

# Icelandic International Developing Agency (ICEIDA) Mozambique



## Mid Term Review of the project: “Fish Processing and Quality Control, at the Fishery School (Escola de Pesca) in Mozambique.”



Figure 1 - Visit to classroom at Escola de Pesca (EP) (photo from N.R. Ágeirsdóttir)

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N U T R A

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## Acronyms

ICEIDA	Icelandic International Development Agency
MoF	Ministry of Fisheries
INIP	Instituto Nacional de Inspeção de Pescado
IDPPE	Instituto Nacional de Desenvolvimento de Pesca Pequena Escala
FAO	Food and Agriculture Organization of the United Nations
EU	European Union
EP	Escola de Pesca
HACCP	Hazard Analysis and Critical Control Point

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## ***Executive Summary***

This report describes the results from the project mid term review of the Fishery School conducted in October 2008 carried out by Dr. Sigurdur Bogason from MarkMar ehf, for ICEIDA. The school facilities in Matola were visited on three different days to review project developments and outputs against the objectives outlined in the Project Document. Two review workshops with industry, Ministry of Fisheries officials and other stakeholders were organized by Francisco Bomba Director of Escola De Pesca (EP) and his staff. The first workshop was held in Maputo on 22 October 2008, and the second one was conducted in Beira on 23 October 2008.

One company, Solmariscos, that had participated in the Express Course was visited on 20.10.08, and its impact on the staff was discussed with few employees. The perception of the Solmariscos staff was that the course was good and had benefited them in their daily work practices.

The key result of the mid term review was that the capacity building at Escola de Pesca was significantly addressed, and the course material and teaching aids development were progressing well, and the courses offered by EP were well received by the industry and appreciated by the authorities. However, some deviations from the Project document objectives were apparent of which some could be viewed as improvements on the original planning, but some not. Therefore the project needs to refocus on the right prioritizing of efforts, and some work in progress needs to be rethought to ensure appropriate impact from the available project resources. The main conclusion is that the project has made significant impacts already and with proper refocusing on relevant priorities, it is viewed to be a potentially a highly successful project. The project is recommended for continuation and appropriate expansion of its scope into aquaculture industry training and heightening of the effort directed towards the artisanal fishermen, and the semi-industrial fleet segment.

## ***Introduction***

This report describes the outcome of the Project mid term review visit to Mozambique carried out by Dr. Sigurdur G. Bogason (SGB) from MarkMar ehf, in October 2008. This work was performed for the Icelandic International Development Agency (ICEIDA) to evaluate the project progress status and give advice on future co-operation and eventual project expansion. A copy of the Terms of Reference for the midterm review is attached as Annex 2. The following objectives for the work were listed in the Terms of Reference for the mid term review:

- a. Evaluate the progress of the Project
- b. To advice on future co-operations end eventual expansion
- c. If expansion will be recommended then it is expected that some outlines of planning and conceptualizations will be recommended regarding a new Project Document.

The reference to the Project here above is the ongoing work funded by ICEIDA for capacity building and development of training material and training courses at Escola de Pesce. The teaching staff at EP with assistance from a consultant from INFOSA develops the courses and training material. Mrs. Luisa Arthur from INFOSA has been developing courses and giving training in the SADC region for many years, and her consulting work in this project is funded by ICEIDA. The Project Document (PD) named “*Fish Quality Assurance of Fish Handling and Processing in Mozambique*” is attached as Appendix 5 to this report for further reference of objectives and background. The specific objectives, and expected outputs listed in the PD are shown here below:

### **Specific Objectives**

- To develop the capacity of Escola de Pesca staff to develop and undertake short-course training in fish quality assurance measures.
- To develop a concept for training various sectors of the fishery based on a comprehensive needs assessment of specific training needs of the different sectors of the fishing industry.
- To develop the appropriate tools (course structure, manuals, video, pamphlets etc.) for conducting demand-driven training in the fishing industry.
- To secure EPs position in providing short course training by providing the equipment necessary for conducting short courses in quality assurance practices.
- Train members of the fishing industry (semi-industrial fishery employees, artisanal fisher and small-scale fish marketers) and extensionists through the developed short-courses in Maputo, Quelimane and Beira.
- Develop an extension package for fish quality assurance measures in the artisanal fishing sector.
- Investigate the feasibility of incorporating fish quality assurance training into the mainstream activities of the EP and, if found feasible, develop an implementation plan.

### **Expected Outputs**

- The EP capacity to undertake short courses in fish quality assurance practices is secured through the availability of trained staff.
- A training concept/strategy developed for main sectors of the fishing industry (semi-industrial, artisanal, marketing) based on a comprehensive needs assessment.
- Short-course structure/syllabus and appropriate educational tools developed for various fisheries sectors including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.
- 10% of employees of major fishing companies trained using available tools.
- Extension tools for fish quality assurance in the artisanal fishing sector and small-scale marketing sector are developed and 50% of extension staff trained in application and dissemination.
- Concept for incorporation of fish quality assurance courses into mainstream curricula of the EP is developed.
- Demand driven delivery of short courses to fishing industry employees secures the financial sustainability of the course in the EP.
- Enhanced fish quality in the fishing sector and maintenance of EU export standards in industry.

The work was carried out based on the TOR for the mid term review of the project progress status, and with consideration of the above specific objectives and expected outputs of the “Project”.

### ***The mid-term Review Process***

The project midterm review visit to Mozambique took place from 19 to 31 October 2008. The school facilities in Matola were visited on three different days to review project developments and outputs against the objectives outlined in the Project Document. Two review workshops with industry, Ministry of Fisheries officials and other stakeholders were organized by Francisco Bomba Director of Escola De Pesca (EP) and his staff. The first workshop was held in Maputo on 22 October 2008, and the second one was conducted in Beira on 23 October. The minutes from the first meeting at EP and both workshops are annexed to this report, see Annex 1, and with list of people attending, and the minutes taken by ICEIDA Intern Ms. Nanna R. Ásgeirsdóttir give a good overview of the proceedings and discussions.

A meeting was held at ICEIDA in Maputo on 24.10.08 with consultant Luisa Arthur from INFOSA and Venâncio Nhavoto and Fátima Antonio, the two EP teachers involved in the curriculum development and responsible for teaching the different courses. At this meeting it was requested that Mrs. Luisa Arthur would deliver a matrix table of the different levels

of training materials created for the different courses to give a summarized overview of the modular design of the training documentation. This table is presented on page 11 and it also shows where documents are still not available or not viewed as needed to execute the project.

During the second week in country the third visit to EP took place on 28.10.08, where the rationale for the Classic course module was discussed with Director F. Bomba and the teachers on how they perceived its future role at the school. Also the focusing of resources and cost issues relating to the printing and preparation of the different course materials like brochures, books, PowerPoint presentations, and the “Tree Based” flip charts designed to be durable for in the field training in areas where no electricity was available, were discussed. The importance of the

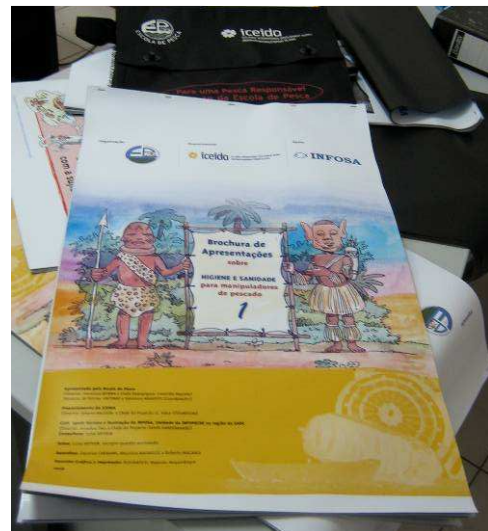


Figure 2 - Sample of a "Tree based" Flip chart printed on durable plastic for use in the field training (photo from N.R. Ágeirsdóttir)

proper assessing of the size the different target groups to be trained was emphasized in the discussions, as production volumes of the different training materials should be based on need to meet targets within the economic resources available.

On Wednesday 29 October a briefing session was carried out at the Ministry of Fisheries (MoF), where Victor Manuel Borge, Vice minister, and other MoF personnel attended, as well as Francisco Bomba Director EP, the EP Project teachers, and Jóhann Pálsson and Guðmundur Valur Stefánsson, Nanna R. Ásgeirsdóttir from ICEIDA were present. A Memorandum reporting initial findings that had been prepared by Sigurdur G. Bogason (SGB) was tabled and distributed to the participants (see Appendix 3). SGB presented his findings and motivated his conclusions on the project midterm review. Following the presentation (copy in Appendix 4) a round table exchange of opinions took place, where the Vice Minister commented on the results and highlighted several observations regarding the project. The briefing meeting gave a valuable opportunity for an open dialogue between the participants and resulted in a common view that the project has already created very positive impacts, and its continuation with a possible further expansion would be very

important for advancing the much needed take up of know-how in the Mozambique fishing industry.

## ***Results and Conclusions***

### **Project Status Evaluation and progress from initiation**

The midterm review of the Escola de Pesca (EP) project established that the team at EP was very spirited and approached the work with a creative approach. The consultant Mrs. Luisa Arthur from INFOSA had delivered to the project a large pool of material from other courses developed by her and INFOSA for different target groups in Mozambique and other neighbouring countries. The EP team had made use of this material for assembling information for the course modules, and added new material in the process of collating this into suitable training tools. This work can be applauded as being assembled within the tight timeframe available and testing in the courses conducted so far. Two “Classic courses” and ten “Express courses” had been taught in the period up to the review, with a total of 243 persons receiving training by this project. Of this number 52 were senior EP students and the other 191 were factory workers and quality assurance staff at 10 different semi-industrial companies.

Based on the experience from the courses the EP team and Mrs. Luisa Arthur (LA) confirmed certain elements about the training materials and course documents that need to be reconsidered. The documented curriculum will need to be further developed to better suit its purpose and the people targeted to receive the training. Special attention needs to be given to focusing the curriculum to the learning capacity of different society groupings, and not attempt to meet all needs with one type of teaching aids.

The dedication of the faculty of Escola de Pesca to this project and the dedicated technical support provided by LA from INFOSA is found recommendable, and the strong team spirit that has evolved can be described as a valuable unexpected positive outcome of the project. The capacity building objective of the project has now been given a good foundation with the dedicated involvement of the EP teaching staff in developing the courses, and this can be further built on in subsequent work in an expanded project should this be funded by ICEIDA. The first output objective in the Project Document (PD) has been obtained.

Table 1 - The following expected outputs / objectives have been met in full or partially:

Expected outputs	Status
<ul style="list-style-type: none"> <li>The EP capacity to undertake short courses in fish quality assurance practices is secured through the availability of trained staff.</li> </ul>	Achieved
<ul style="list-style-type: none"> <li>A training concept/strategy developed for main sectors of the fishing industry (semi-industrial, artisanal, marketing) based on a comprehensive needs assessment</li> </ul>	Partially
<ul style="list-style-type: none"> <li>Short-course structure/syllabus and appropriate educational tools developed for various fisheries sectors including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.</li> </ul>	Partially for some sectors, fully for others
<ul style="list-style-type: none"> <li>10% of employees of major fishing companies trained using available tools.</li> </ul>	Still in progress
<ul style="list-style-type: none"> <li>Extension tools for fish quality assurance in the artisanal fishing sector and small-scale marketing sector are developed and 50% of extension staff trained in application and dissemination.</li> </ul>	Not completed, and training development for “Extensionists” not started
<ul style="list-style-type: none"> <li>Concept for incorporation of fish quality assurance courses into mainstream curricula of the EP is developed.</li> </ul>	Not completed. Decided that Classic course is not suitable – needs revision
<ul style="list-style-type: none"> <li>Demand driven delivery of short courses to fishing industry employees secures the financial sustainability of the course in the EP.</li> </ul>	In progress, but further effort is clearly needed
<ul style="list-style-type: none"> <li>Enhanced fish quality in the fishing sector and maintenance of EU export standards in industry.</li> </ul>	Needs further efforts

### Observations regarding course materials

The “Classic course” modules seemed not to be particularly suitable for the intended purpose of providing training the EP senior students, and the schools Director confirmed that they do not intend to use this unchanged material for the schools curriculum. He said that this material would be maintained to use in training of personnel from INIP and the Ministry of Fisheries as a special on call training activity and/or refresher courses under requests when needed from the MoF. Secondly this training material could be used for the Fisheries School Curriculum intended to design courses for the EP students for Hygiene, HACCP and traceability. The third option would be using the classic course material for special training for the quality control staff at the industrial companies. However, the reviewer is of the opinion that the overall value of the effort of pulling together this material, which was to a large extent available at INFOSA, is considered marginal to the



project. An improvement on the value issue is to be gained if this would be redefined as general background material for various courses and the core text be reworked into a suitable format for the Teachers Manuals that still have not been developed, which constitutes a missed objective from the PD. Secondly this material could be useful for hosting courses for more advanced industry quality assurance staff or be used to develop refresher courses intended for inspectors at INIP and other MoF personnel needing training in this field, and this could also become an objective within Escola de Pesca for future activities to be developed, and this objective has been confirmed by the EP Director. Thus; by realigning the main focus from the Classic course as an implementing tool to developing curriculum suitable for the semi-industrialized companies and artisanal fisher communities would be of a higher future total project impact.

The color printed glossy brochures that had been prepared for the different elements needing attention by industry should be changed, as their real value is considered doubtful in the current format. They are relatively expensive and their medium- to longer-term value might be marginal it is recommended that the available funds should rather be dedicated to the preparation of really durable wall posters that could be left on a wall at the companies, where staff frequently passes like e.g. canteens or hallways. In this manner the information and pictures would act as reminders of what has been taught.

The two books developed and used in the “Express courses” (Book 1. Hygiene, and Sanitation for fish handling, and Book 2. Basis of HACCP for fish handling) represent a very significant development in the project, and the third book for traceability is close to be completed for printing. These books tell a story with many pictures and drawings and use simplified language intended for basic readers. The message is therefore mainly to be carried over by visual storyboard

recognition of basic concepts. The books are printed on strong glossy paper and should therefore be relatively durable for repeated reading or reuse. The cost per book was relatively high, and no analysis had been made on how many students in the fish industry would need to receive the books during course offerings or if it was planned to have them returned for



Figure 3 - Example of the wise fisherman giving the good message in the HACCP book storyboard.

reuse. This kind of analysis of the number of staff to be trained and who should be receiving which teaching materials is needed to ensure that available resources are properly matched to the actual needs.

The material presented in the book format might also be made available in loose page format to be delivered in a course ring binder, as this could facilitate updating of possibly redundant information at a lower cost compared with needing to print the whole book. Also the EP teachers could use selected slides from the PowerPoint slide presentations to prepare printed handouts for students needing updated information in a less costly manner.

The table no. 2 on the following page shows the different training materials developed, and

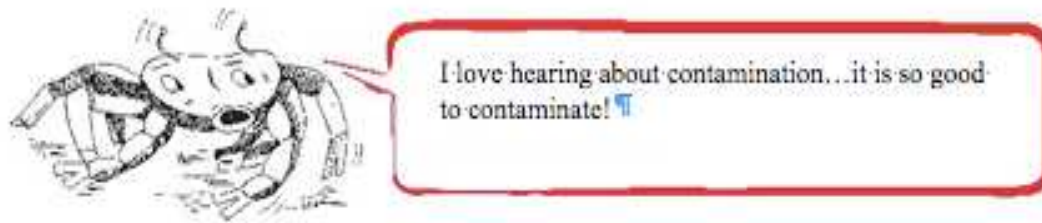


Figure 4 - In the storyboard the crab is in the role of the "bad" or naughty character giving bad advice to people, and its easy to recognize between right and wrong by the pictures. This is an example from the Hygiene book. also where materials have still not been prepared. This overview indicates a clear focusing on the three topics indicated by industry and stakeholders in the survey conducted by the Escola de Pesca team at the start of the project work. The three areas rated with highest priority by this survey for training needs, were Hygiene and Sanitation (Module 5), Quality control and quality assurance Systems – HACCP (Module 10) and Traceability (Module 11).

The documentation for Modules 1-5, and 10-11 included the Classic course documentation discussed earlier, which in the table no. 2 are defined as the Lesson Plan, and represent adaptations of material available at INFOSA. These documents need to be used as background information for the teachers and in some cases are suitable directly for more advanced students. More work is needed to develop from this material appropriate student guides and handouts for the course attendants based on different learning capacities, and finalize the missing teacher manuals.

**Table 2 - RESUME OF THE TRAINING MATERIAL (table from Mrs. Luisa Arthur)**  
**ESCOLA DE PESCA AND ICEIDA Project**  
**Maputo, Mozambique, 2008**

	Lesson plan	Guideline - Classic course		Book - Express Course		Posters of Presentation - Course in small Communities Basic and illiterate level For Participants (Fishermen and small scale communities)
		Guideline	Power Point Presentation	Book	Power Point Presentation	
	High and medium level  For teachers	High and medium level  For Participants (Quality Control, Inspectors and Workers)		Medium and Basic level  For Participants (Workers and Fishermen)		
<b>MODULE 1.</b> INTRODUCTION FISHING ACTIVITY IN GENERAL	<b>1</b> (33 pages)	-	<b>1</b>	-	-	-
<b>MODULE 2.</b> BIOLOGICAL ASPECTS AND PHYSIOLOGY OF THE FISH	<b>1</b> (10 pages)	-	<b>1</b>	-	-	-
<b>MODULE 3.</b> CHEMICAL COMPOSITION AND MICROBIAL CON-TAMINATION IN FISH (quality changes in fish)	<b>1</b> (14 pages)	-	<b>1</b>	-	-	-
<b>MODULE 4.</b> FACTORS INFLUENCING STORAGE AND SHELF LIFE OF FRESH FISH QUALITY	<b>1</b> (20 pages)	-	<b>1</b>	-	-	-
<b>MODULE 5.</b> HYGIENE AND SANITATION	<b>1</b> (65 pages)	<b>5</b>	<b>5</b>	<b>1</b> (46 pages)	<b>*</b>	<b>6</b> (small books with 10 posters each)
<b>MODULE 6.</b> FISH QUALITY PRESERVATION	-	-	-	-	-	-
<b>MODULE 7.</b> QUALITY OF THE FISH PRODUCTS FROM AQUACULTURE	-	-	-	-	-	-
<b>MODULE 8.</b> PACKAGING, LABELLING AND ECO LABELLING	-	-	-	-	-	-
<b>MODULE 9.</b> FISH PRODUCTS AND INTERNATIONAL STANDARDS AND REGULATION	-	-	-	-	-	-
<b>MODULE 10.</b> QUALITY CONTROL AND QUALITY ASSURANCE SYSTEMS	<b>1</b> (41 pages)	<b>4</b>	<b>4</b>	<b>1</b> (40 pages)	<b>*</b>	<b>4</b> (small books with 10 posters each)
<b>MODULE 11.</b> TRACEABILITY	<b>1</b> (33 pages)	<b>2</b>	<b>2</b>	-	-	-
<b>MODULE 12.</b> INSPECTION SERVICES	-	-	-	-	-	-

Note: \* need to adapt and to do the new Power Point slides for this level

### **Stakeholder workshops and review meetings**

The meetings with Escola de Pesca faculty showed keen dedication and interest of the people involved in the project, and the capacity building has progressed in a significant manner. This support to capacity building should be further encouraged and the EP needs to stay in close contact with the industry to motivate its interest in the possibility to acquire new knowledge and build up the industry capabilities to enhance its product quality and safety. During the review meetings the importance for EP to have a clear overview of the fisheries industry and its segmentation was discussed. Francisco Bomba, Director of EP provided a recent statistical overview report on the industry that underlined the importance of this training initiative and its further development in coming years. These overviews report on artisanal fisheries from IDPPE / MoF<sup>1</sup>, dated January 2008 shows the importance of having a strong focus on the scale of things. In Mozambique there are 1.217 fishing centers, 135.529 fishermen using boats to catch fish, and additional 144.511 catch fish without using a boat. The statistics indicate that the size of the artisanal fleet is 39.398 boats, and that multitude of fish and seafood species are harvested, numbering over 40.000 species. Similarly a recent FAO report<sup>2</sup> indicates that the industrial and semi-industrial sectors combined accounted for about 43% of the recorded catches in 2004, while the artisanal sector accounted for about 57% of the total catches. Further to the more than hundred thousand people directly involved in the fishery sector about 500 thousand people depend indirectly on the fishery activities for livelihood. The economic importance of the fishery and more recently growing interest in aquaculture (more than 3.600 people 70% women involved in 2004, reported by FAO<sup>2</sup> / IDPPE) makes it critical to target courses to different groups to ensure most effective results for Escola de Pesca and the Mozambique people in general. It is indicated in the FAO report that women are typically serving as a bridging partner between fishers, producers and the consumers in the distribution chain. Therefore special attention should be given to prepare dedicated courses focusing on the women traders and their groupings or associations handling and trading fish. The training efforts could deliver significant impact towards reduction of losses of caught fish and seafood that could be prevented by improved knowledge about how to preserve quality by

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<sup>1</sup> Recenseamento Da Pesca Artesanal, January 2008, República De Moçambique Ministerio Das Pescas, Instituto Nacional De Desenvolvimento Da Pesca De Pequena Escala (IDPPE)

<sup>2</sup> FAO Fisheries Circular No. 1033. Rome 2008, Present and future markets for fish and fish products from small-scale fisheries – Case Studies from Asia, Africa and Latin America.

employing better industry practices, and thereby concurrently increase safety levels of the seafood in local as well as the export trade.

The development of the “Basic courses” is still not completed, and this should be expedited with more than one target group audience in mind as the artisanal sector and the semi-industrial, and the fish markets (selling points) all represent different challenges. Also the training of Extension personnel linked to IDPPE should be given some priority, as the multiplication factor of dissemination efforts should not be underestimated. EP faculty could then host regular retraining courses to update the extension people on their knowledge and create some harmonization effects on improvement steps in fish handling methodologies, and food safety matters.

### **Workshops**

The two workshops gave clear message of satisfaction with the training effort and expressions of interest for more national / regional coverage and access to training as was being offered by EP with support from ICEIDA. The minutes attached to this report in Appendix 1 give a running account of the discussions and exchanges of opinions. F. Bomba, Director of EP, addressed the sustainability of the course offerings at the workshops and that industry should provide (partial) funding for the local costs at each fishery center / factory / larger vessels etc. The industry representatives did not volunteer much on this, and in some cases the industry representatives were not with a management mandate to discuss such issues. Clearly EP would need to follow this up and develop practical cost sharing modalities to ensure future sustainability of the industry-based courses. The artisanal industry might not have much means of providing support to such training initiative although clearly very much needing to be able to benefit from such opportunities.

Here below are some selected examples of comments expressed at the workshops:

- *Need to reduce and prevent losses of product, ensure health of the consumers*
- *Of interest to have an exchange program of staff between companies and countries in the S-African region to do audits of quality and Hygiene to broaden know-how and horizon of experience*
- *“Language” of the two books is hard to understand – more graphics and pictures would be of interest to staff – use less text,*
- *Course curriculum could be prepared for students at secondary schools to start preparing for proficiency early on,*

- *Industry representative stated; “Course offered by Escola de Pesca causes higher attention and interest from staff than own in house training”,*
- *Factory owner; “Positive experience from the course, and courses like these were always welcome” non committing on participating in course costing,*
- *Company representative; We learned many new things at the course – many that we did not know about before, and we could improve things in our company due to the new knowledge,*
- *Fishermen don’t know about proper fish handling or quality. Many problems on reception due to spoilt or contaminated fish arriving,*
- *Aquaculture company representative; The course was very good we had never had a HACCP course and EP teachers managed to explain what it is about,*
- *Important to offer repeated courses to ensure that the training is retained,*
- *Company’s present expressed worries about the eagerness to be expected to have the courses offered due to current bleak economic outlook in the seafood processing industry. Economic benefits of this not to clear. Many semi-industrial companies have not managed to export goods for a long time,*
- *Keen interest by IDPPE to develop hands-on training materials suitable for use at the regional fishery centers to enable showing by example simple means for improvements,*
- *Short video clips were mentioned as good means to carry important messages to the fishing communities. These should be based on real people and circumstances to give practical examples for improvements – using local examples.*

The briefing meeting at the Ministry of Fisheries was scheduled for Wednesday 29.10.08, and was hosted by Victor Manuel Borge Vice Minister of Fisheries, key people from MoF staff, and the EP team, and Jóhann Pálsson (JP), Gudmundur Valur Stefánsson (GVS) and Nanna R. Ásgeirsdóttir from ICEIDA attended the meeting. At the meeting a Memorandum (copy in Appendix 3) summarizing key findings was tabled by the Project Reviewer Dr. Sigurdur Bogason (SB) from MarkMar ehf, and he presented the results of the project evaluation. Recommendations for the continuation of the project and its potential expansion were highlighted in the presentation (see copy of the slides handout in Appendix 4 to the report). Following the presentation of the project review the participants discussed around the table, its status and possible next steps in the project. Some key observations made in the discussions are listed here below.

V.M. Borge Vice Minister said that this project and similar efforts were important as they provide means to:

- fight poverty,
- improve food security,

- increase amount of food available by preventing unnecessary losses
- help to manage use of by catch,
- improve development of aquaculture,
- help people to obtain more value from their work,
- Escola de Pesca should be leading efforts in providing training,

Jóhann Pálsson (JP) made an intervention into the discussions stating interest from ICEIDA to work further on quality issues, and mentioned the long-standing support to the Fishery Laboratories. The current low level of training in Mozambique fishery sector compounded by lack of knowledge on how to train, gave incentives for focusing on more capacity building efforts. This project could be seen as a good start as a pilot project, and already has a two years history at ICEIDA.

V.M. Borge Vice Minister responded stating that the artisanal fishery contributes significantly to the overall catches, and obviously a strong need exists for improved traceability systems and training for getting this operational. Training in this area could be crucial to ensure means to start supply chains that could open new marketing opportunities.

GVS mentioned the concern that large losses post harvest is due to e.g. lack of ice although the cost of ice probably is much lower than the value lost. He mentioned the importance to work on the by catch issues to ensure that the by catch can be marketed to prevent discards.

JP said it is important to be involved from the early stages in any process to develop best practices, and a good example would be to focus on small to medium size companies in the early stages of development in the aquaculture sector.

Francisco Bomba said that now training capacity was established at EP that could be further developed, and the comments in the reviewer's/evaluator's reporting supported further ambitions at EP in the direction to become a leading education institute in the Mozambique fishery sector.

## ***Recommendations***

The project has delivered many of the expected outputs and answered to the objectives that were described in the Project Document, from March 2007. However, some key objectives

have still to be realized, and below are listed some issues of concern as well as the positive issues needing follow up.

Issues for consideration:

- Analysis is needed to establish different groups of potential beneficiaries, and classifying as target groups with itemized need of practical curriculum dedicated to each category based on capacity to receive / retain information,
- Prepare a costing analysis for the different target groups in relation to course materials to be handed out to each student, factory, boat etc.,
- Based on above costing analysis prepare an appropriate strategy on how many units of each type of course materials can be economically disseminated over next 2 years (short-term) and medium-longer term over the next 5-7 years. The economics of preparing books, handouts, brochures and posters must take into account forecasted funds available for sustaining this training program,
- If above analysis should indicate lack of resources to carry the currently developed teaching materials over to the beneficiaries over medium- longer term, a redesign of course materials to provide better fit to purpose is needed,
- Escola de Pesca must have full right of use of the course materials developed, and the arrangement on this aspect should be clarified with INFOSA,
- The brochure poster format is not convenient (useful) if they are to be left on a wall of each company to provide access to reference materials, and it is therefore recommended to change format to real wall durable posters for longer use, which can be left as an information resource at each company receiving training,
- Doubt is raised regarding the rationale for the Classic course and the material prepared for it. The project document (March 2007) clearly indicated a needed focus towards the semi-industrialized companies and the artisanal fishers, and therefore resources dedicated to the Classic course should be redirected towards this objective. Classic course material could be reused as a part of the Teacher Manuals that have still not been prepared, and should receive proper attention as soon as possible,
- The books prepared for the Express course are a very positive development, and are considered to be excellent teaching material suitable for purpose, and if it can be proven that its cost benefit ratio is correct (see points above), and it is found economically feasible, similar books should be prepared for all course modules and disseminated to the course participants,
  - The books with story lines on Hygiene and HACCP are well developed and provide means to carry home key messages,
  - Format in a book vs. single pages in a ring binder publication should be re-evaluated in future to facilitate updating of parts when needed,
    - Cost versus usability?
    - Handouts suitable for different course levels needs further consideration,



- Story Boards printed on plastic for use in places where no electricity is available “Tree based flip charts or (Tree based Power Point presentations)” is an excellent concept, and more effort should be dedicated on developing more additional simple and economical means for hands on training to efficiently reach out to the artisanal fishery communities,

Implementation issues:

- The need assessment done at the start of the project should be revisited,
- Focus on Hygiene and HACCP are more downstream issues, and have low impact if raw material handling upstream is the root of the problem,
  - Quality can not be put back in if it is lost at earlier steps in the process,
  - Quality Assurance can prevent mistakes and loss of value,
  - The value message is the most important one to implant
    - Scaring the life out of the course beneficiaries is less productive means to implement needed industry improvements,
- Quality of the live fish / shrimp is perfect (100%) at time of catch from then on it is a battle with time and environment, where ranking of importance is:
  - Temperature management is the key one,
  - Handling methods for raw materials,
  - Hygiene and processing environment,
- Focus upcoming training efforts toward upstream causes of problems,
  - Best cure to a problem is to stop it at source,
    - Preventive measures are the most economical ones.

Recommendations:

- A. Strategic analysis of possible number of participants for different course levels,
  - i. How many candidates in each target group,
  - ii. Cost of delivering to each group,
  - iii. Cost of producing course materials for different groups,
  - iv. Prioritize budget on most cost effective dissemination strategies,
    - Who need to get the books, how many will be needed,
    - How to deliver posters that can be left at the companies receiving training – Reference materials and further reading,
    - Who will get power point handouts,
    - Who will only receive basic course and hands on training without retaining course materials.
- B. New follow up project to extend the work is highly recommended based on very positive achievements to date, focusing on following areas:
  - i. Raw material handling from source, and processing,

- Preserving quality from artisanal fishery,
  - Training Extension personnel for hands on training efforts,
  - Retaining quality during critical primary and secondary processing steps.
- ii. Processing for sustainable economic use of natural resources,
- salting, smoking, drying etc. and other means requiring minimum operational costs.
- iii. Aquaculture husbandry,
- water quality, feeds, veterinary medicines use,
  - welfare and good husbandry parameters needed to deliver good product quality and safe food to markets,
  - environmental considerations and sustainability.
- iv. Aquaculture health,
- sanitary issues relation to product quality,
  - processing of aquaculture products,
  - Hygiene and sanitation, HACCP, Quality management, and Traceability course modules adapted to aquaculture.
- C. Maintain and expand on results from the earlier project through collaborations with e.g. INIP, IDPPE and INFOSA to streamline training through Escola de Pesca as the lead player in national fish industry training efforts in Mozambique
- D. Focus upcoming training efforts toward upstream causes of problems,
- Best cure to a problem is to stop it at its source,
  - Preventive measures are the most economical,
  - Economic returns mostly depend on how well the job is done,
  - Provide positive messages when appropriate,
  - Scare campaigns can be counterproductive.

Providing true know-how to people like the artisanal fishers and their communities, and the importance of their actions for their economic wellbeing should be seen as the fundamental tool needed to empower them to progress faster to a sustainable development on their own terms.

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## ***List of Annexes***

Appendix 1 Minutes from meeting at EP 20.10.08, and Review workshop in Maputo on 22.10.08, and Review workshop in Beira on 23.10.08,

Appendix 2 Terms of Reference for the project midterm review,

Appendix 3 Memorandum: Review of project, dated 29.10.08,

Appendix 4 Presentation handout from 29.10.08

Appendix 5 Project Document for the Project, dated March 2007,

## Appendix 1

### Minutes of meeting at Escola de Pesca 20.10.08 (9:30-11:00)

**Escola de Pesca:** Francisco Bomba, Director, Venâncio Nhavoto, Fátima Antonio, Cremildo Ngulele, Reis Candido Muando (translator)

**ICEIDA:** Guðmundur Valur Stefánsson, Maria da Rocha (translator), Nanna Rún Ásgeirsdóttir (Secretary of the meeting)

**INFOSA:** Luisa Arthur, Abilio Candido

**MarkMar:** Sigurdur G. Bogason, Project Review Consultant

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#### **Francisco Bomba starts the meeting by giving general information on EP (Escola de Pesca), its history and development.**

EDP was founded in 1977 and was financed by UNDP but FEO (Food and Agriculture Organisation), was the institution that came and started and installed the EP program. The location was chosen because of the river running through the area. There used to be a company owned by a Portuguese situated there, a fishing company or a processing company. This place was also used to make food for animals.

The first step of fishing activities in MZ (Mozambique) was the institution, Center of Fish Studies. This institution started working on research matters. The research institution was relocated in 1977, the same year EP was founded. Training activities started at EDP in 1978. In the beginning all of the students stayed here and lived here, so it was in fact a boarding school entirely. However when the new economic restructuring system was introduced, EP had the same problem as everyone else had in every other industry. Most of the activities started to have problems, not only in the agricultural area, but also in the fisheries area. Before the new economic restructuring system, the government had had the power to distribute and locate people after they had received their training. But after this restructuring period, the government did not have the same power as they used to. The number of student decreased after this change. Partly that was due to the fact that the students were trained for free before this economic restructuring period. The number of students trained in total from the beginning is about 1500, more or less. The main courses we were offering were around 8 courses. This kind of system was very difficult not only for the student training, but we also had some problems with the companies. So we decided to introduce a new curriculum. Now we have two stages in our curriculum. From the years 1987, 1988-2000 and again from 2002-2003, there were two periods of different curriculums. The second period/phase is still under way today. So to summarize, the newest curriculum, the one we are using today, it was implemented in 2002-2003. Part of that is engineering, navigation, and from the year 1995 the third course is biology. The course is not a regular course in terms of regulation, they are trained only to be able to meet certain needs, needs of IDPPE, extinction from the field, from the beach side to collect data, give information to the fishermen, the technologies in fisheries, which can be used, the best technologies. I think that this will be only the first course; we are not continuing to offer this course, unless these institutions are asking for the continuation, based on their needs. Those two institutions that would ask for the continuation of this course would be *Marine Research Institute (IIP)* and *Small Boats Agency (IDPPE)*.

Probably we will try to develop a new course, hygiene and HACCP. From the beginning of this year we enrolled about 215 students, some of them, around 85 of these students are leaving soon. A part of them are commuting every day (not living on the premises). The number of girls is 52; they belong to the group, which is commuting. Training girls is a new experience for us here at this school. But from 2005, the girls started studying, and so they approximately around 25% of the total number. They are studying all the different courses that we offer.

Thirty teachers, half of these teachers are part time, and half full time. Some of the teachers that work part time come from the IDPPE and IIP. The institution in terms of structure has three main levels or three departments, the director, finance management and human resources, and the third department dealing only with the boarding school. The total number of the staff is around 75-78, including the teachers. In terms of finance or resources, we have finances coming directly from the government, which involves the main payments for the school, salaries, and equipment. We have now this project funded by ICEIDA, and then there is another project funded by Japan. Next March we will end this project with Japan. This project gave us

a lot of equipment for fishing technologies, vessels for training the students. Part of the project is also training the teachers.

Japan offered three boats sized 6 m, 8 m and 15 m. These vessels are not the best for training sessions because they don't have the best conditions for training, they don't have the dorm on the boats, they have to travel every day and come back again in the evening/afternoon. Anyway we don't have an alternative. We are thankful to the government for receiving this equipment, so we cannot be ungrateful for the boats. We would like to have what we call, fishing simulators, for the navigation, and to use it for fishing at the same time, how to navigate and fish at the same time. This was what EP proposed in the beginning to the Japanese, but they unfortunately did not support this idea, "sometimes we just have to receive what others are willing to give".

Building of class rooms will be funded by EU, this has not started yet. There will probably be new boarding houses as well. In general this is the basic information on EP.

**After Mr. Bomba, Luisa Arthur takes over to speak specifically on the development on the training material made by EP.**

We started in January 2007 (contract initial signing in March), EP was coming in three or four provinces, and they asked them if they needed some training. Nhavoto stayed in Iceland for two months, received good training, how we could prepare for the training program, so it was not only management training. After the course there was a small workshop, about two weeks, that was preparation for this work, quality control. The first draft for this project we did in Iceland, Luisa believes this started in the best way. They made a NEED ASSESSMENT, with the information they got from the provinces. What they discovered was that hygiene, HACCP and traceability were a priority. That does not mean they didn't need also information on salting, smoking etc, but the other things were of more importance. The week after the second phase started, everything has been happening quickly. INFOSA needs to train the teachers for the fish school.

In the beginning they started with the general material, for less advanced students. It is important to start discussions on making material for more advanced students as well. There are two types of courses, classic course and an express course (intensive course).

The classic course is for people with medium level, fish processors, people who work with quality control. Then there is the express course, short course, directly in the factory or on the boat, which lasts for 10 hours. So we go there on location to give the express courses. There is the need to also go to the fishing communities, for illiterate level. Our proposal is to stay there for 6 hours, stay with the community, however so far we do not have a good experience with this. The brochure on traceability is not the final edition (it has not been completed yet).

Luisa feels that during teaching session, there should be power point, videos, so that the student's senses can be stimulated.

Traceability is still only for the medium and high level. In some cases, we go to work with basic people, they don't have electricity, and so therefore we need to prepare big posters, which we can use as teaching material (size about 3 meters). Sometimes the entire community comes to these teaching sessions, but it varies. The signs on the posters help to explain everything, you see the picture, do not touch your hair, for example if you do not understand, then at least you see the picture, so you can understand. We would also want to make some videos, we saw some very nice material from Sri Lanka, very short, but very good. The students get very enthusiastic about seeing these films. We need very simple films, we already have some films, which are 15 minutes in length, but they are boring. We need them to be shorter and more entertaining. It would also be good to go to the fish markets, and visit factories to film. In general, all courses are going to have evaluation for the teachers, and the students. The report will show how this is going in the four provinces, the express courses and the medium programs. INFOSA is very happy about this kind of program, because that is exactly what INFOSA emphasizes.

The classic course has been twice  
The express course has been ten times  
Participants have been around 250

Some of the students after these courses ask more questions, they are curious, and they want to more information, they see the use in knowing this information. Unfortunately the results of these courses are not always good. In some cases the tests before and after the course show a negative result. We try and find out what has happened, discuss what went wrong. Perhaps sometimes we give the participants a bad and

complicated experience, but it is good to have these tests so we can find out what went wrong with the teaching course. One thing to remember is that these courses need a lot of material, for example, plastic boxes, chorine, equipment etc., it is important for the courses to have all of these materials.

Also us to work with national consultants, most of the time, they give us lectures, and us try to improve, not every month, but in some kind of subjects when you feel it is not OK, to check if coming well, also to invite other people to come and assist the courses.

Try to encourage the people to use this information. Demonstration is also important while teaching, kike teaching them inside the toilet. It is also important that the students help other colleagues later on, by giving other people the information.

So it is sometimes good to be able to show people, that they have bacteria etc, because sometimes they do not believe that they have bacteria. IDPPE should work on the teaching material on smoking, salting etc. The next step would be to buy the documents, or share the technical information. EDP with the material we already have (hygiene, HACCP, traceability), and IDPPE would work on the other materials. IDPPE they have already started work on this, some material from 15 years ago. Last year, IDPPE introduced new material, very nice, with pictures. Now INFOSA with a budget from the CFC, from Netherlands, have a big project with Angola and MZ, new guidelines about the smoking and salting. Why new material? Well people like to be stimulated and have new material, and also, this is not exactly the same material. Sometimes, the information is specific to the region it was initially manufactured in. The information on African conditions are missing, we need more information on how these things are within specific fishing communities in Africa.

International consultants are good to give good, new ideas on how to make this material. This is the project for the IDPPE and the work she is doing for INFOSA. The plan for January is to do a course with the teachers. They need to learn about salting, smoking etc.

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### **Workshop at IIP 22.10.08 (8:00-11:00)**

**MOF:** Victor Manuel Borge, Vice minister

**Industry and stakeholders:** Refer to List of participants on last page of the minutes

**Escola de Pesca:** Francisco Bomba, Director, Venâncio Nhavoto, Fátima Antonio, Cremildo Ngulele, Reis Candido Muando (translator)

**ICEIDA:** Guðmundur Valur Stefánsson, Maria da Rocha (translator), Nanna Rún Ásgeirsdóttir (Secretary of the meeting)

**INFOSA:** Luisa Arthur, Abilio Candido

**MarkMar:** Sigurdur G. Bogason, Project Review Consultant

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#### **Fatima Antonio**

Starts the meeting, everyone introduces himself or herself, and Fatima Starts goes through the schedule for the day.

#### **Mr. Francisco Bomba**

Announces that not all of the participants invited are present, but even so, he is happy to see those who did make it.

#### **Vice Minister of Fisheries**

Regarding fish quality control, it is important to be here as we are the authority on fish matters. It is important to develop the course for the fisheries sector, for the knowledge. The competent authority IIP and the EDP, with the contribution from ICEIDA are working towards this purpose. We have to look at all of our sectors to guarantee quality.

#### **Francisco Bomba (See also Project Document)**

Introduces the summary of the project to show the participants what they can expect. Project is two years duration, from January 2007 to December 2008. The donor is ICEIDA, total donation from ICEIDA, is

620.000, and the government contributes 60.000 USD (not necessarily in direct cash). Technical assistance comes from INFOSA.

**General objective:** poverty alleviation, strengthening of economic and food security in the fishery sector and development, specifically implementing a training program to secure fishery quality control for the fishery industry, as means to increase the quality for the global consumer and we may also not forget the normal consumer within MZ.

**Specific objectives:** When we talk about capacity building we talk about capacity building at the EDP. I would like to emphasize, we had initially contact with institutions that are working with us today. Capacity building, regarding production and the provisions of these specific objectives include the assessment of needs for the industry.

- The development of tools, pamphlets, videos etc.
- Secure the capacity building at EDP with training courses, so that these short courses can be carried out.
- Training of members of the industry, small-scale fishermen, fish vendors and extensionists.
- Location of implementation Maputo, Quilemane, Zambesia Province.
- Develop a package for quality control in the artisanal sector.
- Assess the possibility of incorporating these goals within the EDP.

**Expected results:** Increased capability of the EDP and quality control

- Develop a strategy of training for different sectors of the fishing industry
- Restructuration of short programs and adequate tools of different sectors of the fisheries.
- At least 10% of the workers in the fishing industry should be able to use those tools.
- At least 50% of the extensionists should have this training.
- Increase the quality of fish in order to be able to export to foreign markets.

### **Venancio Nhavoto**

Fatima and I are both vets, we have been involved in this project from the beginning. We have been working on the project quality control; fish quality at regional level

The Fishery School “Escola de Pesca” was founded in 1977. Until 2007 the school has trained 1293 technicians, coming from different parts of Mozambique. It was for the need of this project that this project started. The importance was to improve the quality of the fish, to organize short courses, so that we can go to the field, and see what is going on in the industry.

In order to start these activities, we had a need assessment made in different provinces Sofala, Zambesia, Maputo, Nampula and Inhambane. In this survey, we proposed 6 courses for this industry and the number of people who should be involved in this sector.

The results from the Need Assessment showed that the courses were preferred by the industry, were HACCP, Hygiene and Sanitation and Traceability.

In total we had 12 modules. The project only developed 6 modules. We skipped from module 5 to 10; this is because these are the modules that have already been developed by other partners within the industry.

6 modules: lesson plans, guides, books, brochures, videos, power point, handbooks, and some of the material specifically for illiterate students.

**Training material, types of documents:** Lesson plans, guides, power point presentations, handbooks, brochures, Films. Some of the recent material produced like posters, were especially produced where there is no electricity. With regard to lesson plans, we have 7 plans developed.

### **1. Course on Hygiene and Sanitation**

We focused on how to do the cleaning correctly; we used to ask the students what is hygiene. This material is based on regulations. One of the steps of the industry is to wipe the litter of the ground. Cleaning also includes other steps. It is important for the person in the industry to know the dosage, temperature and how they are applied. It is important to clean the floor frequently. If the floors are not being used a lot, then at least it is important to clean the entrance. Individual responsibility, if people don't handle the products properly then there is physical risk for that person. It is important to register all activity. WHEN, HOW, WHO, it is

important that someone is held responsible for this registry. There are in place certain quality control practices within the industry we just wanted to emphasize.

**2. Course on HACCP:** EU requested that people respect the HACCP (we didn't change the name). Students in general felt that this part of the course was more difficult and harder to understand. This course depends on what we looked at in the first course, which is hygiene. So within the first stage we analyze the hazard, it is important for the person to see if there is a problem (CCP) or not. In all stages it is important to pay attention for the whole process, to see if there any risks or hazards.

### **3. Course on Traceability**

Traceability involves the entire chain from the origin to the consumer. Applied to a certain degree within the industry and it can be applied in other industries, e.g agriculture. It is about where the products come from, in order to find out where the problem started. This is part of the classical course, unfortunately the Sofala province did not benefit from this course. It is necessary for the industry to have specific codes, companies each containing a separate code.

### **Types of Courses**

Classic Course: 3-5 days. Short courses for medium level participants, for example technicians of Quality Management and students for the Fishery School.

- Express 8-12 hours: a short course for people with no education, for example small-scale fishermen.
- Basic course 4-8 hours: illiterate people, fishermen, artisan fishermen,
  - In total there were 2 classic courses and 10 express courses.

\*MARBONE, we had some problems working with these people, as they mostly spoke their local language, need to find a way to work with people who mostly speak the local language.

**Evaluation:** In each course there was evaluation, 0 poor, 1 regular, 2 good.

Slide showing the evaluation grade and places where the courses were implemented. We evaluated not only the students, but also the teachers. Then they would classify the teachers, we also had an evaluation of the course, which we gave the first day and the last day of the course, then we could see if there was negative improvement or positive.

During the course we had evaluation; result from the evaluation. We also evaluated the teachers, and the average grade was 2, which is good. We also evaluated the participants, before and after the course. So we rated them in four categories, negative improvement, not considerable improvement (less than 5%), considerable improvement (more than 5%), and good improvement (more than 15%).

\*For the first question, the participants showed good improvement, but most participants in different companies had difficulties with the second question.

\*With regard to the HACCP, what does HACCP mean? Why should I mix fish with ice? Those were the two questions given for the evaluation. The same thing happened with the evaluation as before, first question showed good improvement, but participants had problems with the second question. We also evaluated the courses themselves, the rate ranged from 0-3, 0-bad, 3-excellent (see slide for results).

\*A part from these activities, the project also funded some refurbishment of EDP and the library. Two people were also supported to go to Cape Town for a workshop.

\* Aside from the training material introduced here, there is also the development of videos. Each will be 5 minutes in length.

\*We couldn't have any courses in Zambesia, we will contact them within the next month to see if they can participate. They were not able to offer artisan fishermen either.

\*We intend to expand into aquaculture.

### **Intermission**



**Fatima Antonio**

Fatima asks for comments from the people from the industry.

**Representative from Solmariscos**

The course lasted one week. There was a positive impact for the visual system; it helped us see the difference. The workers took the teaching material two weeks after the course, and they reread and corrected what they had been doing wrong. This course helped us from the training we had before, the impact was spectacular, and we were satisfied.

**Sonja, representative from INIP**

I found one thing interesting, the material being for different levels of the industry. Our proposal is to have more pictures. But in general we are happy with the work of EDP, and it will increase to a point the quality of our product.

**Pesca Norte (Information missing regarding speaker)**

I would like to comment on the importance of EDP and these courses. There is a need for quality in raw material; and we need the training to follow the artisan fishermen. The entire coastline has artisan fishermen. We ask who is going to finance the training of the artisan fishermen? It is though not all about the training, we have to create a situation to pass on this knowledge. And offer the materials so they can also apply these procedures.

**Guðmundur Valur Stefánsson**

Dear colleagues, what I am thinking about this moment is whether or not this project will influence the fish buyer, will he have fresher fish, will he know where the fish came from, will he feel that it is healthy and secure, if the answer is yes, then we have done a very good thing. Then the question is what to do now. The situation is that this project is soon coming to an end. We are trying to figure how we have done, and if we will continue and how. One of the main things which I think is important to figure out, is what the real need for courses like this is, and also what kind of courses, and also how many people need courses like this in Mozambique. Will we be able to give courses to all those that need them. If that was a possibility, the question, what would that lead to, would that increase the value of the fish? What would the result be? And also we have to take into consideration the links to other similar sectors like aquaculture, not only the fishing sector; we can look more around the sector. I think aquaculture will develop in the coming years, and I think that these sectors can work together. I would like to end this on one thing, thank you Fatima and Venancio for this presentation; I have a very good feeling for this project, thank you very much.

**Vice Minister of Fisheries**

I would like to say that one of the main objectives is to reduce losses in harvest. We have exploited a lot from the sea, so now is to develop aquaculture, and reduce loss of harvest. If you want to know how many people, I think all artisan fishermen, we are focusing on the industry but we cannot forget the coastline, like my colleague mentioned earlier on. We have around 140.000 artisan fishermen. We want to protect the health of the consumers in export market but we also want to protect the consumer in Mozambique. We have a memorandum, so that we can check quality here and there. I am not going to say the same thing for EU, but here in Mozambique we have this system of checking, so that is a starting point. If we could go to a bigger scale that would be our objective, we are starting from small things and going to bigger things.

**Albertu Simao, representative from Pirep**

I would like to thank the IIP for inviting us, even though we could not participate in the courses. Our program is a technical restructuring program it is called Pirep. It is a capacity building program and a technical program. We are developing infrastructure in different parts of the country, in different fields; aquaculture, fishing or other activities. For us it is important that the quality control is good and that this program is developed. We are looking at the school as a resource center so we can go and get the materials that we have in mind. This body, finances these small programs within this Pirap program. With this potential, although we have managed to develop this, we still have problems with quality control, so we can supplement this (EDP material) with the program we have already created. Other than the artesian fishing industry, there is at least a field for us to cooperate.

**Carlos from Pesca Sul**

We are sorry that our company could not participate in the course. We would like for the courses not be in the beginning of fish season. We think it would be better if you could create conditions so that the companies can participate. Our experience is that when the courses are held within the companies, our workers do not absorb the knowledge properly.

**Francisco Bomba**

I would like to inform that the vice minister of fisheries will be leaving; I hope that will not discourage us.

**Francelino, a student from EDP**

I would like to thank for the course that we had, it was a great opportunity for us to learn about fish processing and handling and to have an idea of how it is applied in the fish industry.

**Francisco Bomba**

We want to hear more from the industry, we cannot continue if the industry is not giving us feedback on how to continue. We had Mr. Carlos da Silva speak earlier. Today we have ICEIDA with us, and the fisheries school does not have the finances to sponsor this alone. So we need to make sure that these courses can continue. Therefore these companies that are here need to show that they are interested in the continuance of these courses.

**Woman speaks (name of industry missing)**

Mr. Valur asked if the consumer would know where fish comes from. At this moment, the consumer knows where the fish comes from. In our companies we have artisan fishermen, we put them in association. When they arrive we give them a code, so that this material comes from X island. So we supply the information of where the fish is coming from. Somebody went to train these people, and these codes come on the package. So today the consumer can see where the product is coming from.

**Francisco Bomba**

I would like to emphasize some comments made here earlier. With regard to training material, it needs to be oriented for the target group as Dr. Sonja said. At the moment, the level of the language used in the books is high. So we need to review this. This was one of the comments from the auditor as well. Our goal is to provide training for the entire country; we want to improve the conditions at different landing places in the country. We also understood that there could be the possibility of cooperation between EDP and Pirap. As EDP is based in Maputo, there is a limitation of our work and therefore cooperation with others could prove beneficial. Maybe the school could have more students in partnership with other partners, so the school could expand their work all over the country with new partners. We do not want to break the momentum of our work, and therefore this discussion here is important. Comments were also made about training taking place during off-season.

**Sigurður Bogason**

This has been informative and positive. Students or the industry, can answer my questions. Where do you feel the most need is for this type of training? What are the issues that really are burning?

**Guðmundur Valur Stefánsson**

We did a need assessment in all the biggest places within the country, and we made a statistical analysis which gave us those three projects (HACCP, Hygiene and Sanitation and Traceability). But maybe we will need to do another need assessment.

**Sigurður Bogason**

After having the course, based on what your experience is now, what is the main issue at the moment?

**Luisa Arthur**

Regarding the first question from Valur, the reason why we chose HACCP and Hygiene and Sanitation was because we had a higher percentage with these courses in the need assessment. We didn't have much time, so that is why we had those three courses.

Second question, the plan within the near future is to have an exchange within this industry, on materials. We have the fishing inspectors who are looking at the raw material, checking what our colleagues the fishermen are working on the coastline. We have two situations that are both concerned about quality control. The two institutions should collaborate. Why are we not dealing with other things, in terms of perspectives? The problem for us is always the costs of the projects. There are other possibilities of Pirap assisting us. In order to

have sanitation license, the company needs to have training. Just to answer questions, which were made by the auditor (Sigurdur Bogason), there is a set of actions that need to develop to improve the quality of the fish. The EDP is the entity that is responsible for this training. However the EDP cannot do the training alone, we need to have the assistance from the technicians. Thank you very much.

### **Representative from Solmariscos**

I would like to answer the question brought up by Guðmundur Valur Stefánsson regarding what impact this course would have on the fishing sector. My opinion is that whatever training we receive it will always be good, for training is important. We can see the impact it could have on the fishing sector when we look towards the high number of fishermen (150.000), like the deputy mentioned earlier on. When we look at how many people have already been trained since the beginning of EDP, we see that there is a great need for the continuation of training of fishermen. Like Luisa said, I think that the cooperation is important for us to reach the same goal. The EDP has a high level of coordination. This is still the beginning, but this is a big issue in this sector, so that there is a challenge, our fight is to minimize the loss of harvest. So this is a challenge, for it is a big challenge for us to reach this level of coordination.

### **Francisco Bomba**

Regarding what you said, don't forget that the EDP is not the first one to train; INIP has always provided this training. We are only within this sector, other than training, we have other jobs to do, if the school is capacitated to provide this training, then we will be able to help.

INIP has been assisting in this training. IDPPE is not totally responsible for the training, but it is responsible for finding different ways of doing finding ways to develop the industry.

### **Guðmundur Valur Stefánsson**

What are the results? Will the project be sustainable when it comes to an end? If the answer is yes, then it was a very good project. In the beginning when we made the need assessment, we asked ourselves, will people be able to pay for the courses in the future? We noticed that many companies were willing to pay, but of course, the artisan fishermen do not have the money to pay for the courses. It would be good for ICEIDA, good way to be able to convince the board of ICEIDA, that we can charge a little bit for some of the courses. However we would not charge those with no money, like artisan fishermen.

### **Luisa Arthur**

One of the perspectives, one strategy is to train extensionists (word used by the interpreter). Now they have started doing this with some students from EDP, which come from different sectors. It is important to see here that the industry has started supporting the courses, they don't pay for them directly but they provide the snacks, transportation.

There is at least the perspective within the industry to assist with these projects. In terms of the coastline, this is also a big issue as it is a very large area.

### **Francisco Bomba**

We have not forgotten that the industry is already doing something for the training of people; we hope that they will continue to provide these conditions to assist us. We want to provide something that can benefit the industry, something tangible. At least this will give us hope that these courses will help. Maybe in the future we will just send the teachers and the rest of the expenses will be covered by the industry. So EP and the industry would organize the training, and we would not need cooperation of other partners.

### **Luisa Arthur**

I would like to thank the fisheries school. If EDP had not worked on this with INFOSA, there would have been these results; I would also like to thank ICEIDA, the financier. What is interesting about ICEIDA is that when we say we need something we are provided with what we need right away and they have assisted us right away, when we have needed assistance. I would like to thank all the institutions; quality is the result from joint efforts from all of us. We have here some students, Vice Minister of Fisheries and a representative from INFOSA.

I had a lot of fun working on this and for me it was positive work. I would like to thank the national consultants.

**Francisco Bomba**

We are going to finish our meeting with the perspective that we will continue to have the assistance of the industry. I am talking about assistance, the time provided, and the conditions, and also the fact that the work that we are doing is important for the country. As Luisa Arthur said, I would like to thank all the companies that provided assistance. Our area in EDP is mostly in engineering and navigation. This gives us/EDP a new project to emphasize. I would like to thank ICEIDA, who provided us with the opportunity to do this work. For me I would like to continue to consolidate these activities. I would like to thank INIP for providing us with the facilities.

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List of participants in the Maputo workshop.

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Telma Silva	E. Pesca	
Acyrecua Jamito	IDPPE	
Sónia Pereira	INIP.	
Carmilto L. Nfulele	Es. Pesca	
Venâncio Marique Nharoto	Escola de Pesca	
Maria de Fátima Afonso	ES. PESCA	

MAPUTO



## **Workshop in Beira 23.10.08 (10:30-15:00)**

**Provincial Fisheries Directorate:** Nélia Domingos, Director

**Industry and stakeholders:** Refer to List of participants on last page of the minutes

**Escola de Pesca:** Francisco Bomba, Director, Venâncio Nhavoto, Fátima Antonio, Cremildo Ngulele, Reis Candido Muando (translator)

**ICEIDA:** Guðmundur Valur Stefánsson, Maria da Rocha (translator), Nanna Rún Ásgeirsdóttir (Secretary of the meeting)

**INFOSA:** Luisa Arthur, Abilio Candido

**MarkMar:** Sigurdur G. Bogason, Project Review Consultant

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### **Francisco Bomba**

I would like to apologize for running late, as you know we are coming from Maputo, and we were supposed to start our journey at 8:00, but because of technical problems, we were delayed. I have been talking to the provincial director here, and we have decided that those who will be running late will join us later. For your knowledge, we have people from the fisheries sector with us here today. I would like to welcome the provincial director of fisheries.

### **Nélia Domingos**

Much of what I am going to say has already been said by Bomba. First I would like to thank the participants, and also we will welcome all of your opinions. I would like also to thank EDP for its efforts for leaving its infrastructure in Maputo and joining us here. I would like to thank ICEIDA, a foreign partner who has been funding this project. We hope that this cooperation will assist our sector to allow us to continue with this process. I would like also to thank Luisa Arthur who has been collaborating on this project.

### **Francisco Bomba (Power Point-same as from the 22.10)**

### **Venancio Nhavoto (Power Point-same as from the 22.10)**

### **Francisco Bomba**

I was talking to the Provincial Director and since we were expecting more people from the industry than we have now, I suggest we have a discussion and then afterwards we have a quick snack. I would like to begin by asking some of the students from the course about their impression. What is your impression of the courses? It may be your opinion on these course presented here, or any other course on smoking, salting. What do you think the school should do? What improvements would you like to see?

### **Benjamin, a student from Pra Pesca**

I want to say that I like the course, and I would like the EDP to continue to provide these courses. The course was good.

### **Francisco Bomba**

Personally you are happy with the courses; do you think your company was also happy with the courses?

### **Benjamin, a student from Pra Pesca**

Yes I think that my company was also satisfied with the course.

### **Francisco Bomba**

Do you think that your company has gained anything by having this course?

### **Benjamin, a student from Pra Pesca**

Yes I think that the company has gained something.

### **Francisco Bomba**

What is your impression on the course?

**Wacha, a student from a Bazaruto Pescas**

I would like to thank for this opportunity for training, it improved a lot the quality of fish in our company. I also would like to ask you to increase the duration of the course. I would like to increase the duration because we think that the time we had was short. The course also needs to take place during off-season, because we otherwise we don't have time to do the course.

**Francisco, student from Gelmar**

I would like to thank EDP, we have learned about Hygiene and Sanitation and HACCP. But we haven't learned about the most complex part, we would like to learn about that (traceability). We are interested in having another course, but in traceability. The management of my company was happy with the course. It is my understanding that people work on contract, so sometimes when they finish their contract they do not return. So I think that the new workers that replace the old ones should be trained also.

**Francisco Bomba**

Do you know how to manage HACCP? If I take you to your company, will you be able to manage HACCP and know the CCP at your company? Where do you see the problems in your company?

**Francisco, student from Gelmar**

The reception is the most critical point, because the raw material is not fresh, they don't know the origin of the material.

**Guðmundur Valur Stefánsson**

Do you think that the fishermen need to have this course?

**Francisco, student from Gelmar**

The fishermen need to know about the things taught on the courses, they don't know about quality and conservation.

**Francisco Bomba**

From all the courses we deliver, we have the opportunity of getting participants from aquaculture, from Beira there was one participant from this area, and we would like to hear your experience and thoughts.

**Duarte Adulumbuke, a student from Sol & Mar**

We had never had this training in HACCP, it was an opportunity for us. I felt that my colleagues had some difficulty with learning about this. Before the course we looked at hygiene without looking at the consequences, HACCP looks at these things, and so we also look at these things now. People are looking at things differently than before the training. A very notable difference is that people now talk openly about contamination and about other things as well.

I would also like to say that the fact that the company allowed teachers from EDP to come and hold this course, this shows openness in regard to receiving external people within the company.

**Francisco Bomba**

What would you like to see happen next?

**Duarte Adulumbuke, a student from Sol & Mar**

Given the level of the people in the factory, it is important that these courses are delivered again and again, so that the information can be consolidated.

**Luisa Arthur**

This course was not specific for aquaculture, it was a general course. Do you think that the general program is good enough to meet the requirements for aquaculture; do you think that something should be added or modified?

**Duarte Adulumbuke, a student from Sol & Mar**

Given that it's a company in which its power is in the hands of foreigners, I don't know how we could design a course, which is oriented to bring together these sectors. If we look at the whole structure, we see foreigners everywhere. There is a common framework and harmonization is needed in the whole process.

**Francisco Bomba**

It is not only up to us, we also have people from aquaculture and INIP. What we could do is contact your company, and if they are open to working with us then we can go from there. I could also talk to the national directors, to see if they could establish this contact with your company.

Colleagues from INIP, do you have any contribution? Since we have started, we have made some mistakes, and so we would like to have your comments?

**Horario Herminio, INIP**

The work that the EDP has initiated is good, and what we would like to see is that the work will be continuous and not sporadic for that would allow us to evaluate the work. It also helps us to take a look at our level on what we can do and what we cannot do. These courses should not only cover people in the fish processing, but also fishermen, fish mongers, people involved in the industry, and also those who work with prawn and crabs. One of the problems in the fish inspection area, that came up with the auditing from the EU was the origin of the raw material. We know that the fishermen are the ones that produce the raw material and provide it to the factories, which eventually are exported to the EU. The need to provide the training for these small scale fishermen is important, that would improve the quality of the product. We have to continue to do risk management from the origin; the risk is from the origins of the material. I am talking about hygiene, a product which is not fresh. There can be the possibility of the sea including toxins and physical metals. Some areas are contaminated. The EDP needs to spread the information about the metal, toxins, and different contaminations.

We are taking different samples from different areas to look at contamination. We want EDP to spread this information to different fishermen. In terms of modules, I think they are good. I have nothing today to say about what can be done to improve the modules. IDPPE should have been here to participate; perhaps it was a problem in communication or coordination. The problem of the people who work for Sol & Mar is the language barrier.

**Francisco Bomba**

How do you work? (Question raised for Sol & Mar)

**Duarte Adulumbuke, a student from Sol & Mar**

Only the director speaks English, and he does the translating. They used to have a translator; he was however only translating from Portuguese to English.

**Guðmundur Valur Stefánsson**

How many artisan fishermen are bringing fish to factories for processing in Beira? It is a high or low number?

**INIP representative**

I believe that IDPPE is the right institution to answer that question, but I would personally say that the number of small-scale fishermen doing this work is high. In the beginning of this year INIP and IDPPE trained around 100 small-scale fishermen. We provided training in specific points and places. Nova Sofala, Machanga, Cinguane (*not sure about the names*). These places mentioned were places of training. The training involved hygiene and good handling practices and the use of ice. The majority of the raw material that the processing rooms receive comes from small-scale fishermen. That is why I would like the EDP to continue with this training of the small-scale fishermen.

**Nélia Domingos**

It seems that INIP and IDPPE are taking over the activities from the EDP. The problem is that EDP has not been physically able to train these people and that is why these other institutions have been training these people. But as they seem to have the capacity to do it, the best thing would be is that EDP continues with this work.

**INIP, Horario Herminio**

Training is not our role. We are an alternative to resolving this current problem at the moment. The main problem was the origin of the raw material from the small-scale fishermen. Does INIP control the material from the small-scale fishermen? No, in fact we do not have any control over the material, and therefore we



should do something. Therefore we should mobilize the human resources, together with the IDPPE. They know the different locations of where this training is needed. Now the EDP could continue with this work. This work has to continue and EDP is now here to continue, we are happy with that.

**Antonio Augusto, representative from IDPPE**

I think that the training is important; most of the raw material comes from the small scale fishermen as was pointed out earlier. EDP should target mostly the practical matters in areas for small-scale fishermen. Not only teaching material in the form of a text written on paper in booklets and brochures, I would like to see demonstration, I would like to see more learning by doing. As an example, when the fishermen are at sea, when you show them that you have to improve the quality of the fish, they will ask how they should do that. They will say my boat is small and I have no ice. The demonstration should show ways of being able to meet with those needs. Somebody asked the question on contamination, people use the sea for urinating and dispose of waste. When the water comes back to the beach, this is a contamination source. Sometimes people dig holes in the sand, just to preserve the shrimp. There is also problems with mentality, people don't accept these changes, people tend to resist change in regards to training, and there should be ways that motivate this change in people's minds. The other thing is, is that EDP will not be able to cover the whole country as it is based in Maputo. IDPPE has extensionists who have no knowledge on these things specifically, and that is why EDP should provide training for these extensionists, as they are the ones that are in daily contact with the small-scale fishermen. As we saw from the power point, there are videos being developed. These videos should take into considerations locally orientated things. Because the videos that have been shown in the past, have not showed situations that apply. That is why it is important to show the relevant circumstances, specific to the country and the regions.

**Sigurður Bogason**

We discussed about the intervention of IDPPE and INIP, I am curious to know about the input from the companies. It must be in their best interest to be a part of this process, as the companies are buying the product and therefore also the problems as well. Shouldn't they be a part of solving the problem?

**Nélia Domingos**

They are interested, an example is one company that bought insulated boxes, and then showed the workers how to use them in the processing room. But this process cannot cover all fishermen, because of social conditions and other reasons.

**Sigurður Bogason**

Would these companies be willing to finance these courses?

**Nélia Domingos**

I will not answer on behalf of the companies, but my feeling is that these companies are not economically healthy at the moment; this is due to falling reduction of prices on the international market and the increase in the price of petrol. They would need the moment to be pushed up and later on, they would be able to participate in a greater way in regards to financing.

**INIP, Horario Herminio**

GELMAR, exported squid to South Africa only once in the last year, just to give an example of the financial crisis that is going on.

SOL & MAR tried to export at the beginning of the year, but they also have not exported anything. We do however expect SOL & MAR to export more at the beginning of next month. Aqua Pesca, has also only exported only one or two times this past year.

Bassarute Pesca, exported prawns to South Africa and some products to France. We know that exporting to South Africa has implications as the price is very low, what they need to do is find other alternatives for they cannot just stop. They need to evaluate what has happened this past year. The companies are in crisis. The companies are also facing general problems like low harvest. There is an increase of operational courses in terms of fuel. And that influences the financial situation of the companies. Maybe for the management of these companies, they will give info on whether they could finance these courses from the EDP.

**Guðmundur Valur Stefánsson**

Yes, that is very true, the MT follows the dollar, and the Rand is lower. So therefore it is very true the price for you is very low. So possibly the best market would be the inland market. In regards to ICEIDA and EDP, these meetings are for the evaluation of the cooperation and what the outlook will be for the future.

#### To get the big picture of the project:

We started with need assessment. Found out that it was the most need for making courses in Hygienic and Sanitation, HACCP and Traceability. Then we started to develop the courses and develop the teaching material. After that we started to run the courses and produce and print the teaching material.

And now we want to look back and go through what has been done but also look forward to figure out what is possible to do in this situation. Shall we stop running the courses now, shall we continue running the courses as they are now or shall we run the courses and consider a new project which is build on this project.

That's way we are gathered here with the Auditor and having this Workshop.

One of the main goal for a project like this is to create something which will last and be sustainable in the future. When a project comes to an end it is very important that the work can continue and goes on for oven power.

One of the main issues is to figure out how to pay running cost after end of support. Shall the participants pay for the courses, shall the cost be covered by official financial recourses or a mixture of those two.

It is also important to figure out what the project has really created for the fish sector and for the people of Mozambique. Did it actually make a different? And, of course, what can we now do to make improvement on an eventually a new project to make that more efficient compared with the project which is now coming to an end.

#### **Sigurdur Bogason**

My background is food science, starting from a fishermen and food processing. I know the industry in my country from the bottom up. The bottom line is always that there is money flowing in this process and to be sustainable for a long time an industry has to have economics that are based on the value of the product. And I can see from the discussion today, that there is a great deal of loss coming from handling the product. The most economic way of increasing revenue is to develop KNOW-HOW because that makes money. My take on all this is that we all have the same opinion. Sustainability comes from the industry by knowing where it wants to go. In that way everyone has to go in the same way. So the future is positive. You can only improve. Sigurdur shows a video about traceability, which shows how to sell fish at a higher price. The video is made for the English market. Sigurdur then explains why traceability is important, and what the short video clip is in fact saying.

#### **Francisco Bomba**

I just wanted to emphasize this: who owns the product, who fished the product, where it comes from; traceability has to do with all this process. I want to tell you a story, a company, which can receive fish from the different fishermen, buy the fish from the fishermen, and later deliver to everyone. We had these companies, which received supplies from different fishermen. However, after they restructure of MZ, socialist regime, these companies stopped because of the economic situation of the country. They were abandoned. So the person who hired this company was a South African but originally from Portugal. So language barrier was not a problem, because he was from a Portuguese origin. He wanted to earn money by cheating others. Then this product he was receiving was not necessarily within the area of the local fishermen where he was supposed to be supplied with fish. He was receiving a stolen product from fishermen from other places. I emphasize this because Sigurdur mentioned trust being an issue earlier on. The stolen product this man received was coming from a company that was located here in Beira. When the fishermen working for this company were returning home from fishing in Sofala fishing grounds, this person that stole their products intercepted them on their route deliver the fish. I wanted to emphasize the fact that traceability involves trust. Regarding this issue, there was a man who used to complain a lot about this person, but no one would listen to him. Finally the truth was revealed when a man with a container full of prawn had an accident. When asked where this prawn was from and where it was going, he could not explain where he got the container from. So this is just to emphasize the issue of trust for the people who are working in the industry.

#### **INIP, Horario Herminio**

Just to comment on what has been said, with our work with INIP and IDPPE, this fish coming from the sea in the processing room, does not always come straight from the fishermen who caught the fish. Sometimes there are two or three people that are within this chain from the fishermen to the industry/companies. Therefore this chain needs to be reformed. This chain is the reason why there are some companies that bring the boxes straight to pick up the raw material. They do this just to avoid this chain.

#### **Francisco Bomba**

Thank you very much to all of the participants. As it is the end of this session, I would like to review the prominent aspects we looked at this morning. We have realized and understood that our participation and

intervention has been accepted and people are happy with it. However we have to target the participants, and provide the courses during off-season. As well as providing courses on traceability for companies that now do not have access to this type of course. We also have concluded that these courses need to be provided continuously, not only for EP but also for the whole industry. This will of course require more time. As far as Sol and Mar is concerned, there is the need to make courses that are for both foreigners as well as the Mozambicans working for the companies. There is also a need for designing courses concerning aquaculture, something we are not providing at the moment. This training should involve more stakeholders, fishermen, vendors and other people involved in the industry, as well as the preparation of extensionists, training them is important in order for the training to continue. The course material that is being produced should be locally orientated. Lastly I would like to mention what Nélia Domingos suggested. She said that maybe we could design a survey which could be sent out to the industry, to evaluate the project. This survey could give us important information. With regard to the contribution of the companies to this project, maybe we could include a question about their contribution in this survey Nélia Domingos has recommended. With this inquiry we might be able to answer some of the questions raised here in regards to the cost.

**Nélia Domingos**

I would like to thank the participants and all those who have been here this morning for the seminar. The director has given a good summary on what issues have been raised here. I would like to wish the people returning to Maputo a good journey.

List of participants in the Beira workshop

ORDEM	INSTITUIÇÃO ou EMPRESA	CONTACTO	ASSINATURA
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5.	Darciso José Tite - INIP-Sofala	824018807	Tite
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## **Terms of Reference for a Consultancy**

### **Mid Term Review of the project: Fish Processing and Quality Control, at the Fishery School (Escola de Pesca) in Mozambique.**

Maputo 03.08.2008

#### ***1. Introduction***

Reference is made to the General Agreement on Forms and Procedures for Development Co-operation between the Government of Iceland and the Government of Mozambique, signed on 18<sup>th</sup> July and 21<sup>st</sup> August 1996.

On the basis of that Agreement, Iceland has from 1997, provided technical support and funding to the fisheries sector, first through the Ministry of Agriculture and Fisheries and later through the Ministry of Fisheries (MoF) after the establishment of that Ministry.

The main objective of this co-operation between ICEIDA and the Ministry has been to establish a free flow of Mozambican fish products to its main marketing areas. The official fish control in Mozambique has gained considerable knowledge in fish quality matters while the fish processing industry is lacking in that area to fulfill the official requirements. An agreement was signed between ICEIDA and the Ministry of Fisheries (MoF) in 2007, regarding establishment off a line or courses at the Fishery School (EdP) that could offer training in fish quality control and processing.

The project is build up in a three steps:

1. Course material and curriculum development
2. Course implementation and logistics
3. Project review, planning and conceptualization of project expansion

#### ***2. Objective***

The main objective of the consultancy is to evaluate the progress of the project, and advice on future cooperation.

#### ***3. Background***

Activities at the Fishery School are mainly concentrated on mechanics and fisheries techniques. Currently there are about 210 students taking classes.

The European Union is providing funds for the rehabilitation of the school and it surroundings, which is planned for 2007 and 2009. The Japanese government is also giving some support to the school in the form of teaching equipments and a training vessel. Some adjustments are being considered on the curriculum although it is not planned to make any drastic changes at this moment.

The school, which is under the Ministry of Fisheries (MoF), has now been allocated some funds from the EU fishing license fees for total rehabilitation of the facilities. That indicates that the MoF has the intention to strengthen the school activities.

#### ***4. Scope of Work***

- a. Evaluate the progress of the Project

- b. To advice on future co-operations end eventual expansion
- c. If expansion will be recommended then it is expected that some outlines of planning and conceptualizations will be recommended regarding a new Project Document.

## **5. *Output***

The consultants shall deliver an Assessment Report in English, by November 15<sup>th</sup>, which will include a status report, progress evaluation of the Project from the beginning and future recommendations addressed to the Ministry of Fisheries in Mozambique and ICEIDA.

## **6. *Implementation (plan of work)***

The work will be implemented in Maputo and Matola. Some preparatory and final work can be carried out in other locations. ICEIDA will provide an assistant with god skills in planing educational programs and write and speaks fluent Portuguese and English. The consultant will be in a closed co-operation with the ICEIDA Project Manager for Fisheries and key persons at the Fishery School in Matola.

## **7. *Required expertise***

The consultancy shall be carried out by a person with experience and knowledge in planning educational programs. In addition it is important to have experience and knowledge of quality control systems in fisheries and knowledge in fish processing techniques.

## **8. *Reporting***

The consultation should be carried out in Mozambique in October 2008. A final report must be delivered in English no later then two weeks after the consultation in Mozambique. It is expected that the total time required will be about 10 days. The consultant will brief the ICEIDA Country Office and the director of Escola de Pesca. A short summary of the results is expected to be delivered before leaving the country after the consultation.

## Appendix - 3

### Memorandum



**To:** Francisco Bomba, Gudmundur Valur Stefánsson  
**From:** Sigurdur G. Bogason  
**CC:** Venancio Nhavoto, Fatima Antonio, Luisa Arthur  
**Date:** 29 October 2008  
**Re:** **Status Evaluation of the Project: Assistance to the Fisheries Laboratories in Maputo, Beira and Quelimane concerning Quality Review of project**

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The mid term review of the project “*Fish Processing and Quality Control, at the Fishery School, Escola de Pesca (EdP) in Mozambique*” took place from 20 - 31 October 2008, and this memorandum is written to highlight some key findings and recommendations. The extended reporting on the results of the mid term review will be in the form of a full review report to be delivered in November. This Memo is prepared for tabling at the meeting of project partners at the Ministry of Fisheries (MoF) on the morning of 29.10.08.

Several meetings were held at the EdP to review project documents and status of the work. Two workshops with stakeholders were organized to facilitate open dialogue on the project status, its benefits and other aspects of this initiative of interest to the participants. The first workshop took place in Maputo on 22.10.08 with 26 persons attending, and the second one was held in Beira on 23.10.08 with 18 persons attending. In both workshops some representatives from the industry participated, although a higher industry representation would have been of interest to the process the industry persons present gave a number of valuable insights to the needs.

#### **Summary:**

The overall results of the evolution review are very positive, and the project has enabled EdP to build up important expertise and capacity in developing a curriculum, teaching aides, books, other training materials, and conducting courses for industry in this phase of the project. In total 243 persons have benefited from this training, 52 EdP senior students (Classic course), and 191 factory workers and quality assurance staff at 10 semi-industrial companies attended the Express course designed for the fishery industry.

The curriculum has been tested in this period, and it has become clear that some aspects of the documented curriculum will need to be further evolved to better suit purpose. Special attention is needed to focus the curriculum to the learning capacity of different society groupings, and not attempt to meet all needs with one type of teaching aids.

The dedication of the faculty of Escola de Pesca to this project and the dedicated technical support provided by Luísa Arthur from INFOSA is found recommendable, and the strong team spirit that has evolved can be described as a valuable unexpected positive outcome of the project. The capacity building objective of the project has now been given a good foundation, and this can be further built on in subsequent work in an expanded project should this be funded by ICEIDA.

### **Conclusion and first recommendations:**

The project has delivered many of the expected outputs and answered to the objectives that were described in the Project Document, March 2007. However, some key objectives have still to be realized, and below are listed some issues of concern as well as the positive issues needing follow up.

#### Issues for consideration:

- Analysis is needed to establish different groups of potential beneficiaries, and classifying as target groups with itemized need of practical curriculum dedicated to each category based on capacity to receive / retain information,
- Prepare a costing analysis for the different target groups in relation to course materials to be handed out to each student, factory, boat etc.,
- Based on above costing analysis prepare an appropriate strategy on how many units of each type of course materials can be economically disseminated over next 2 years (short-term) and medium-longer term over the next 5-7 years. The economics of preparing books, handouts, brochures and posters must take into account forecasted funds available for sustaining this training program,
- If above analysis should indicate lack of resources to carry the currently developed teaching materials over to the beneficiaries over medium- longer term, a redesign of course materials to provide better fit to purpose is needed,
- Escola de Pesca must have full right of use of the course materials developed, and the arrangement on this aspect should be clarified with INFOSA,
- The brochure poster format is not convenient (useful) if they are to be left on a wall of each company to provide access to reference materials, and it is therefore recommended to change format to real wall durable posters for longer use, which can be left as an information resource at each company receiving training,



- Doubt is raised regarding the rationale for the Classic course and the material prepared for it. The project document (March 2007) clearly indicated a needed focus towards the semi-industrialized companies and the artisanal fishers, and therefore resources dedicated to the Classic course should be redirected towards this objective. Classic course material could be reused as a part of the Teacher Manuals that have still not been prepared, and should receive proper attention as soon as possible,
- The books prepared for the Express course are a very positive development, and are considered to be excellent teaching material suitable for purpose, and if it can be proven that its cost benefit ratio is correct (see points above), and it is found economically feasible, similar books should be prepared for all course modules and disseminated to the course participants,
  - The books with story lines on Hygiene and HACCP are well developed and provide means to carry home key messages,
  - Format in a book vs. single pages in a ring binder publication should be re-evaluated in future to facilitate updating of parts when needed,
    - Cost versus usability?
    - Handouts suitable for different course levels needs further consideration,
- Story Boards printed on plastic for use in places where no electricity is available “Tree based PPTs” is an excellent concept, and more effort should be dedicated on developing more additional simple and economical means for hands on training to efficiently reach out to the artisanal fishery communities,

Implementation issues:

- Need assessment should be revisited,
- Focus on Hygiene and HACCP are more downstream issues, and have low impact if raw material handling upstream is the root of the problem,
  - Quality can not be put back in if it is lost at earlier steps in the process,
  - Quality Assurance can prevent mistakes and loss of value,
  - The value message is the most important one to implant
    - Scaring the life out of the course beneficiaries is less productive means to implement needed industry improvements,
- Quality of the live fish / shrimp is perfect (100%) at time of catch from then on it is a battle with time and environment, where ranking of importance is:
  - Temperature management is the key one,
  - Handling methods for raw materials,
  - Hygiene and processing environment,
- Focus upcoming training efforts toward upstream causes of problems,
  - Best cure to a problem is to stop it at source,
    - preventive measures are the most economical ones


Some first initial recommendations:

- E. Strategic analysis of possible number of participants for different course levels,
- v. How many candidates in each target group,
  - vi. Cost of delivering to each group,
  - vii. Cost of producing course materials for different groups,
  - viii. Prioritize budget on most cost effective dissemination strategies,
    - Who need to get the books, how many will be needed
    - How to deliver posters that can be left at the companies receiving training – Reference materials and further reading
    - Who will get power point handouts
    - Who will only receive basic course and hands on training without retaining course materials,
- F. New follow up project to extend the work is highly recommended based on very positive achievements to date, focusing on following areas:
- v. Raw material handling from source, and processing,
    - Preserving quality from artisanal fishery,
    - Training Extension personnel for hands on training efforts
    - Retaining quality during critical primary and secondary processing steps,
  - vi. Processing for sustainable economic use of natural resources,
    - salting, smoking, drying etc. and other means requiring minimum operational costs
  - vii. Aquaculture husbandry,
    - water quality, feeds, veterinary medicines use
    - welfare and good husbandry parameters needed to deliver good product quality and safe food to markets,
    - environmental considerations and sustainability
  - viii. Aquaculture health,
    - sanitary issues relation to product quality,
    - processing of aquaculture products,
    - Hygiene, HACCP, and Traceability course modules adapted to aquaculture
- G. Maintain and expand on results from the earlier project through collaborations with e.g. INIP, IDPPE and INFOSA to streamline training through Escola de Pesca as the lead player in national fish industry training efforts in Mozambique
- H. Focus upcoming training efforts toward upstream causes of problems,
- Best cure to a problem is to stop it at its source,

- Preventive measures are the most economical,
- Economic returns mostly depend on how well the job is done
- Provide positive messages when appropriate,
- Scare campaigns can be counterproductive

Providing true know-how to people like the artisanal fishers and their communities, and the importance of their actions for their economic wellbeing should be seen as the fundamental tool needed to empower them to progress faster to a sustainable development on their own terms.


## Appendix 4

  
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 N U T R I T I O N

Mid Term Review: Project Fish Quality Assurance and  
 Fish Handling and Processing  
 Implemented by Escola de Pesca  
 Funded by ICEIDA


Briefing meeting in Mozambique  
 29.10.2008

Sigurður Bogason | [sigurdur.bogason@markmar.is](mailto:sigurdur.bogason@markmar.is)

  
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 N U T R I T I O N

Contents overview


- List of Review Events
- Project progress status
- Curriculum development and Course material
- Implementation issues
- Key findings
- Next steps and Recommendations


  
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List of Project Review Events

- Meeting at Escola de Pesca (EP) → 20.10.08\*
- Document Review Session at EP → 21.10.08\*
- Stakeholder Workshop in Maputo → 22.10.08\*
- Stakeholder Workshop in Beira → 23.10.08\*
- Curriculum review at ICEIDA → 24.10.08\*
- Follow up documents review at EP → 28.10.08<sup>#</sup>


*\*EP staff and INFOSA involved*  
*<sup>#</sup>EP staff without INFOSA*

  
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Project Progress Status 


- Project has progressed well taking note of late actual start
  - Kick off with INFOSA expert Luísa Arthur onboard 13 Sept. '07
  - Curriculum developed and teaching material expedited on background available at INFOSA
  - Training Courses conducted at companies started 11 February 2008 (at Movimbi)
    - Industry wants training during off season December, January to early February
  - To date
    - 10 in company Express courses held for 191 persons
    - 2 Classic courses held for Escola de Pesca students 52 students
    - Total beneficiaries 243 persons

## Appendix 4

  
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Curriculum development and Course material

- The documented course texts provided by L. Arthur (INFOSA) are in part based on other courses developed for others in the region (Angola, INIP in Mozambique etc.)
- Therefore, rights of use and ownership for EdP and ICEIDA has to be made clear to prevent any future misunderstandings with INFOSA
- Escola de Pesca must have ownership / full right of use of the course materials developed

  
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Curriculum development and Course material (2)

- The Classic course text material is suitable for more advanced students, and company staff with higher educational background,
- It is not suitable for those targeted by the Express and Basic courses,
- The Power point presentations have been developed for the purpose of the Classic course, and need to be scrutinised for other target groups,
- Must maintain separate power point presentations suitable for the different groups

  
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Curriculum development and Course material (3)

- A need exist to simplify key messages and repeat, repeat in different formats to get them home,
- Glossy brochures have a purpose to provide background information – sometimes complicated messages,
- The brochure poster format not convenient if they are to be left on wall of each company to provide access to reference materials
  - recommend to change format to real wall posters for longer duration of use,

  
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Curriculum development and Course material (4)

- The books with story lines on Hygiene and HACCP are well developed and provide means to carry home key messages,
- Format in a book vs. single pages in a ring binder publication should be re-evaluated in future to facilitate updating of parts when needed,
  - Cost versus usability?
  - Handouts suitable for different course levels needs further consideration,
- Story Boards printed on plastic for use in places where no electricity is available “*Tree based PPTs*” is an excellent concept.

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### Curriculum development and Course material (5)

- The project should dedicate some effort and resources to develop appropriate teacher guides,
  - Important to supplement know-how to the teachers on how to conduct the courses,
  - Add extra points of background information that the teachers can use to add emphasis “spice” on certain issues,
- Create a plan for conducting regular reviews on curriculum to ensure it will be maintained up to date.

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### Implementation Issues



- Need assessment should be revisited,
- Focus on Hygiene and HACCP are more downstream issues, and have low impact if raw material handling upstream is the root of the problem,
- Quality can not be put back in if it is lost at earlier steps in the process,
- Quality Assurance can prevent mistakes and loss of value,
- The value message is the most important one to implant
  - Scaring the life out of the course beneficiaries is less productive means to implement needed industry improvements,

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### Implementation Issues (2)




- Quality of the live fish / shrimp is perfect (100%) at time of catch from then on it is a battle with time and environment, where ranking of importance is:
  1. Temperature management is the key one
  2. Handling methods for raw materials
  3. Hygiene and processing environment
- Focus upcoming training efforts toward upstream causes of problems,
- Best cure to a problem is to stop it at source  
→ preventive measures are the most economical

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### Key Findings


- The project has created significant positive impacts already,
- Industry is interested and positive,
  - Need to become supportive in future by contributing towards part of course funding,
  - EdP needs to find indicators of positive impacts to promote this aspect
- Authorities are supportive and interested to see this progress further as a key initiative in upgrading the industry,

## Appendix 4




### Key Findings (2)

- INIP and IDPPE expressed interest to handover to EdP all responsibility for industry training activities,
- Mapping of different industry actors needed to estimate training needs and effort focusing,
- At the Beira workshop it was stated that majority of shrimp landings for processing at semi-industrial factories comes from the artisanal fleet of about 140.000 fishers,
  - The larger exporting companies rely on their own fleet to catch raw material to minimize contamination and quality risks
    - Implies fundamentally different needs for training at artisanal level




### Key Findings (3)

- Quality of course documentation and suitability is variable,
  - Some parts still in English, and further adaptation to different target groups is needed,
  - External review of course books and posters would be recommended prior to investing in more expensive and durable printed materials,
  - EdP could benefit from maintaining one PPT template for each target group for ease of differentiating the Course levels, Classic, Express, Basic etc.



### Next Steps and Recommendations

- Strategic analysis of possible number of participants for different course levels,
  - How many candidates in each target group,
  - Cost of delivering to each group,
  - Cost of producing course materials for different groups,
  - Prioritize budget on most cost effective dissemination strategies,
    - Who need to get the books, how many will be needed
    - How to deliver posters that can be left at the companies receiving training – Reference materials and further reading
    - Who will get power point handouts
    - Who will only receive basic course and hands on training without retaining course materials,



### Next Steps and Recommendations (2)

New follow up project to extend the work is highly recommended based on very positive achievements to date, focusing on following areas:

- Raw material handling from source, and processing,
  - Preserving quality from artisanal fishery,
    - Training Extension personnel for hands on training efforts
  - Retaining quality during critical primary and secondary processing steps,
- Processing for sustainable economic use of natural resources,
  - salting, smoking, drying etc. and other means requiring minimum operational costs

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Next Steps and Recommendations (3)

- Aquaculture husbandry,
  - water quality, feed, and veterinary medicines,
  - welfare and good husbandry parameters needed to deliver good product quality and safe food to markets,
  - environmental considerations
- Aquaculture health,
  - sanitary issues relation to product quality,
  - processing of aquaculture products,
  - hygiene, HACCP, and Traceability course modules adapted to aquaculture
- Maintain and expand on results from the earlier project through collaborations with e.g. INIP, IDPPE and INFOSA to streamline training through Escola de Pesca as the lead player in national fish industry training efforts in Mozambique.


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Next Steps and Recommendations (4)

- Focus upcoming training efforts toward upstream causes of problems,
- Best cure to a problem is to stop it at source,
  - preventive measures are the most economical,
  - Economic returns mostly depend on how well the job is done
  - Provide positive messages when appropriate,
  - Scare campaigns can be counterproductive



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*Fishing  
for  
good  
Ideas!*

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# Fish Quality Assurance of Fish Handling and Processing in Mozambique



## Project Document

March 2007



**iceida**

ICELANDIC INTERNATIONAL DEVELOPMENT AGENCY  
ÞRÓUNARSAMVINNUSTOFNUN ÍSLANDS

Collaboration of the

Icelandic International Development Agency (ICEIDA)

and

Escola de Pesca

## **Preface**

This project is the result of the work of teachers of **Escola de Pesca** (Maria Helena Gonçalves, Venâncio Merique Nhavoto), after the training at **UNU-Fisheries Training Programme in Iceland (Reykjavik)**, with the support of **ICEIDA** and Olaf Weyl from the Department of Ichthyology and Fisheries Science, Rhodes University, South Africa.

## Acronyms

ICEIDA	Icelandic International Development Agency
NORAD	The Norwegian Agency for Development Cooperation
MoF	Ministry of Fisheries
ITC	Information and Training Centre
DA	Department of Aquaculture
UNU-FTP	United Nations University – Fishery Training Programme
INIP	Instituto Nacional de Inspeção de Pescado
MCS	Monitoring Control and Surveillance
IDPPE	Instituto Nacional de Desenvolvimento de Pesca Pequena Escala
EN	Escola Náutica
ANAP	Associação Nacional de Amadores de Pesca
AMAPIC	Associação Moçambicana de Amadores de Pesca Industrial de Camarão
DFID	Department for International Development, UK
EU	European Union
EP	Escola de Pesca
US	United States of America
HACCP	Hazard Analysis and Critical Control Point
MoT	Ministry of Transport
DANIDA	Danish International for Development Assistance
ISO	International Organization for Standardization
GOM	Government of Mozambique
FFP	Fundo de Fomento Pesqueiro
PARPA	Government Programme for poverty reduction
ASSAPEMO	Associação dos Pescadores de Mocambique

## Project Summary Sheet

Country:	Mozambique
Sector:	Fishing Sector/Education Sector
Executing Agencies:	Ministry of Fisheries, ICEIDA
Project Title:	Quality Assurance of Fish Handling and Processing in Mozambique
Project Period:	01.01.2007-30.12.2008
Total Estimated Cost:	680,000 USD
Donor:	ICEIDA
Tentative ICEIDA contribution:	620,000 USD
Tentative MoF contribution:	60,000 USD

## Scope of the Project

### ***Overall objective***

The development objective of this project is to contribute towards poverty alleviation, economic empowerment and food security in the fisheries sector by increasing human capacity for fish quality assurance in the fishing industry by developing and implementing an education programme on fish quality assurance specifically designed for the fishing industry, thereby enhancing fish quality in the capture fisheries and aquaculture sectors, reducing losses from spoilage, increasing export potential and increasing economic value of fishing produce. .

### **Specific Objectives**

- To develop the capacity of Escola de Pesca staff to develop and undertake short-course training in fish quality assurance measures.
- To develop a concept for training various sectors of the fishery based on a comprehensive needs assessment of specific training needs of the different sectors of the fishing industry.
- To develop the appropriate tools (course structure, manuals, video, pamphlets etc.) for conducting demand-driven training in the fishing industry.
- To secure EPs position in providing short course training by providing the equipment necessary for conducting short courses in quality assurance practices.

- Train members of the fishing industry (semi-industrial fishery employees, artisanal fisher and small-scale fish marketers) and extensionists through the developed short-courses in Maputo, Quelimane and Beira.
- Develop an extension package for fish quality assurance measures in the artisanal fishing sector.
- Investigate the feasibility of incorporating fish quality assurance training into the mainstream activities of the EP and, if found feasible, develop an implementation plan.

### **Expected Outputs**

- The EP capacity to undertake short courses in fish quality assurance practices is secured through the availability of trained staff.
- A training concept/strategy developed for main sectors of the fishing industry (semi-industrial, artisanal, marketing) based on a comprehensive needs assessment.
- Short-course structure/syllabus and appropriate educational tools developed for various fisheries sectors including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.
- 10 % of employees of major fishing companies trained using available tools.
- Extension tools for fish quality assurance in the artisanal fishing sector and small scale marketing sector are developed and 50 % of extension staff trained in application and dissemination.
- Concept for incorporation of fish quality assurance courses into mainstream curricula of the EP is developed.
- Demand driven delivery of short courses to fishing industry employees secures the financial sustainability of the course in the EP.
- Enhanced fish quality in the fishing sector and maintenance of EU export standards in industry.

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## 1.0 Introduction

### 1.1 Socio-economic situation

Mozambique, with a per capita GDP of \$ 277 and rural poverty rates of 54 %<sup>3</sup>, is one of the poorest countries in the world. The Mozambican population is estimated at *ca.* 20 million, of which *ca.* 45 % of the population is under 15 years of age, *ca.* 68 % lives in rural areas and the HIV infection rate is estimated at 15 %.

Mozambique has considerable natural resources and with a coastline of 2780 km fisheries is an important economic activity and an estimated 90 000 tons of fishery produce (fish, molluscs and crustaceans) are landed annually. Much of Mozambique's population is dependent on fisheries and about two thirds of the population live in the coastal zone where population densities are much higher (120 people/km<sup>2</sup>) than in inland districts<sup>4</sup>. The utilisation of these fisheries resources provides an important source of national income, food security and employment to the population in the coastal zone.

### 1.2 The fisheries sector

The Mozambique fisheries sector is well described by the Norwegian College of Fisheries study in 2002<sup>5</sup>. The fishery resource utilisation falls into three broad categories, industrial, semi-industrial and artisanal.

#### Industrial and semi-industrial fisheries

The industrial and semi-industrial fishing vessels are concentrated on the Banco de Sofala and Baía de Maputo and land *ca.* 31 000 tons of fish, crustaceans and molluscs with a total value of USD 110 million per annum (Table 1). These vessels fish primarily for export and the main target resource is shrimps *Penaeus indicus*, *Metapenaeus monoceros*, *Penaeus monodon*, *Penaeus japonicus* and *Penaeus latisulcatus*. These are either: processed and frozen at sea (industrial vessels), or are processed in shore-based plants for the local market and for export (semi-industrial catch). The industrial and semi-industrial fishing sectors

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<sup>3</sup> PARPA II

<sup>4</sup> Macrodiagnostico da Zona Costeira de Moçambique, 1998.

<sup>5</sup> Norwegian College of Fishery Science (2002) A Study of the Fisheries Sector in Mozambique. University of Tromso, Norway. 88p.

export of ca. 16 500 tons of shrimp and high quality fish to external markets and contribute ca. 40% to the total national export earnings. The primary export market is the European Union which takes 62 % of the export.

**Table 1.** Total catch by the industrial and semi-industrial fisheries in Mozambique for the year 2006.

Description	Catch (tons)	Value (USD '000's)
Lobster	0	0
Crabs	150	168.5
Gamba	1,100	5,918
Fish catch by line(hook)	450	2,187
Shrimp/prawn	8,100	76,221
Small lobster	130	1,038.7
Squids and octopus	200	134
Kapenta (Cahora Bassa)	20,000	24,000
By-catch	1,000	120
<b>Total</b>	<b>31,130</b>	<b>110,117.4</b>

To support the fishing industry there are four essential fishing ports localized in Maputo, Sofala (Beira), Zambézia (Quelimane) and Angoche. The fishery is effort limited and total catch is controlled by a TAC. In Maputo, 33 industrial and 33 semi-industrial vessels are licensed. The province also has 5 onshore processing plants that are licensed and allowed to export to EU, and from industrial vessels 22 were approved to processing and export their products to EU, 20 to other countries and 24 to the national market<sup>6</sup>.

In Sofala 70 vessels are licensed to process fisheries products, among them 44 belong to Europe Union (EU), 23 to Oceano Pesca and 2 connected. There also 15 processing plants inland whom 7 are allowed to export to EU<sup>4</sup>. In Zambézia there are 23 vessels licensed to processing fisheries products and 10 of them export to EU and 13 to other countries. There is also 1 establishment for products of aquaculture<sup>4</sup>.

### **Artisanal sector**

<sup>6</sup> Instituto Nacional de Inspeção de Pescado (2005). Relatório anual



The artisanal fishing sector, which accounts for 70 % of the total catch, provides income, livelihood and food security for 500 000 people. This sector, therefore, generates the largest number of direct jobs and creates employment in associated industry including fish processing and distribution. The sector includes both subsistence, as well as small-scale commercial enterprises. The majority of artisanal fishers use small vessels of which only 3 % are equipped with engines and a substantial proportion of the sector (40%) operates on foot either as fishers, using small seine nets or as collectors. The majority of the fish landed is low value grade 3 fish with only a small portion of the artisanal catch comprising grade 1 fish and prawns. The grade 1 fish comprises large fish species that are caught with hook and line and landed near major centres such as Beira and Maputo. These fish and prawns are preserved with ice or frozen and are subsequently supplied to upper income strata in these centres or are exported by processing plants (Norwegian College of Fishery Science, 2002). While part of the catch is consumed and/or sold fresh, a most is preserved by sun drying, smoking and salting.

### **Aquaculture**

Aquaculture in Mozambique is developing rapidly. This is particularly the case with the high value prawn culture which produces *ca.* 1200 tons and has a value of USD 6 million<sup>7</sup>. Finfish aquaculture is currently dominated by the small scale sector with an annual production of 40 tons.

## **1.3 Fisheries Policy**

The overall strategic perspective of the fisheries sector in Mozambique is presented by the 1995 Master Plan which highlights improved domestic food supply, improved national income and increased standard of living of fishing communities as its main objectives. Current developmental activities in the fisheries sector are guided by the Mozambique Government Programme 2006-2010. According to the Government Programme for poverty reduction 2005-2009 (PARPA), the major objectives of the Mozambique Government with regard to fisheries are:

- To improve the internal supply of fish through increasing the volume of landed fish and *reducing post-catch losses*;

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<sup>7</sup> Direcção Nacioal de Economia Pesqueira (2005). Plano Económico e Social do Sector – 2006.

- The improvement of the living conditions of the fishing communities through integrated social development actions.
- The sustainable exploitation of fishing resources.
- To contribute to the improvement of the balance of payment.

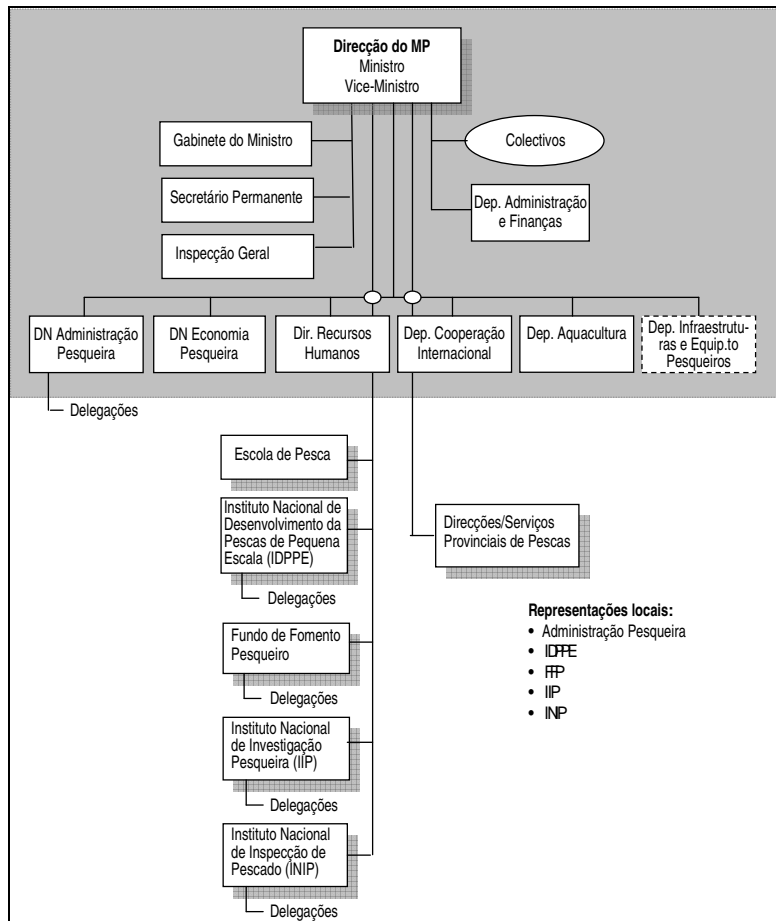
To achieve these objectives, intervention efforts are to focus on: the sustainable management of natural resources that will ensure economic, social and environmental sustainability based on an appropriate resource management and conservation actions involving the communities, the public sector and the interests of the private sector and by strengthening artisanal fisheries and aquaculture sectors.

## **1.4 Organisation**

The Mozambique Fisheries Administration comprises the Ministry of Fisheries and respective provincial bodies as well as the central institutions with respective local representations (see organisation chart). The Ministry of Fisheries (MP) is a political body, coordinator of the fisheries administration system whose main responsibilities relate to the development of fisheries development policies and plans, as well as the coordination of execution by means of control over the following subordinate institutions:

- ***The Fisheries School (EP)***: carries out specific training at basic and medium levels required by the sector's development. The ***National Institute of Fisheries Research (IIP)***: responsible for determining the state of resource exploitation and determining sustainable harvest levels, data collection for fisheries resources for monitoring studies and presentation of management recommendations;
- The ***National Directorate of Fisheries Administration (DNAP)***: controls access to the resources, is responsible for fishing surveillance.
- The ***National Institute of Fishery Inspection (INIP)***: aims to ensure that the quality of the fish products produced and exported comply with the sanitary conditions stipulated in the national legislation and international legislature.
- The ***National Institute for the Development of Small-scale Fisheries (IDPPE)***: promoting the development of the small-scale fisheries for the reduction of poverty and promotion of well-being of artisanal fisher communities.

- The **Fisheries Development Fund (FFP)**: management of financial resources from public investment in the sector, and granting credit funds for development.
- The **Department of Aquaculture**: promotes aquaculture.
- The **Provincial Fisheries Service (SPP)** is in charge of fisheries planning and management at provincial level.



**Figure 1.** Organisational diagram of the Ministry of Fisheries, Mozambique.

## 2.0 Project Description

### 2.1 *Background and justification*

The fisheries sector is considered as an important sector in the fight against poverty<sup>8</sup>. However, it is evident that many of Mozambique's fishery resources are fully exploited and that major expansion in the production part of sector is unlikely. This is recognized by the Government of Mozambique's PARPA-Government Programme (2006-2010) which specifically identifies the *development of conditions to increase the value the fishery production through the implementation of improved processing techniques for fish, and mechanisms to conserve and market the production and the reduction of post-catch losses as major interventions* (PARPA, Mozambique Government Programme 2006-2010).

The rationale is that increased quality of product increases market price for fishers and exportability of the product, thereby contributing to poverty alleviation, employment provision and foreign exchange earnings. This is of particular importance when one considers that 70% of the catch is landed by the artisanal sector in which spoilage rates, resulting from bad fish handling practices are suspected to be as high as 30% (Bjarnason 2006). It must also be considered that the main export market for Mozambique's fish produce is the EU (62%) which has stringent health and safety regulations. The maintenance and improvement of product quality is, therefore, vital for the export market and the maintenance or improvement of national income earnings from fisheries.

The importance of fish quality has long been recognised and ICEIDA has been supporting fish quality control in Mozambique through support to INIP since 1995. The primary objectives of these projects were to assist Mozambique to fulfil its requirements to the main export markets through: establishing a fish inspection agency; building up competence in fish inspection to enable the authorities to enforce regulations regarding fisheries and fish processing; building laboratories to deal with necessary microbiological and chemical analyses; and supporting the regulatory framework regarding fisheries with respect to export. *While this project is achieving its intended objectives a need to increase good fish handling practices in the fishing and marketing sector through the provision of demand-driven and appropriate training of industry employees has been identified.*

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<sup>8</sup> ICEIDA (2005) ICEIDA Annual Report 2005.

The availability and provision of adequate training for capacity building at the implementation-level (fishers, processors, and marketers) is currently inadequate. There are some attempts to provide information and training. The Information and Training Centre (ITC) of the MoF, currently compiles fisheries information and publishes a newsletter and some information booklets for the semi-industrial and industrial fishing sectors. The Department of Aquaculture (DA), in the aquaculture industry, mainly shrimp production, has, as a result of a lack of availability of directed training courses, run some short courses in processing quality control. The IDPPE is currently conducting informal training of the artisanal fishermen through 150 extensionists located within artisanal fishing communities. The EP provides a comprehensive training programme for students that incorporate some aspects on fish handling in a 3 - 7 year curriculum. ***While such training undoubtedly contributes to national capacity building, there is a dire need for the development of directed training courses to address the needs of the fishing industry, particularly at the lower levels of the production sector.***

A rapid appraisal<sup>9</sup> conducted in April/May 2006<sup>1</sup> based on semi-structured interviews conducted with major potential stakeholders including government departments, the Escola de Pesca, members of the fishing industry and artisanal fishers, ***identified the need for organized training and development of information and educational material for enhancing fish quality through good handling practices*** (Bjarnason 2006). In addition, the assessment demonstrated that there was ***a large demand by all sectors of the fishing industry for the development of appropriate training for people handling fish.*** Of particular relevance was that ***the private sector (fishing industry, ASSAPEMO, ANAP and AMAPIC) recognise that there is a lack of skills and know in the industry in all areas of production: fishing, packaging and marketing.***

### ***Escola de Pesca (EP)***

In Mozambique, the Escola de Pesca (EP) of the MoF has the mandate to provide such services. The EP was founded in 1978 with support from the Norwegian Development Agency (NORAD). The school is located in the outskirts of Matola and consists of several small buildings that house school rooms, offices and a dormitory. It is well staffed with 14

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<sup>9</sup> Bjarnason P (2006) Assessing a fish processing and fish quality program at the Escola de Pesca in Mozambique, Report of a consulting mission to Mozambique April/May 2006.

permanent academic positions, 3 contract positions and 5 part time teachers that are drawn from the IIP and MoF to conduct specialist courses.

The current educational activities at the EP revolve around three courses: (1) maritime engineering; (2) navigation and fisheries and (3) biology and fishery extension. Students can enrol at the school after 7<sup>th</sup> or 10<sup>th</sup> grade and according to a new curriculum (2004/2005) the length of the school period is now 3-7 years. Essentially a course comprises traditional school subjects as well as the specific 'fisheries' subjects (see Box 1 for example). On request, the school has also run short courses on fishing technology, engine maintenance and maritime safety. Currently there are currently 220 students taking classes but some years previously only about 60 students or fewer have been enrolled at the school annually.

According to Bjarnason (2006), the school has a good reputation and although people in the industry have some suggestions on their requirements of graduates from the school, the EP graduates are considered to have good skills. As a result, some fishing companies send their staff to the EP for training. However, such support from industry is limited as ***a result of the length of the educational courses offered at the EP, which are considered too long for industry to support by sending it's staff on a 3-7 year course.*** In addition, many fishing companies continue to import most of their key personnel and EP graduates struggle to obtain employment. The success of the school therefore depends on: (1) Government and industry support to the graduating students in terms of employment provision; and (2) the development of short-courses that specifically address the needs of the fishing industry.

The development of such short courses with a focus on fish handling will require capacity building within the EP: first and foremost in short course and curriculum development and subsequently, in developing the expertise to teach these courses. As there is sufficient depth within the academic staff (age range 28 – 50) of the EP to allow for internal capacity building through staff-directed training.

**Box 1:** Example of a typical Escola de Pesca 3.5 year course in navigation and fisheries.

<b>Subjects</b>	<b>Total hours</b>
Portuguese I, II, III	252
English I and II	144
Physical Education	144
Maths I and II	306
Physics	216
Chemistry	126
Computers I and II	144
General Biology	72
Ecology	72
<b>Specific subjects</b>	
Fishing Technology I	126
Maritime Safety	36
Navigation I,II	234
Sailing	108
Meteorology and Oceanography	126
Fisheries Biology	90
Fish Processing	36
Ship Handling	126
Navigation III	198
Naval Communication	72
Maritime laws	126
Fish technology II and III	288
Detection techniques	162
Maritime Security	108
Ship Stability	108
Internal Engines	54
Drawing	72
<b>Practical activities</b>	
Engine Practice	126
Training Practice	480
Project Work for the conclusion of the course	240
<b>Total</b>	<b>4392</b>

## ***2.2 Problems to be addressed***

Many fisheries in Mozambique are fully utilised and fisheries expansion is not possible. As a result any increase in the economic potential from the sector will have to be derived from processes that add value to the product. While Mozambique attempts to maximise the value of fisheries products, the outcome of a recent visit from EU fisheries authorities was less than positive. Members of the fishing industry consider this as ‘proof’ that handling practices in the Mozambique fisheries sector have to be changed rapidly to fulfil the requirements of this important market (Bjarnason 2006). In addition, post-harvest losses in the artisanal sector, which currently accounts for 70 % of all fish landed in Mozambique, are estimated at up to 30 %. This poor fish quality and post-harvest losses are a consequence of the lack of fish handling skills in the sector. This lack of appropriate skills has a direct negative economic and social impact on the industry by reducing market price

and export potential (as found by the recent EU assessment) which reduces profits. As a result, the industry is operating at sub-optimal economic levels.

As poor fish quality and post-harvest losses are a direct result of poor fish handling and processing practices, the improvement of practices through direct education programmes and awareness creation at a national level will contribute directly to maintaining/enhancing the important export market and increasing fish supply from the artisanal sector. This is recognised by the **private sector** (fishing industry, ANAP and AMAPIC) which identified the lack of skills in all areas of production: fishing, packaging and marketing, as primary constraint to development (Bjarnason 2006).

The enhancement of fish quality through improved handling and quality assurance practices will, therefore, contribute to maximising economic gain from the fishery and result in increased food security, income and employment in the fishing sector. However, while there is a large demand by all sectors of the fishing industry for the development of appropriate training programmes for employees and participants in the sector, there are currently no specific training programmes to meet this demand. Further, while the IIDP has the capacity in the field for extensive sensitisation and information dissemination to the artisanal fishing sector, there is a general lack of appropriate training materials.

**This project, through support to the EP aims to address the lack of availability of adequate training opportunities for fish handling to addresses the major fisheries policy objectives: (1) the development of conditions to increase the value the fishery production through the implementation of improved processing techniques for fish, and (2) the reduction of post-catch losses as major interventions (Mozambique Government Programme 2005-2009).**

### ***2.3 Previous and ongoing support to the EP***

After NORAD support came to an end some years back the facilities have been deteriorating steadily due to lack of finance for maintenance and that running cost in general has been lacking. However, the EP, which is under the Ministry of Fisheries (MoF), has now been allocated sufficient funds from the EU fishing license fees for total



rehabilitation of the facilities. The European Union is providing funds for the rehabilitation of the school and its surroundings, which has been approved for 2006/7 (Director, Escola de Pesca *pers. com.*). However, there has been a delay in fund availability and in contracting. As a result, physical work has not yet been initiated. The Japanese government is also providing some support to the school in the form of teaching equipment and a training vessel.

In addition, two EP staff members were supported by ICEIDA to undertake training at the UN University in Iceland. During this training, the EP staff identified necessary short courses, undertook a basic elaboration of the topics and subtopics within the course, defined course frameworks and timetables, elaborated initial lesson plans. This work presents a suitable baseline for the project and shows that initial capacity building is already under progress. In addition, 6 short courses: (1) handling and Icing Fish; (2) freezing fish / shrimps; (3) salting and drying fish; (4) hygiene and sanitation; (5) HACCP; (6) traceability; have been identified and elaborated.

## **2.4 Target Beneficiaries**

Primary beneficiaries of the project's outputs will be artisanal fishers, small scale marketers (many of which are women) and semi-industrial fishers whom will benefit from increased income resulting from increased market value of landed fish, greater market opportunities for higher quality fish and decreased spoilage rates of fish.

Local communities who are not directly involved will also benefit through the indirect effects of increased income and spending power at local level through associated economic opportunities. The improvement of fish quality will also have positive effects on health and the decrease of fish spoilage through better handling practices will increase fish availability and contribute to the enhancement of food security, reduction of absolute poverty. The EP will benefit through the improvement of in-country human capacity resulting from directed training. Further, the major importance of the fishery to the provincial and national economy means that the project will have far reaching benefits beyond the target area.

## ***2.4 Implementation strategy***

Mozambique that is capable of providing such training is the Escola de Pesca of the Ministry of Fisheries. The project will be implemented by the staff of the Escola de Pesca with technical assistance from ICEIDA.

While the Escola de Pesca staff have considerable experience in training and have been participating in a course on curriculum development at the UNU in Iceland a need for technical assistance is identified. It is envisaged that such technical assistance will focus on three specialist areas:

1. Course material and curriculum development;
2. Course implementation and logistics;
3. Project evaluation, planning and conceptualisation of project expansion.

The diversity of the required technical assistance will require the use of short-term experts with individual input of 4-5 months each from ICEIDA. These short-term experts will aid project counterpart staff in the development of curricula, course materials, course co-ordination and project evaluation and conceptualisation of project incorporation into the mainstream curricula of the Escola de Pesca. It is envisaged that the project will be managed and implemented by Escola de Pesca staff and that the use of short-term experts will allow for considerable opportunities for on-the-job training. In addition, the project will have to collaborate closely with various other departments in the Ministry of Fisheries including the IDPPE, IIP and INIP.

## ***2.5 Institutional arrangements***

The main implementer of the Project will be the EP which will be responsible for the preparation of the annual work plans that will be presented to FFP and ICEIDA for approval. The annual work plans will spell out detailed annual objectives and activities to be executed, as well as, inputs required and detailed budgets.

Financial resources will be provided by ICEIDA and the Government of Mozambique. To facilitate the process of implementation and flow of funds, there will be a Plan of Operations developed and signed between the Department of Fisheries and ICEIDA

according to the agreement between the Ministry of Fisheries of Mozambique and ICEIDA regarding institutional cooperation in the fisheries sector.

## **2.6 Cross cutting issues for special consideration**

Through this project, public awareness on fish quality and public health will be promoted. Issues of gender, HIV/AIDS, environmental degradation, sanitation, illiteracy and collaboration with other stakeholders will be taken on board. As many fish traders are women, gender issues will be addressed.

## **2.7 Description of Project Site**

The project will be based at the EP in Matola where courses will be developed and delivered to participants from the Maputo area. In addition, courses will also be given in Beira and Quelimane where courses will be held at industry facilities with EP staff traveling with the necessary training equipment and materials.

## **3.0 Development objectives**

The development objective of this project is to contribute towards poverty alleviation, economic empowerment and food security in the fisheries sector by developing and implementing an education programme on fish quality assurance specifically designed for the fishing industry, thereby enhancing fish quality in the capture fisheries and aquaculture sectors, reducing losses from spoilage, increasing export potential and increasing economic value of fishing produce.

## **4.0 Specific Objectives**

The EP project will, focus on the development of human capacity, appropriate tools and direct training to increase awareness and good practices on fish handling in the small-scale fish marketing sector, artisanal fishery sector and semi-industrial sector. This will contribute towards the enhancement of fish quality and price as well to the reduction of post harvest losses from the fishery. This enhancement will, in turn, increase fish price and supply and contribute to food security, poverty alleviation and economic empowerment. The specific objectives of the project are:

- 1.1. To develop the capacity of Escola de Pesca staff to develop and undertake short-course training in fish quality assurance measures.
- 1.2. To develop a concept for training various sectors of the fishery based on a comprehensive needs assessment of specific training needs of the different sectors of the fishing industry<sup>10</sup>.
- 1.3. To develop the appropriate tools (course structure, manuals, video, pamphlets etc.) for conducting demand-driven training in the fishing industry.
- 1.4. To secure EPs position in providing short course training by providing the equipment necessary for conducting short courses in quality assurance practices.
- 1.5. Train members of the fishing industry (semi-industrial fishery employees, artisanal fisher and small-scale fish marketers) and extensionists through the developed short-courses in Maputo, Quilimane and Beira.
- 1.6. Develop an extension package for fish quality assurance measures in the artisanal fishing sector.
- 1.7. Investigate the feasibility of incorporating fish quality assurance training into the mainstream activities of the EP and, if found feasible, develop an implementation plan.

## 5.0 Expected outputs

The expected outputs of the project are primarily the development of materials and capacity in the EP to conduct courses and undertake training that will lead to the enhancement of fish quality in major centres, Maputo, Quelimane and Beira. This will result in better market prices for fishers and the maintenance of export quality fish in the formal sector.

Direct expected outputs of the project are:

- The EP capacity to undertake short courses in fish quality assurance practices is secured through the availability of trained staff.
- A training concept/strategy developed for main sectors of the fishing industry (semi-industrial, artisanal, marketing) based on a comprehensive needs assessment.

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<sup>10</sup> Some of the background work has already been performed through an initial assessment by Bjarnason (2006) and by Escola de Pesca staff during a workshop at the UNUI in Iceland. However, these cover primarily the needs of the semi-industrial sector and artisanal sector and small-scale marketing sector needs still have to be incorporated.

- Short-course structure/syllabus and appropriate educational tools developed for various fisheries sectors including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.
- 10 % of employees of major fishing companies trained using available tools.
- Extension tools for fish quality assurance in the artisanal fishing sector and small scale marketing sector are developed and 50 % of extension staff trained in application and dissemination.
- Concept for incorporation of fish quality assurance courses into mainstream curricula of the EP is developed.
- Demand driven delivery of short courses to fishing industry employees secures the financial sustainability of the course in the EP.
- Enhanced fish quality in the fishing sector and maintenance of EU export.

## **6.0 Activities**

Detailed activities will be prepared during the first two months of implementation by a team of experts from EP and stakeholders. However, the following major activities are envisaged to be undertaken:

## **7.0 Strategy**

The project outputs will be achieved through three components: capacity building, course material development and training.

### ***7.1 Capacity building component***

Capacity of EP staff to undertake course planning and training in fish quality assurance measures will be developed through directed staff development programmes and through the provision of an ICEIDA technical adviser (**course development specialist**) to aid in course co-ordination, curriculum development and course material development for the initial 5 months of the project. Directed staff development programmes will be conducted by facilitating the participation of EP staff in training programmes at the UN University as well as through supporting other relevant staff development programmes. In addition, training of Escola de Pesca staff at the UNU was initiated in 2006 and there is a need for

ongoing consultation during the course development phase with the UN-FTP in Iceland. The provision of technical assistance by ICEIDA through a course co-coordinator will also result in direct training of counterparts through on the job training.

## ***7.2 Course material development component***

To develop short courses that are of relevance to the sector and address direct needs will be achieved through a number of activities. First, a needs assessment to assess specific training needs of the different sectors of the fishing industry will be conducted. This will provide the input to the courses and allow for strategic planning and course development. Subsequently a concept for training various sectors of the fishery needs to be developed. This will allow for the design and production of the training tools (course structure, manuals, video, pamphlets etc.). The equipment necessary for short courses in quality assurance practices will also be procured at this stage.

## ***7.3 Training component***

Training is a vital element of the project and will be directed towards the specific target groups, including training of trainers, the semi-industrial fishing sector, fish processing factories, small-scale fish marketers, artisanal fishers and extensionists. Training will be conducted in major centres of Maputo, Quelimane and Beira. Further, as much subsequent training will be undertaken by extensionists, the project will undertake ‘training of trainers’ and develop an extension package for fish quality assurance measures in the artisanal fishing sector. An ICEIDA technical adviser (**training specialist**) will facilitate and aid in the co-ordination of training activities, provide on the job training to Escola de Pesca staff in short course implementation and teaching methods. The training specialist will also aid in adapting course materials according to inputs received from the initial implementation of the short courses. It is envisaged that the training specialist will be attached to the Escola de Pesca for a 5-month period at the beginning of the training phase (year 2) of the project to provide technical expertise.

## **7.4 Course alignment and integration component**

One of the major outcomes of the project is the potential integration of these short courses into the mainstream of the Escola de Pesca curriculum. This will require a feasibility analysis and, if found feasible, a new project needs to be conceptualised and planned to align and integrate the short courses with the Escola de Pesca curriculum. To facilitate this process and aid in the planning of the new project a short-term (3-5 months) technical adviser will be needed. This adviser will be specialist in **project evaluation and planning**. As with other project components the project evaluation and planning specialist will work closely with Escola de Pesca staff in this evaluation and planning phase to provide on-the-job training in project development.

## **8.0 Inputs**

The inputs by ICEIDA and the MoF are governed by the agreement between the Ministry of Fisheries of Mozambique and ICEIDA regarding institutional cooperation in the fisheries sector. A plan of operation and budget are provided in sections 18.0 and 19.0, respectively. In summary, ICEIDA inputs include 3 short-term specialists to assist in specific phases of the project. Specifically these are:

- (1) Course development specialist (5 months);
- (2) Implementation specialist (5 months);
- (3) Project evaluation and planning specialist (3-5 months).

All the operational costs of the experts will be met by ICEIDA.

The MoF will provide suitable and adequate professional, technical and support or counterpart staff and office space.

## **9.0 Major Assumptions**

Major assumptions in this Project are that there is commitment and support to the project by the EP, the fishing industry, extension service, artisanal fishers and fish marketers actively participate in the project. Of special relevance is that: (1) the fishing industry utilises the training opportunity presented by the courses and supports the courses held in the major centres; and (2) that the IDPPE extension section utilises the training, tools and

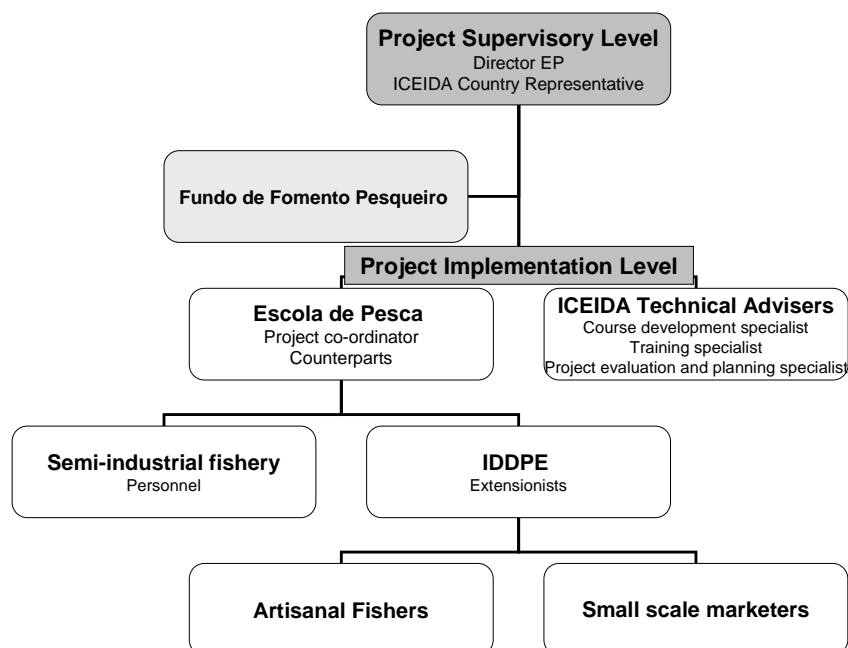
materials developed by the EP project for dissemination to artisanal fishers and small-scale fish marketers.

## 10.0 Risks

The most significant risk to the success of the Project is the change in the political environment both in Mozambique and Iceland. This can further be compounded by the changes in policies of ICEIDA and GOM.

## 11.0 Organisation, administration, and monitoring of the project

The EP will, before the commencement of the Project, enter into an agreement with ICEIDA through the signing of Plan of Operations on the funding procedures and provision of Project experts from Iceland. The organisation and the managing role and responsibilities between different organisational levels of the project is shown in the organisational hierarchy for project implementation shown in Figure 2.



**Figure 2.** Organisational hierarchy for project implementation.

The first level is the **Project Supervisory Level**. This is the decision-making authority with the overall responsibility of the project. The EP bears the overall responsibility of the project component and ICEIDA is the co-funding agency. This level comprises the director of the EP and the ICEIDA country director. They are supported by the funds management



and accounting section of the FFP and will ensure that funds are utilised as agreed by the funding parties and that accounting is done properly. The FFP will manage the funds and supervise all expenditures to ensure that funds are used as budgeted according to the agreement between the Ministry of Fisheries of Mozambique and ICEIDA regarding institutional cooperation in the fisheries sector. The director of EP will have a legal status and authority to sign local and international contract agreements on behalf of EP. The director of EP will appoint a co-ordinator representing the institution in the daily management of the project.

The second level is the **Project Implementation Level**. This level is the responsible authority for the execution of the work to be carried out during the project implementation. The execution of the project component will be the responsibility of EP- counterparts whom will be supported by ICEIDA advisers in course development, training and project evaluation and planning. The EP counterpart and technical advisers will monitor the implementation of the project and report to the project supervisory level. Educational materials will be developed in close collaboration with the ITC and INIP whom have a background in preparing educational material and training courses. IDDPE extension staff will be trained as part of the project and will ultimately disseminate information to artisanal fishers and small-scale marketers.

The organisational structure of the project will require good and clear communications between different parties involved. One of the roles of the EP and the FFP supervisor are to secure fluent and prompt communications between parties. The EP will bear the main responsibility of communicating information to the Director of the EP and the MoF while the various advisers will communicate information to the ICEIDA.

## **12.0 Indicators and means of verification**

All activities of the project and individual components will be monitored from the initiation of the project. The monitoring procedures will be based on an internal monitoring and reporting system developed by the EP in collaboration with the course co-ordinator at the initiation of the project. Evaluation will be based on this monitoring and reporting system and criteria put forward in the project document. The expected outputs for the project in general have been identified (see section 16). Reporting will be based on periodical progress reports, training reports and annual reports.

### **13.0 Monitoring, Reporting and Evaluation**

All activities of the project and individual components will be monitored from the initiation of the project. The monitoring procedures will be based on an internal monitoring and reporting system applied by EP. Evaluation will be based on this monitoring and reporting system and criteria put forward in the project document. The expected outputs for the project in general have been identified (Project Matrix). A milestone plan and main activities that will form the basis of evaluation of the progress of the project component have been established (Annex 1).

Reporting will be based on periodical progress reports and annual reports, including a description of the state of the projects execution and a final report including full description of results with an evaluation of individual project elements.

### **14.0 Budget and Financing**

The total budget for is estimated at 680,000 USD over the two-year implementation period. Of the total budget, 620,000 USD is the ICEIDA contribution and 60,000 USD is the Government of Mozambique (GoM) contribution to the project. The division of financing between the parties co-financing and the distribution by activities and items during the project period are shown in section 19.0. The procurement of goods and services of the project will comply with rules agreed upon by the funding agencies and in accordance to the GOM rules.

### **15.0 Accounting and Auditing**

It is the responsibility of EP to carry out internal monitoring and evaluation and the Fundo de Fomento Pesqueiro (FFP) to carry out the accounting and auditing. Accounting and auditing procedures will be according to the agreement between the Ministry of Fisheries of Mozambique and ICEIDA regarding institutional cooperation in the fisheries sector.

### **16.0 Project implementation plan**

The logistical frame matrix is presented in section 17.0. The initial project is planned to last two years (2007-2008) with a possible extension to 2010 if the integration of the short courses into the curriculum of the school is found feasible. For the effective implementation, an annual implementation plan will be developed and submitted, to help focus the direction of the project. A proposed implementation plan with interim results is

presented in section 18.0. The project implementation plan will include and overall timeframe for the project including schedules on the project's inputs and outputs. The EP with the aid of ICEIDA will be responsible for the preparation of the annual work plans to be presented to FFP and ICEIDA for approval. The annual work plans will spell out detailed objectives to be achieved in the year, activities to be executed within that year, all inputs required and detailed budget including source of funding for the various inputs.

## 17.0 Logical Framework:

Development Objective	Indicators	Risk/External Factors
<p>To contribute towards poverty alleviation, economic empowerment and food security in the fisheries sector by increasing human capacity for fish quality assurance in the fishing industry by developing and implementing an education programme on fish quality assurance specifically designed for the fishing industry, thereby enhancing fish quality in the capture fisheries and aquaculture sectors, reducing losses from spoilage, increasing export potential and increasing economic value of fishing produce.</p>	<p>Maintenance and improvement of fish quality in the sector leads to maintenance of export market.</p>	<p>Change of policy in Mozambique or in Iceland. Industry involvement and support of the project</p>
Immediate Objectives	Indicators	Risk/External Factors
<ol style="list-style-type: none"> <li>1. Develop the capacity of Escola de Pesca staff to develop and undertake short-course training in fish quality assurance measures.</li> <li>2. Develop a concept for training various sectors of the fishery based on a comprehensive needs assessment of specific training needs of the different sectors of the fishing industry.</li> <li>3. Develop the appropriate tools (course structure, manuals, video, pamphlets etc.) for conducting demand-driven training in the fishing industry.</li> <li>4. Secure EPs position in providing short course training by providing the equipment necessary for conducting short courses in quality assurance practices.</li> <li>5. Train members of the fishing industry (semi-industrial fishery employees, artisanal fisher and small-scale fish marketers) and extensionists through the developed short-courses in Maputo, Quelimane and Beira.</li> <li>6. Develop an extension package for fish quality assurance measures in the artisanal fishing sector.</li> <li>7. Investigate the feasibility of incorporating fish quality assurance training into the mainstream activities of the EP and, if found feasible, develop an implementation plan.</li> </ol>	<p>2 EP staff trained in course development at UNU and course structure/concept developed.</p> <p>Training needs assessment report available for all sectors including and identification of quantity, timeframe and content of short courses.</p> <p>Syllabus, lecture notes, course handouts, materials and other tools (videos, pictures, posters) for 10 short courses are available.</p> <p>Equipment and hardware are available and 10 short courses are conducted in 2008.</p> <p>10 short courses are held in 2008 and 20 fishing industry employees and 20 extensionists are trained in each centre.</p> <p>Extension package available and 60 extensionists trained in its application by 2008.</p> <p>SWOT analysis and concept for incorporation of fish quality assurance courses into mainstream curricula of EP is developed.</p>	<p>Funds, availability of software and working facilities.</p>

Main Outputs	Indicators	Risk/External Factors
<ul style="list-style-type: none"> <li>• The EP capacity to undertake short courses in fish quality assurance practices is secured through the availability of trained staff.</li> <li>• A training concept/strategy developed for main sectors of the fishing industry (semi-industrial, artisanal, marketing) based on a comprehensive needs assessment.</li> <li>• Short-course structure/syllabus and appropriate educational tools developed for various fisheries sectors including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.</li> <li>• Extension tools for fish quality assurance in the artisanal fishing sector and small scale marketing sector are developed and 50 % of extension staff trained in application and dissemination.</li> <li>• Demand driven delivery of short courses to fishing industry employees secures the financial sustainability of the course in the EP.</li> <li>• Enhanced fish quality in the fishing sector and maintenance of EU export standards in industry.</li> </ul>	<p>EP staff trained in course development at UNU and course structure/concept developed 2</p> <p>Training tools: including teacher manuals, extension manuals, flip charts, pamphlets, posters and instructional videos available.</p> <p>60 employees of major fishing companies trained in fish handling by 2008.</p> <p>Extension package available and 60 extensionists trained in its application by 2008.</p> <p>3 courses held by request from fishing industry by end of year 2.</p> <p>Export companies with staff in course retains EU standard for exports.</p>	<p>Change of policy in Mozambique or in Iceland. Industry involvement and support of the project</p>

## 18.0 Preliminary Project Implementation Plan (PIP)

Activity	Indicator/interim result	2007				2008			
		1	2	3	4	1	2	3	4
<b>1 Capacity development of Escola de Pesca staff.</b>									
<i>1.1 Short-term training for EdP staff at UNU* (initiated 2006)</i>	<i>2 EdP staff complete training at UNU</i>	X	X						
<i>1.2 Attend training course workshop in Namibia (Namibia)</i>	<i>2 EdP staff attend training course workshop in Namibia</i>				X				
<i>1.3 Backstopping by UNU-staff on development of training courses</i>	<i>Backstopping reports on course material development available.</i>		X	X	X				
<i>1.4 Technical advisor - Course Development Specialist</i>	<i>On-the-job training in course development</i>		X	X	X				
<i>1.5 Technical advisor - Training Specialist</i>	<i>On-the-job training in course development</i>				X	X	X		
<i>1.6 Technical Advisor - Project Evaluation and Planning</i>	<i>On-the-job training in project evaluation and planning</i>						X	X	X
<i>1.7 Procurement of equipment necessary for conducting short courses in quality assurance practices.</i>	<i>Equipment for conducting courses available.</i>	X	X						
<i>1.8 Discussion on training course material (Iceland)</i>	<i>Report on course development training in Iceland for 2 EdP staff.</i>				X				
<b>2 Training concept development.</b>									
<i>2.1 Training needs assessment.</i>	<i>Training needs assessment report for semi-industrial, artisanal and small scale marketing sectors available.</i>	X	X						
<i>2.2 Semi-industrial fishery training syllabus and strategy developed.</i>	<i>Report - syllabus and initial training strategy available.</i>		X						
<i>2.3 Extensionist syllabus for artisanal fishery developed.</i>	<i>Report - syllabus and initial training strategy available.</i>		X						
<i>2.4 Extensionist syllabus for small-scale marketing developed.</i>	<i>Report - syllabus and initial training strategy available.</i>		X						

Activity	Indicator/interim result	2007				2008			
		1	2	3	4	1	2	3	4
<b>3 Short-course structure/syllabus and appropriate educational tools available.</b>									
3.1 Semi-industrial fishery elaboration of lessons plans for each topic and preparation of course materials.	Course outline, lecture notes and presentations available.		X	X	X				
3.2 Artisanal fishery elaboration of lessons plans for each topic and preparation of course materials.	Course outline, lecture notes and presentations available.		X	X	X				
3.3 Marketing elaboration of lessons plans for each topic and preparation of course materials.	Course outline, lecture notes and presentations available.		X	X	X				
3.4 Review of course outlines, lecture notes and presentations by UNU.	Review available for all course notes.			X	X				
3.5 Semi industrial fishery – training course materials available.	Teacher manual, power point presentation, pamphlet, poster and instructional video available.				X				
3.6 Artisanal fishery - Extension package comprising flip charts, pamphlets and posters.	Teacher manual, extension manual, flip charts, pamphlets and posters available.				X				
3.7 Small-scale marketing sector - Extension package comprising flip charts, pamphlets and posters.	Teacher manual, extension manual, flip charts, pamphlets and posters available.				X				
<b>4.0 Training members of the fishing industry (semi-industrial fishery employees, artisanal fisher and small-scale fish marketers) and extensionists through the developed short-courses in Maputo, Inhambane and Beira.</b>									
4.1 Courses for members of semi industrial fishing industry held in Maputo, Sofala and Zambezia.	Training report on one complete course held in each region.				X	X	X	X	X
4.2 Extension staff trained in dissemination and use of extension tool kit for artisanal fishers and small scale marketers in Maputo, Sofala and Zambezia..	Training report and dissemination of training materials to extensionists in each of the three regions				X	X	X	X	X
<b>5.0 Investigate the feasibility of incorporating fish quality assurance training into the mainstream activities of the EP and, if found feasible, develop an implementation plan.</b>									
5.1 Project evaluation	Report available						X	X	
5.2 Preparation of project document for phase II	Plan of operation for 2009-2010 available.						X	X	

## 19.0 Preliminary budget summary

No	Item	Total		2007		2008	
		ICEIDA	OGE	ICEIDA	OGE	ICEIDA	OGE
<b>1</b>	<b>Investment</b>	<b>80,000</b>	<b>10,000</b>	<b>70,000</b>	<b>5,000</b>	<b>10,000</b>	<b>5,000</b>
1.1	<i>Building &amp; maintenance</i>		10,000		5,000		5,000
1.1	<i>Vehicle</i>	40,000		40,000			
1.2	<i>Laptop computers, data projector, photocopiers etc.</i>	40,000		30,000		10,000	
<b>2</b>	<b>EP Staff Training</b>	<b>20,000</b>	<b>3,000</b>	<b>20,000</b>	<b>3,000</b>	<b>0</b>	<b>0</b>
2.1	<i>Attendance at UNU course in Iceland and discussion of training documents.</i>	12,000	2,000	12,000	2,000		
2.2	<i>Training workshop Namibia</i>	8,000	1,000	8,000	1,000		
<b>3</b>	<b>Research and development - running costs</b>	<b>40,000</b>	<b>7,000</b>	<b>20,000</b>	<b>3,000</b>	<b>20,000</b>	<b>4,000</b>
3.1	<i>Training needs analysis</i>	15,000	1,000	15,000	1,000		
3.2	<i>Lecture notes, presentations for courses.</i>	10,000	4,000	5,000	2,000	5,000	2,000
3.3	<i>Course evaluation and curriculum development.</i>	15,000	2,000			15,000	2,000
<b>4</b>	<b>Training materials*</b>	<b>70,000</b>	<b>10,000</b>	<b>30,000</b>	<b>4,000</b>	<b>40,000</b>	<b>6,000</b>
4.1	<i>Semi industrial - Teacher manual, power point presentation, pamphlet, poster and instructional video available.</i>	20,000	3,000	10,000	1,000	10,000	2,000
4.2	<i>Artisanal - Teacher manual, extension manual, flip charts, pamphlets and posters available.</i>	25,000	4,000	10,000	2,000	15,000	2,000
4.3	<i>Marketing - Teacher manual, extension manual, flip charts, pamphlets and posters available.</i>	25,000	3,000	10,000	1,000	15,000	2,000
<b>5</b>	<b>Traveling cost for training</b>	<b>80,000</b>	<b>20,000</b>	<b>20,000</b>	<b>10,000</b>	<b>60,000</b>	<b>10,000</b>
5.1	<i>Training semi-industrial sector</i>	40,000	10,000	10,000	5,000	30,000	5,000
5.2	<i>Training extensionists for artisanal and marketing sectors</i>	40,000	10,000	10,000	5,000	30,000	5,000
<b>6</b>	<b>Administrative costs</b>	<b>10,000</b>		<b>5,000</b>		<b>5,000</b>	
<b>7</b>	<b>External Expertise</b>	<b>10,000</b>	<b>10,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>
<b>8</b>	<b>Course co-ordinators/ Technical Advisor</b>	<b>250,000</b>		<b>120,000</b>		<b>130,000</b>	
<b>9</b>	<b>UNU staff</b>	<b>60,000</b>		<b>30,000</b>		<b>30,000</b>	
<b>TOTAL</b>		<b>620,000</b>	<b>60,000</b>	<b>320,000</b>	<b>30,000</b>	<b>300,000</b>	<b>30,000</b>

\* Development and printing costs for training materials must not be underestimated. Also, the printing of posters, making of videos etc is an expensive component.