimstad	DMTU, Navigation section
Mr. Jacobsen	Maritime Adviser

Mara Region

Mr. N.T. Nyitombe	Regional Development Director
Mr. R.N. Nyambwa	Regional Planning officer
Mr. G.M. Semkiwa	Regional Natural Resources officer
Mr. E.S. Kilosa	Regional Fisheries officer

Mwanza Region

Mr. Z. Mulegi	Regional Natural Resources officer
Mr. J. Mtolela	Regional Fisheries
Mr. W. Fundi	Assistant Fisheries officer

Mwanza Boat Yard (wooden boats)

Mr. E.J. Nkaka	Boat Yard Manager
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Mwanza Fishnet Industries Ltd.

Mr. K.J. Rao	Executive Director
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Freshwater Fisheries Institute Nyegezi

Mr. R. Mapunda	Principal
Mr. J. Kayungi	Fisheries officer (Skipper and Training officer)
Mr. Bungaba	Fisheries officer

Ukerewe District

Mr. Kabeja	District Executive Director
Mr. W. Mwaibullah	District Natural Resources officer
Mr. F.D. Borwani	District Fisheries officer

Bahari, Misitu na Utalli - Zanzibar

Mr. J. Dahona	Principal Secretary
Mr. S. Othman	Director of Fisheries

Zanzibar Fisheries Corporation (ZAFICO)

Mr. Aziz	Ag. General Manager
Mr. N. Mahame	Production Manager
Professor Holler	Project Manager - Federal Republic of Germany

Institute of Marine Science

Professor A.M. Mikerudiwe	Director
Mr. Mohammed S. Mzee	Research Fellow

Ministry of Finance and Planning

Mr. Idd Mshangama	Deputy Principal Secretary
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Morogoro Region

Mr. Ngdea	Regional Planning officer
Mr. Mwendamseke	Regional Fisheries officer
Mr. M.S. Kistaka	Fisheries officer (Aquaculture station)
Mr. Chambuo	District Fisheries officer

Pansiari Boat Yard Mwanza

Mr. Lemaireene	Project Manager
Mr. Heryewe	Boat Yard Manager

Mbegani Fisheries Development Centre

Mr. M. Hallaråker	Principal
Mr. S. Andersen	Assistant Principal & Training Coordinator
Mr. B. Lund Jensen	The Bursar

Boat Building Department

Mr. E. Engebretsen	Ag. Head of Dept.
Mr. O. Lilungulu	Counterpart to Head of Dept.
Mr. O. Matola	Counterpart to Head of Prod.Sect.
Mr. G.L. Shirima	Head of Training Sect.

Short Courses

Mr. B. Pedersen	Assistant Training Coordinator
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Nautical Science Department

Mr. L. Karason	Ag. Head of Department
Ms. I. Lalata	Counterpart to Head of Dept.
Mr. R. Kasella	Counterpart to Head of Fishing Gear Section
Mr. I. Håseth	Skipper of M/V Mafunzo and Head of Vessels Section

Fish Processing Department

Mr. R. Sundet	Head of Department
Mr. J. Mbombo	Head of Fish Marketing Section
Mr. D. Mliga	Head of Fish Processing Section

Marine Engineering Department

Mr. L.B. Olsen	Head of Department
Mr. J. Slåttholm	Head of Electrical Section
Mr. C. Marks	Head of Marine Engines Section
Mr. A.B. Hansen	Head of Refrigeration Section
Mr. M. Sobo	Counterpart to Head of Marine Engines Section
Mr. N. Tillya	Counterpart to Head of Elect. Sect.

Maintenance Department

Mr. A. Adeler	Head of Department
Mr. C. Mndolwa	Counterpart to Head of Dept.
Mr. A. Dengwa	Ag. Head of Electrical Section
Mr. P. Ernest	Head of Buildings Section

CCM

Mr. A. Melele	CCM Chairman
Mr. D. Nyirenda	Executive Committee member
Mr. J. Bouriani	Executive Committee member

JUWATA

A. Dengwa
D. Nyirenda
N. Masudi

Ag. JUWATA Chairman
Ag. JUWATA Secretary
Executive Committee member

UWT

Mr. Y. Phillippo
Mr. E. Mweyo
Ms. F. Sobo
Ms. Masaigana

MUWATA

Mr. A.B. Mayaru
Mr. A.S. Zambetakis

Chairman
Ag. General Secretary

Bunda District

Mrs. M. Chipps
Mr. Nuko
Mr. J. Mkoyongi

District Commissioner
District Executive Director
District Natural Resources officer

Tarime District

Mr. Konyuni
Mr. Mana

District Planning officer
Fisheries officer, officer i/c Sota Fishermen's Project

Musoma District

Mr. L. Kahama

Officer i/c Musoma Fishermen's Training Centre

Examination Policy and Student Performance at MFDC.

A thorough look and assessment of the examination policy of MFDC have been made and the team found several irregularities. In this report some suggestions have been made for inclusion or deletion.

a) **Nature of Course.**

The courses offered at MFDC are very specialized and as such need more skill and practical knowledge. It is therefore important that industrial training shall be given the necessary weighting when assessing the students.

b) **Assessment.**

- i) The continuous assessment seems to be workable in many institutions in Tanzania and it is hoped that an average student who has attended the course should be able to pass. In this case it is suggested that it shall be given not more than 40 per cent total assessment.
- ii) Industrial training does not carry the necessary weighting as seen for other subjects. If it is considered important, and also taking into consideration the time taken to do the course, more weighting should be awarded. In other courses, the weighting are relative to the time spent on each particular subject. Since industrial training takes one year, it should carry the same units as other years. It is being proposed that industrial training be awarded at least 16 (sixteen) units. The students should be required to write a monthly report which should carry marks. Also the supervisors and tutors report should be given as often as possible.

It is quite likely that some students are placed to institutions where they would not benefit for industrial training due to lack of equipment, materials etc. In case like these, MFDC should engage such students at the centre.

For example, boat building students should be assigned in groups to make a boat for ngalawa at specified time, in this case the tutors should be able to assess them easily.

c) **Grading Procedures.**

The grading procedures proposed by MFDC look alright although they would be modified to make a meaning. Only exceptionally intelligent students can score 80 per cent and above. In view of this the evaluation team I proposes the following ratings:

Grade	% Score	Points
A. Distinction	75 and above	5
B+. Upper Credit	60 - 74	4
B. Lower Credit	55 - 59	3
C. Pass	50 - 54	2
D. Failure (resit)	5 - 49	1
E. Failure (no resit)	Below 35	0

It should be noted that a student who scores grade E does not qualify for any point and should not be allowed to resit the subject. It is necessary for MFDC to develop means of allowing students to go through even if they fail some minor courses. For example if the courses are grouped as a) core courses and b) elective courses, then every student must pass all core courses before being awarded a Certificate. Such a student could fail one or two electives and still be able to pass the examination.

If the above suggestion is accepted, then the GPA should also run from 1 to 5 and the following would be the score keys.

1. Distinction	4 - 5	A
2. Upper Credit	3,5 - 3,9	B+
3. Lower Credit	2,7 - 3,4	B
4. Pass	2,0 - 2,6	C
5. Fail (resit)	Below 2,0	D

d) **Resits, Repeats, Discontinuation.**

This area needs more scrutiny. It is not clear when a student who fails does resit or repeats the course. Provisions should be made so that students who fail marginally or in special cases are allowed to repeat.

e) **Examination Boards.**

Currently Mbegani has three examination boards, namely departmental examination board, interdepartmental examination board and the Mbegani FDC examination board. One of the major functions of an examination board is to assess the progress of students in relation to the syllabus. This entails assessing the type of questions set the answers given and the fairness with which the exams are marked.

Generally it is not surprising to find good teachers who may not be able to set reasonably fair exams. Some teachers set questions that cover only their interests and leave out those they dislike or are unable to teach properly.

It is therefore recommended that the departmental boards should have a "departmental moderation committee". This committee shall moderate all exams in the department and could ask the tutor to explain some of the ambiguous questions. It is only after moderation that the questions can be typed ready for examination day.

Apart from moderation, it is highly recommended that MFDC invites external examiners for every subject. These external examiners should come from outside MFDC. The report of external examiners should first be discussed at the departmental board before being submitted to the interdepartmental board.

Lastly, the composition of the Mbegani FDC examination board, should be examined. This board has so many representatives from the ministry. In order to be fair to the exams, this board should be composed

of qualified professionals within the outside MFDC. The representation from the ministry should be minimized.

In the annual report of 1985 it is observed that a large number of students failed at their first sitting, for example in the Boat Building Diploma all but one student had to resit supplementary exams. In the Master Fishermen's exams held at DMTU for class TU certificate, only one student out of twelve students passed the whole examinations while the rest had to resit supplementary examinations.

This very high failure rate may be due to one of the following factors:

- a) poor teaching
- b) poor examination
- c) lack of teaching aids
- d) lack of textbooks
- e) poor students.

A thorough survey of the teaching carried out at the centre revealed that some of the teachers lack teaching qualities and techniques. The training coordinator realizing this shortfall recommended in his 1985 Annual Report that for better implementation of the teaching at MFDC all teaching staff should have been given a practical pedagogical general course. Most staff, especially the local staff lack skills for using teaching aids. This is a drawback to the teaching at the centre. It is being recommended that a thorough scrutiny shall be made while selecting tutors (both expatriates and local) for MFDC.

**MBEGANI FISHERIES DEVELOPMENT CENTRE
ORGANISATION CHART**

