Icelandic International Developing Agency (ICEIDA)
and Ministry of Fisheries (MoF)
in Mozambique

Project Evaluation:
"Upgrading of Laboratory facilities in Maputo and Inhambane"

Report by:
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Executive Summary

The Icelandic International Development Agency has in cooperation with the Government of Mozambique financed a construction of a new laboratory building, training of its staff, provided chemicals, equipment and technical assistance for its operation.
The expected outcome was equipped and functional laboratory with trained and qualified personnel, operating in accordance to a quality manual based on specifications laid down in the ISO 17025 standard.
The evaluation revealed that the newly build laboratory is fit for its purpose and the housing generally holds an international standard for such a facility. New equipment was purchased and necessary chemicals were bought for the initial start-up and running of the laboratory. The laboratory staff has received basic training.

The goal of achieving accreditation according to ISO17025 was not reached and still a substantial work is necessary but the laboratory and its staff has a very good ground to continue the work already in progress given that the laboratory receives suitable support and sustainable income e.g. through the "auto finance system".
Quality manual(s) are available for all departments and several important documents have been written. The quality manuals give a good description of the work carried out in the laboratory. However the quality manuals need thorough revision and calibration and other quality control routines should be implemented.

It is recommended that the laboratory should work towards formal accreditation and it should be done in two stages, first a Good Laboratory Practice and then accreditation according to ISO-17025. For this work an external advisor is recommended and needed. The advisors role should be to write the road map (a working plan) to accreditation, to list the milestones and to follow up the results. The laboratory manager –or a quality manager – should be responsible for the implementation of necessary routines and documents according to the lines laid down in the roadmap.
It is further recommended that the laboratory should strengthen its management procedures. The laboratory needs a manager with clear responsibilities such as budget planning, planning of operational activities such as purchasing, maintenance of building and equipment and for maters related to personnel, recruitment, allocation of work and training. The manager should also have the overall responsibility for the quality system, implementation of working procedures and necessary maintenance.

It is necessary to continue the work on calibration and "capacity building". It is recommended that this is done as a part of the work to achieve accreditation. It is recommended that this is done by external advisors. The responsibility for implementing and follow up of the training activities should lie in the hands of the laboratory manager, as this would normally be his responsibility.

It is recommended that ICEIDA's future support regarding the Maputo laboratory should be in the area of training and competence building.

1. Introduction

In 1994 the Government of Mozambique (GOM) issued a "Master Plan" for the development of the fishery sector. One of the objectives of the master plan was to "Increase the net foreign exchange earnings of the sector".
Placing fish on a demanding marked, in order to increase foreign earnings, requires that several demands are fulfilled, some of which are set by the private sector and some by the official sector. One demand is that the exporting country has an appropriate system for quality assurance. An accredited analytical laboratory is one of the cornerstones in such a system.

In August 2002 new laboratory facilities for quality assessment of fishery products were taken into use in Maputo. The construction of the laboratory was a part of a co-operation between the Government of Iceland –represented by ICEIDA– and the Government of Mozambique –represented by the Ministry of Fisheries (MoF). The co-operation between the parties also included technical assistance in quality control.
The purpose of the co-operation was to strengthen Mozambique's efforts to comply with international requirements regarding fish export quality assurance, and fisheries inspection and laboratories in Maputo and Inhambane. ICEIDA provided through the former DNP and later MoF a technical assistance and funds in this effort.

Both financial and technical support has continued by ICEIDA until 2003 and the implementation of the Project after the year 2000 has followed a "plan of action" made on yearly base.

The components of the project, relevant to this evaluation, were:

1. Construction of a laboratory in Maputo
2. Renovation and furnishing of the Laboratory in Inhambane
3. Training of staff in Maputo, Inhambane
4. Provision of Chemicals
5. Technical Assistance.

The expected output was:

> Equipped and functional Laboratory in Maputo with trained and qualified personnel, operating in accordance to a Quality Manual based on the EN 45001 (now named ISO17025) specifications and able to seek accreditation at the year 2000.

In spring 2003 ICEIDA decided to have an external evaluation of the project in order to ascertain the extent to which the goals and the objectives of the project have been achieved. The evaluation should specially focus on the project in Maputo as the evaluation team did not have time to visit Inhambane.

In general, the evaluation should;

- Consider the goal and purpose of the project, as well as inputs and outputs and financial management;

- Consider unintended outcomes of the project;
- Provide a description of major constraints and risk factors for project implementation and sustainability;
- Assess the degree of project sustainability;
- Provide a description of lessons learned in relation to future project implementation;
- Give recommendations on future modifications and improvements in light of the above listed objectives.

The full terms of references can be found in Appendix 1.

1.1 Methodology

Preparation for the evaluation began in August and September 2003 by formulating and adoption of terms of reference.

The Evaluation team consisted of:
Dr. Hjörleifur Einarsson professor, team leader
Guðmundur Guðmundsson
Margeir Gissurarson
Maria Luiz Fernandes
Carlos Riquixo
Relevant background material was assembled and handed over to the team leader for initial offsite evaluation.

The team leader arrived in Maputo on November 10th. After initial meeting with ICEIDA staff at ICEIDA office a series of meetings, visits and discussions took place together with two or more members of the evaluation team.

Final discussions took place at the MoF on Nov 14th where the main preliminary findings and recommendations of the team were presented.
During preparation of the report additional material was gathered, mainly facts and figures.

2. The Project

2.1 Project framework – outline

Brief description of the project – project history.

THE LABORATORY

The initial outline of the project is laid down in a document called "Upgrading laboratory facilities in Maputo and installation of a laboratory in Inhambane". The document is from September 1996. At that time the laboratory was situated in a building belonging to the Port Authorities in Maputo. The laboratory performed sensory and some chemical analysis. The microbiological analysis and some chemical analysis were performed at the The National Laboratory for Food and Water at the Ministry of Health. At that time no laboratory activities were in Inhambane.

It was proposed that ICEIDA would provide funds to "either renovate or build a new building in Maputo pending on further cost analysis. ICEIDA would furthermore provide funds for laboratory equipment".
For Inhambane the plan was to set up facilities to perform limited number of analysis like on sulphite and sensory analysis.

In a report from an ICEIDA visit to Mozambique in January 1998 the report authors note with some surprise "that the project has changed from upgrading a existing laboratory to building a new laboratory.
It is not clear from the written documentation used in this evaluation why, when or who took the decision to build a new laboratory. It is however evident that a new building was what the local organisers planned from start.

From early 1999 it is evident that a new laboratory would be built and to be completed in the same year (start in April and to be finished in 6 to 8 months).The estimated cost was around 450.000 US$.

The work on the laboratory started in February 2000.

In 2000 Mozambique suffered serious flooding that affected the building process.

In March 2001 additional funds were requested for securing electricity for the laboratory. This included the building of a power house for generator and transformer. This was found necessary as the initial plan of receiving electricity from the Port Authorities could not be realised. During the construction of the laboratory, the fishing harbour in Maputo was completely rebuilt for Japanese funds. During the reconstruction of the harbour the power transformer for the site was reduced. As a result electricity for the laboratory could no longer be provided by the new transformer.

In September 2001 the work is not yet finished and then it is estimated that the construction should be completed at end of May 2002.
The construction of the powerhouse was completed in June 2002 but the power was not connected to the house until August 2002

The laboratory facilities were taken into use in full use in August 2002.

TRAINING OF STAFF

The training of staff has been along two main lines one on analytical methods and the other on issues associated with quality assurance.

In March 1997 an Icelandic laboratory expert started working at the Department of Fisheries Inspection. Included in the expert's tasks was work on quality assurance procedures in the laboratory in Maputo also work on laboratory manuals for chemical, microbiological and sensory analysis. This work continued till 2003 although by a different expert.

A series of workshops were prepared in co-operation with DANIDA and two were held under Icelandic supervision.
Both workshops were given by an external expert: one on basic microbiological theory (June/July 2001) and the other on Microbiological analysis and Quality assurance at the microbiological laboratory (July 2002).

An in-house advisor was hired and was in the laboratory from beginning of June 2001 till Dec. 2003. His expertise was in food science, quality assurance and general laboratory procedures.

The head of the Maputo laboratory has received training in Iceland at the Icelandic Fisheries laboratories, Icelandic Environmental Agency and UNU fishery training program. MLF will conduct her M.Sc. work on quality systems for testing laboratories in Maputo and Iceland under the supervision of Franklin Georgsson.
Equipment and chemicals were bought according to a list that was prepared by the partners and these were all in place at the time of the evaluation.
New equipment included autoclave, incubators, ovens, pH-meters, Millipore-filters, laminar flow bench to mention few.

2.2 Changes in the project context during the implementation

The initial proposal was to "upgrade [an existing] or to build [a new]" laboratory facility in Maputo. It is clear from existing documents and interviews that the vision was some what different in Iceland and Mozambique.
It is not clear when, how or who changed the direction of the project towards building a new laboratory (see also 2.1).
The ISO 17025 states that facilities should be fit for purpose and although an old laboratory can gain accreditation it more likely that a new laboratory will full fill demands.

2.3 Relevance to partners

The project had high relevance to both partners- GOM and ICEIDA. The project is an important part of the GOM policy to strengthen the "Inspection and Quality Assurance system for Fishery Products".
The project is also in line with ICEIDA's goals to strengthen the fishery sector in Mozambique

Pictures from the laboratory: Chemistry (top) and microbiology (bottom)

3. Efficiency:

Results achieved (inputs -outputs).

Have resources been effectively used in the project? What problems have arisen? Could they be avoided in similar projects?

- ✓ Review of the project organisation on all levels (including management, reporting and monitoring, human resources and technical backup);

The lack of formal and extensive project description or a contract makes it difficult to assess organisation and management of the project.
The local organisation (building committee) in Maputo comprised of Luisa Arthur Mof. and Agusta Gisladottir advisor ICEIDA. The MoF was the formal constructor and ICEIDA the financer.
Two consultant companies SOMOCON and Arquiplan were hired by the MoF to supervise the construction of the laboratory. This included e.g. preparation of tender documents, the tender, selecting contractors and on-site inspections and reporting to the owners.
The Ministry of Public Works assisted the partners during the tender period. But the service provided to a long time and caused some delay in the whole process.

Initially the construction was contracted to the company MOTREX but they again sub-contracted different parts of the work to other companies - possibly causing some delays.

During the construction period weekly meetings were between contractor, sub-contractor and owner (MoF) and financer.

The tender was based on drawings and plans that DANIDA had made for a laboratory in Beira and the idea was to use the same drawings for more than one laboratory to decrease cost. Due to rebuilding of the harbour during the construction of the laboratory, it became necessary to redesign the entrance and corridor of the laboratory. The estimated cost of these changes was 14.000$ and 7 months delay.
Some months after the construction started the building committee asked for changes on several items regarding the windows, roof and drainage system.
As the total budged was not increased, cost was decreased on other items resulting in poorer material quality.

The work suffered from series of delays some of which have already been mentioned. It is clear that management of a project of this type is difficult if and when lines of commands are unclear and many different parties are involved.

- ✓ Assessment of financial management including disbursement of funds at the different levels and financial reporting;

The initially estimated project cost was 469.000$ and the final cost was 489.000$ which is approximately 4% higher than the initial plan and must be regarded as well acceptable. Part of the increase was agreed upon.

A more detailed analysis of costs is given in table below.

Item	Estimate ($)	Actual cost ($)	Difference
Building cost	220,000	304,660	84,660
Furniture	25,000	18,000	-7,000
Air conditioning	25,000	24,884	-116
Generator	20,000	0	-20,000
Architect	18,000	18,000	0
Supervision	6,000	6,000	0
Equipment and chemicals	155,000	117,682	-37,318
Total:	**469,000**	**489,226**	**20,226**

According to Arquiplan the budget for the project was too "tight" from the beginning. No comments were made on distribution of funds. In Nov. 2003 the contractor had received approximately 95% of the contracted sum, the rest (~5%) is retained in the MoF.

Besides the direct building cost ICEIDA financed cost for consultations and training.

- ✓ Assessment of staff development and needs for further capacity building;

In November 2003 the laboratory had 11 staff, 10 working full time and one working half time. Nine had permanent position or a "contract" and two were trainees. Four had university degree, 3 grammar school and 4 had finished compulsory education.
In addition the laboratory had an external advisor.

In November 2003 the laboratory had sufficient staff to deal with the workload at that time. However the situation is vulnerable as part of the staff is temporary and the head of laboratory is expected to spend half of the time on writing M.Sc. thesis during spring 2004.

The staff had received basic training in chemical analysis, sensory analyses, microbiological methods and in quality assurance by the ICEIDA advisors a work that had begun already in 1997. Workshops were held in microbiology, chemical analysis, sensory and physical methods and on quality control.
Seminars were held on risk analysis and fish inspection systems.
Training on an individual basis was also carried out. Individual training was both on basic techniques in microbiological and chemical analysis. Still further training is considered necessary especially in microbiology.

Also the personnel received basic training regarding quality control and quality assurance but this training was far from sufficient to implement sustainable quality assurance routines in the laboratory. Further training in this area is needed and should be done by an external expert.

The laboratory should have a microbiologist with university degree capable of supervising trained laboratory workers and to be able to make corrective actions in unforeseen situations.

The management of the laboratory seems week. Key staff were absent for extensive periods, no budget/financial nor operational plans could be presented for the laboratory.

The master's thesis work currently supported by ICEIDA as part of the capacity building will not result in a functional quality manual for the laboratory. The thesis will give a generic manual that needs to be customised to practical situation in the laboratory.

- ✓ Assessment of the infrastructure facilities, equipment etc;

The laboratory building is fit for its purpose and fulfils on all major points requirements to such a building. The layout is functional and allow for necessary separation of different activities. Some concern is raised regarding building material and details in the construction. Thus windows and doors are not sufficiently tight and in order to cut some cost a tightening list between the walls and roof was omitted. The result is that there is a risk that bird and other small animals can enter the building through the gap between the roof and walls.
The quality of the painting on walls and windows will demand frequent maintenance.
The building is situated at the harbour and surrounded by a lawn on three sides. The fourth side is faced by an uncovered ground that could cause dust problems.
The construction of power house and installation of transformer was necessary to supply the laboratory with electricity. Still there is a risk of power shut-down and a power generator would increase the operational security of the laboratory but to invest in such an installation would demand a thorough cost-benefit analysis.

All necessary chemicals were bought for the initial start-up and running of the laboratory. At the time of evaluation several of them had passed "use by" date and new chemicals must be bought.

The laboratory has good and sufficient equipment for its present operations. All principal equipment have been installed and tested. However instruments must receive regular maintenance and a plan for such is not in place.

The laboratory is not fit for accreditation and still lot of work is to be done in order to achieve that status. That work includes building and training in quality systems.

Several documents related to the quality system have been written and placed in appropriate quality manual. Still several documents are missing and some of the existing documents already need revising.
The quality manual must be revised and all necessary documents implemented.

Calibration of instruments has started but several instruments have not been calibrated and it must be borne in mind that calibration is a continuous process that must follow a schema.

Calibration is one of the cornerstones of a quality system and is necessary to ensure accuracy and traceability of results.

The laboratory is not taking part in an inter- nor an intra-laboratory comparison and this weakens the laboratory credibility.

- ✓ Assessment of needs for eventual additional equipment and other capital investment;

As stated in the previous section all necessary instruments are in place. The laboratory manager expressed the view that there is still need for further equipments. No formal list was presented but need was more to increase the capacity and to facilitate the work already done rather than the "missing" equipment prevented that work could be carried out.
It is not recommended to invest in power generator unless a cost-benefit analysis shows it highly relevant.

4. Effectiveness

Achievement of objectives.
Has the project achieved its objectives? What has facilitated or prevented the effectiveness of the project?

- ✓ The potential of the project to reach the stated objectives;

The overall objectives of the project were linked with Government of Mozambique´s policy and economic objectives were a functional system for the fish processing industry that guarantees the quality of products intended for export is an important component.

The immediate objectives of the project were:

- ✓ Strengthening of the government Inspection and Quality Assurance system for Fishery Products with the construction and equipment of a credible Fish Products Inspection Laboratory in Maputo and renovation and equipment of existing Laboratory in Inhambane and to
- ✓ Increase the capacity of the laboratories´ personnel with providing in house training and specialised courses and studies in Iceland.

The project reached the stated objectives of the project in all major points. The laboratory in Maputo was built, equipment was bought and the capacity of the personnel was increased by training both in house and in Iceland.

It is clear that the support from ICEIDA was a crucial factor for the realisation of the project.

However the laboratory in Maputo is not fit for a formal accreditation process at this moment. Several factors can be listed to "explain" why this goal was not reached.

First of all is to mention that this is a very ambitious goal and probably not a very realistic one. From the evaluators own experience it can take several years even in a fully operational laboratory to document all routines and to implement them.

It is clear that a lot of the effort was placed on the construction and the building and the delays resulted in less time for the accreditation process.

An accreditation progress require that certified materials are available and intra-laboratory comparison is performed.

- ✓ To which extent the programme is progressing towards producing the anticipated outputs;

In chapter 9 "Conclusion and Recommendations" several recommendations are given for achieving the anticipated objectives.

5. Impact

Other effects of the project. Technological and socio-cultural factors affecting project implementation shall be considered.
What are the positive and negative effects of the project? What are their causes?

- ✓ Assessment of the impact of the project activities on the fisheries industry, and possibility to export fish;
- ✓ Assessment of the impact of the training of the personnel.

In order to "strengthening the government Inspection and Quality Assurance system for Fishery Products" it is of great importance to have an access to a "credible" testing laboratory.
Therefore the laboratory in Maputo is already having a high impact and will in the future if work continues on the quality system and if the laboratory is maintained on all critical points –house, equipment, chemicals and not least personnel.

The laboratory can play a vital role in keeping the doors open to demanding markets like the on in Europe.

Laboratory results are necessary to support statements from the official- and private-sector that the fishery products from Mozambique are of high standard both regarding quality and safety.

The training of personnel will increase the laboratory standard and thus its credibility. Trained and competent staff is a valuable asset and it is a real risk that the laboratory can lose key personnel to outside parties.

The training of staff has already had an positive impact as the competence has increased. It is important to continue this work.

It is difficult to see a major negative impact of the project.

6. Relevance

The direction and usefulness of the project.
Are the objectives worthwhile?

- ✓ Assessment of the degrees and need for collaboration with other… in the sector, including the role of government institutions;
- ✓ Assessment of project relevance in relation to MoF Policy and strategy;
- ✓ Assessment of project relevance in relation to other donor agencies activities in this field;

The project has a high relevance and the objectives are "worthwhile". As stated earlier a laboratory having an international recognition is of great importance for export of fishery products from Mozambique.

The project has a high relevance for the GOM policy and economic objectives regarding:

- ✓ Food Security
- ✓ Sustainable Economic Growth
- ✓ Reduction of Unemployment
- ✓ Reduction of Poverty.

Also for the MoF policy laid down in the "Master Plan".
The project has a high relevance for ICEIDA's policy support activities in the fishing sector.

7. Sustainability

The long-term viability of the project.
Which benefits of the project continue beyond donor involvement?

- ✓ Assessment of the project potential to survive after donor financial and technical support
- ✓ Assessment of the need for external technical assistant after end of year 2003 (short term or long term)
- ✓ Assessment of what kind of follow-up/exit strategy would be needed to secure the sustainability of the programme

The evaluation will be sensitive to unintended outcomes of the project.

The sustainability of the project will be determined by the political and financial support it will be given by the GOM and the MoF.

Running a laboratory is in many ways like any other business, the laboratory must have customers, it must have income to pay for necessary expenses, it must have competent staff, it must have defined working procedures, it must have the right environment, equipment and materials to fulfil it's tasks.
Finally the laboratory must have a competent management.

The main customer of the laboratory is the inspection service and it is likely that samples will continue to come to the laboratory. There are however warning flags to be raised.
An implementation of a HACCP based quality and safety assurance system will decrease the number of samples that needs to be analysed as the quality and safety will be "built" in to the product in the whole process. Also it can be argued that the number of samples already analysed is high compared to the number of landings and volume of catch.

Very few samples are delivered by others like private companies.
The sustainability of the laboratory could be improved if more samples –that bringing net income– were analysed.
If –on the other hand –further analytical capacity was built in Mozambique taking samples from the Maputo laboratory the sustainability is greatly lowered.

Based on the numbers of lots exported the absolute highest number of samples that needs to be analysed is in the order 5000-6000 samples. This can be done in one laboratory of the size of the one in Maputo.

A laboratory must have a stable income to pay for expenses –salary, chemicals, equipment, maintenance and other operational costs.
It was evident from the evaluation that this is a very weak point and can jeopardise the future and operation of the laboratory.
An "auto finance" system was presented the evaluator supports the idea and urge the involved partners to work toward such a system and put it into practise. It must be guaranteed that the income will be allocated to the laboratory.
Also the laboratory should have access to a small fund for day to day purchase of necessary consumables.
It is recommended that the Fundo de Fomento Pesquero will act as a financial office in this matter.

At a meeting with represents from the "industry" the idea was put forward by the evaluator and although raising some words of warning that such a system is just another tax and a burden for the industry they were understanding that a laboratory was necessary and in must have a sound financing to run its operations.

The manager must have authority some "autonomy"

The position of the laboratory in organization charts (Mof and Servico de Inspeccao de Pescado) is both complicated and unclear and undermines the integrity of the laboratory and thus sustainability.

In the ISO17025 standard -General requirements for the competence of testing and calibration laboratories- demands that an accredited laboratory has "managerial and technical personnel with the authority and resources needed to carry out their duties" [4.1.5. (a)]
It is thus clear that a laboratory not having resources to buy necessary materials and maintenance will not get an accreditation.
If resources can not be allocated to the operation of the laboratory fulfilling the demands of the standard, another way of recognition must be sought.

The sustainability of the laboratory depends highly on the staff and its competence. It is clear that the competence of the personnel has been raised but still further improvements can be done especially on the microbiology side. It must also be borne in mind that competence must be maintained and it is a continuous process. It is important that the personnel has access to well defined working procedures.

Turnover of staff will pose threat to the sustainability of the laboratory and some lessons could be learned from DANIDA's experience from Beira, where the laboratory is suffering from departure of key staff and it has proved difficult to recruit new staff and build up a quality system.

Competent management of the laboratory is of vital importance for both the short and long term operation of the laboratory. The role of the manager is to allocate resources for the operation of the laboratory, to ensure that obligations are fulfilled but not least to make financial and operational plans for the operation. The manager must have from his supervisor the necessary authority and –again– resources to implement and carry out his obligations.

8. Lessons learned

8.1 Operational lessons

The project suffered from a series of delays.
The project clearly shows the importance of "in advance" written contracts that have been reviewed – as possible– for all eventualities.

8.2 Developmental lessons

The developmental lesson learned is that clear objectives from both sites can bring about important changes toward common goals for both partners.

9. Conclusions and Recommendations

9.1 Conclusion

A project initially aiming at upgrading an analytical laboratory for the fish inspection services in Maputo, Mozambique resulted in construction of a brand new facility.

The new laboratory is fit for its purpose and the housing generally holds an international standard for such a facility. The building is already requiring maintenance and it is likely that it will require a considerable maintenance in the future. A separate building was built to house a transformer and a generator.

The project suffered from series of delays and is still formally not finished as the MoF has not approved –by signature- a letter from the project supervisor (Arquiplan) stating that the contractor has finished its part of the project according to contract.

New equipment was purchased and most of it is in place and operational, some calibration routines have been implemented and further calibration work planned.

Necessary chemicals were bought for the initial start-up and running of the laboratory.

The laboratory staff has been trained by in-house advisor- provided by ICEIDA-, by external advisors and by individual program in Iceland (not completed). The laboratory has a chemist with a university degree but lacks a microbiologist with a university degree.

The goal of achieving accreditation according to ISO17025 / EN 45001 was not reached and still a substantial work is necessary.
Quality manual(s) are available for all departments and several important documents have been written. The quality manuals give a good description of the work carried out in the laboratory. However the quality manuals need thorough revision and calibration and other quality control routines should be implemented.

The work currently being preformed in the Master´s Program of the head of laboratory will not give the laboratory an operational quality system but could still be valuable.

The position of the laboratory in organization charts (Mof and Servico de Inspeccao de Pescado) were found to be both complicated and unclear.

It was evident that the laboratory is lacking funds to maintain normal operation of the laboratory.

The management of the laboratory is weak.

The project has in many aspects, achieved its immediate objectives by strengthening the QA system and increased the capacity of the laboratory's personnel although falling short on (many) some points.

It is necessary for export of fishery products that the industry and officials alike have an access to a laboratory of an international recognized standard. This is necessary to support claims regarding both safety and quality of the products and thus keep the door open to e.g. European markets.

The project had a high relevance both regarding ICEIDAs and MoF overall policy but above mentioned delays, lack of staff, lack of funds for running the laboratory has seriously impaired the effectiveness of ICEIDAs advice.

Finally it is concluded that in order to ensure the sustainability and long term viability of the quality assurance policy for the fishery sector in Mozambique the below recommendations should be followed.

9.2 Recommendations

In order to ensure the sustainability and long term viability of the quality assurance policy for the fishery sector in Mozambique it is of prime importance that all actors in the sectors have a access to a laboratory operating under conditions equivalent to those set in international standards like ISO17025.
This does not say that formal accreditation is immediately necessary but laboratory without quality system or Good Laboratory Practice will not hold an international acceptance in the long run.
The road to formal recognitions should be in two stages, first a GLP and then accreditation according to ISO-17025. This will probably take 2-3 years and an external advisor is needed. The advisors role should be to write the road map (a working plan) to accreditation, to list the milestones and to follow up the results. The laboratory manager – or a quality manager – should be responsible for the implementation of necessary routines and documents according to the lines laid down in the roadmap.

In the ISO-17025 standard the integrity of a laboratory is of prime importance. There for it is recommended that the laboratory should have a status of a “legal entity” and its organization and its organizational status with in MoF must be clear. This is especially important if more than one laboratory will be under one umbrella and under three independent provincial departments.

The laboratory must have a sound economic base to run its operations and adequate funds must be allocated to the laboratory on an annual basis to cover its operational costs. Additionally the laboratory management must have access to some funds on regular, short-term basis. The MoF must present a financial plan and organization for the operation of the laboratory for the next coming 2-3 years and guaranty sufficient fund for the operation of the laboratory.

It is recommended that the proposed "auto finance system" should be implemented as soon as possible and the revenues should be a priory allocated to cover the operational cost of the laboratory. The aim should be that the price for the individual analysis should reflect the actual cost of ditto. In the meantime the MoF must secure resources in the period from now to the possible new auto finance system.

The laboratory should have a manager with clear responsibilities. The responsibilities should include budget planning, planning of operational activities such as purchasing, maintenance of building and equipment. The manager should have the overall responsibility for maters related to personnel, recruitment, allocation of work and training. The manager should also have the overall responsibility for the quality system, implementation of working procedures and necessary maintenance.
It is important to insure stability in maters related to personnel and to avoid to many changes especially of people in top positions. Also the laboratory must have stable and even flow of samples to ensure that necessary skills of staff are maintained.

The work on the quality system should continue but it must be guaranteed that the work supported by ICEIDA so far on this subject will be more or less directly applicable to the laboratory.

It is necessary to continue the work on calibration, traceability and validation. Here an external advisor is necessary. The advisors role is to improve and implement necessary documents and train staff to carry out calibration routines. This can be done in 2 to 3 slots, 1 to 2 weeks at the time. A prerequisite is to buy reference material and to initiate inter-laboratory tests.

The "capacity building" should continue as further training in analysis techniques is necessary. This is especially true for the microbiological analysis. Here an external advisor is necessary. The advisors role is to implement and give the necessary training in order to give the staff necessary confidence to carry out microbial analysis on a routine basis. The training should be done in 2 to 3 slots, 1 to 2 weeks at the time. This depends on the permanent in-house capacity.
The capacity building should be a part of the road map toward the accreditation. The responsibility for implementing and follow up of the training activities should lie in the hands of the laboratory manager, as this would normally be his responsibility.

It is recommended that ICEIDA's future support regarding the Maputo laboratory will be in the area of training and competence building.

Akureyri April 2004

Hjörleifur Einarsson

APENDIX 1 – TOR

Terms of Reference For the Evaluation Of The Project " Upgrading of Laboratory facilities in Maputo and Inhambane" Maputo (1996 - 2004)

Funded and implemented by the Icelandic International Development Agency (ICEIDA). in co-operation with the former National Directorate of Fisheries (DNP) and since 2000 the new Ministry of Fisheries (MoF).

The evaluation will be carried out in November 2003

1. Introduction

Reference is made to the Agreement signed April 21st 1996 between the Government of Iceland and the Government of Mozambique regarding development co-operation between the two Countries.

From 1997 Iceland has provided technical support and funding to the fishery sector through the Ministry of Agriculture and Fisheries and later through the new Ministry of Fisheries (MoF). Co-operation between the parties has included: Building and upgrading of laboratory in Maputo and Inhambane, technical assistance in quality control, emergency aid to artisanal fishermen due the floods in 2000. Furthermore ICEIDA supplied a research vessel (Fengur) and a manager for the operation of the vessel as a part of a project funded by the Nordic Development Fund.
Other project falling under the scope of the MoF is establishment of an Information and Training Centre (ITC), which serves the Ministry and all parties engaged in activities relating to fisheries.

2. Background

Following a request from the Mozambican government officials in 1996, ICEIDA decided to provide through the former DNP and later MoF a technical assistance and funds to strengthen DNP´s efforts to comply with international requirements regarding export quality assurance, and fisheries inspections and laboratories in Maputo and Inhambane.

An outline of a four years project was designed that was in line with the Government Fisheries Policy and implementation Strategy that had been signed in May 1996. The project´s outline was accepted by both partners.

The support both financial and technical has continued by ICEIDA until 2003 and the implementation of the Project after the year 2000 has followed a plan of action made on yearly base.

3. The Components of the project are:

- Construction of a laboratory in Maputo
- Renovation and furnishing of the Laboratory in Inhambane

- Training of staff in Maputo, Inhambane
- Provision of Chemicals
- Technical Assistance.

4. The development Objective:

Strengthening of the semi-industrial fisheries through a functional system for the fish processing industry that garantees the quality of products intended for export. The system will be in line with the MoF Fisheries policy and will be linked with Government of Mozambique´s (GOM) overall economic objectives:

- ✓ Food Security
- ✓ Sustainable Economic Growth
- ✓ Reduction of Unemployment
- ✓ Reduction of Poverty.

The Immediate Objectives are:

- ✓ Strengthening of the government Inspection and Quality Assurance system for Fishery Products with the construction and equipment of a credible Fish Products Inspection Laboratory in Maputo and renovation and equipment of existing Laboratory in Inhambane;
- ✓ Increase the capacity of the laboratories´ personnel with providing in house training and specialised courses and studies in Iceland.

5. The Output

- ✓ Equipped and functional Laboratory in Maputo with trained and qualified personnel, operating in accordance to a Quality Manual based on the EN 45001 specifications and able to seek acredition at the year 2000.

6. Strategy

ICEIDA provided assistance in form of funds for renovation of a laboratory in Inhambane and for construction of a new laboratory in Maputo. In December 1999 a contract for the construction of a new laboratory in Maputo was signed.

ICEIDA provided also funds for material and necessary equipment, study tours and training courses for the personnel. A Technical adviser, specialist in food science has been engaged in the project since 1997.

Starting date:
Estimated duration: 4 years 1997 - 2000.
Revised total budget (as from September 1996 - 2000): US$ 462,000. (Technical assistance cost excluded).
GOM commitments: Employ laboratory staff for Inhambane. GOM pledged to use the export tax, which was due to come into effect 1997, to participate in the running cost of its laboratories.

7. Reasons for the Evaluation.

This external evaluation is being undertaken by the request of ICEIDA in order to ascertain the extent to which the goals and the objectives of the project have been achieved. The evaluation shall focus specially on the project in Maputo.

The results and recommendations of the evaluation are to guide the involved parties in their decision-making regarding the future of the ICEIDA support to the project.

The evaluation should also provide the personnel of the laboratory and MoF with information that could assist in planning and implementing future activities.

The evaluation should also be of special importance as a learning exercise for ICEIDA and MoF co-operation in this field.

8. Scope and Focus of the Evaluation

The evaluation will focus on providing information for decision-makers, both in Mozambique and Iceland, but will also be a learning exercise for the stakeholders.

In general, the evaluation shall;

- ✓ Consider the goal and purpose of the project, as well as inputs and outputs and financial management;
- ✓ Consider unintended outcomes of the project;
- ✓ Provide a description of major constraints and risk factors for project implementation and sustainability;
- ✓ Assess the degree of project sustainability;
- ✓ Provide a description of lessons learned in relation to future project implementation;
- ✓ Give recommendations on future modifications and improvements in light of the above listed objectives.

9. Issues to be covered in the evaluation

Special attention shall be given to but not necessarily limited to, the following issues:

Efficiency:
Results achieved (inputs -outputs).
Have resources been effectively used in the project? What problems have arisen? Could they be avoided in similar projects?

- ✓ Review of the project organisation on all levels (including management, reporting and monitoring, human resources and technical backup);
- ✓ Assessment of financial management including disbursement of funds at the different levels and financial reporting;
- ✓ Assessment of staff development and needs for further capacity building;
- ✓ Assessment of the infrastructure facilities, equipment etc;
- ✓ Assessment of needs for eventual additional equipment and other capital investment;

Effectiveness
Achievement of objectives.
Has the project achieved its objectives? What has facilitated or prevented the effectiveness of the project?

- ✓ The potential of the project to reach the stated objectives;
- ✓ To which extent the programme is progressing towards producing the anticipated outputs;

Impact
Other effects of the project. Technological and socio-cultural factors affecting project implementation shall be considered.
What are the positive and negative effects of the project? What are their causes?

- ✓ Assessment of the impact of the project activities on the fisheries industry, and possibility to export fish;
- ✓ Assessment of the impact of the training of the personnel.

Relevance
The direction and usefulness of the project.
Are the objectives worthwhile?

- ✓ Assessment of the degrees and need for collaboration with other… in the sector, including the role of government institutions;

- ✓ Assessment of project relevance in relation to MoF Policy and strategy;

- ✓ Assessment of project relevance in relation to other donor agencies activities in this field;

Sustainability
The long-term viability of the project.
Which benefits of the project continue beyond donor involvement?

- ✓ Assessment of the project potential to survive after donor financial and technical support
- ✓ Assessment of the need for external technical assistant after end of year 2003 (short term or long term)
- ✓ Assessment of what kind of follow-up/exit strategy would be needed to secure the sustainability of the programme

The evaluation will be sensitive to unintended outcomes of the project.

10. Evaluation Team

The team leader should have relevant experience in operations of laboratories, quality issues and good understanding of training and management issues. The team leader shall also have a University degree in food science. Fluency in the English language is required and knowledge of Portuguese is an advantage.

Other team members should have good knowledge of the project in general.

Team leader will be Dr. Hjörleifur Einarsson, professor

Other team members will be:
Guðmundur G. Guðmundsson
Margeir Gissurarson
Maria Luiz
Carlos Riquixo

Other resource persons;
Laboratory staff;
MoF staff;

ICEIDA; Ms. Elín Sigurðardóttir Country Director, Mr. Sighvatur Björnsson Director, Mr. Björn Dagbjartsson former Dir.of ICEIDA and Ms. Ágústa Gísladóttir former technical adviser at the laboratory in Maputo Mozambique.

Representatives from other donor Agencies in similar projects or programmes;

The cost of the evaluation will be covered by the project budget.

11. Methodology

- ✓ The team will have access to relevant background material, including MoF Master Plan and Development plan??
- ✓ The review will be carried out through meetings with MoF personnel and staff at all levels including representatives from the fisheries industry through visits to selected companies????
- ✓ The team will meet, if possible, with other donors who provide similar support and that MoF is responsible for.
- ✓ Final discussions will be held in Maputo with MoF and ICEIDA, where the main preliminary findings and recommendations of the team will be presented.

12. Timetable and reporting

Preparation for the evaluation will take place during 10 days in November 2003. Fieldwork will be carried out in Mozambique on the 10th to 16th of November 2003, seven days, with a draft report being prepared on-site.

The team leader shall have the main responsibility for the writing and compilation of the report. A draft report will be submitted to MoF and ICEIDA for comments before end of November. The final report will be submitted to the, MoF and ICEIDA before middle of December 2003.

It is recommended that the findings and recommendations of the report will be presented to the personnel of the Laboratory in Maputo and other relevant MoF personnel.

List of Documents (Iceland):

1. **Project Outline**
   - ✓ Memorandum and letters regarding the ICEIDA support to the Inspections Service in the National Directorate of Fisheries 1996.
   - ✓ Terms of reference for the Laboratory Expert.
   - ✓ Project Outline September 1996
2. **Agreed Minutes**
   February 1999,
   September 2001
3. **Training**

- ✓ Terms of reference - Training and assistance to laboratory staff 2000
- ✓ Report on training programme: Franklin Georgsson 10.July 2001
- ✓ Report on training programme: Franklin Georgsson 31. July 2002

4. Correspondence between the Mof and ICEIDA regarding a request from MoF for additional funds for the Laboratory in Maputo; March 2001- May 2001.

5. Reports from DANIDA

- ✓ Sector Programme Support to the semi-industrial Fisheries Sector Mozambique; Dec. 2000
- ✓ Final Programme Completion Report; Sept. 2003

6. A proposal to Iceland´s Continued Support to The Fisheries Sector in Mozambique

- ✓ A report by Garðar Sverrisson Aug. 2002
- ✓ Terms of reference for external programme Assessment
- ✓ Álitsgerð vegna skýrslu Garðars Sverrissonar

7. Correspondence between the MoF and ICEIDA

- ✓ Request for technical and financial support to the fish inspection project

8. ICEIDA Annual Reports 1997 - 2001

9. Bi-annual reports -Mozambique

- ✓ January - August 2002
- ✓ July - December 2002
- ✓ January - June 2003.

10. Other documents:

- ✓ Annual Report 2002
- ✓ Fréttabréf Þróunarsamvinnustofnunar Íslands tbl. 1. árið 2001 tbl. 1. 2002
- ✓ Master Plan Ministry of Fisheries Mozambique 1994
- ✓ Mósambík, bæklingur á íslensku
- ✓ Newsletter no.10. 1999, no 12, 2001
- ✓ Official Journal of the European Communities: Commission Decision 29. Oct. 2002
- ✓ Travel reports from Mozambique 1996-2003, ICEIDA

Documents (Maputo):

SOMOCPN/Arquiplan: Memorando Sobre a Situação da Obra Fevereiro 2001

DANIDA/MK Dec. 2002: Assistance to fish inspection lobratories in Mozambique – Three laboratory training workshops in Maputo and Beira.

DANIDA/AL Dec. 2000: Technical review of the fish inspection laboratory in Beira and Maputo