【Indicators】
5-1. By the end of September 2007, set up and operate an INCOPESCA-UNA committee of stock assessment.
5-2. By the end of September 2007, carry out stock assessment of main species of Gulf of Nicoya.

Findings : Overall achievement of Output 5 is very high.
- Stock Assessment Committee was established in August, 2005 within the Project.
Committee member is consisted of 3 C/Ps from UNA, 4 C/Ps from INCOPESCA and 2 from JICA.

-The Committee has held a series of study meetings to conduct stock assessment of the target species by using data collected by the Project.

-The Committee has assessed the stock of white shrimp and pargo mancha and prepared a recommendation for fisheries management. The committee has published "Stock Assessment Committee Report No1/2007" in English. A Spanish version is being prepared.

(6) **Output 6**: The condition and problems of quality control of marine products distribution from fishing boats to fish stores are clarified.
【Indicators】
6-1. By the end of 2004, the investigation in the area of quality control (freshness, sanitary condition, personal hygiene, price, etc.) of marine products distribution are conducted.
6-2. By the end of 2005, results are reported.

Findings : Overall achievement of Output 6 is high.
-Field surveys were conducted to grasp the quality management situation from producer (fishers) to retailers and consumers. During the study, germ bacteria test and freshness test were conducted. No enteritis vibrio was found and the occurring of pathogenic bacteria is rare. It was obvious that the freshness declined as the distribution stage proceeds. All C/Ps of INCOPESCA in the area of quality control and 2 C/Ps of UNA participated in this survey and 3 reports were compiled.

-The relationship between freshness of fish and the price in the local market was not studied properly during the early stage of the Project.

-All of the 26 fishing villages that produce shellfish were visited. The number of shellfish collectors, the species of shellfish, working hours, fishing grounds, and the selling price of shellfish were studied.

From this study, monitoring sites for shellfish and water sample collection were decided. Two (2) C/P from UNA participated in this survey and a report was compiled.

(7) **Output** 7: C/Ps acquire the techniques of freshness tests and freshness maintenance.
【Indicators】
7-1. By the end of 2005, C/Ps implement the freshness tests by themselves.
7-2. By the end of 2006, C/Ps perform to instruct the technique of freshness maintenance to stakeholders.

Findings : Overall achievement of Output 7 is very high.
-A manual on freshness tests written in Spanish was prepared. The techniques on freshness test were properly transferred to C/Ps, through the manual and training. It became clear that K-value and organoleptic test were available for the evaluation of freshness in main commercial fishes.

-Several manuals on freshness maintenance written in Spanish were prepared. The techniques on instant fish-killing method and iced-storage etc were favorably transferred to C/Ps, using the manuals and practice. The acquired technology and the useful information have been shown to fishers, transporters, retailers and the other related people at the workshops and seminars.

(8) **Output 8**: The improvement of monitoring system of toxic shellfish is advanced.
【Indicators】
8-1. By the end of 2005, C/Ps implement monitoring by themselves.
8-2. The contents of recommendation for improvement are reviewed and implemented.

Findings : Overall achievement of Output 8 is very high
-During 2002-2007, 3 species of toxic phytoplankton have been observed, which were *Gymnodinium catenatum*, *Pyrodium bahamense* var. *compressum* and *Alexandrium catenella*. These species were at low level.

-There were no relationships between the toxin levels in the shellfish meat and the densities of toxic phytoplankton. The toxin deposit into shellfish and human poisoning are not reported to P/J office so far.

-The monitoring of nutrient salts has been conducted since November in 2003. Seasonal fluctuations of nutrient salts in sea water have been recognized. There were no apparent relationships between the

densities of toxic phytoplankton and the concentrations of nutrient salts.

-The toxin levels in shellfish meat such as piangua, concha perla and mejillon negro have not been exceeded the value of regulation all the time. But ostion vaca frequently showed the levels over regulation, and it has been found that the parts except muscle are depositing toxins.
The concentrations of heavy metals in the shellfish meat were analyzed twice at private laboratory. It was confirmed that those were negligible and safe in all of samples.

-At an occurrence of red tide in September 2005, dominated by *A.monilatum* with mixture of several species, samples were taken and analyzed with HPLC. Paralytic shellfish poison (PSP) components were confirmed.

-The results of monitoring on toxic phytoplankton, nutrient salts, shellfish toxins etc and the future proposals were arranged and presented to the Red Tide Commission in August 2006 and April 2007.

(9) **Output 9**: C/Ps acquire the knowledge and technique for dissemination of quality control to stakeholders.

【Indicators】

9-1. By the end of 2006, C/Ps prepare texts and implement workshops and seminars by themselves.
9-2. The questionnaire is implemented and analyzed.

Findings : Overall achievement of Output 9 is high.
-The project has produced 26 textbooks and pamphlets. Moreover, 3 educational videos, Power-Point materials for screen-show and 6 posters were also produced.

-A strong connection is established between C/Ps and supermarkets, transporters, fish-processors, retailers, brokers and fishermen by frequent visit-guidance activities. Freshness maintenance is now put into practice in most of the distribution levels, however, ice-utilization has not been actually understood by fishermen, because freshness hardly affects the price of fish at landing sites. Therefore, as the next step, it is needed to make new regulation on freshness standard or find new market that can properly appreciate the high freshness.

-The workshops on shellfish toxin were held 24 times, having totally 709 participants, and the workshops on treatment of fish-product were held 276 times, having totally 7,176 participants. The seminars were held 15 times.

-Site visits and follow up for the seminars and workshops have not been conducted satisfactorily.

-Three educational videos have been made and used by C/Ps for their lectures since March 2007. This video will be on air in TV-program in June.

1-3. Achievement of the Project Purpose

【Project Purpose】 National University (UNA) and Costa Rican Fishing and Aquaculture Institute (INCOPESCA) are able to recommend scientific basis for sustainable fisheries management.

【Indicators】

(1) The strategy and plan are recommended for sustainable resource management.

(2) The strategy and plan are recommended for improvement of quality control of marine products.

Findings : Achievement of the Project Purpose is very high

It is found that an English version of the recommendation for sustainable resource management is completed. A Spanish version of the recommendation is expected to be available soon. For the recommendation for improvement of quality control of marine products, a Spanish draft is completed and will be finalized before the end of the Project.

1-4. Achievement of the Overall Goal

【Overall Goal】 Sustainable management and utilization of fisheries resources are performed in and around the Gulf of Nicoya.

【Indicators】

1. Fisheries management policies of main species are formulated each year according to the appropriate stock assessment.

Findings : Facts and evidences are not sufficiently available to judge the probability of achieving the Ovrall Goal at the time of evaluation.

The Project has established a good basis for achieving the Overall Goal.

Some progress has been already made in such direction, some of which are as follows:

White shrimp maturation data collected through the project activity has been used to determine the period of closed season.

There is a consensus among C/Ps that the Stock Assessment Committee should be an official body between UNA and INCOPESCA that will provide scientific evidence for resource management continuously for the fisheries policy makers.

While further countinuous efforts by relevant organizations in Costa Rica are needed, it should be noted that realization of the Overall Goal depends on the strong political intention. The probability of achievement of the Overall Goal can be considered high if necessary political decisions with the specific actions are made. The Evaluation Team declines to judge this part.

2. Results of the Evaluation with Five Criteria

2-1. Relevance

(1) Overall Evaluation of Relevance

Overall relevance of the Project is very high. The Project Purpose and the Overall Goal have been consistent with the Costa Rican development priority. The Project was designed to undertake the issues addressed in the fisheries sector management policy.

(2) Relevance of Overall Goal

The project overall goal is consistent with the national development plan of Costa Rica.
National Development plan (2006-2010) that was prepared after the inauguration of the President Oscar Arias in May, 2006 highlighted the reduction of poverty and inequality as one of the five pillars of the policy. This policy is succeeding the policy of the former president Abel Pacheco.
The Gulf of Nicoya is the most productive and important fishing area in Costa Rica where over 3500 fishermen are depending their livelihood on the fisheries resources in the Gulf. As the number of fishermen increased in the Gulf, the catch and the revenue per fishermen have been affected. The Project was to conduct investigations to grasp the changes of fisheries resources for the future.

(3) Relevance of Project Purpose

The project purpose is consistent with the vision and mission of INCOPESCA that aims at sustainable management and conservation of fisheries resources.
It is mentioned in the vision of UNA that the university is pursuing important issues on equitable and sustainable human development. It was found that the UNA's president attached high priority to field activities and social contribution. It is described in the creation law of INCOPESCA that the institute is to regulate the use of resources, increase the economic benefit from the resources, promote aquaculture and to protect marine lives so that to realize rational use of fisheries resources.
INCOPESCA's head quarter and UNA's marine biology station (EBM) both locate in Puntarenas which is the most important city in the Gulf of Nicoya. It is reasonable to expect that these two organizations would provide administrative and research contribution respectively in order to implement sustainable fishery management in the Gulf of Nicoya.

Therefore, it is quite reasonable to select these two organizations as target groups for technical transfer.

(4) Gender consideration
Although the Project did not target women directly, the project activities have benefited the women as they had been invited to workshops and seminars. In Costa Rica, women are the ones who collect shellfish, attach baits to the long line hooks and even go fishing with their husbands.

2-2. Effectiveness
(1) Overall Evaluation of Effectiveness
Effectiveness in achieving the Project Purpose has been very high.
Achievement of the project purpose was due to an accumulated result of the project outputs.
Cooperation between UNA and INCOPESCA has been well enhanced.

(2) Achievement of the project purpose
The project activities and outputs in collection and dissemination of biological and statistical information have enabled the project researchers to assess white shrimp and pargo mancha stocks in the Gulf of Nicoya. Recommendations for resource management for these species were made.
For the quality control, the Project has introduced the importance of freshness of fish in addition to the safety assurance of sea food such as germ bacteria and toxic shellfish tests that were only the concern of Costa Rican people. The project experts and C/Ps have conducted workshops and seminars for fishermen, fish distributors, and retailers on these subjects. As a result, a strategy to improve quality control has been made.

(3) The factors that promoted or inhibited the achievement of the project purpose
The factors which promoted the achievement of the project purpose were: (i) timely and adequate inputs from JICA, (ii) the collaborative effort between UNA and INCOPESCA, and (iii) strong ownership of the project by the Costa Rican side.

2-3. Efficiency
Inputs both from Japan and Costa Rica were sufficient and used appropriately. Efficiency was very high.
UNA and INCOPESCA have collaborated activities with their specialties in analysis/research and fisheries statistics/education of fishermen respectively, which made a synergy effects.
Most of the short term experts visited Costa Rica have also provided trainings for C/Ps in Japan. A short term expert has visited Costa Rica twice. These efforts have realized efficient technical transfer

activities.
The project has limited the acquisition of equipment that requires a high maintenance cost. The provided equipment has been used well.

2-4. Impact

Impact is high as there are a few signs of impact as a result of the project activities.
White shrimp maturation information collected through the project activity has been used to determine the period of closed season.
Biological and statistic data compilation system (using ACCESS database program) introduced by the Project will be utilized not only for the Gulf of Nicoya but also for the whole country's fisheries statistics. More cases have been observed at supermarkets in San Jose which sell filet fish on a plastic tray and covered with plastic wrap before placing the products on ice. They used to put fillet fish directly on ice together with whole fish next to them. This is partially a result of promotion activities of the Project through seminars and workshops.

2-5. Sustainability

(1)Overall Evaluation of Sustainability
Sustainability of the project activities is high since UNA and INCOPESCA will most probably be able to maintain the project activities by themselves as mentioned below. It should be emphasized, however, that further continuous efforts are needed to ensure the sustainability.

(2) Institutional aspects
Preparation has been started to add detailed fisheries regulations based on the new Fisheries and Aquaculture law. Law enforcement is expected to be reinforced.

(3) Organizational aspects
UNA and INCOPESCA have the organizational capacity to continue the activities initiated by the Project. Both UNA and INCOPESCA consider the Project as the first phase of its own long-term plan and the second and third phase plan are now in preparation. It is stressed that the collaborative work between the two organizations should be further enhanced after the completion of the Project.
The activities of EBM and the allocation of staff for the EBM are not expected to be changed.
Most of INCOPESCA staff members are well experienced and capable people. Nonetheless, recruitment and training of new generation staff members is inevitable to continue the activities.

(3)Financial aspects

Both UNA and INCOPESCA did not specify any specific budget for the Project, instead, Field work and Research activity costs were disbursed within the regular activity budget. Teaching materials such as posters, pamphlets, textbooks and videos were produced during the project period. Therefore, it is assumed that there will be no problem to continue most of the activities initiated by the Project. However, an additional budget should be allocated to purchase fish samples and reagent as well as maintaining the equipment.

(4) Technical aspects

As a result of the Project activities, C/Ps have obtained necessary skills and knowledge to continue the various activities initiated by the Project. It was a good strategy to work with multiple number of C/Ps to transfer techniques and knowledge.

V. CONCLUSIONS

Based on the series of discussions with officials concerned and counterparts as well as field survey, the Joint Evaluation Committee has concluded:

(1) The project activities have been successfully conducted under a close collaboration between the Costa Rican counterparts and the Japanese experts. The substantially successful collaboration between the two different entities, namely UNA and INCOPESCA, has been also recognized as a remarkable example.

(2) The Project has made considerable contribution to the areas of resource management and quality control, recalling that even the catch statistics by species was not sufficient for stock assessment and the recognition of quality control in terms of freshness was almost none at the time of the project commencement.

(3) With the various difficulties having been overcome, UNA and INCOPESCA as a team have obtained the sufficient capacity to make recommendations based on good scientific basis. Those recommendations will be made available in public shortly, and will be utilized for policy making decisions on the fisheries management. The trained people with the sufficient capacity are supposed to continue to play a critical role in supporting such policy development.

(4) As the project outcomes are prominent in Central America, the accumulated experiences and knowledge can bring impacts to neighboring nations in this region. A regional seminar was held in

October, 2006 with a good success, to which 83 people participated from nine countries, and some ideas relating to regional cooperation are already emerging for the specific actions in the near future.

(5) While further sustainability need to be ensured for the activities initiated and/or improved in the Project with the view to improving the livelihood of artisanal fishermen in the long run, it is appropriate that the Project terminates as planned in the R/D since the Project has achieved and/or will achieve by the end of the project period its objectives described in the PDM.

VI. RECOMMENDATIONS AND LESSONS LEARNED

1. Recommendations

Based on the previous sections, the following recommendations are made. Most of these are for further strengthening sustainability of the project outcomes in the future, and maximal efforts should be made during the remaining project period in this regard.

1) Since the project outcomes should be fully utilized for the future activities, the proposed strategies and plans for resource management and quality control should be shared among the stakeholders. It is essential that based on the communication with the stakeholders, the Costa Rican authorities will make prompt policy decisions and take specific measures.

i. The importance of recommendations in the report to the Stock Assessment Committee (April, 2007) is fully endorsed through this evaluation process. INCOPESCA should have a strong initiative to start the discussions among the stakeholders promptly in order to make policy decisions and to take specific measures accordingly. As soon as such policy decisions emerge, it would be highly helpful to have an action schedule of UNA and INCOPESCA with a specific time line for the research activities in the resource management area

ii. For the quality control area, the recommendations in the report to the Red Tide Commission are also found valuable and the serious consideration by the Commission is strongly expected for specific actions. The proposed strategy with a specified time line for quality control is helpful to provide a vision for the future and this strategy should be authorized in an appropriate manner for clearer recognition of the people concerned.

2) Roles and functions, and mutual linkage of relevant organizations should be enhanced, in particular for the sustainability of the activities established and/or strengthened in the Project. It is essential to

ensure that the activities related to the Project in UNA and INCOPESCA will be maintained and enhanced in terms of financial, institutional and technical aspects.

i A formal agreement between UNA and INCOPESCA should be established in order to form a solid and sustainable basis for mutual collaboration. This idea has been already shared broadly among the people concerned.

ii. Sufficient financial and human resources should be allocated to the relevant activities; in particular, the increase of personnel in INCOPESCA implicated in the new Fisheries and Aquaculture Law should take place as soon as possible. Also, a sufficiently capable team for research on integrated management for fisheries resources should be established in INCOPESCA, and the existing laboratory for quality control in should be strengthened and properly accreditated.

iii. A formal status should be given to the Stock Assessment Committee, which was established in the Project and have been playing a critical role to discuss the resource management issues among the stakeholders including scientists and regulatory authorities. It is recommendable to consider having a sub-committee under the existing Scientific and Technical Commission in INCOPESCA for this purpose. Such a sub-commission should maintain and enhance its capability by constantly providing a scientific basis for policy design.

iv. There should be a formal inter-organizational group to discuss quality control issues, which would be helpful in order to facilitate the information sharing and policy decision making in the area.

v. The schedule of proper preventive maintenance for laboratory equipment should be specified with necessary budget ensured. In the Project some problems have been observed due to the lack of proper efforts for ensuring budget. The improvement for the maintenance activities is important in the view of further sustainability of the Project.

3) For transparency and broader recognition, the project outcomes should be shared with other potential beneficiaries, including artisanal fishermen, authorities related to social issues, consumers as well as stakeholders in neighboring countries.

i. The outcomes from the project and its follow-up activities such as statistical/scientific data and information, analytical results and recommendations, should be made available in public and possibly accessible on the websites of UNA and/or INCOPESCA. This may reduce the cost of publication and

enable the information provision in a timely manner. In addition, the introduction of newly developed or obtained methods, such as registration forms for fisheries statistics, to the regional offices of INCOPESCA would be helpful in realizing efficient and effective policy development on a national basis.

ii. Activities related to information sharing with the stakeholders are essential. In the area of resource management, the regulatory measures would not work if they are proposed without sufficient scientific basis. For the area of quality control, the consumer preference for freshness is definitely needed to make differences in price, which will certainly be the incentives for distributors and fishers to introduce necessary measures for the improvement. A proposed questionnaire survey for managers of restaurants may find whether the improved freshness leads to increased price.

iii. Since the long term goal of the Project is closely related to social issues, the involvement of broader communities is important to achieve it, which is another reason why the transparency should be enhanced. The UNA and INCOPESCA should keep monitoring the progress and have opportunities to evaluate the related policy development towards the long term goal, in cooperation with other related organizations.

iv. Costa Rica can have a leading role in the Central American region since resource management are often a regional issue and neighbors may have similar problems to address. It may be a good idea to examine possible ways of contribution, such as annual seminars under the framework of Organizacion del Sector Pesquero y Acuicola del Istmo Centroamericano (OSPESCA), which may require good coordination with the neighboring countries.

2. Lessons Learned

1) It is essential to identify the facts concerning the key assumptions for the project design before its commencement. In addition, in the very first stage of the project activities, the verification process for those assumptions should be highly prioritized. In the Project, the key assumptions are based on the unverified facts, such as "fishermen in Costa Rica throw away 20-40% fish because of low freshness" and "people will buy fresher fish at higher prices". These often caused some difficulties in reaching common understandings among the concerned people on the prioritization of project activities.

2) To ensure the sustainability of the project outcomes, it is highly recommendable to make maximal

use of the pre-existing schemes and/or systems for the project activities. In the Project, the workshops for stakeholders have been utilized and strengthened to achieve the outcomes, participation to which was prerequisite to relevant licenses, with a success of the sustainability. In the same way, it is necessary to consider the advantages and disadvantages of creating the new framework or scheme and/or demanding the full participation to the project activities of all counterparts. For the project itself, it is probably better to do so, but would not be the best way to ensure the sustainability of the outcomes after the project completion. Pre-existing schemes and counterparts of partial involvement might be better choices for the sustainability and such alternatives should be paid attentions to in the project design.

3) "Local cost expense" by the organizations of recipient countries should be properly specified not just in amount but in nature as well before the project commencement. In the Project, the differences in understanding the actual meanings sometimes unfortunately caused the fruitless and lengthy discussion without good results.

ANNEX 1 :Project Design Matrix (PDM) Ver.4

Project name: Project on Sustainable Fisheries Management for the Gulf of Nicoya in the Republic of Costa Rica
Duration: October 1, 2002-September 30, 2007
Project Site:EBM, UNA, Puntarenas
Implementation Agency: UNA, INCOPESCA
Target Area: Gulf of Nicoya and Surrounding Area
Target Group: UNA and INCOPESCA's counterpart and artisanal fishermen in and around the Gulf of Nicoya

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Super Goal Household incomes of artisanal fishermen are improved in and around the Gulf of Nicoya	1. Their income becomes higher than minimum wages established by the Government.	1. Questionnaire to and interview with artisanal fishermen.	a. The existing national policy on fishery development will remain unchanged.
Overall Goal Sustainable management and utilization of fisheries resources are performed in and around the Gulf of Nicoya.	1. Fisheries management policies of main species are formulated each year according to the appropriate stock assessment.	1. Minutes of meetings, related policy documents, newspaper account 2. Investigative report, questionnaire and interview with persons concerned with fishery and consumers	a. Economical and political stability
Project Purpose National University (UNA) and Costa Rican Fishing and Aquaculture Institute (INCOPESCA) are able to recommend scientifio basis for sustainable fisheries management.	1. The strategy and plan are recommended for sustainable resource management. 2. The strategy and plan are recommended for improvement of quality control of marine products.	1. Minutes of meetings, Project report, recommendations on fishery management, newspaper account 2. Project report, recommendations on quality control	a. The pollution in the Gulf of Nicoya will not be aggravated b. The effort input by the Costa Rican side will be continued even after the cooperation period completed c. The legal framework for fisheries resource management is put in order
Outputs 1. The operational and managerial system of the Project Unit is enhanced.	1-1. C/Ps are allocated as planned. 1-2. Budget is adequately allocated and executed. 1-3. Equipment provided are appropriately installed, operated and maintained. 1-4. Committees and management meetings are held at an appropriately pace. 1-5. The number of public relations on the Project increases.	1-1. Allocation record of C/P 1-2. Accounting record 1-3. List of equipment, maintenance record of equipment 1-4. Record of committees and management meetings 1-5. Record of public relations of the Project	a. The C/P who received technical transfer from the Japanese experts will remain at UNA/INCOPESCA

2. Data required for resource management is collected.	2. By the end of 2004, surveys on present fishing activities and investigations on biological characteristics are started.	2. Project reports (PO, APO, progress reports, etc.), technical manuals, scientific reports	
3. Databases are introduced to accumulate data and to increase convenience of access to necessary data.	3-1. By the end of 2004, databases to manage biological data collected by surveys and investigations are introduced. 3-2. By the end of 2005, a new database for catch and effort statistics is introduced.	3-1. Number of database introduced, Project reports 3-2. Number of database introduced, Project reports, fisheries statistics	
4. Utilizing databases, technologies of data processing for stock assessment are introduced.	4. By the end of 2006, technologies required for analysis on catch and effort and biological data on stock assessment are transferred.	4. Project reports, technical manuals, scientific reports	
5. Institutional framework for recommending fishery-management policies is established.	5-1. By the end of September 2007 set up and operates an INCOPESCA-UNA committee of stock assessment. 5-2. By the end of September 2007, carry out stock assessment of main species of Gulf of Nicoya.	5-1. Documents on staff allocation of committee, minutes of meetings 5-2. Scientific reports on stock assessment, recommendations on fishery management	
6. The condition and problems of quality control of marine products distribution from fishing boats to fish stores are clarified.	6-1. By the end of 2004, the investigation in the area of quality control (freshness, sanitary condition, personal hygiene, price, etc.) of marine products distribution are conducted. 6-2. By the end of 2005, results are reported.	6. Report of the investigation	
7. C/Ps acquire the techniques of freshness tests and freshness maintenance.	7-1. By the end of 2005, C/Ps implement the freshness tests by themselves. 7-2. By the end of 2006, C/Ps perform to instruct the technique of freshness maintenance to stake-holders.	7-1. Experiment manual, reports of freshness tests 7-2. Records of visiting instruction, records of workshop and seminar.	
8. The improvement of monitoring system of toxic shellfish is advanced.	8-1. By the end of 2005, C/Ps implement monitoring by themselves. 8-2. The contents of recommendation for improvement are reviewed and implemented.	8-1. Monitoring records, Project reports, meeting record of Red Tide Committee 8-2. Recommendation for improvement of monitoring, meeting record of Red Tide Committee	
9. C/Ps acquire the knowledge and technique for dissemination of quality control to stake-holders.	9-1. By the end of 2006, C/Ps prepare texts and implement workshops and seminars by themselves. 9-2. The questionnaire is implemented and analyzed.	9-1. Text, pamphlet ,workshop and seminar records, questionnaire, news paper articles 9-2. Results of analysis of questionnaire.	

Activities	Inputs		
	<Japanese Side>	<Costa Rican Side>	a. The project administrative staff will not be changed frequently
1-1 Plan the C/P allocation. 1-2 Formulate and execute budget plan appropriately. 1-3 Establish and operate management system. 1-4 Formulate plans of operation and maintenance of equipment. 1-5 Implement public relations through seminars/workshops, brochures and periodicals.	1. Dispatch of Japanese experts (1) Long-term experts: 4 a. Chief Advisor/Fishery Policy b. Project Coordinator c. Resources Management d. Quality Control (2) Short-term experts: as necessity arises	1. Allocation of C/P and supporting staff C/Ps and staff (1) Administrative C/P: 5 (2) Technical C/P: 21 (3) Supporting staff: Supporting staff Secretary 1 Driver 1 (As the need arises)	
2-1 Conduct surveys on fishery activities. 2-2 Conduct investigations on biological characteristics.			
3 Conduct introduction of appropriate databases.			
4-1 Conduct introduction of data-analysis technologies.	2. C/P Training in Japan	2. Provision and maintenance of buildings and facilities	
4-2 Conduct modification of fisheries statistics.			
5-1 Set up a committee of stock assessment. 5-2 Conduct stock assessment of main species by committee members. 5-3 Recommend fishery managemant by committee members.	3. Provision of machinery and equipment 4. Support for local cost	3. Provision and installation of machinery and equipment and their maintenance 4. Local cost: Necessary budget for the implementation of the Project.	
6-1 Conduct basic survey on quality control from fishing boat to fish store. 6-2 Conduct basic survey on shellfish collector.			**Preconditions** a. The counterpart organ (INCOPESCA) has competence to deal with the fisheries resource management policy
7-1 Implement techniques of freshness test. 7-2 Implement techniques of fresh maintenance.			
8-1 Monitor toxic phytoplankton. 8-2 Monitor nutrients of seawater. 8-3 Monitor shellfish toxicity (Bioassays of mouse, PSP analyzer). 8-4 Monitor heavy metal of shellfish 8-5 Recommend improvement of shellfish toxin monitoring system.			
9-1 Make text, presentation materials and pamphlat for workshop and saminar. 9-2 Conduct visiting instruction. 9-3 Implement workshops. 9-4 Implement seminars.			

ANNEX 2 Plan of Operations (PO)

(Revised on May, 2007)

Costa Rican Fiscal Year			2002				2003				2004				2005				2006				2007		
Japanese Fiscal Year	2001		2002				2003				2004				2005				2006				2007		
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Term of Technical Cooperation				▼Signing of R/D (Jul.																					
				▲Commencement (Oct. 1)																					
1 Enhancement of Management System of the Project																									
1-1 Plan the C/P allocation.																									
1-2 Formulate and execute budget plan appropriately.																									
1-3 Establish and operate management system.																									
1-4 Formulate plans of operation and maintenance of equipment.																									
1-5 Implement public relations through seminars/workshops, brochures and periodicals.																									
2 Collection of data required for resource management																									
2-1 Surveys on fishery activities																									
2-1-1 Survey on fishing boats in the Gulf of Nicoya.																									
2-1-2 Survey on fishing activity.																									
2-1-3 Survey on fixed & variable costs and earnings.																									
2-2 Investigation on biological characteristics																									
2-2-1 Species identification.																									
2-2-2 Maturity observation.																									
2-2-3 Otolith study.																									
2-2-4 Body-part measurement.																									
2-2-5 Mark-recapture experiment.																									
2-2-6 Collection of length-frequency data at landing sites.																									
2-2-7 Investigation on spawning and nursery grounds of main fish species																									
3 Introduction of database and GIS																									
3-1 Database																									
3-2 GIS																									
4 Introduction of data-analysis technologies																									
4-1 Introduction of data-analysis technologies																									

Costa Rican Fiscal Year		2002			2003				2004				2005				2006				2007		
Japanese Fiscal Year	2001	2002				2003				2004				2005				2006				2007	
	III IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
4-2 Modification of fisheries statistics																							
4-2-1 Modification of existing data sampling methods & existing fisheries statistics of the Gulf of Nicoya																							
4-2-2 Compile annual fisheries statistics of the Gulf of Nicoya																							
5 Stock assessment																							
5-1 Setting up of the committee of stock assessment																							
5-2 Stock assessment of target species																							
5-3 Recommendation of fishery-management policy																							
6 Basic survey on quality control																							
6-1 Conduct basic survey on quality control from fishing boat to fish store.																							
6-2 Conduct basic survey on shellfish collector.																							
7 Technical transfer of freshness tests and freshness maintenance																							
7-1 Implement techniques of freshness test.																							
7-1-1 Implement technology transfer of freshness measurement techniques.																							
7-1-2 Carry out the freshness evaluation of marine products.																							
7-1-3 Recommend for improvement of freshness contro method.																							
7-2 Implement techniques of freshness maintenance.																							
7-2-1 Implement technology transfer of freshness maintenance techniques.																							
7-2-2 Implement technical transfer of public relations.																							
7-2-3 Recommend for improvement of freshness maintenance technique.																							
8 Improvement of monitoring system of toxic shellfish.																							
8-1 Monitor toxic phytoplankton.																							
8-2 Monitor nutrients of seawater.																							
8-3 Monitor shellfish toxicity																							
8-3-1 Mouse Bioassays																							
8-3-2 HPLC																							

Costa Rican Fiscal Year		2002			2003			2004			2005			2006			2007		
Japanese Fiscal Year	2001	2002			2003			2004			2005			2006			2007		
	III IV	I	II	III IV	I	II	III IV	I	II	III IV	I	II	III IV	I	II	III IV	I	II	III
8-4 monitor heavy metal of shellfish.																			
8-5 Recommend for improvement of shellfish toxin monitoring system																			
9 Improvement of knowledge and technique for dissemination of quality control																			
9-1 Make text, presentation materials and pamphlet for workshop and seminar.																			
9-2 Conduct visiting instruction.																			
9-3 Implement workshops.																			
9-4 Implement seminars.																			

Note:
1.Japanese fiscal year starts in April and ends in March.
2.Plan of Operation is subject to change in accordance with the progress of the Project.
3. ——— Planned and - - - - Implememted.

ANNEX 3 Evaluation Grid

4: Very high 3: High 2: Normal 1: Low

Criteria	Question	Sub-question	Required Data	Information Source	Method	Findings	Evaluation
Relevance	Relevance of Overall goal Is the Overall Goal consistent with the government policy of Costa Rica?	1. Super Goal, "Household incomes of artisanal fishermen are improved in and around the Gulf of Nicoya" was consistent with the National priority of Costa Rican government which was poverty reduction and the improvement of the quality of life. Is it still relevant to the current national development policy? 2. Is the Overall Goal"Sustainable management and utilization of fisheries resources are performed in and around the Gulf of Nicoya." still consistent with the fisheries and environmental policy of Costa Rica?	National and sector strategic plan Economic indicators National development plan Fisheries sector development plan Environmental protection strategy	Project document National Economic report National development plan Fisheries sector development plan Environmental protection stratagy	Review of the existing documents Obtain from the Project staff	1.The project overall goal is consistent with the national development plan of Costa Rica. National Development plan (2006-2010) that was prepared after the inauguration of the President Oscar Arias in May, 2006 highlighted the reduction of poverty and inequality as one of the five pillar of the policy. This policy is succeeding the policy of the former president Abel Pacheco. The Gulf of Nicoya is the most productive and important fishing area in Costa Rica where over 3500 fishermen are depending their livelihood on the fisheries resources in the Gulf. As the number of fishermen increased in the Gulf, the catch and the revenue per fishermen have been decreased affected. The Project was to conduct investigations to grasp the changes of fisheries resources for the future. 2. "Fisheries and Aquaculture Law" (new Fisheries Law) was enacted in April, 2005. It is hilighted in the beggining chapter that "[(INCOPESCA) assure the conservation and protection of fisheries resources and sustainable development, which is consistant with the Overall Goal of the Project.	
	Relevance of Project Purpose •Does the Project Purpose contribute to the achievement of the Overall Goal?	1. What conditions are necessary for achieving the Overall Goal beside achieving the Project Purpose "National University (UNA) and Costa Rican Fishing and Aquaculture Institute (INCOPESCA) are able to recommend scientific basis for sustainable fisheries management in Costa Rica? 2. Who enforce the law?	Objective tree Bases for making realistic fisheries management	Project document Project personel Fisheries Law, Environmental Protection Law	Document review Interview to the Project staff	1. Legalization of the fishing effort reduction based on scientific evidences does not automatically mean the success of the resource management. It is mentioned in the annex of the new Fisheries Law to increase the number of law enforcement officer at INCOPESCA. Project staff believe that explanation and discussion session with fishers to formulate the management plan is indispensable. 2. Assistance of police or marine police is required to arrest illegal fishermen and to confiscate illegal fishing gear.	
	•Is the Project Purpose still consistant with the needs of UNA and INCOPESCA?	1. Is UNA's mission statement or long-term strategy consistent with the Project purpose? 2. Is INCOPESCA's mission statement or long-term strategy consistent with the Project purpose?	Strategy of UNA Strategy of INCOPESCA	Pamphlet of UNA Document of INCOPESCA	Document review Interview to the relevant people	1.It is mentioned in the vision of UNA that UNA is pursuing important issues an equitable and sustainable human development. It was stressed by the UNA's president that field activities and social contribution were UNA's strength. 2.It is described in the creation law of INCOPESCA that INCOPESCA is to regulate the use of resources, increase the economic benefit from the resources, promote aquaculture and to protect marine lives so that to realize rational use of fisheries resources.	
	Are Project Purpose and Overall goal consistant with ODA policy of Japan	1. Are there any changes in policy of Japanese government or JICA headquarters that caused influence on the direction of the Project after it started? 2. What is the position of the project in the assistant strategy of JICA Costa Rica?	MOFA and JICA's assistant strategy to Costa Rice	Project document JICA document	Document review Interview to the Project staff	1. Government of Japan considers Costa Rica as the leader of promoting democracy and development in the Central America and to continue economic assistance to Costa Rica based on long term friendship between the two countries. 2. JICA's assistant priority in Costa Rica are given to industry development, environmental protection, and improve the quality of life of citizens. The Project's super goal is to improve the livelihood of artisanal fishermans by sustainable use of fishermanies resources. As fishermanies resources management is one of environmental protection issue, it fit to the assistant policy of JICA Costa Rica office.	
	Relevance of Project Design	•Is the achievement of the Project purpose directly lead to the achievement of the Super goal?	PDM	Project document JICA document	Interview to the Project staff	The narrative summary of the project purpose of the Project Design Matrix (PDM) is not so clear to express the relationship between resource management and quality control.	

	Was the selection of the implementation bodies adequate?	Are UNA and INCOPESCA the most appropriate organizations for the Project purpose?	Activities of UNA and INCOPESCA	Project document JICA document	Interview to the Project staff	INCOPESCA' s head quarter and UNA' s marine biology station (EBM) both locate in Puntarenas which is the most important city in the Gulf of Nicoya. It is reasonable to expect that these two organizations would provide administrative and research contribution respectively in order to implement sustainable fishery management in the Gulf of Nicoya. Therefore, it is quite reasonable to select these two organizations as target groups for technical transfer.	
	Relevance from the view point of social justice?	In a process of achieving the Super goal, what sort of consideration is given for the benefit of women and artisanal fisharmans?	Opinion of INCOPESCA	Project document JICA document	Interview to the INCOPESCA manager	INCOPESCA certainly concern about the affect of fishing effort reduction to the artisanal fisharmen. INCOPESCA is considering aquaculture development as an alternative to fishing activities.	
	Consistency with other projects Relationship with the other projects implemented in Costa Rica. Are there any conflicts overlaps.	Are there other fisheries management related project in and around the Gulf of Nicoya?	Project activities	Project document JICA document	Interview to the UNA and INCOPESCA managers	UNA is conducting a feasibility study of oyster culture with fishermen and women's group. The original fund was from FAO but the current project is financed by UNA's own fund combined with other government agency.	
	Suitability of Japanese technology	Was Japanese technology suitable to Costa Rica situation?		Project document JICA document	Interview to the UNA and INCOPESCA managers	Japan has a long history of studies on resource management and fish quality control and Japan is one of a leading country in these field. It is reasonable for Japan has a rich experience in working with fishing adjustment committee and fisheries cooperatives under the direction of fisheries agency. It is reasonable for Japan to transfer such knowledge and technology to Costa Rica.	
	Overall Evaluation of Relevance					Overall relevance of the Project is vert high. The Project Purpose and the Overall Goal have been consistent with the Costa Rican development priority. The Project was designed to undertake the issues addressed in the fisheries sector management policy.	4
	Achievement of Project Purpose	To what extent has the Project achieved and is predicted to achieve the Project Purpose?		Project document JICA document	Document review Interview to the Project staff	The project activities and outputs in collection and dissemination of biological and statistical information have enabled the project researchers to assess white shrimp and pargo manche stocks in the Gulf of Nicoya. Recommendations for resource management for these species were made. For the quality control, the project has introduced the importance of freshness of fish in addition to the safety assurance of sea food such as germ bacteria and toxic shellfish tests that were only the concern of Costa Rican people. The project experts and C/Ps have conducted worksheps and seminars for fishers, fish distributors, and retailers on these subjects. As a rasult, a strategy to improve quality control has been made. The factors which promoted the achievement of the project purpose were: (i) timely and adequate inputs from JICA; and (ii) the collaborative effort between UNA and INCOPESCA, and (iii) strong ownership of the project by the Costa Rican side.	
	Contribution by the project outputs To what extent have the Outputs been achieved?	Output 1 How successfully the Project has been managed?	Management structure and method	Achievement record	Document review Interview to the Project staff	-The fishery management area currently has 13 C/Ps of which 10 have been the C/Ps since the beginning of the Project. The field of Quality control currently has 9 C/Ps of which 5 have been the C/Ps since the beginning of the Project. One (1) C/P has been assigned for fisheries policy since the beginning of the Project. -UNA and INCOPESCA have been allocating the budget for facilities, human resources as well as research and field work appropriately, though JICA has assisted some cases to purchase fish samples and expendables occasionally. -Equipment provided is well utilized. Nonetheless, an allocation of budget for regular maintenance of the machinery and purchase of necessary reagent is needed. -There have been 1 director and 2 managers who managed the Project with JICA experts. Joint Coordinating Committee meetings have been conducted once a year and Steering Committee meeting have been held every month since the beginning of the Project. Coordinators meeting has been created and meet almost once a week.	

	Output 2 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	Field surveys (at 36 fish landing sites), literature review and analysis of statistical data have been conducted. As a result, essential information on the artisanal fisheries such as fishing activities and economic situation of fishers was obtained. -Studies and surveys are carried out in the following 7 subjects, and the techniques and knowledge have been transferred to 6 C/Ps. The 7 subjects were; (1)Species identification, (2)Maturity observation, (3)Otolith study, (4)Body part measurement, (5)Mark-recapture experiment, (6)Collection of length-frequency data at landing sites, (7)Investigation on spawning and nursery grounds of main fish species. Studies were conducted for 6 target species and biological information for resource management were compiled into 22 short papers.	
	Output 3 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	Several forms of database for statistics and biological data compilation and 3 computers haves been introduced to INCOPESCA and UNA. Nine (9) C/Ps were trained to use the data base. C/Ps are already familiar with using the data base for the target species. There is a plan to extend the use of the data base to INCOPESCA regional offices throughout Costa Rica. -A marine geographic information system (GIS) software together with a GPS- echo-sounder and two computers heves been introduced to EBM, UNA. Two C/Ps were trained and one of them is already familiar with processing information and publishing papers.	
	Output 4 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	Maturity, sex ratio, length-weight relationship, otolith observation, and analysis of size-frequency data, were introduced to 5 C/Ps. Growth parameters of Ppargo mancha, Ccorvinae and Bbarracuda were estimated by the C/Ps. -Methodologies to assess a fisheries stock such as production model, virtual population analysis (VPA), yield per recruit (Y/R) and spawning biomass per recruit (%SPR) were introduced to 5 C/Ps. Stock assessment of white shrimp and pargo mancha were completed and a report has been compiled. -Fisheries statistics of INCOPESCA has been modified. With the species information collected at landing sites, the catch statistics by commercial categories of fish were analyzed and separated into fish species and compiled into improved fisheries statistics. As a result, a new Fisheries statistics of the Gulf of Nicoya 1664-2665 was published.	
Contribution by the project outputs To what extent have the Outputs been achieved?	Output 5 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	Stock Assessment Committee was established in August, 2005 within the Project. Committee member is consisted of 3 C/Ps from UNA, 4 C/Ps from INCOPESCA and 2 from JICA. -The Committee has held a series of study meetings to conduct stock assessment of the target species by using data collected by the Project. -The Committee has assessed the stock of white shrimp and pargo mancha and prepared a recommendation for fisheries management. The committee has published "Stock Assessment Committee Report No1/2007" in English. A Spanish version is being prepared.	
	Output 6 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	Field surveys were conducted to grasp the quality management situation from producer (fishere) to retailers and consumers. During the study, germ bacteria test and freshness test were conducted. No Enteritis Vibrio was found and the occurring of pathogenic bacteria is rare. It was obvious that the freshness declined as the distribution stage proceeds. All C/Ps of INCOPESCA in the area of Quality Control and Two C/Ps from INCOPESCAof UNA participated in this survey and 3 reports were compiled. -The relationship between freshness of fish and the price in the local market was not evaluated properly during the early stage of the Project. -All of the 26 fishing villages that produce shellfish were visited. The number of shellfish collectors, the species of shellfish, working hours, fishing grounds, and the selling price of shellfish were studied. From this study, monitoring sites for shellfish and water sample collection were decided. Two (2) C/P from UNA participated in this survey and a report was compiled.	

Effectiveness

	Output 7 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	A manuel on freshness tests written in Spanish was prepared. The techniques on freshness test were properly transferred to C/Ps, through the manual and training. It became clear that K-value and organoleptic test were available for the evaluation of freshness in main commercial fishes. -Several manuals on freshness maintenance written in Spanish were prepared. The techniques on instant fish-killing method and iced-storage etc were favorably transferred to C/Ps, using the manuals and practice. The acquired technology and the useful information have been shown to fishers, transporters, retailers and the other related people at the workshops and seminars.	
	Output 8 How successfully the resource management activities were conducted?	Achievement of each Output	Achievement record of resource management field Project documents	Document review Interview to the Project staff	During 2002-2007, 3 species of toxic phytoplankton have been observed, which were Gymnodinium catenatum, Pyrodium bahamense var. compressum and Alexandrium catenella. These species were at low level. -There were no relationships between the toxin levels in the shellfish meat and the densities of toxic phytoplankton. The toxin deposit into shellfish and human poisoning are not reported to P/J office so far. -The monitoring of nutrient salts has been conducted since November in 2003. Seasonal fluctuations of nutrient salts in sea water have been recognized. There were no apparent relationships between the densities of toxic phytoplankton and the concentrations of nutrient salts. -The toxin levels in shellfish meat such as piangua, concha perla and mejillon negro have not been exceeded the value of regulation all the time. But ostion veca frequently showed the levels over regulation, and it has been found that the parts except muscle are depositing toxins. The concentrations of heavy metals in the shellfish meat were analyzed twice at private laboratory. It was confirmed that those were negligible and safe in all of samples. -At an occurrence of red tide in September 2005, dominated by A.monilatum with mixture of analyzed with HPLC. Paralytic shellfish poison (PSP) components were confirmed. -The results of monitoring on toxic phytoplankton, nutrient salts, shellfish toxins etc and the presented to the Red Tide Commission in August 2006 and April 2007.	
To what extent have the Outputs been achieved?	Output 9 How successfully the quality control activities were conducted?	Achievement of each Output	Achievement record of quality control field Project documents	Document review Interview to the Project staff	The project has produced 26 textbook and pamphlet. Moreover, 3 educational videos, Power-Point materials for screen-show and 6 posters were also produced. -A strong connection is established between C/Ps and supermarkets, transporters, fish-processors, retailers, brokers and fishermen by frequent visit-guidance activities. Freshness maintenance is now put into practice in most of the distribution levels, however, ice-utilization has not been actually understood by fishermen, because freshness hardly affects the price of fish at landing sites. Therefore, as the next step, it is needed to make new regulation on freshness standard or find new market that can properly appreciate the high freshness. -The workshops on shellfish toxin were held 2024 times, having totally 548 709 participantstors, and the workshops on treatment of fish-product were held 270 276 times, having totally 7,2667,176 participantstor. The seminars were held 15 times. -Site visits and follow up for the seminars and workshops have not been conducted satisfactorily.	
To what extent have the Outputs contributed to the achievement of the Project Purpose?	Were the outputs sufficient to achieve the project purpose?	Achievement of each Output	Achievement record of quality control field Project documents	Document review Interview to the Project staff	It is found that an English version of the recommendation for sustainable resource management is completed. A Spanish version of the recommendation is expected to be available soon. For the recommendation for improvement of quality control of marine products, a Spanish draft is completed and will be finalized before the end of the Project. Effectiveness in achieving the project purpose was an accumulated result of the project Outputs. Cooperation between UNA and INCOPESCA has been well enhanced.	

	Other factors	Were there factors that promoted or inhibited the achievement of the Project Purpose?	Achievement of each Output	Achievement record of quality control field Project documents	Document review Interview to the Project staff	The president of INCOPESCA changed in November, 2006. The new president was a professor at University of Costa Rica and he respects scientific evidencas for resources management and supported the project activities.	
	Overall Evaluation of Effectiveness					Effectiveness in achieving the Project Purpsse has baan vary high. Achievement of the project purpase was due to en aocumulated result of the project Outputs. Cooperation between UNA and INCOPESCA has bean wall enhancad.	4
Efficiancy	Inputs from Japanese sida	Long-term experts Short-term axperts How many iogn term and short term experts were dispatched? How	Expert list	Project documents	Document reviaw Interview to the Project staff	A total of five (5) long-term experts and eighteen (18) short-term experts hava been dispatched. The timing and the duration of tha short term experts was satisfactory. A same short term expert in the field of shellfish toxin visited Costa Rica twice. Several short term experts received thair countarparts in Japan for their training too. Most of the counterparts keep contact with the short term experts. Detailad information is available in the Annex.	
		C/P training in Japan How many C/P have received training in Japan	C/P training list	Project document	Document raview Interviaw to the Project staff	A totel of seventeen (17) C/Ps have participated in training in Japan. Eight (8) C/Ps participated in fishary managamant oourse, six (6) C/Ps in quality control, and thrae (3) in fishary policy. Detailed information is availiabla in tha Annax.	
		Provision of Equipment Was the timing of aquipment provision appropriate? Spacification and amount was appropriate? Are tha equipmant managed properly?	Equipment list	Projaot document	Document review Interview to the Project	A total amount of US$377,000 equipmant and machinary ware provided to carry out tha project activitias effactivaly. Tha list of aquipment is shown in ANNEX. Almost all the aquipment axcapt for 2 aquipment (US$33,000) wara purchased in Costa Rica.Datailad information is available in the Annex.	
		Operating axpenses Operational cost was availiable?	Expenditura list	Project document	Document raview Interview to the Project	The Japanase side bore a part of the project iocal cost to implement tha Projact mora effectively. The aupplementary fund amounted to US$250,080. The fund was usad to host international and local seminars as wali as producing poatera and publications. Datailad information ia available in tha Annax.	
	Inputs from Costa Rican side	C/P aasignment How many C/P hava been assigned and how many of them racaivad training in Jspen	C/P list	Project document	Document rsview Interview to tha Projact staff	During tha iast four years, 32 C/Ps hava been assignad to tha Projact. Currantly, 25 C/Ps ara working, of which 4 ara administrative and 21 ara technicai C/Ps. Nine (9) technical C/Ps ara from UNA and 12 are from INCOPESCA.Datailad information is availabla in tha Annax.	
		Land, Buiiding, offica rooms, extansion activity.	Facility list	Projact document	Document raview Interview to the Projact staff	Provialon of Land, Buildings and Facilities ・Land ・Buildings including offices and laboratories in UNA (EBM), training rooms and conference facilitiea both in UNA and INCOPESCA. ・Utilities including water, elactricity, janitorial services	
		Operating expenses.	Expenditura table	Projact document	Document review Intarview to the Projact staff	The sum of US$836,000 was expended by UNA and US$747,000 was expended by INCOPESCA so fer aa part of tha overall Costa Rican contribution to the Projact. Thara waa a diffarence in the definitian of a few items of tha budget between tha Japanese and the Csata Rican sida. UNA considered the use of axisting facilities and equipment as their contribution and included in the budget. JICA considared the budget aa a source of acquiring new aquipment. Both sidea now understand the difference.	
	Overall Evaluation of Efficiency			Project document	Document review Intarview to	Inputs both from Japan and Costa Rica wara aufficient and used appropriately. Efficiency was very high.	4

Impact	Achievement of Overall Goal and Super Goal			Project document	Document review Interview to the Project staff	White shrimp maturation information collected through the project activity has been used to determine the period of closed season. Biological and statistic data compliation system (using ACCESS database program) introduced by the Project will be utilized not only for the Gulf of Nicoya but also for the whole country' s fisheries statistics.	
	Unexpected impact	Were there any positive or negative impacts beside the overall goal?		Project document	Document review Interview to the Project	More cases have been observed at supermarkets in San Jose which sell filet fish on a plastic tray and covered with plastic wrap before placing the products on ice. They used to put filiet fish directly on ice together with whole fish next to them. This is partially a result of promotion activities of the Project through seminars and workshops.	
	Overall Evaluation of Impact					Impact is high as there are a few signs of impact as a result of the project activities.	3
Sustainability	Institutional and organizational aspect	Is there institutional support for the project activities even after the end of the project? Will there be sufficient number of staff?		Project document	Review of the existing documents Obtain from the Project staff	Preparation has been started to add detailed fisheries regulations based on the new fisheries and aquaculture law. Law enforcement is expected to be reinforced. UNA and INCOPESCA have the organizational capacity to continue the activities initiated by the Project. Both UNA and INCOPESCA consider the Project as the first phase of its own long-term plan and the second phase and third phase plan is being prepared. It is stressed that the collaborative work between the two organizations should be further enhanced after the completion of the Project. The activities of EBM and the allocation of staff for the EBM are not expected to be changed. Most of INCOPESCA staff members are well experienced and capable people. Nonetheless, recruitment and training of new generation staff members is inevitable to continue the activities.	
	Financial aspect	Is there financial support for project activities even after the end of the project?		Project document	Review of the existing documents Obtain from the Project staff	Both UNA and INCOPESCA did not specify any specific budget for the Project. Field work and Research activity costs were disbursed within the regular activity budget. Teaching materials such as posters, pamphlets, textbooks and videos were produced during the project period. Therefore, it is assumed that there will be no problem to continue most of the activities initiated by the Project. However, an additional budget should be allocated to purchase fish samples and reagent as well as maintaining the equipment.	
	Technical aspect	Are the counterparts capable of continuing the activities after the end of the project?		Project document	Review of the existing documents Obtain from the Project staff	As a result of the Project activities, C/Ps have obtained necessary skills and knowledge to continue the various activities initiated by the project. It was a good strategy to work with multiple number of C/Ps to transfer techniques and knowledge.	
	Use and maintenance of equipment provided	Will the equipment provided by the project be used and maintained appropriately?		Project document	Review of the existing documents Obtain from the Project staff	The project has limited the acquisition of equipment that requires a high maintenance cost. The provided equipment has been used well. However, an additional budget should be allocated to purchase fish samples and reagent as well as maintaining the equipment.	
	Overall evaluation of Sustainability					Sustainability of the Project activities is high since UNA and INCOPESCA will most probably be able to maintain the project activities by themselves as mentioned below.	3

Annex-4. The Progress of the Administrative Activities (As of May, 2007)

Plan of operation		Goal	Progress and results	Achiev. Level	Reason of delay	Future plan
Items	Contents					
1-1.Plan the C/P allocation.	Formulate a C/P allocation plan in order to assure the sufficient number of personnel necessary to execute the Project activities.	The counterpart personnel is assigned as planned.	According to the initial C/P allocatioa plan elaborated by the Record of Discussions signed on July, 2002, the Project had planned to allocate 12 technical C/Ps and 3 administrative C/Ps at UNA, and 9 technical C/Ps and 1 administrative C/P at INCOPESCA. As of March, 2007, 9 technical C/Ps and 3 administrative C/Ps at UNA and 13 technical C/Ps and 1 administrative C/P at INCOPESCA are assigned.for the Project. D6	4		
1-2.Formulate and execute budget plan appropriately.	The budget plan is formulated to secure necessary budget for smooth implementation of the Project.	The budget is secured and executed appropriately.	The execution results of the budgets assigned to the Project operstion from the beginning of the Project (October, 2002) to December, 2006 havs attained to US$ 636,083.77 (UNA) and US$ 746,709.00 (INCOPESCA) executed according to the quinquennial budgetary plan for the Project operation formulated by the Record of Discussions signed on July, 2002 (UNA had budgeted around US$ 150,000.00 annually and INCOPESCA had budgeted around US$ 110,000.00 annually during 5 years of technical cooperation.). The above mentioned executed budgets had been covering mainly the items corresponding to the personnel expenses, basic services (telephone, water, electricity, etc.), travel expenses and fuel expenses. The expense items such as facility expenses (office and space, US$ 99,000.00) and field/laboratory equipment supply expenses (US$ 128,799.00) are also included in the executed budgets of UNA, however, these items were unsubsutantial expenditures. Therefore, there is a difference between the projected budgets and the executed ones. In the other band, UNA/INCOPESCA do not have budget properly assigned to the Project with the expense items tagged for the Project. As the result of this, the budget execution takes a lot of time.	2		UNA/INCOPESCA should secure the items of expenditure necessary for the smooth implementation of the Project.
1-3.Establish and operate management system.	In the Project a administrative group is formed to establish the management system.	The administrative capacity of the counterpart personnel is enhanced.	Weekly coordinator meetings have been held, as well as meetings at the management level such as the Joint Coordinating Committee (composed of the National Planification Ministry (MIDEPLAN), Embassy of Japan in Costa Rica and Office of JICA in Costa Rica) and Monthly Steering Committee. Problems concerning project management have been resolved as a result of discussions in the meetings. Technical experts have attended the meeting and given advice when necessary.	4		
1-4.Formulate plan of operation and maintenance of equipment.	Implement necessary preventive/corrective maintenance.	The counterpart personnel acquire the operation and maintenance technique of the equipment.	Because the budget expense item that corresponds to the preventive maintenance of the machinery and equipment installed mainly in the quality control laboratories of the Marine Biological Station (EBM) do not exist in the Project operation budget of UNA/INCOPESCA, the preventive maintenance of the machinery and equipment has not been carried out up to the present time.	2		UNA/INCOPESCA should secure the item of expenditure necessary for the preventive maintenance of the machinery and equipment.

1-5. Implement public relations through seminars/workshops, brochures and periodicals.	Implement the diffusion activities of the Project.	The number of diffusion activities is increased.	As public relations of the Project activities, the Project published 4 Project presentation pamphlets in total (once a year between 2003 and 2006). Each time, 2,000 copies were distributed to the organizations, persons, etc. related to the Project. In addition, the Project has published 5 newsletters since 2003 with 500 copies which were distributed to the organizations of the fishery sector and participants in the seminars/workshops organized by the Project. In February, 2005, an internet homepage for the Project was established. Workshops organized by the Quality Control Group of INCOPESCA have been held 268 times and a total of 7,400 people (fishermen, persons working in the commercialization chain, etc.) participated by the end of September 2006, and 24 workshops organized by the Quality Control Group of UNA have been held to give information on the shellfish toxins and red tide to the shellfish extractors and a total of 692 people participated in the workshops. Also, the Project organized 4 national seminars and 1 international seminar (once a year between 2003 and 2007) destined to the industrial, governmental and academic institutes and these seminars were managed and imparted by the counterpart personnel of the Project. So, the counterpart personnel of the Project have acquired sufficient capacity to transfer the techniqua and knowledge to the technical experts of the industrial, governmental and academic institutes .	4		

Annex-4. The Progress of the Activities (Fisheries Resources Management, As of May,2007)

Plan of operation		Goal	Progress and results	Achiev. level	Reason of delay	Future plan
Items	Contents					
2-1 Conduct surveys on fishery activities	Research surveys are carried out in the following 3 items and the technologies for those surveys are transferred to counterparts; 1. Survey on fishing boats in the Gulf of Nicoya, 2. Survey on fishing activity, 3. Survey on fixed & variable costs and earnings	Information on the present artisanal fisheries in the Gulf of Nicoya is obtained.	1. Concerning survey on fishing boats in the Gulf of Nicoya, in total, 36 fish landing sites were surveyed. 2. Concerning survey on fishing activity, in total, 65 fishermen were interviewed. 3. Concerning survey on fixed & variable costs and earnings, after introduced the methology of the research survey by a short-term expert, counterparts collected 40 questionnaires from the fishermen of 4 different communities in the Gulf of Nicoya. The results from each survey were summarized in short papers.	4		
2-2 Conduct investigations on biological characteristics	Studies and surveys are carried out in the following 7 items and the technologies for those research works are transferred to counterparts; 1. Species identification, 2. Maturity observation, 3. Otolith study, 4. Body-part measurement, 5. Mark-recapture experiment, 6. Collection of length-frequency data at landing sites, 7. Investigation on spawning and nursery grounds of main fish species	The biological characteristics of the target species for resource management are obtained.	1. Concerning species identification, the speed for the identification of fish was very improved by using photo collection than using book. 2. Concerning maturity observation, the maturity of the target species was oberved monthly throuout a year. 3. Concerning otolith study, after introduced the technologies on the otolith obervation by two short-term experts counterparts studied about the otoliths of 6 fish species. 4. Concerning body-part measurement, the body-part of all target species were measured. 5. Concerning mark-recapture experiment, juvelines of Pargo mancha were collected in the area of Paquera, the Gulf of Nicoya, and marked and released. In total 701 juveniles were marked and 58 of them were recaptured. 6. Concerning collection of length-frequency data at landing sites, counterparts of INCOPESCA monitored the catch data and total-length data by using the modified sampling sheets. The number of boats monitored in 2003-2006 were 1131, 1097, 1260, 994 boats, respectively. 7. Concerning investigation on spawning and nursery grounds of main fish species, a hearing investigation to fishermen was carried out to obtaine the information on the spawning and nursery grounds. The results from each study or survey were summarized in short papers.	4		
3 Conduct introduction of appropriate databases	New database and GIS are introduced into UNA and INCOPESCA and the operation methods are transferred to counterparts.	The data obtained by the research activities is well managed and effectively utilized.	1. Concerning database, 3 forms of database were intraduced into the computers of INCOPESCA and 4 forms of database into UNA by using Microsoft Access. Counterparts are using those forms to manage the data obtained from research surveys. 2. Concerning GIS, a GIS software, echo-sounder, and a computer were donated into UNA as the equipment of the 2005 fiscal year. Then, a counterpart trained in Japan about GIS. After introduced the methodology of making bathymetric chart by a short-term expert the counterpart made the bathymetric charts of Negritos and San Lucas Islands which are main fishing grounds in the Gulf of Nicoya.	4		The activities on GIS continues until the end of the Project.

Plan of operation		Goal	Progress and results	Achiev. level	Reason of delay	Future plan
Items	Contents					
4-1 Conduct introduction of data-analysis technologies	Methodologies of the stock assessment are introduced.	Methodologies of the stock assessment are transferred to counterparts	The species composition of the commercial groups (PG, PP, CLASE, CHATARRA) and the size composition of the target fish species were studied. The change of maturity of target species, L50%, sex ratio, and length-weight relationship were analized by using the data obtained by the Project. A short-term expert introduced the technologies on the growth analysis by using size-frequency data and the growth parameters of Pargo mancha, Corvinas, and barracuda were estimated by this method. Also by using the results of otolith observation, the growth parameters of 4 fish species were estimated. Concerning the sotck assessment, the methodologies on analysis such as production model, VPA, Y/R, and %SPR were introduced to counterparts. The results from each analysis were summarized in short papers or reports.	4		
4-2 Conduct modification of fisheries statistics	The fisheries statistics of INCOPESCA is modified and a new annual fisheries statistics of the Gulf of Nicoya is compiled.	The present fisheries statistic of INCOPESCA is improved to use for the fisheries resources management.	After corrected the refistration errors in the database of INCOPESCA, the fisheries statistics were newly compiled according to fishing methods and fishing areas. The catch of commercial categories were separated into species as much as possible after the year of 1998. A new fisheries statistics of the Gulf of Nicoya, 1994-2005, was published. Since 2006, the receit "factura" which is the origin of the catch data is ramdomly sampled 25% after sorted those into fishing methods. And a new form of database of Access is being introduced into a computer of INCOPESCA as a first trial to registar the catch data of factura because the present database has a code-input system and so it is not easy to operate. This system may produce many registration errors and the registration items is fixed and so registrators can not change the items even when they found the new items or error items.	4		
5-1 Set up a committee of stock assessment	A committee for stock assessment is established and managed.	An organization to conduct the stock assessment even after the Project is established.	The Committee of Stock Assessment was established on 18th August 2005 and it consists of 9 members, that is, 3 members from UNA, 4 from INCOPESCA, and 2 from JICA. The role of each member and the work plan was also decided. Until now, this Committee was held 6 times to discuss about the stock assessment and recommendation. In addition to the meeting of this Committee, the study meeting by volunteers of the members of this Committee was held 7 times to study the theories and methods of analyses for several types of stock assessment.	4		
5-2 Conduct stock assessment of main species by committee members	The committee conducts the stock assessment of the target species by using the data accumulated by the Project.	The committee conducts the stock assessment of the target species.	The members of the Committee are studying the theories and methods of stock assessment. Concerning white shrimp and Pargo mancha, members carried out the several analyses for stock assessment by using production model, VPA, Y/R, and %SPR, and they exchanged their opinions about those results. Now, the Committee is preparing a report including the results of stock assessmant and recommendation.	4		The activities of tha Committee continues until the end of the Project.
5-3 Recommend fishery management by committee members	The committee writes a recommendation for the fisheries management according to the results of the stock assessment.	The committee writes a recommendation for the fisheries management of the target species in the Gulf of Nicoya.	The Committee is preparing a report including the results of stock assessment and recommendation.	4		The activities of the Committee continues until the end of the Project

ANNEX 4 :The progress of the activities (Quality Control, As of May,2007)

2007.4.8

Plan of operation		Goal	Progress and results	Achiev. level	Reason of delay	Future plan
Items	Contents					
6-1 Conduct basic survey on quality control from fishing boat to fish store.	1) Clarified the problems of quality control by instructive visit. 2) Investigated pathogenic bacterias. 3) Investigated actual freshness conditions with indicator.	Clarify actual conditions and problems of quality control.	1) Implemented this activity until the end of 2004, clarified causes and problems which caused loss of quality control at every level of distribution, and made report No. 6-001. 2) *Vibrio enteritidis* which causes the principal intoxication in Japan doesn't exist in seawater near the Gulf of Nicoya. 3) Coliform and Escherichia coli presented problems but other pathogenic bacteria were few. Made report No.6-002 of the results. 4) Freshness was worse as distribution level advanced. Mace report No.6-003.	4		
6-2 Conduct basic survey on shellfish collector	Visited 26 shellfish collector communities in Gulf of Nicoya, to study collector number, shellfish species, working hours, price, etc.	Clarify actual shellfish collector´s conditions.	1) Implemented this activity until end of 2003 and made report No. 6-004 2) Collected data concerned with shellfish collector in the Gulf of Nicoya and decided shellfish and seawater monitoring points.	4		
7-1. Realizar técnicas de medición de frescura	1) C/Ps learned how to measure freshness. 2) Investigated the change of freshness with storage time, evaluated products at every level of distribution. 3) Put In order improvement points of quality control.	Evaluated freshness the fisheries products and made improvement recomendations	1) Made manuals of different freshness measuring method and C/Ps learned these techniques. 2) Investigated freshness change of three species of fish with variety indicators. As a result, decided organoleptic test and K value for freshness indicator. 3) pH and VBN increased when putrefaction started, so these were confirmed for putrefaction indicator. 4) Investigated freshness changs of 6 main species of fish. As ths result, K Value increasad in the following order: cabrilla>macarela>3 species of corvina and pargo. Corvina and pargo can be eaten for more than 1 week. 5) Investigated freshness of 3 species of fish depending on the variety's temperatures. As a result, in the case of 20 and 30 ℃, putrefaction occurred within 1 day.	4	Increase sample number to improve confidence.	Investigate freshness of other main species of fish until end of project.
7-2 Implement techniques of fresh maintenance.	1) C/Ps learned the techniques and knowledge of freshness maintenance. 2) C/Ps transferred and taught the stakeholder techniques and knowledge which they learned through the project. 3) Made recommendations to improve freshness maintenance.	C/P´s acquire teaching capacity and transfer techniques to stakeholder. Make freshness maintenance recommendation.	1) Made manuals of ikeshime and conservation method with ice and C/Ps learned these techniques. 2) In the case of storing the fish with water and ice, the fish temperature decreased 5℃ within 20 minutes, but in the case of ice only, 70 minutes was needed to decrease the temperature to less than 5℃. 3) C/Ps utilized these techniques immediatsly after lsarning them through the project and transferred them to stakeholder. According to repeat instruction, the techniques improved. 4) Made 3 educational videos in March, 2007 and it is expected to be utilized efficiently to stakeholder. 5) Confirmed that killing the fish immediately with ice and water is valid to maintain freshness. 6) Make a report current to April, 2007.	4		

8-1 Monitor toxic phytoplankton.	Decided the monitoring points in the Gulf of Nicoya, to implement the monitoring and analyze the results.	Decide toxic phytoplankton monitoring points and analyze results.	1) Confirmed 2 species of toxic phytoplankton (*Gymnodium catenatum* and *Pyrodium bahamense var. compressum*) until 2006, but these concentrations weren't high. *Alexandrium monilatum,* the main component of red tide, apeared in August, 2005. It was analyzed with HPLC, but it isn't one of the toxic phytoplankton. 2) Concentration of phytoplankton didn't have a relation with shellfish toxicity. 3) Changed toxic phytoplankton monitoring points to close to shellfish and seawater sampling point. Implemented new monitoring from May, 2006. 4) High concentration of *Gymnodium catenatum appeared* from February, 2007, but shellfish didn't accumulate toxin less than permitted concentration.	4		Continue monitoring until end of project.
8-2 Monitor nutrients of seawater.	Implemented nutrients monitoring and environmental factors, to analyze relationship to toxic phytoplankton concentration.	Monitor the nutrients and analyze the results.	1) Implemented this activity continuously from November, 2003. 2) The concentrations of nutrients were different in the rainy and dry seasons. 3) The nutrient concentration didn't have a relation with toxic phytoplankton.	4		Continue monitoring until end of project.
8-3 Monitor shellfish toxicity (Bioassays of mouse, PSP analyzer).	1) Send shellfish meat samples to MAG to analyze toxicity with mouse assay. 2) Constructed PSP analyzer and transferred technique to MAG and C/Ps.	Implement shellfish toxin monitoring with mouse bioassay and HPLC and analyze the results.	1) Piangua, concha perla and mejillón didn't have toxin over the permitted level. 2) In the case of Ostión Vaca, toxin concentracios were over then permitted level. 3) Only the muscle had toxin, but not other parts of Ostion Vaca.	4		Continuar el monitoreo hasta final del proyecto.
8-4 Monitor heavy metal of shellfish	Analyzed heavy metals for the rainy and dry seasons.	Analyze heavy metal of shellfish.	1) Implemented this activity from November, 2004 to May, 2005 in an exterior laboratory. The results showed that the concentrations of heavy metal were very low.	4		
8-5 Recommend improvement of shellfish toxin monitoring system	Put in order the monitoring results and made recommendations and discussed with Red Tide Commission.	Recommend improve points to toxic monitoring sistem for Red Tide Comission.	1) Formed a recommendation to improve shellfish toxin monitoring system in March, 2007 for the Red Tide Committee. 2) Made the recommendation to the Red Tide Committee in April, 2007.	4		
9-1 Make text, presentation materials and pamphlet for workshop and seminar.	Made manuals, textbooks and videos for public promotion.	Make manuals and videos, etc., for workshop and seminar.	1) Made e textbook for workshop (No. 9-001) 2) Write 14 chapters of manual (No. 9-002) 3) Made 5 pamphlets (No. 9-003) 4) Made Power Point presentations(No. 9-009) 5) Made 6 workshop materials (No. 9-006) 6) Made 3 education videos (No. 9-008) 7) Made 6 posters for International Seminar.	4		

9-2 Conduct visiting instruction	1) Implemented instructor visits periodically in fishing boats, landing sites, transportation vehicles, fish stores and supermarkets. 2) Take samples and analyze pathogenic bacterias and histamines in INCOPESCA's Laboratory.	Imptement instructive visit periodically in every level of distribution.	1) Constructed communication network of supermerket, processing company, fish stores in San José, Heredia y Alajuela, transport, landing site and fishermen, according to instructive visit.. 2) Conditions improved slowly through instructive visit, but improvement points which needed funding didn't change. 3) As good freshness doesn't increase the price directly, the use of ice didn't change much. 4) As INCOPESCA doesn't have legal power, they couldn't inspect well to improve the quality of fishery products.	2		Select some models of fishermen group, try pilot project with freshness to produce the price add.
9-3 Implement workshops	Implemented workshop to stakeholder.	Implement workshops.	1) Put on 20 shellfish toxin workshops and 548 people participated. 2) Put on 270 wokshops on good handling practices of fishery products, and 7268 persons participated.	4		Continue this activity until end of project.
9-4 Implement seminars	Implemented seminars for C/Ps to increase learning and techniques.	Implement seminars.	1) Implemented 15 seminars.	4		Implement seminars after May, 2007.

ANNEX 5-1. List of Japanese Experts

No	Name of Experts	Assigned Scope	Assigned Term
a. Long-Term Experts			
1	Hitoshi Fujita	Chief Adviser/Fisheries Politics	1/10/2002-08/06/2005
2	Yasuhiko Shimazu	Chief Adviser/Fisheries Politics	20/05/2005-30/09/2007
3	Yuichi Endo	Project Coordinator	1/10/2002-30/9/2007
4	Kazuhito Hiramatsu	Resource Management	1/10/2002-30/9/2007
5	Hikaru Ishihara	Quality Control	1/10/2002-30/9/2007
b. Short-Term Experts			
6	Yuji Uozumi	Fishery Resource Management (Seminar lecturer)	25/6/2003-28/6/2003
7	Masaaki Kodama	Quality Control (Shellfish Toxin measuring and Monitoring Techniques)	6/8/2003-28/8/2003
8	Ryo Kimura	Fishery Resource Management (Aging Determination)	3/11/2003-2811/2003
9	Naoki Takatori	Quality Control (Freshness Control)	30/1/2004-16/2/2004
10	Takashi Nakanishi	Fishery Resource Management (Evaluation of Social Aspects Related to Management of Marine and Coastal Resources	19/7/2004-19/8/2004
11	Kazuhiko Kameda	Quality Control (Freshness Control in Fish Market)	21/1/2005-14/2/2005
12	Takashi Yamakawa	Fishery Resource Management (Resource Analysis)	26/2/2005-6/3/2005
13	Masaaki Kodama	Quality Control (Shellfish Toxin Instrumental Analysis- HPLC)	1/8/2005-23/8/2005
14	Satoshi Katayama	Fishery Resource Management (Age Determination and Evaluation)	31/10/2005-20/11/2005
15	Kiyoshi Ito	Fishery Resource Management (Submarine Topographic Cartography by G.I.S.)	22/4/2006-20/5/2006
16	Kazuhiko Hiramatsu	Fishery Resource Management (Seminar lecturer)	15/10/2006-27/10/2006
17	Katsuhiko Tachibana	Quality Control (Seminar Lecturer on Freshness Test of Marine Products)	11/10/2006-23/10/2006
18	Akira Okamoto	Quality Control (Freshness Conservation of Marine Products))	2/3/2007-16/3/2007

ANNEX5-2. List of the Costa Rican Counterpart Personnel Trained in Japan

	Name of C/P	Term of Acceptance	Technical Coopera-tion Area	Subject of Training & Recipient Institute	Function when receiving the training	Present Function (Date of leaving the post· New employment)
1	Jorge Arturo Rodriguez (UNA)	9/3/2003-26/3/2003	Fishery Manage-ment	Course of Training : Fishery Management/ Project Administration Recipient Institute: the Fisheries Agency, National Research Institute of Fisheries Science, National Research Institute of Far Sees Fisheries	Director of Biological Sciences School, UNA	In May, 2003, he took mandatory retirement.
2	Antonio Porras Porras (INCOPE SCA)	9/3/2003-26/3/2003	Fishery Manage-ment	Course of Training : Fishery Management/ Project Administration Recipient Institute: the Fisheries Agency, National Research Institute of Fisheries Science, FRA, National Research Institute of Far Sees Fisheries, FRA	General Technical Director, INCOPES-CA	In July, 2004, he was sent on loan to FAO and in May, 2006 he returned to INCOPESCSA as General Technical Director.
3	Roland Ramirez Villalobos (INCOPE SCA)	1/11/2003-12/12/2003	Quality Control	Course of Training : Quality Control of Marine Products Recipient Institute : Tokyo University of Marine Science and Technology	Chief of Marketing Research Section, INCOPESCA	Chief of Marketing Research Section, INCOPESCA
4	Hubert Araya Umaña (INCOPE SCA)	16/11/2003-3/12/2003	Fishery Manage-ment	Course of Training : Fishery Management Recipient Institute : National Research Institute of Fisheries Science FRA, Seikai National Fisheries Research Institute	Chief of Investigation/ Development Section, INCOPESCA	Chief of Investigation/ Development Section, INCOPESCA
5	Adan Chacon Cascante (INCOPE SCA)	7/3/2004-27/3/2004	Fishery Manage-ment	Course of Training : Fishery Statistics Recipient Institute : National Research Institute of Far Sees Fisheries, FRA	Chief of Statistics Section, INCOPESCA	Chief of Statistics Section, INCOPESCA
6	Emilia Calvo Vargas (UNA)	12/9/2004-9/10/2004	Quality Control	Course of Training : Shellfish Toxin Identification/Monitoring Recipient Institute : Tokyo University	Researcher of Phytoplankton Lab. at EBM, UNA	Researcher of Phytoplankton Lab. at EBM, UNA

7	Rosa Lidia Soto (UNA)	30/9/2004-30/102004	Fishery Manage-ment	Course of Training : Aging Determination Recipient Institute : National Research Institute of Fisheries Science, FRA, Japan Sea National Fisheries Research Institute, FRA	Researcher of the Fishery Lab. at EBM	Researcher of the Fishery Lab. at EBM
8	Cristian Fonseca (UNA)	18/2/2005-27/3/2005	Quality Control	Course of Training : bacteriological examination Recipient Institute : National Research Institute of Fisheries Science, FRA, Japan Sea National Fisheries Research Institute, FRA	Researcher of the Quality Control Lab. at EBM	Researcher of the Quality Control Lab. at EBM
9	Berny Marín (INCOPESCA)	6/9/2005-5/10/2005	Fisheries Policy	Course of Training: Fishery Management/ Fisheries Policy Recipient Institute: the Fisheries Agency, National Research Institute of Fisheries Science, FRA (Hokkaido, Okinawa)	INCOPESCA Chief of Environment Protection Section	INCOPESCA Chief of Environment Protection Section
10	Hannia Vega Bolaños (UNA)	1/11/2005-9/12/2005	Fishery Manage-ment	Course of Training : GIS technique Recipient Institute : Environmental Simulation Laboratory, Co, Ltd, National Research Institute of Far Sees Fisheries, FRA, National Research Institute of Fisheries Science, FRA	Researcher of Phytoplankton Lab. at EBM	Researcher of Phytoplankton Lab. at EBM
11	Fernando Méjia Arana (UNA)	20/3/2006-22/4/2006	Fishery Manage-ment	Course of Training: Ecology Recipient Institute : National Research Institute of Fisheries Science, FRA	Researcher of the Fishery Lab. at EBM	Researcher of the Fishery Lab. at EBM
12	Ana Rita Vasquez Arias (INCOPESCA)	28/3/2006-1/5/2006/5	Fishery Manage-ment	Course of Training : Stock Assessment Recipient Institute : Tokyo University, National Research Institute of Fisheries Science, FRA	Technical Officer, Investigation/ Development Section	Technical Officer, Investigation/ Development Section, INCOPESCA
13	Cecilia Soto Monge (INCOPESCA)	16/9/2006/-12/10/2006	Quality Control	Course of Training : Freshness Control Recipient Institute : Nagasaki University	Technical Officer, Marketing Research Section	Technical Officer, Marketing Research Section, INCOPESCA

14	Ginnette Valérin (INCOPE SCA)	16/9/2006/-12/10/2006	Quality Control	Course of Training : Freshness Control Recipient Institute : Nagasaki University	Technical Officer, Marketing Research Section	Technical Officer, Marketing Research Section
15	Luis Sierra Sierra (UNA)	1/11/2006-1/12/2006	Fisheries Policy	Course of Training : Fishery Management/ Project Administration Recipient Institute: the Fisheries Agency, National Research Institute of Fisheries Science, FRA, National Research Institute of Far Sees Fisheries	Dean of Collage of Exacts & Natural Sciences, UNA	Dean of Collage of Exacts & Natural Sciences, UNA
16	Calorina Alexandra Marín (UNA)	30/1/2007-28/2/2007	Quality Control	Course of Training : Microorganismo Marino Recipient Institute : Miyazaki University, Tokyo University of Marine Science and Technology	Researcher of the Quality Control Lab. at EBM.	Researcher of the Quality Control Lab. at EBM.
17	Ricardo Jiménez Montealegre (UNA)	2/3/2007-24/3/2007	Fisheries Policy	Course of Training : Coastal Fishery Management Recipient Institute Tokyo University, Tokyo University of Marine Science and Technology, Kagoshima University, National Research Institute of Aquaculture	Director of Biological Sciences School, UNA	Director of Biological Sciences School, UNA