資　　料

THE MINUTES OF THE FIFTH JOINT COORDINATING MEETING CONCERNING THE ASSESSMENT AND MONITORING OF FISHERIES RESOURCES PROJECT IN THE ARGENTINE REPUBLIC

The Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Akira NIWA, Director of Fisheries Cooperation Division, JICA, visited the Argentine Republic for the purpose of evaluating the Assessment and Monitoring of Fisheries Resources Project in the Argentine Republic (hereinafter referred to as "the Project") from July 11 to July 21 in 1999.

During its stay, the Team surveyed in the project site and had a series of discussion with concerned Argentine authorities.

As a result of discussion, both sides agreed to report to their respective Governments the matters referred to in the documents attached hereto.

Buenos Aires, July 20,1999

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The Final Evaluation Report for the Project

1. INTRODUCTION

Based upon the Record of Discussions (hereinafter referred to as "the R/D") signed on October 5, 1994, the Government of Japan and the Government of Argentine Republic have been implementing the Project since December 1, 1994.
The Project is scheduled to be implemented for five (5) years at The National Institute for Fisheries Research and Development in Mar del Plata (hereinafter referred to as "INIDEP") and is to be completed on November 30, 1999.

With the remaining project period of approximately 4 months, JICA dispatched the evaluation team to Argentina. Argentine side also formed an evaluation team. Both teams joined together and formed a joint evaluation team to evaluate the project together. The members of the joint evaluation team are described on Item 2 of this document.

In order to evaluate more precisely, the joint evaluation team has made a Project Design Matrix (hereinafter referred to as "PDM"). PDM was not prepared at the start of the Project. Therefore the joint evaluation team sorted out the Project activities and outputs through review of past documents and discussions with the parties concerned and agreed to use PDM summarized in Annex1.

Narrative summary of the PDM is as follows:

The Overall Goal of the Project:

- The Argentine Republic implements fisheries resources management policies based on the scientific information provided by INIDEP.

The Purpose of the Project:

- The capability of INIDEP on fisheries resources assessment is improved.

Output:

Counterparts' research methodologies and technique for ecological characteristics / reproduction / life cycle of target species are improved

Counterparts' research methodologies and technique for the impact of fishing on the target species are improved.

Counterparts' knowledge and technique in utilization of satellite image to analyze fisheries resource assessment are improved.

Activities:

1. Fisheries Ecology and Biology
   1-1 Geographic distribution
   1-2 Migration and displacement
   1-3 Feeding behavior
   1-4 Growth pattern
   1-5 Sexual Maturation and reproduction
   1-6 Age determination
2. Fishing technology
   2-1 Standardization of fishing effort
   2-2 Fishing gear selectivity
   2-3 Selective action of fishing gear and methods
3. Training on satellite image analysis and utilization of the data

2. EVALUATOR

2-1. Japanese Side

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Mr. Shigeyuki KAWAHARA Fisheries Biology	Director of Oceanic Resources Division National Research Institute of Far Seas Fisheries Fisheries Agency
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2-2 Argentine Side

Lic. Jorge Luis CAJAL	Interventor National Institute for Fisheries Research and Development
Dr. Ramiro P. SANCHEZ	Coordinator Pelagic Fisheries and Marine Environment Section
Dr. Leszek Bruno PRENSKI	Coordinator Demersal and Inland Water Fisheries Section
Lic. Maria I. BERTOLOTTI	Coordinator Fisheries Information and Technology Section
Eng. Ruben ERCOLI	Chief Fishing Technology Research Group
Dr. Norma E. BRUNETTI	Chief Squid Research Group

3. OBJECTIVES OF THE EVALUATION

Objectives of the evaluation of the Project is as follows:

(1) To execute a comprehensive evaluation of the achievement in accordance with the original plan described in the R/D, Tentative Schedule of Implementation (TSI), Plan of Operation, Annual Work Plan and PDM.

(2) To make recommendations and suggestions concerning the measures to be taken after the termination of the cooperation period of the Project to the authorities of the respective Governments.

4. METHODOLOGY OF EVALUATION

4-1. Survey

The Project was evaluated jointly by the Japanese and Argentine side. The Team visited the Project site and had a series of hearings from Japanese long-term experts, Argentine counterparts personnel.

4-2. Items of the Evaluation

4-2-1. Accomplishment of the Project

Accomplishment of the Project was measured in terms of inputs, activities, outputs and project purpose, all of which in accordance with the R/D, TSI and PDM.

4-2-2. Effectiveness

Effectiveness was assessed by evaluating the extent to which the Project has achieved outputs and project purpose.

4-2-3. Impact

Impact of the Project activities was identified as positive and negative change produced by the Project directly and indirectly (including unexpected changes).

4-2-4. Efficiency

Efficiency of the Project implementation was analyzed focusing on the relationship between outputs and inputs in terms of training, quantity, and linkage with other cooperation scheme of JICA and other organization.

4-2-5. Relevance

Relevance of the Project was reviewed as the validity of the project purpose and overall goal in connection with the development policy of the Government of Argentine Republic and needs of the beneficiaries.

4-2-6 Sustainability

Sustainability of the Project was focused in organizational, financial and technical aspects by examining the extent to which the achievement of the Project is sustained or expanded after the assistance is completed.

5. RESULT OF EVALUATION

5-1. Accomplishment of the Project as of July 20,1999.

Both evaluation teams received the progress report attached as Annex II from the Project and investigated its content. As a result, the details of Accomplishment of Input, Activities and Outputs are the same as described in the progress report.
Refer to Annex II in details.

5-1-1. Accomplishment of Input

(1) Measures taken by the Government of Argentina Republic

1) The necessary Land, Building and Facilities of the Project have been provided in line with Annex V of R/D.

2) Allocation of Counterparts and Other Personnel

During the cooperation period, twenty-five (25) in total net counterparts personnel were allocated.

(2) Cooperation by the Government of Japan

1) Dispatch of Experts

(a) Eight(8) in net total Long-term Experts were dispatched.

(b) Thirteen(13) Short-term Experts in three fields were dispatched. Four (4) Short-term Experts will be dispatched during the remaining period of the Project.

2) Provision of Machinery

Approximately 176,350 thousand yen was allocated for the Project.

3) Local expenditure

(a) Approximately 1,290 thousand yen was allocated for two (2) counterparts to participate in the International Conference in Norway, 1998.

(b) Approximately 4,240 thousand yen were allocated to execute the Project for

implementing period.

(c) Approximately 4,240 thousand yen will be allocated to hold seminar on September 8 to September 12, 1999.

5-1-2. Accomplishment of Activities

Geographical distribution, migration and displacement (Activity 1-1 and 1-2 on PDM)

For Argentine shortfin squid, allozyme electrophoretic technique was introduced to identify genetical differences within the spawning populations of the species which is valuable tool for resource management. Several enzymes and polymophic were detected through a screening process. With this technique, it became possible to compare between each spawning population of the squid. The technique was also applied for each phylogenetic level: sub-species, species, genus, and family of squids. Low levels of inter-population genetic variability were found for the squid stock, and the genetic distance between two spawning populations was suggested by the results. This technique is applicable to fish populations.

By analyzing statolith daily increments, the squid spawning populations were identified and growth parameters were determined

For the research of Patagonian grenadier and southern blue whiting, samples collected in the past research cruises were utilized and the distribution of these species was identified. Estimation of stock and abundance of these species were also improved.

For kingclip and Patagonian toothfish, their distributions were revealed from the data and samples collected in the past except for the juvenile of Patagonian toothfish.

Feeding behavior (Activity 1-3 on PDM)

For Patagonian grenadier, cannibalism and predation to the larvae were studied. Analysis was made to reveal the feeding ecology in order to get an insight of the natural mortality of the species.

For southern blue whiting, analysis on feeding on plankton has been done and the data is being accumulated.

Age determination and rearing of the target species (Activity 1-4 and 1-6 on PDM)

For Argentine shortfin squid, processing of daily-ring readings of the statolith have been greatly improved with newly introduced optical equipment and the system. Through the establishment of artificial insemination technique, it was made possible to analyze the formation of daily rings in the early development stages of the larvae. The result was utilized to validate the daily rings of wild larvae of the squid. Statolith tagging with fluorescent substances was introduced.

Age determination routine was established and criteria of daily ring reading were also established for larvae of the squid. Validation of daily rings of young adult and matured squid will be conducted by the counterparts.

For Patagonian grenadier and Southern blue whiting, reading technique of daily and yearly rings on otolith has been established with the use of equipment (several optic machineries). With this information, growth models were estimated and the knowledge of stocks was enhanced. From the study of otolith from young fish of Patagonian grenadier (less than one year old), spawning season has been estimated.

Early stage (less than one year old) growth pattern of kingclip has been revealed in preliminary form by the description of larval occurrence, morphology and daily ring analysis. It was found there are many false daily rings during larval and juvenile stage of the fish. Studies on age determination of Patagonian toothfish have been conducted in preliminaly form.

Sexual maturation and reproduction (Activity 1-5 on PDM)

Technique on artificial insemination of squid on board and transportation of hatched larvae has been established. This enabled the study of hatching condition with different water temperature and other reproductive studies by ensuring stable supply. Estimation of spawning ground, study on the development of embryo, observation of reproductive ecology, study on the cause of early stage mortality, study on early growth pattern have been conducted. Model for development speed and growth curve has been estimated. Scientific papers have been presented at international scientific meetings and published.

For Patagonian grenadier and southern blue whiting, sampling method on board a research vessel has been established. These samples were studied histologically to determine their sexual maturation. Daily ring reading was conducted for the young fish of Patagonian grenadier (less than one year) and spawning season was estimated. From the combination of

the studies, first maturity size is determined. As larvae sample of both species was difficult to obtain, anchovy larvae was mostly utilized to develop technique. Technique on egg collection from the wild, hatching, rearing of anchovy, and histological study of digestive organs have been conducted. A manual on histological study will be proposed.

Standardization of fishing effort (Activity 2-1 on PDM)

In order to understand squid fisheries (jigging and trawling), distribution map of fishing effort and catch was made. The commercial fishing vessels' data in 1994 was used to plot on a one-degree block basis.

Same kind of distribution map was made for Patagonian grenadier and Southern blue whiting with bi-monthly fishing report of 1991-1995.

CPUE (Catch per Unit Effort; catch per day per vessel) was estimated as an indicator to standardize a fishing effort. Fishing ability of fishing vessels from different countries was compared. There was a significant deference in the fishing ability between Japanese and Argentine boats. This method was well accepted by the counterparts. A short-term expert was dispatched and counterpart training was conducted.

For Patagonian grenadier, a preliminary study of fishing effort standardization was conducted. Because of the complex fishing style (mixture of different vessel size and mixed species catch), it is necessary to consider the effect of mixed species catch before standardizing fishing effort.

For southern blue whiting, CPUE of Surimi factory boat was utilized to compare the fishing ability. With the data of 1990 to 1995, CPUE of Surimi fleet was standardized.

A short-term expert transferred theory of estimation technique of standardized total fishing effort to the counterparts.

Fishing intensity (Activity 2-2 on PDM)

A technique on artificial insemination of squid on board and transportation of hatched larvae has been established. This enabled the study on hatching condition under different water temperature and other reproductive studies. Researches on estimation of spawning ground, the embrionic development, reproductive ecology, early stage mortality, early growth pattern, have been conducted. Growth model for development has been estimated. Scientific

papers have been presented at several international scientific meetings and published.
For Patagonian grenadier and southern blue whiting fisheries, INIDEP's bottom fish resource analysis method was VPA (Virtual Population Analysis), and differed from the Japanese analysis method. Therefore, estimation of fishing intensity and estimation of resource abundance indicator were introduced but not actually used.

Fishing gear (Activity 2-3 on PDM)

The selectivity effect of fishing gear and method was investigated with the data available from fisheries statistics. Species composition of different types of fishing boats was studied and the methodology was introduced.

Mesh selectivity study of Patagonian grenadier was conducted twice by a research vessel of INIDEP and the result was published.

Survey method on length composition of the fish on board commercial fishing vessels was introduced. This is basic knowledge directly applicable to fishing gear selectivity study.

Application of mathematical models of fishing gear selectivity was introduced.

Training on satellite image analysis and utilization of the data (Activity 3 on PDM)

Number of different levels of meetings with counterpart, coordinator, and director of INIDEP had been held to discuss the implementation plan of the satellite information utilization. Counterpart was sent to Japan to obtain knowledge and skills on utilization of Satellite information. Problems were sorted out and the plan of operation including provision of a room and stuff was decided.

Equipment was reorganized and modified to enable the counterpart to take the information to computer. Satellite Information is obtained regularly and the processed data are available through INIDEP's LAN network. NOAA satellite information has been accumulated and stored for the future analysis.

Computer systems to utilize satellite data with various fisheries information from fishery observer program and fishing port sampling have been established.

5-1-3. Accomplishment of Outputs

The summaries of the outputs for the three activity fields are presented as follows. For the ease of understanding, Fishery Ecology field and Fishery Biology field are presented together in Output 1. Fishing Technology field is presented in Output 2 and Satellite image as Output 3.

Fishery Ecology and Biology fields (Output 1 on PDM)

Counterparts' research methodologies and technique on ecological characteristics / reproduction / life cycle of the target species have been improved.

Joint activities with long term experts, that were enhanced by short-term experts as well as training of counterparts in Japan, were conducted as planned. The total number of activities rose to 85 when different species are considered.

As a result, 51 scientific papers, 7 manuals were produced and there were 25 presentations at scientific meetings.

For the Fishery Ecology field (squids), numbers of significant research result on Argentine shortfin squid have been revealed. They include (1) identification of stocks and species using isozyme method, (2) establishment of artificial insemination technique and the study of early life cycle and reproduction characteristics, (3) establishing statolith daily ring criteria and the routine work for reading daily age determination.

The introduced techniques are applied to other squid such as two species of *Loligo spp.*

For the Fishery Biology field (fishes), otolith ring analysis and daily ring reading method has been established for patagonian grenadier, southern blue whiting, Patagonian toothfish, kingclip and anchovy. As a result, growth models have been developed. Also some knowledge has been obtained on distribution range, stock identification and feeding behaviors.

Those outputs on squids and fish were presented at international scientific meetings in the South Africa, Brazil, Norway and Argentina.

For both Ecology and Biology field, the operation of the equipment has been mastered, that improve the techniques that shorten the sample preparation and analyzing time.

Fishing Technology field (Output 2 on PDM)

Counterparts' research methodology and technique concerning the impact of fishing on the target species were improved.

Although the cooperation period of this field was shorter than the originally planned, the combination of the long term expert and short-term experts as well as counterpart training in Japan had made the technology transfer efficient. As a result of activities on Argentine shortfin squid, Patagonian grenadier and southern blue whiting fisheries, monthly catch and efforts data were complied and mapped on a 1 degree x 1-degree bases.

For the squid jigging fisheries, fishing effort has been standardized and the difference in fishing efficiency among vessels of the different countries was shown.

The methods on estimating the overall fishing intensity and the consideration on abundance and biomass have been transferred by a short-term expert.

Mesh selectivity of trawl net had been studied both in theory and practice, which helped the understanding of size distribution of fish caught by commercial fishery.

These results were presented at International meeting (ICES) and published in scientific papers.

Satellite Image Analysis (Output 3 on PDM)

Counterparts' knowledge and technique of satellite image analysis has been improved.

This field was added in 1997. Effective guidance of the long-term expert combined with dispatch of short-term expert and counterpart training in Japan has enabled the transfer of technology efficiently within a short time frame. As a result, the satellite data analysis system that was donated by Japanese grant aid became in full use to utilize the NOAA satellite information. The satellite image analysis system research room was provided to work of this field so that the activity became more emphasized.

As the skills of the counterparts improved, processed images of the satellite data could be combined with GIS (Geographic Information System). The images are available at INIDEP's Internet home page. However, it was also recognized that ability of present equipment has the limitation to process the information.

In the mean time, the expert and his counterparts surveyed the needs for satellite image among national research institutions, universities and fisheries organizations and they have confirmed the existence of high demand for such information. With this information, INIDEP has made a plan to purchase high-resolution satellite image receiving system.

There were no particular constraints that have prevented the achievement of the project purpose.

5-1-4. Accomplishment of the Project Purpose

During the first half of the project, the Project made effort to improve research capability of INIDEP by diversifying its methodology and technique on Ecological, Biological and Fishing Technological researches for Argentine shortfin squid, Patagonian grenadier and southern blue whiting. In the second half of the project, patagonian toothfish, kingclip, anchovy and other squid were added to the target specious list. Satellite image analyzing technique was also added in the later part of the project activities.

As the results of these activities, several advanced techniques were introduced and some important scientific implications were obtained. Those outputs were presented to scientific meetings and published in scientific papers. The activities of the dispatched experts and supplied equipment have been highly appreciated by INIDEP.

For the sustainability of the activities after the completion of the project period, it was found certain that INIDEP would be able to develop the transferred technologies in the future. Therefore, the achievement of the output is evaluated to be on the satisfactory level.

5-2. Analysis on Evaluation Issues

5-2-1. Effectiveness

The effectiveness of the Project is judged as quite high.

There were at least 4 major methodologies (daily and annual age determination with otolith, genetic identification study using electrophoresis technique, daily age determination with statolith, ecological study with artificially inseminated squid) that were newly introduced and effectively utilized by INIDEP staff.

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There were at least 3 highly improved research methodologies due to the equipment supplied (histological and optical equipment) and software for analyzing mesh selectivity.

Some of these methodologies and techniques were utilized not only for the project's target species but also other important species.

As the project activity moved on, significant amount of papers in high quality journals were published. JICA experts and their counterparts had presented their papers at international scientific meetings. The total number of these papers was 25. In addition to these papers, there were 51 papers and 7 manuals published by INIDEP by the time of evaluation. The number is expected to be increased as an international seminar is planned at INIDEP in September 1999 with full support of JICA.

5-2-2. Impact

The impact of the project was found as fair. Impacts on project purpose level and overall goal are as follows.

Project purpose level:

Histological study as well as age determination with otolith and statolith have been applied to the studies of other species that were not targeted by the project.

Satellite image analysis will benefit not only INIDEP research activities but will be also useful for other institutions such as universities and fisheries associations. Significant number of staff improved their status from temporary to permanent employment. There was no noticeable negative impact.

Overall goal level:

Existence of JICA project itself validated the quality of research to the overseas scientists. Excellent relationship between INIDEP and JICA served to enhance the good environment existing between Argentina and Japan. It is the mission of INIDEP to submit TAC (Total Allowable Catch) recommendations for number of species to the Federal Fisheries Council created in 1998. The project activity has directly and indirectly supported this important but difficult duty of INIDEP.

There was no noticeable negative impact at the Overall goal level.

5-2-3. Efficiency

The efficiency of the Project is judged as high. Long-term Experts and Short-term Experts transferred knowledge and methodologies smoothly to the counterparts.

Judging from the project document and interviews conducted during the evaluation survey, quality and quantity of inputs have been maintained.

The timing of input was as it had been planned, except for the field of Fishing technology. Assistance to this field was terminated as the project purpose was almost accomplished by the end of the third year. Satellite image analysis field was added instead because the needs of INIDEP were considerably high.

Equipment supplied by the project has been fully utilized by the project counterparts as well as other staff of INIDEP. The equipment was maintained well and the registration of the equipment was excellent using computer bar code.

5-2-4. Relevance

The project purpose and the overall goal were confirmed valid at the time of final evaluation.

The role of INIDEP has been ever important in the Argentine fisheries resource management. Argentine government established the Federal Fisheries Council in accordance with the Fisheries Act in 1998. The Federal Fisheries Council is the highest authority to manage and conserve the fisheries resources. INIDEP is defined as a sole institute that will assess the fisheries resources and recommend management measures to the Council based on its scientific research. As the responsibility of INIDEP has been expanded to TAC recommendation, the project purpose has certainly served to the accomplishment of the overall goal.

5-2-5. Sustainability

The overall sustainability was found satisfactory high from the following three aspect of the sustainability.

Organizational Aspect

The sustainability of organizational aspect was confirmed as high, because the number of staff of INIDEP has increased through the project period and the number would be secured. INIDEP is managing well and making effort to distribute the findings of the research

worldwide through, for example, annually published Bulletin, holding international conference of fisheries and so on. As the role of INIDEP increased in response to the establishment of Fisheries Act in 1998, organizational importance and sustainability became even higher and the trend would continue.

Financial Aspect

The sustainability of financial aspect was judged as relatively high, because the budget of INIDEP will be sustained with the drastically increased responsibilities of INIDEP. As a financial support for observer program from the World Bank is finishing within this year, there is some uncertainty to maintain the activities that is crucial to collect necessary data. Nonetheless, as the priority of fisheries management is expected to be higher, the budgetary problem should be overcome.

Technical Aspect

The sustainability of technical aspect is high, because almost all counterparts have worked continuously at INIDEP throughout the project period. Temporary staffs have improved their status to permanent staff in the past several years, which increased the sustainability of the project. The knowledge and technique of the counterparts to utilize and maintain the equipment are high and research activities would develop continuously.

6. CONCLUSION AND RECOMMENDATIONS

6-1 Conclusion

The Project has implemented to improve the research capabilities of INIDEP concerned with fisheries resources assessment. As a result, various accomplishments such as the introduction of new or efficient research methodologies and extension of new knowledge have been recognized. It should be noted that most of counterparts have enough knowledge and experience concerning each field. Although, there are a few pending items remained in three fields in term of academic viewpoint, it is expected that INIDEP will be able to succeed and extend those items themselves. Accordingly, it is a reasonable conclusion to complete the cooperation of the Project in the end of November 1999 as scheduled.

However, the authorities of INIDEP stated the convenience of the continuous support in the future. It must be added that continuous data collection, data analysis and communications between

scientists as well as publishing and dissemination of the research results in cooperation area are important.

6-2 Recommendations

6-2-1 Long Term Recommendation

(1) The sustainable employment of counterparts be considered to keep the Project transferred technique in INIDEP.
(2) The equipment and machinery provided by the Project be maintained in good condition in future by INIDEP.
(3) The studies such as the ecology and biology of kingclip, Patagonian toothfish and anchovy as well as relation between oceanographic conditions and fishery resources be more intensified.
(4) In case the necessity of the Japanese cooperation concerning items described above will arise, it is desired for both Governments to consider the possibility of additional cooperation such as an after care program by JICA based on request by Argentine Government. In addition, it is convinient that INIDEP submits annual report on items of the Project to JICA Argentine Office for the next several years.

6-2-2 Short Term Recommendation

(1) The output of the Project be expanded in Argentina and neighboring countries, for example, international scientific seminar which will be held in September 1999.
(2) The all activities of the Project be published such as reports or manuals by the end of the Project as possible as they can.

LIST OF PARTICIPANTS
THE ASSESSMENT AND MONITORING OF FISHERIES RESORURCES
FIFHT JOINT COORDINATING COMMITTEE
Buenos Aires, 20 July 1999

ARGENTINE SIDE	JAPANESE SIDE
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Project Title: The Assessment and Monitoring of Fisheries Resources Project in Argentine Republic
Project Site: Mar del Plata Target group: Research staff of INIDEP
Project Period: 1994.12.01 - 1999.11.30
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Narrative Summary	Indicators	Means of Verification	Important Assumption
Overall Goal The Argentine Republic implements fisheries resources management policies based on the scientific information provided by INIDEP.	Fisheries resource management and regulations (such as TAC, size limit, opening/closing of season, protected area)proposed by INIDEP.	Fisheries resource management plan, Fisheries Development plan, Fisheries Act and regulations	There is no substantial change in Argentine's fisheries development and management policy
Project Purpose The capability of INIDEP on fisheries resources assessment is improved	Number of newly introduced research The result of the research activities are presented at scientific conference and journals.	Official document of INIDEP, Publication of INIDEP, Scientific journals, Progress reports of the Project Interview to Project leader and Manager	There is no major changes in the status of the INIDEP
Output 1. Fishery Ecology and Biology fields Counterparts' research methodologies and technique on ecological characteristics and on reproduction and life cycle of the target species have been improved.	Level of research activities and transfer of research methodologies are evaluated based on the Work Plan (Plan of operation) in Appendix Table 2 of Annex II	Progress reports of the Project, Manuals published by the Project Scientific papers Home page of the Satellite image, Navigation plan for research voyages, Plan of operation table, Reports of short term experts Interview survey of Experts and Counterparts	Budget for the INIDEP operation is not reduced Preservation of the samples and data will not be worsen than the level when the Project started
2. Fishing Technology field Counterparts' research methodology and technique concerning the impact of fishing on the target species are improved.	Level of research activities and transfer of research methodologies are evaluated based on the Work Plan (Plan of operation) in Appendix Table 2 of Annex II		
3. Satellite Immage Analysis field Counterparts' knowledge and skills in utilization of satellite image to analyze fisheries resource are improved.	Level of research activities and transfer of research methodologies are evaluated based on the Work Plan (Plan of operation) in Appendix Table 2 of Annex II		

Activities	Input	Input	
1. Carry out research on ecological characteristics of target species with counterparts including;	Japanese side	Argentine side	Counterparts are properly assigned
1-1 Geographic distribution	Long term experts	Counterpart assignment	Sampling by research vessel
1-2 Migration and displacement	Team Leader 1 person-5 years	Project Manager 1 person 5 years	done without problems
1-3 Feeding behavior	Project Coordinator 1 person 5 years	Project Coordinator 1 - 5 years	
1-4 Growth pattern	Expert on Fisheries ecology 1 person 5 years	Counterparts for each Japanese	When necessity arises, access
1-5 Maturity and reproductive patterns	Expert on Fishery biology 1 person 5 years	expert ---Necessary number of	to the INIDEP owned data is
1-6 Age determination	Expert on Fishing Technology 1 person 5 years	counterpart	allowed
	Short term experts (15 persons) 3 persons/year		Equipment is shipped on
2. Carry out research on fishing technology with counterparts including;	Equipment: Vehicles, Analyzing equipment (176.35 million yen)	Facility: Research laboratory is provided	schedule
		Local cost: Project operation and	
2-1 Standardization of fishing effort	Counterparts training in Japan (15 persons)		
2-2 Fishing intensity	Local operation cost: 25.1 million yen	management cost is paid	
2-3 Selective action of fishing gear and methods			Precondition:
			The project team can use the
3. Carry out training on satellite image analysis and utilization of the data			facility of the INIDEP
Each activity includes guidance on research methodology, handling of fishes, sample preparation, data collection and analysis and so on.			

ANNEX II

PROGRESS REPORT ON TECHNICAL COOPERATION FOR THE ASSESSMENT AND MONITORING OF FISHERIES RESOURCES

Duration of Project: 1 December 1994 - 30 November 1999
Reporting Period: 1 December 1994 - 30 June 1999

PREFACE

(Appendix Tables 1 and 2)

The Progress Report covers the project activities performed during the duration from its initiation, 1 December 1994 until the end of June 1999, five months prior to its termination, which covers also 55 months of the chronological period of the project. There will also be a brief description on the anticipated activities to be implemented during the remaining period of the project made at the end of this report.

The "Joint Coordinating Committee Meeting" was held once every year during the period on the premises of the Ministry of Agriculture, Livestock, Fisheries and Food of Republic of Argentina. It was attended by the Minister as the Project Director, the Deputy Minister as the representative from the Department of Fishery and Aquaculture, the Director of the National Institute for Fisheries Research and Development (INIDEP) as the Project Manager and the representative of the Ministry of Foreign Affairs for the Argentine side, and by the Team Leader and Long-Term Experts of the Japan International Cooperation Agency (JICA), personnel from the JICA Argentine Office and the observer(/s) from the Japanese Embassy for the Japanese side. The Committee reviewed the activities of the Project performed every year and examined the Work Plan to be implemented for the forthcoming year for approval. The "Structure of Project", including all the personnel concerned is given on the Appendix Table 1. The records of the Meetings held are given below;

First Meeting: 14 June 1995, with the JICA's Advisory Team
Second Meeting: 13 December 1996
Third Meeting: 22 July 1997, with the JICA's Advisory Team
Fourth Meeting: 29 July 1998

The "Advisory Team of JICA" had visited the Project every other year. The first visit of the Team was to establish the detailed "Annual Work Plan" of the project to be implemented through the entire project period, which was submitted to the first Committee Meeting and approved. The second visit of the Team was to conduct, together with the Project and INIDEP staff, the "Interim Evaluation" of the project activities performed. They found that all the activities had been achieved satisfactorily with plenty of meaningful contributions. The Team had also prepared a draft on the revised work plan, by the tripartite bodies, to be implemented during the remaining last three years being based on their findings. All the findings and the revised draft annual work plan as well as the Progress Report during the reporting period were

submitted to the third Committee Meeting, and were all approved. The approved "Annual Work Plan of Research and Studies to be implemented during the Last Three Years" is given on the Appendix Table 2.

1. REVIEW OF MEASURES TAKEN BY THE GOVERNMENT OF JAPAN DURING THE REPORTING PERIOD

1.1 Dispatch of the Japanese Experts

(1) Long-Term Experts (Appendix Tables 1 and 3 (1))

In addition to the Team Leader and Project Coordinator, the project has been technically composed of three Long-Term Experts to be assigned to the specific fields of research and studies as was defined in the "Record of Discussion (R/D)" of the project. There have been eight Long-Term Experts in total engaged in the project activities so far, in which three experts had terminated their assignment and had been replaced with a relief for each. It is noted that the Project Coordinator currently assigned holds two assignments concurrently, assignment on the Experts of the Field of Fishing Technology in addition to his original duty. A brief description of their assignments are given on the Appendix Table 3 (1), those are also given on Appendix Table 1 with all the correlated Counterparts. The Experts have covered cooperative activities satisfactorily in each of all the fields as defined in R/D and there has been no lacking in requisite activities.

(2) Short-Term Experts (Appendix Table 3 (2))

Fourteen Short-Term Experts in total have been dispatched to the Project so far in various fields of research and studies. Their names, institutions in Japan, research and studies employed and assignment periods are given on the Appendix Table 3 (2). All the Experts performed their duties sufficiently enough to give their guidance properly in respective field.

1.2 Acceptance of the Counterpart Training in Japan (Appendix Table 4 (1, 2))

Fifteen counterpart personnel of INIDEP in total have been accepted by the Government of Japan to be accommodated in the suitable institutions in relevant fields of research and studies for training in Japan during the reporting period. All the participated personnel have expressed that the training in Japan had been suitably arranged to acquire the necessary training in respective field, and were satisfactory with extremely fruitful gain. Details on the record of the training performed are given on the Appendix Table 4 (1, 2).

1.3 Provision of the Machinery and Equipment, Local Costs and Other Special Funds

(1) Provision of the machinery and equipment (Appendix Tables 5)

The total amount of the cost of the machinery and equipment provided by the Government of Japan is about ¥ 176,350,000 in Japanese yen, which is equivalent to US $ 1,469,600 at the rate of US$ 1 = ¥ 120, for which major machines are listed on the

Appendix Table 5 by each of the fields of Research and Studies. All the machinery and equipment, including chemicals, reagents and supplies, provided by the government have been utilized effectively in each of the study fields.

(2) Provision of local costs and other special funds (Appendix Table 6)

The funds for the local costs and the special funds for implementing specific plan, such as Technical Exchange, Terminal Seminar and/or Preparing Manual, provided by the Government of Japan are given for each year in Appendix Table 6. All those expenditure have been appropriately made.

2. REVIEW OF MEASURES TAKEN BY THE GOVERNMENT OF ARGENTINE REPUBLIC DURING THE REPORTING PERIOD

2.1 Allocation of Necessary Budget (Appendix Tale 6)

So long as the project activities are concerned, the Government of Argentine Republic has allocated the necessary budget suitably for the implementation of their task, and there has been no constraint on expenditure of the local cost experienced throughout the reporting period. Although it was difficult to count the amount of funds separately for the Project use, the items of the contents are given in Appendix Table 6.

2.2 Allocation of Necessary Counterpart Personnel (Appendix Tables 1 and 7)

INIDEP has allocated its staff suitably as the "Counterpart" personnel to the Japanese Long-Term Expert in each of the fields of research and studies. The full structure of the counterparts in INIDEP as of the end of June 1999 (unchanged since 1 May 1999) is given in Appendix 1 with each of the correlated Japanese Experts, for which the personnel currently assigned are summarized as follows;

Field of Assignment	Counterpart Coordinator	Counterpart Researcher/Working Staff @
Director and Administration		
Director	Lic. D. J. L. Cajal	
Administration	Dr. R.P. Sánchez	(Director, Research Department)
	Dr. H.J. Mego	(Director, Administration Division)
Research Department		
Fisheries Ecology	Dr. R. P. Sánchez	6 personnel (3 personnel concurrently assigned)
Fisheries Biology	Dr. L. B. Prenski	11 personnel (4 personnel concurrently assigned)
Fishing Technology	Lic. M. I. Bertolotti	13 personnel (7 personnel concurrently assigned)

It should be noted here that the allocation of Counterpart in the Research Department of INIDEP in each of the fields of research and studies had been adjusted

(increased) expediently in accordance with the progress made in the project activities. For instance, there had been 12 counterparts increased (decreased 1 counterpart afterwards) during the reporting period, which had come up to 25 personnel in total net-number currently involved in the project, compared to 14 at the initial stage of the project. The records of such a change in the assignment are given monthly/annually in Appendix Table 7.

All the counterparts have been actively engaged in the cooperative activities, and there has been no lazy performance observed.

2.3 Utilization of the Equipment provided by the Government of Japan

The machinery and equipment provided by the Government of Japan have all been utilized properly and have been actively employed in the research and studies in each of the fields. They have been kept in a good condition with an appropriate handling, care and custody.

3. REVIEW OF THE OVERALL PROGRESS OF THE TECHNICAL COOPERATION PROGRAM

3.2 Achievement made in each of the Study Fields (Appendix Table 8)

Since its initiation, the project activities had been implemented for the first two years in conformity with the "Work Plan of Research and Study for the First Two Years" which was approved at the First Joint Coordinating Committee Meeting. However, since the Third Joint Coordinating Committee Meeting had revised the Work Plan for the last three years, the project activities since then have been implemented in conformity with the revised "Work Plan for the Last Three Years", which is given on the attached Appendix Table 2. The revised (increased) part of the Work Plan will be briefly explained in each of the fields of research and studies. All the methodology acquired and the results obtained through the cooperative activities as described below have been all transferred to the Counterparts and will be delivered to INIDEP at the ending of the project.

The results of all outputs obtained so far from the cooperative activities, those include the presentations made at scientific meetings, papers published in scientific bulletins and manuals prepared, by both the JICA Project and INIDEP staff are given by each of the fields of Research and Studies in Appendix Table 8.

(1) Fishery Ecology (Argentine shortfin squid and other cephalopods)

The research and studies on the biology of the other cephalopods have been added as the new target species to the revised Work Plan in this field. The subjects allocated to the "Other Cephalopod" are four items to be studied. The Expert has worked out appropriately all the duties including the newly added subject.

i) Argentine shortfin squid

Among the various achievements made, success in the studies on bio-chemical genetic analyses, artificial insemination and hatching, rearing hatched larvae, age

determination (number of days from birth), growth analyses for the Argentine shortfin squid resources are highlighted.

Regarding the technology transfer of the bio-chemical analytical methods of squid to the counterpart, which aims ultimately the genetic identification of stocks, the counterpart has acquired the techniques to be able to handle the methods for electrophoresis analyses of isozyme on her own. The technology transfer of this aspect was facilitated greatly by both the Counterpart Training in Japan and the Short-Term Expert assigned to this specific field. The study results shows that the identification at various taxonomic levels is being found by the method, i.e. family, species, sub-species and stock levels. It is expected for the counterpart to proceed onto a group genetic study to develop the method to further advanced level.

The artificial insemination and hatching/rearing larvae of squid had succeeded on the INIDEP's research vessel in the Argentine waters at the first time of the World for this species, resulting in the great progress in identifying many of the ecological characteristics during the early life stage of the squid. For instance, it has been made clearer the questions on how do they growth and how much speed do they attain, how the daily ring is formed on statolith, how much is their survive/mortality rate, all examined with the change in environmental conditions (water temperatures). These results will contribute to estimate the survival/mortality rate at early life stage and to estimate partly the location of spawning and/or reproductive area.

The success in establishing the methodology on age determination (counting the number of days from birth) is the another highlighted events. The methods have been greatly facilitated by introducing the RATOC Computerized Microscope System, which was for the first time introduced into INIDEP. Basic methods on processing samples and reading statolith had been transferred to the counterparts and INIDEP has established reading routine. This was fostered substantially by the Counterpart Training in Japan for two INIDEP's personnel. As the result, the information on age structure of the squid has been greatly accumulated in INIDEP. It has also been a unique technique employed in the growth study of squid that marking with a fluorescent chemical was tried on squid larvae and succeeded in principle.

The growth analyses have also been upgraded being supported by the introduction of RATOC System for both the adult and larval squids, and as well as by the information obtained from the observation on larvae being supported by the success in the artificial insemination, hatching eggs and rearing larvae. In addition to the study on growth in early life stage, for which the explanation has previously been made in this report, the growth of squids at their adult form have been made clearer by applying the back-calculation method and the examination on the relation between body length and breadth of statolith. The results of these studies will make it possible to estimate the preliminary growth curve of squid and to proceed onto the comparison of them among the stocks (breeding group).

However, the validation of age (days passed) still remains somewhat uncertain especially for both young and adult squids. It is the difficult task to ascertain within a short time, for which continuous effort should be paid in the future by applying the various methods. The counterparts concerned need to clarify this on their own in the future.

The installation of a Japanese made jigging machine on the research vessel was may be of minor but quite effective way to collect the vivid samples of squid for scientific examination purposes. The another minor techniques employed, which supported implementing the various activities greatly were the establishment of the methods for the transportation of live adult squids from the research vessel to laboratory on land, which had made the detailed experiment (temperature controlled) possible. The occasional availability of scanning electron microscope (during the Counterpart Training in Japan) for growth analyses was also effective way to analyze and to verify the growth of squid.

It is specifically noted that the participation of the Long-Term Expert in the cruise of research vessel of INIDEP is extremely important and efficient to carry out the research and studies assigned to the subject. For instance, "observations on larvae produced by artificial insemination" are not possible to carry out without such sea-going activities, which contributed a great deal on clarifying various ecological characteristics of squid. In addition to those academic matters, guidance on the improvement in various techniques, i.e. transferring the live vivid squid onto the laboratory on land, quick collection of statolith samples and easy keeping/storing of them were all made during the sea-going activities. The Expert has participated in such cruise experiments for ten times in total so far.

ii) Other cephalopods

For *Loligo* spp. squids, the age determination (counting the number of days passed) has currently been being achieved and taxonomic studies on them are also being undertaken. For the biological studies on the other squids, four species being involved, are currently being made, especially on taxonomic and general biological studies including the methods on age determination for these species.

The major results obtained from these studies were presented, together with the counterparts concerned, at two international scientific meetings, the International Oceanographic Society of South America (COLCMAR), Santos, Brazil and the Committee for International Advisory on Cephalopods (CIAC), Cape Town, South Africa by JICA 's funding. And the most of those have been/(will be) published in the form of INIDEP's publication. A series of "Manual" (biological survey, statolith reading, bio-chemical study and artificial insemination and rearing larvae) will be published either by INIDEP or by JICA Project within the project period.

Taken as a whole, the activities performed in this field for the Argentine shortfin squid and the Other cephalopods have been reaching a highly satisfactory level. The references have been made on Appendix Table 8.

(2) Fishery Biology (Patagonian grenadier, southern blue whiting, Patagonian toothfish, kingclip, and ecological research on larval stage of the other fishes)

Patagonian toothfish and kingclip have been added as the new target species, and ecological studies on larval stage of the other fishes have also been included as new subjects to be studied to the revised Work Plan in this field. The Expert has worked out appropriately all the duties including the newly added species and subjects. The items of

Research and Studies specifically defined to the newly added three species groups are four subjects for the first two and two for the last.

i) Patagonian grenadier and southern blue whiting

The distribution range of these fishes has been well studied by the data obtained through the survey cruises of the INIDEP's research vessel employed every year. The examination on existing biological data is also fairly well done. The information on the feeding behavior and the predatory loss has been made clearer by the data collected so far. The generalization of growth pattern and the age-length key have also been made clearer and the data on those subjects are continuously being accumulated. The length and age of commercial catch have been well documented and the data are still being accumulated every year. The study on the seasonal changes in maturity and spawning area has been being well undertaken, however it is necessary for the counterparts to move onto the histological examinations more to grade up the study results in the future. The analyses on daily ring of younger fish samples have facilitated estimating the spawning season for southern blue whiting, however the study on the histological analyses and on the daily ring formation need to be intensified in the future for Patagonian grenadier. It is noted here that the installation of a set of the machinery for high-speed histological sample processor and the RATOC System provided by the Government of Japan have facilitated a great deal in studying these subjects. The information on the age at first maturity has also been well collected and analyzed being based on analyses of otolith, however it is necessary in the future to intensify the histological examinations for southern blue whiting. The basic methodologies of study on the same subjects for Patagonian grenadier have already been transferred to the counterparts. The methods of age determination have been established for the aging routine and the verification of the first ring (year) has been made through the daily ring analyses for the both species. The growth analysis and estimating growth formulae have been documented in preliminary forms.

The major results of those studies obtained for these species were presented together with two counterparts at an International Scientific Meeting on "Fish Otolith Research and Application", Bergen, Norway by JICA 's funding, for which the references are given on Appendix Table 8.

The studies on these species have been relatively well made taking as a whole, however consideration on oceanographic conditions and the ecological studies on early life stages for both species need to be intensified in the future.

ii) Patagonian toothfish and kingclip

Four items have been allocated to these species to be studies, geographic distribution, examination of existing biological data, validation of age determination for establishing aging routine and growth analyses to estimate growth formulae. Amongst them the distribution ranges have been well understood with the exception of those for younger specimens, and the existing data have also been well studied. Regarding the validation of age determination, the studies for both species have not yet completely clarified the problems by being encountered with extremely complicated structures of otolith (a lot of sub-annual rings exist), therefore the application of further analytical

methods needs to be tried in the future. There have been some progress made for reading the daily rings of younger fish of kingclip. Therefore, further intensive studies on older specimens are required in the future with the application of various methods to both species. The study on estimating growth formula for Patagonian toothfish has been made with a preliminary form.

iii) Larvae of the other fish

Amongst the three items allocated to this subject, the observation on the artificially inseminated larvae has not been engaged in due to the difficulty in collecting/transporting parental fishes and in practicing artificial insemination.

Adopting Argentine anchoita as the sample specimen to be examined, for which the information on distribution range has already been well documented and the distribution and ecological characteristics at early life stage have also been well studied, an experimental trial has been undertaken.

First, a considerable amount of naturally spawned eggs were collected at sea by the research vessel and transported to the laboratory. On arrival to the laboratory, naturally hatched larvae were reared for several days in the two different nutritional conditions, one was fed with rotifer and the other was kept not fed at all. Then the histological inspection had been employed on the larvae to check the change in the internal organs caused by the difference in nutritional conditions given. As the results, various clear histological differences were observed between the two sample specimens on major internal organs, which suggested that the difference in nutritional conditions would sometimes be fatal to the larvae. The method employed is considered to approach to the clarification of survival conditions at early life stage of the fish. The experiment was made at once during the project period so far due to the limited spawning season of the fish.

The importance of sea-going activities by the research vessel for giving the guidance in various aspects of research and studies is completely the same to that for squid research. The Expert has participated in such activities for four times in total so far.

A unique activity undertaken in this field was that the JICA Project participated in an International Workshop organized principally by INIDEP on the "Age and Daily Somatic Growth of Juvenile Fishes". It was participated by 35 scientists, including 6 from the adjacent nations and 5 leading scientists from U.S.A., Spain, Brazil and Japan. The Project contributed to the Workshop with the two Short-Term Experts and RATOC System, and the Workshop was highly successful with a number of fruitful results.

Taking as a whole, the cooperative activities in this field have done fairly well covering the various subjects, however the studies on aging and growth of Patagonian toothfish and kingclip should be intensively continued especially for older fish in the future. It is also needed that the ecological study on early stage of life for the other fish larvae to be continued in the future to confirm the results obtained on the nutritional conditions with repeated examinations.

All the results obtained for the research and studies on Patagonian grenadier, Southern blue whiting, Patagonian toothfish, Kingclip and Larvae of the other fish have

been and will be published in suitable scientific bulletins. A manual for processing histological samples for the fish larvae has already been proposed. The references have been given on Appendix Table 8.

(3) Fishing Technology (Squid, cods, Patagonian toothfish and kingclip fisheries, and the relation between oceanographic and fishing conditions)

The research and studies on the relation between oceanographic and fishing conditions, in particular utilizing the satellite imagery to examine the oceanographic conditions has been added as a new subject to be studied to the revised Work Plan in this field. It was noted that at the Fourth Joint Coordinate Committee the research and studies on the squid, cods, Patagonian toothfish and kingclip fisheries would be terminated thereafter and the activities in this field should be shifted to the "Area of the Relation between Oceanographic and Fishing Conditions". The examinations on the fisheries on Patagonian toothfish and kingclip had, therefore been not continued thereafter.

The Expert currently assigned to this field has, therefore thoroughly engaged in the newly added subject. However, in this report, the results of the activities performed on the squid and cods fisheries have also been incorporated.

i) Standardization of fishing effort

For the jigging and trawl fishing of squid fisheries, the distribution of fishing effort and catch were analyzed by weekly basis with latitudinal/longitudinal 1 ° square for 1994, and the distribution maps were prepared. For the fisheries on Patagonian grenadier and southern blue whiting, similarly to those for squid fishery, the distribution of fishing effort and catch were analyzed by bimonthly basis with latitudinal/longitudinal 1 ° square for 1991-1995, and the distribution maps were prepared.

It had been made clear that in squid jigging fishery a considerably large difference existed between the Argentine and Japan, in which Japanese vessel showed higher efficiency with 5-10 percent in the daily catch. The result of the study gave us a basis to standardize the fishing effort for those fisheries.

It was very difficult to analyze the standardization of fishing effort in the Patagonian grenadier trawl fishery, being composed of various fishing methods (difference in scale of vessel size and by-catch component), the trial to standardizing fishing effort had thus been not completed.

For southern blue whiting trawl fishery, the standardization of the catch per unit effort (CPUE) had been carried out by the Short-Term Expert for its Surimi Processing Factory fleet for the years during 1990-1995.

For both Patagonian grenadier and southern blue whiting trawl fisheries, the methods on estimating the overall standardized fishing effort was introduced and guided in a global way by the Short-Term Experts and by the Counterpart Training in Japan.

ii) Examination of fishing intensity and examination on abundance and biomass

The methods on estimating the overall fishing intensity and the consideration on abundance and biomass for all the fisheries concerned were introduced and guided in a global way by the Short-Term Experts and by the Counterpart Training in Japan. The

reasons for this were due to the difference in the methodology employed in the stock assessment in INIDEP, where the "Leslie-Delury Analysis" have been used for the squid fishery on one hand and the "Virtual Population Analysis" have widely been applied to the demersal fish fisheries onthe other, instead of analytical assessment method with fishing intensity.

iii) Selective action of fishing gear/methods

Being based on the data on fisheries statistics, the selective action among different fishing gears and methods were examined with the difference in species composition of their catches.

With regard to the selective action of mesh-size of trawl net, the Long-Term Expert participated in the research cruises on the experimental fishing of INIDEP twice, and actively cooperated with INIDEP's counterpart staff. The results obtained had been published in one of a series of INIDEP's academic reports. Thus the sea-going activity was employed in this field too.

iv) Relation between oceanographic and fishing conditions

After receiving the satellite imagery on oceanographic condition, it was transferred to a computer and processed. The information on fishing through the maritime satellite was also incorporated into computerized data, and they have been made open available to the public. Thus the satellite imagery on oceanographic conditions processed have been made available on a continuing basis with the systematically stored form. The counterparts concerned acquired well the operation methods for both the satellite receiver and the software of "Geographic Information System (GIS)" on the computer. As the result, the information on the distribution of water temperature on the surface of the sea processed on the computer has been opened to the public on a Home Page of the Inter-net.

Taking as a whole, the results of the cooperative activities performed on the Relation between Oceanographic and Fishing Conditions in this field are approaching a satisfactory level. All the outputs, including those for the standardization, fishing intensity and selective action of fishing gear/methods, have been documented in suitable bulletins for which the references have been given on Appendix Table 8.

4. ANTICIPATED WORK PLAN FOR THE REMAINING PERIOD OF PROJECT

4.1 The "Joint Final Evaluation" and "Fifth Joint Coordinating Committee"

The "Evaluation Team" of JICA will visit Argentine Republic possibly in the middle of July to conduct, jointly with the INIDEP staff concerned, the "Final Evaluation" of the project activities performed during the past. The result of the "Final Evaluation" will then be submitted to the "Fifth Joint Coordinating Committee Meeting" for approval to be organized with the Ministry of Agriculture, Livestock, Fisheries and Food, the Ministry of Foreign Affairs and INIDEP for the Argentine side, and the Evaluation Team, Project Staff, personnel of the JICA Office and the observer(/s) from the Japanese Embassy for the

Japanese side on the premises of the Ministry. On approval of the "Final Evaluation" at the Committee, the arrangements for finalizing the project will be made.

4.2 Dispatch of Japanese Experts

(1) Long-Term Experts

The Long-Term Expert currently being engaged in each of the fields will remain as they are until the termination of the project, 30 November 1999.

(2) Short-Term Experts

The following four Short-Term Experts are expected to be assigned to each of the three fields of research and studies during the remaining period of the project.

Field	Number	Assignment period	Timing
1) Fishery Ecology	one	about 1/2 months	September 1999
2) Fishery Biology	one	about 1/2 months	September 1999
3) Fishing Technology	one	about 1/2 months	August 1999
4) Fishing Technology	one	about 1/2 months	September 1999

4.3 Acceptance of the Argentine Counterpart Personnel for Training in Japan

Following two personnel of INIDEP is expected to accept by the Government of Japan for training in Japan in each of the specific fields during the remaining period of the project.

Field	Name	Duration	Timing @@@@
1) Biology of squid	Mrs. Silvana E. Pineda	1.5 months	Oct.-Nov. 1999
3) Fishing Technology	Mr. Juan J. Buono	1.5 months	August 1999

4.4 Plan for the Technical Cooperation for the Remaining Period

It is anticipated that the "Terminal Seminar of the Project" will be organized in sometime in September 1999 to display the outcomes of the project activities. In addition to the Counterparts of INIDEP, the participants of the fisheries scientists and/or administrators from the region (adjacent four countries) and provinces/cities of Argentina (eight districts) will be invited. The Japanese Short-Term Experts are also expected, in addition to their basic assignment on giving their guidance, to participate in the Seminar. This is considered to be a roundup of the entire project activities.

All the reporting procedure, including those for the above mentioned "Seminar", will also be undertaken for the results of activities performed for which with a written form is available for each, and a series of manuals will also be prepared.

In addition to the above, all the outcomes of the project activities will be summed up and delivered to INIDEP so that the "Overall Goal" and "Project Purpose" as was defined in the "Record of Discussion (R/D)" will be fulfilled.

Structure of Project

Appendix Table 1 (1/2)

The total number of C/P in Research Department is 25 as of 1 May 1999.
Original version : 14.06.95, Progress Report, ANNEX 1, (initial number of C/P in Research Department was 14)

First revision	: 09.11.95 (increased 1 C/P)	Second revision	: 20.06.96 (increased 2 C/P)
Third revision	: 01.04.97 (increased 3 C/P)	Fourth revision	: 05.06.97 (increased 1 C/P)
Fifth revision	: 20.06.97 (increased 1 C/P)	Sixes revision	: 30.12.97 (increased 3 C/P)
Seventh revision	: 26.03.98 (appointment: Interventor)	Eighth revision	: 06.05.98 (increased 1 C/P)
Ninth revision	: 08.05.98 (change in Res.Dep.'s director)	Tenth revision	: 01.09.98 (Secretary/Interventor)
Eleventh revision	: 01.05.99 (decreased 1 C/P)	Twelfth revision	: 11.05.99 (nominate Interventor)

Project Director
Secretary, Secretariat for Agriculture, Livestock, Fisheries and Food
Eng. Agr. Felipe Sola (01.12.94 - 27.08.98)
Dr. Gumersindo Alonso (01.09.98 - 09.04.99)
Eng. Agr. Ricardo Jose Novo (09.04.99 - . .)

Joint Coordinating Committee
Chairman: Secretary of Secretariat for Agriculture, Livestock, Fisheries and Food

Japanese Members:	Argentine Members:
Team Leader, Coordinator and Experts	Project Manager (Director, INIDEP), Counterpart Coordinators and Counterparts
Director of JICA Argentine Office	Representative from Secretariat for Agriculture, Livestock, Fisheries and Food
Other personnel dispatched from JICA	Representative from Under-secretariat of International Cooperation, Ministry of Foreign Affairs
Observer(/s) from the Embassy of Japan	Representative from Division of Fishing and Aquaculture, Secretariat for Agriculture, Livestock, Fisheries and Food
	Representative(/s) of other related organization(/s) (if necessitated)

Project at the Site (Location: INIDEP: National Institute for Fisheries Research and Development)

Japanese Section (Long-term Experts of JICA)

Team Leader
Dr. Shiro Chikuni (01.12.94 - 30.11.99)

Project Coordinator
Mr. Takashi Kuroki (01.12.94 - 30.11.97)
Mr. Masahiro Hasegawa, Concurrently with Fishing Technologist (10.11.97 - 30.11.99)

Expert on Fisheries Ecology
Dr. Mitsuo Sakai (01.12.94 - 30.11.99)

Argentine Section (Selected Staff of INIDEP)

Project Manager

Dr. Fernando A. Georgiadis	Director	(01.12.94 - 31.07.97)
Dr. Gerardo E. Habich	Interventor	(26.03.98 - 27.08.98)
Lic. D. Jorge Luis Cajal	Interventor	(11.05.99 - . .)

Counterpart Coordinator:
Steering Stuff: Dr. Ramiro P. Sánchez, Director, Research Department (concurrently assigned)
Dr. Héctor J. Mego, Director, Administration Division

Counterpart Coordinator: Dr. Ramiro P. Sánchez, Director, Pelagic Fish Fisheries and Marine Environment Division
Counterpart Researcher: Dr. Norma E. Brunetti, Chief, Squid Research Group
Counterpart Working Staff: Lic. Beatriz Jerez, Lic. Marcela L. Ivanovic, Tec. Gabriel R. Rossi, Lic. Beatriz Elena and Lic. Silvana E. Pineda

(To be continued to the next page)

(Continued from the previous page)

Expert on Oceanographic Biology
Dr. Kenichi Isida (22.02.95 - 21.02.97)
Expert on Fisheries Biology
Dr. Shinsuke Morioka (01.06.97 - 30.11.99)

Counterpart Coordinator: Dr. L. Bruno Prenski, Director, Demersal Fish Fisheries Division
Counterpart Researcher: Dr. Ramiro P. Sánchez (concurrently assigned)
Counterpart Working Staff: Dr. Jorge E. Hansen, Dr. Otto C. Wöhler, Lic. M. Cristina Cassia, Dr. Marcelo Pájaro, Lic. M. Felisa Sánchez, Lic. Noemí R. Marí, Lic. Laura Machinandiarena, Dr. Gustavo J. Macchi, Dr. Analía R. Giussi and Lic. M. Fernanda Villarino

Expert on Fishing Technology
Mr. Takahisa Mitsuhashi (01.12.94 - 30.11.97)
Mr. Masahiro Hasegawa, Concurrently with Project Coordinator (17.12.98 - 30.11.99)

Counterpart Coordinator: Lic. María I. Bertolotti, Director, Fisheries Information and Technology Division
Counterpart Researcher: Dr. Norma E. Brunetti and Dr. L. Bruno Prenski (both concurrently assigned) and Eng. Rubén Ercoli, Chief, Fishing Gear and Method Research Group
Counterpart Working Staff: Tec. Alfonzo Izzo, Tec. Julio C. García, Dr. Jorge E. Hansen, Dr. Otto C. Wöhle, Lic. Noemí R. Marí, Tec. Gabriel R. Rossi, Lic. Silvana E. Pineda, Lic. Aníbal Aubone, Mr. Juan J. Buono and Lic. Fernando A. López

Work Plan of Research and Study to be employed during the Last Three Years

The items of specific research and study to be applied to each of the target species and fisheries have been listed as follows in accordance with the list of items defined in the "Record of Discussion: R/D" and the items approved at the Third Joint Coordinating Committee Meeting held on 22 July 1997.

(Application of Research and Studies ○ : YES, × : NO)

Field of Research and Studies	Target species and fisheries					
	Argentine shortfin squid[1]	Patagonian grenadier[2]	Southern blue whiting[3]	Other cephalopods[4]	Patagonian toothfish[5] and Kingclip[6]	Other fishes[7]
1. ECOLOGICAL CHARACTERISTICS OF TARGET SPECIES						
1.1 Geographic distribution						
a. Distribution range	×	○	○	×	○	×
b. Biochemical stock identification	○	×	×	○	×	×
c. Taxonomic and morphometric examination	×	×	×	○	×	×
1.2 Migration/displacement						
a. Examination of existing biological data	×	○	○	×	○	×
b. Tagging experiment, if applicable	×	○	○	×	×	×
c. Consideration on oceanographic condition	○	○	○	×	×	×
1.3 Feeding behaviors						
a. Review of feeding behavior	×	×	○	×	×	×
b. Investigation on predatory loss	×	○	○	×	×	×
c. Consideration on oceanographic and biological conditions	×	○	○	×	×	×
2. REPRODUCTION AND LIFE CYCLE OF TARGET SPECIES						
2.1 Growth pattern						
a. Generalization of growth pattern by brood	×	○	○	×	×	×
b. Age-length-key by brood	×	○	○	×	×	×
c. Length and age structure of commercial catch	×	○	○	×	×	×
d. Consideration on oceanographic conditions	○	○	○	×	×	×
2.2 Maturity and reproductive patterns						
a. Seasonal change in maturity and spawning area	○	○	○	×	×	×
b. Distribution and ecology at early life stage	×	○	○	×	×	○
c. Observation on larvae artificially inseminated, if applicable	○	×	×	×	×	○
d. Rearing experiment to observe reproduction, if applicable	○	×	×	×	×	○
e. Histological analysis on gonad	×	○	○	×	×	×
f. Age at first maturity and reproductive potential	×	○	○	×	×	×
g. Consideration on oceanographic conditions	○	○	○	×	×	×
2.3 Age determination						
a. Validation of age determination and aging routine	○	○	○	○	○	×
b. Growth analysis and growth formulae	○	○	○	○	○	×

Field of Research and Studies	Target species and fisheries					
	Argentine shortfin squid[1]	Patagonian grenadier[2]	Southern blue whiting[3]	Other cephalopods[4]	Patagonian toothfish[5] and Kingclip[6]	Other fishes[7]
3. IMPACT OF FISHING ON TARGET RESOURCES						
3.1 Standardization of fishing effort						
a. Time/spatial analyses of effort and catch	O	O	O	×	O	×
b. Investigation on standardization of fishing effort	O	O	O	×	O	×
c. Estimation of total fishing effort	O	O	O	×	O	×
3.2 Fishing intensity						
a. Estimation of total fishing intensity, abundance indices	×	O	O	×	O	×
b. Comparison of abundance indices with biomass estimates	×	O	O	×	O	×
3.3 Selective action of fishing gear/method						
a. Investigation on different selective actions on gear/operation	×	O	×	×	×	×
b. Participation in INIDEP's mesh-size testing project	×	O	×	×	×	×
c. Examination on length composition of commercial catch	×	O	×	×	×	×
3.4 Relation between oceanographic and fishing conditions						
a. Examination of satellite imagery and fishing conditions	O	×	×	O	×	O

Remarks on fish species:

	English Name	Local Name	Japanese Name	Scientific Name
1)	Argentine shortfin squid,	"Calamar",	"アルゼンチン・マツイカ",	*Illex argentinus*
2)	Patagonian grenadier,	"Merluza de cola",	"ホキ",	*Macruronus magellanicus*
3)	Southern blue whiting,	"Polaca",	"ミナミダラ",	*Micromesistius australis australis*
4)	The "Other cephalopods" include the following, with the different combination for each of the subject:			
	a) Neon flying squid	"Calamar rojo"	"アカイカ",	*Ommastrephes bartrami*
	b) Short-finned squid	"Calamar negro"	"ニセスルメイカ",	*Martialia hyadeshi*
	c) Patagonian squid	"Calamarete"	"パタゴニアヤリイカ",	*Loligo gahi*
	d) Sao Paulo squid	"Calamarete"	"ブラジルヤリイカ",	*Loligo sanpaulensis*
	e) Greaterhooked squid	—	"ミナミニュウドウイカ",	*Moroteuthis ingens*
5)	Patagonian toothfish	"Merluza negra",	"オオクチ",	*Dissostichus eleginoides*
6)	Kingclip	"Abadejo",	"キングクリップ",	*Genypterus blacodes*
7)	The "Other fishes" include various species relevant to each of the "Field of Research and Studies", e.g. mackerels, anchovies, etc.			

Dispatch of Japanese Experts

Appendix Table 3 (1/1)

1. Long-Term Experts

Post	Name	Research and studies employed	Status	Assignment period
1) Team Leader	Dr. Shiro Chikuni	Comprehension	continuing	01.12.94 - present
2) Project Coordinator	Mr. Takashi Kuroki	Coordination on administrative matters	terminated	01.12.94 - 30.11.97
3) (same)	Mr. Masahiro Hasegawa	(same as above)	continuing	12.11.97 - present
Experts in the field of;				
4) Fishery Ecology	Dr. Mitsuo Sakai	Ecological research and studies on squids	continuing	30.11.94 - present
5) Fishery Biology	Dr. Kenichi Ishida	Biological research and studies and cods	terminated	22.02.95 - 21.02.97
6) (same)	Dr. Shinsuke Morioka	Biological research and studies on cods and fish larvae	continuing	02.06.97 - present
7) Fishing Technology	Mr. Takahisa Mitsuhashi	Research and studies on fishing technology	terminated	01.12.94 - 30.11.97
8) (same)	Mr. Masahiro Hasegawa	Research and studies on fishing technology, includes satellite imagery	continuing	17.12.98 - present

2. Short-Term Experts

Name	Institution	Research and studies employed	Assignment period
1) Dr. Hideaki Nakata	Ocean Research Institute, University of Tokyo	Oceanographic condition and distribution of fish	06.11.95-25.11.95
2) Dr. Yasunori Sakurai	Faculty of Fisheries, Hokkaido University	Biology squid, ecological aspects in general	01.08.95-19.08.95
3) Dr. Kotaro Yokawa	National Research Institute of Far Seas Fisheries	Bio-chemical study of squid, stock identification	02.12.96-12.01.97
4) Dr. Kotaro Tsuchiya	Dept. of Aquatic Bio-sciences, Tokyo University of Fisheries	Biology of Squid, taxonomy of squid	15.11.97-14.12.97
5) Dr. Yoshikazu Nakamura	Hokkaido National Fisheries Research Institute	Biology of squid, statolith reading methods	01.11.98-21.11.98
6) Dr. Daiji Kitagawa	Tohoku National Fisheries Research Institute	Biology of cod, reading annual ring of otolith	04.09.95-30.09.95
7) Dr. Akira Nishimura	National Research Institute of Far Seas Fisheries	Biology of cod, reading daily ring of otolith	02.12.96-22.12.96
8) Dr. Yoshiro Watanabe	Ocean Research Institute, University of Tokyo	Biology of cod, reading daily ring of otolith	22.11.97-11.12.97
9) Dr. Susumu Umeda	Institute of Marine Biology, Kochi University	Fisheries biology, histological analyses of larvae	14.11.98-30.11.98
10) Dr. Kazumi Sakuramoto	Dept. Fishery Resources Management, Tokyo University of Fisheries	Fishing technology, standardizing of fishing effort	17.08.96-06.09.96
11) Dr. Tadashi Tokai	Dept. Fishery Resources Management, Tokyo University of Fisheries	Fishing Technology, selective action of mesh	02.08.97-22.08.97
12) Mr. Haruhisa Mizumoto	FURUNO Electric Co., Ltd. Development Department	Fishing Technology, Setting up a satellite receiver	13.10.98-25.10.98
13) Mr. Toshiyuki Iizuka	RATOC System Engineering Co., Ltd.	Equipping electronics, RATOC microscope system	16.10.95-27.10.95
14) Mr. Toshiyuki Iizuka	RATOC System Engineering Co., Ltd.	Equipping electronics, RATOC microscope system	15.11.97-30.11.97

Acceptance of Counterpart Personnel for Training in Japan

Appendix Table 4 (1/2)

Name	Post (Division)	Major institutions visited	Research and studies employed	Trained period
1) Lic. María I. Bertolotti Division Director	Fisheries Information and Technology Division	Nat.Res.Inst.FarSea.Fish./Fish.Sci/Nansei, Tokyo Univ. Fish., J.Fish.Inf.Serv.Center, JAMARC, O.R.I. Univ. Tokyo	Fisheries Information: Collection and management of fisheries data	07.03.95-31.03.95
2) Dr. Ramiro P. Sánchez Division Director	Pelagic Fish Fisheries and Maine Environment Division	Nat.Res.Inst.Fish.Sci/FarSea.Fish.,KanagawaPre.Exp.St., KyotoUniv., Oce.Res.Inst. Univ. Tokyo	Oceanography: Oceanographic condition and distribution of fish	01.08.95-29.08.95
3) Dr. Norma E. Brunetti Chief, Squid Group	Pelagic Fish Fisheries and Maine Environment Division	Oce.Res.Inst. Univ. Tokyo, Hokkaido Univ., Tokyo Univ. Fish., Nat.Sci. Musium, Nihon Univ.	Biology of squids: Studies on resources research in general	01.10.95-31.01.95
4) Lic. Noemí R. Mari	Demersal Fish Fisheries Division	Tokyo Univ. Fish., Nat.Res.Inst. Tohoku/Nansei/FarSea. Fish./Fish.Sci., Jap.Fish.Inf.Serv .Center	Biology of cods: Studies on statistical analyses of fishing data	30.01.96-28.02.96
5) Lic. Beatriz Jerez	Pelagic Fish Fisheries and Maine Environment Division	Nat.Res.Inst. FarSea..Fish./Fish.Sci., Tokyo Univ. Fish.	Biology of squids: Bio-chemical studies on stock identification	09.09.96-06.11.96
6) Lic. M. Cristina Cassia	Demersal Fish Fisheries Division	Nat.Res.Inst. FarSea.Fish./Fish.Sci., Tokyo Univ. Fish., Oce.Res.Inst. Univ. Tokyo	Biology of cods: Studies on growth analyses by otolith	10.09.96-23.10.96
7) Tec. Julio C. Garsía	Fisheries Information and Technology Division	Tokyo Univ Fish., Nat.Res.Inst.Fish.Eng.	Fishing Technology: Studies on selective action of trawl net	08.10.96-06.11.96
8) Tec. Gabriel R. Rossi	Pelagic Fish Fisheries and Maine Environment Division	RATOC Sys.Eng.Co., Hokkaido Nat.Fish.Res.Inst., Oce. Res.Inst. Univ. Tokyo	Biology of squids: Statolith measuring by RATOC system	30.09.97-08.11.97
9) Lic. Laura Machinandiarena	Pelagic Fish Fisheries and Maine Environment Division	Hokkaido Univ., Oce.Res.Inst. Univ. Tokyo, Kyoto Univ.	Biology of cods: Morphology and biology of early life stage of fish	07.10.97-11.11.97
10) Dr. Otto C. Wöhler	Demersal Fish Fisheries Division	Nat.Res.Inst. FarSea.Fish./Fish.Sci, Tokyo Univ.Fish.	Biology of cods: Methodology on stock assessment	04.11.97-05.12.97
11) Lic. Beatriz Elena	Pelagic Fish Fisheries and Maine Environment Division	RATOC Sys.Eng.Co., Hokkaido Nat.Fish.Res.Inst., Hokkaido Univ.	Biology of squids: Methodology on measurering statolith	27.09.98-31.10.98
12) Lic. M. Felisa Sánchez	Demersal Fish Fisheries Division	Nat.Res.Inst.Hokkaido/Nansei/Fish.Sci., Hokkaido Univ.	Biology of cods: Studyies on methods of cannibalism research	27.10.98-27.11.98
13) Lic. Aníbal Aubone	Fisheries Information and Technology Division	Tokyo Univ .Fish., Nat.Res.Inst. FarSea.Fish/Fish.Sci	Biology of cods: Methodology on stock assessment	10.11.98-19.12.98
14) Lic. Fernando A. López	Fisheries Information and Technology Division	PASCO Corp., Tokai Univ. Fac.Eng./Ocea., Nat.Res.Inst. FarSea.Fish., Jap.Fish.Inf.Ser. Center, O.R.I. Univ. Tokyo	Fishing Technology: Studies on processing satellite imagery data	16.02.99-18.03.99
15) Dr. Marcelo Pajaro	Pelagic Fish Fisheries and Maine Environment Division	Kyoto Univ., Nat.Res.Inst. FarSea.Fish/Fish.Sci., Oce.Res. Inst. Tokyo Univ.	Biology of fish larvae: Studies on nutritional conditions of fish larvae	11.05.99-22.06.99

Full Name of the Institutions Visited

Appendix Table 4 (2/2)

Abbreviation	Name of institutions in full
Hokkaido Nat.Fish.Res.Inst.	Hokkaido National Fisheries Research Institution
Hokkaido Univ.	Hokkaido University, Faculty of Fisheries
JAMARC	Japan Marine Fishery Resources Research Center
Jap.Fish.Inf.Serv. Center	Japan Fisheries Information Service Center
J.Fish.Inf.Serv. Center	(same as above)
Kanagawa Pre.Exp.St.	Kanagawa Prefectural Fisheries Experimental Station
Kyoto Univ.	Kyoto University, Faculty of Fisheries
Nat.Res.Inst. FarSea.Fish.	National Research Institute of Far Seas Fisheries
Nat.Res.Inst. Fish.Sci	National Research Institute of Fisheries Science
Nat.Res.Inst. Fish.Eng.	National Research Institute of Fisheries Engineering
Nat.Res.Inst. Hokkaido	Hokkaido National Fisheries Research Institute
Nat.Res.Inst. Nansei	Nansei National Fisheries Research Institute
Nat.Sci. Museum	National Science Museum
Nihon Univ.	Nihon University, Faculty of Veterinary Medicine
Oce.Res.Inst. Univ. Tokyo	Ocean Research Institute, University of Tokyo
O.R.I. Univ. Tokyo	(same as above)
PASCO Corp.	PASCO Corporation Co., Ltd.
RATOC Sys.Eng.Co.	RATOC System Engineering Co., Ltd.
Tokai Univ. Fac.Ocea.	Tokai University, Faculty of Oceanography
Tokai Univ. Fac.Eng.	Tokai University, Faculty of High Technology for Human Affairs
Tokyo Univ. Fish.	Tokyo University of Fisheries, Department of Fishery Resources Management

Appendix Table 5 (1/5)

List of Major Machinery and Equipment provided by the Government of Japan

"Major Equipment" means those rather costly ones which exceeds ¥ 100,000 (Japanese yen) or $ 850 (US dollar) in unit price. The value in US dollars have been converted into Japanese yen at the rate of $ 1 = 120 ¥. The total amount of the listed equipment is ¥ 78,176,600 which accounts for about 45 % of total expenditure for the all.

Articles by Field of Research and Studies	Make and standard	Number	Unit Price	Total cost
Fisheries Ecology (biology of squids)				
Lap-top type personal computer (1)	TOSHIBA T2450CT	1	193,500	193,500
Personal computer including Printer (2)	COMPAQ Prosignia 300, Hewlett Packard DeskJet 693C	1 set	955,800	955,800
Hard-disk for Lap-top type computer	TOSHIBA PCHD-520	1	198,000	198,000
RATOC Systematic Microscope	RATOC System Engineering	1 set	5,221,700	5,221,700
RATOC Systematic Version-up kit	RATOC System Engineering	1 set	2,810,000	2,810,000
RATOC Systematic copy processor	RATOC System Engineering	1	100,000	100,000
Deferential Intervening Microscope	NIKON Y2F-NTF-16	1	1,255,000	1,255,000
Ultra-High resolution CCD color camera	NIKON KY-F55BE	1	500,000	500,000
Ultra-High resolution CCD color TV monitor	NIKON BM-2000PN	1	280,000	280,000
Ultra-High resolution camera's accessories	NIKON	1 set	104,000	104,000
Accessories for microscope	NIKON	1 set	171,000	171,000
Microscope	NIKON LABOPHTO-2	1	473,000	473,000
A lens fore LABPHOTO-2	NIKON 60 times CF-PLAN NCG60X	1	109,000	109,000
Photographing machine for microscope (1)	NIKON MICROFLEX	1 set	356.900	356.900
Photographing machine for microscope (2)	NIKON HFX-DX-DB	1 set	660,000	660,000
Photographing machine accessories (3)	NIKON DB-1	1 set	108,000	108,000
CCD Color TV camera	Tokyo Electronic Industry CS 572 BL	1	145,200	145,200
High resolution TV color monitor	SONY PVM-2054Q	1	152,500	152,500
Stereo-microscope (1)	NIKON SMZ-10A	2	363,700	727,400
Stereo-microscope (2)	NIKON SMZ-10A-6	1	509,000	509,000

Stereo-microscope accessories	NIKON 12 pieces	1 set	293,700	293,700
Sketching apparatus for stereo-microscope accessories	NIKON	1	109,000	109,000
Double arm lightning apparatus (1)	NIPPON P.I. PICL-NEX-PLL-100	1 set	122,000	122,000
Double arm lightning apparatus (2)	NIKON PSM-21520	2 sets	318,280	636,600
Double arm lightning apparatus (3)	NIKON PSM	1 set	126,000	126,000
Reflex camera	CANON EOS-KISS, including accessories	1 set	127,200	127,200
Refrigerator	SANYO	1	792,000	792,000
Low temperature jar	E-03773-54	1	207,000	207,000
Vacuum wrapping machine	ICHII SQ-202	1	262,000	262,000
Accessories for vacuum wrapping machine	HIRYU	1 set	226,500	226,500
Electric power machine for electrophoresis	NIHON Bio-Radd-Power	2 sets	140,000	280,000
Homogenize	IUCHISAIEIDOU 51-315-01	1	120,000	120,000
Centrifugal machine	EPPENZORF 5402	1	650,000	650,000
Distiller	ISIZU WDA-11	1	113,000	113,000
Electric squid jigging machine	HAMADE MO-7H	1	681,600	681,600
Small squid fishing gears for sampling	various	1 set	399,000	399,000
Portable incubator	NIPPON BEC	1	160,000	160,000
FRP Water tank with filter	EARTH KFS-1500-2	1	450,000	450,000
Cooler for sea-water	EARTH RX-759HY, filtered circulation	1 set	571,000	571,000
Self-recording water temperature meter	ISUZU 3-3158-05, including recording paper	1 set	128,000	128,000
Freezer dryer	YAMATO DC41A, including accessories	1 set	877,200	877,200
Jars for samples	JAPAN, 4 kinds	1 set	439,000	439,000
Chemicals and reagents for bio-chemical analyses	Various	1 set	1,153,400	1,153,400
Sub-total				23, 954,200

Fisheries Biology (biology of cods, other fishes and larvae)				
RATOC Systematic Microscope	RATOC System Engineering	1 set	5,202,000	5,202,000
Deferential Intervening Microscope (1)	NIKON Y2F-NTZ-2Z-33	1	2,450,000	2,450,000
Microscope (2)	NIKON LBBOPHOTO-2	1	473,000	473,000
Microscope (3)	NIKON SMZ-U-4	1	550,000	550,000
Accessories for Microscope-1	NIKON	1 set	146,000	146,000
Photographing machine for microscope (1)	NIKON MICROFLEX	1 set	356.900	356.900
Photographing machine for microscope (2)	NIKON H-III-351	1 set	580,000	580,000
Photographing machine for microscope, Data-back (3)	NIKON H DETA BACK DB-S	1 set	209,000	209,000
CCD Color TV camera (1)	Tokyo Electronic Industry CS 572 BL	1	350,000	350,000
CCD Color TV camera (2)	Tokyo Electronic Industry CS 572 BL	1	145,200	145,200
High resolution color TV monitor	Tokyo Electronic Industry PVM-20540M	1	300,000	300,000
High resolution TV color monitor	SONY PVM-2054Q	1	152,500	152,500
Stereo-microscope (1)	NIKON SMZ-10A	1	363,700	363,700
Stereo-microscope (2)	NIKON SMZ-10A-5	1	525,000	525,000
Tri-ocular Stereo-microscope (3)	NIKON SMZ-U1	1 set	718,000	718,000
Teaching Head of microscope	NIKON	1 set	750,000	750,000
Double arm fiber lightning machine (1)	NIKON D-2	1 set	340,000	340,000
Double arm fiber lightning machine (2)	NIKON D-2	1 set	544,000	544,000
Precise low-speed cutter	Buehlet Isomet 15 HC	2 sets	728,300	1,456,600
Automatic Embedding machine	SAKURA RH-12DM-1	1 set	850,000	850,000
Embedding Block Processor	SAKURA NO-4672	1 set	1,450,000	1,450,000
Paraffin box for SAKURA RH-12DM-1	SAKURA, 5 pieces	1 set	510,000	510,000
Tissue basket for SAKURA RH-12DM-1	SAKURA, 5 pieces	1 set	180,000	180,000
Paraffin Stretcher	SAKURA PS-52C	1	150,000	150,000
Digital camera	OLYMPUS, including accessories	1 set	112,000	112,000

Precise Microtome (1)	YAMATO M-1600	1	2,850,000	2,850,000
Microtome (2)	YAMATO PR-50	1	354,800	354,800
Microtome (3)	YAMATO LR-85	1	600,000	600,000
Refrigerator for processing frozen sample	YAMATO MC-802A	1	523,000	523,000
Electronic balance (1)	Zartous BP 210-S	1	130,000	130,000
Electronic balance (2)	MARUTO MC-201	1	900,000	900,000
Electronic balance (3)	SHIMAZU EB-4300S	1	115,000	115,000
Incubator	TGK DS-410	1	198,000	198,000
Cultivate machine	TGK 354-61-22-06	1	160,000	160,000
Small cultivate machine	TGK 050-61-40-51	1	100,000	100,000
Precise Area meter	USHIKATA	1	120,000	120,000
Personal computer including Printer	COMPAQ Prosignia 300, Hewlett Packard DeskJet 693C	1 set	955,800	955,800
Waterproof sand-papers	JAPAN, 4 kinds	1 set	440,000	440,000
Wrapping film	JAPAN, 5 kinds	1 set	320.000	320.000
Sub-total				26,630,500
Fishing Technology				
Gravity Adjustable Heavy Balance (1)	Scanvaetg, Norway 150 kg (installed in research vessels)	2	2,436,000	4,872,000
Gravity Adjustable Heavy Balance (2)	Scanvaetg, Norway 50 kg (installed in research vessels)	2	2,436,000	4,872,000
Gravity Adjustable Heavy Balance (3)	Scanvaetg, Norway 10 kg (installed in research vessels)	2	1,944,000	3,888,000
Gravity Adjustable Heavy Balance (4)	Scanvaetg, Norway 5 kg (installed in research vessels)	2	1,944,000	3,888,000
Lap-top computer including printer	TOSHIBA Linea	1 set	368,400	368,400
Lap-top computer	COMPAQ	1	400,000	400,000
Depth meter	SCAMER	1	2,988,000	2,988,000
Video camera	CCD-TR2300E	1	160,000	160,000
Double-deck Video deck	WV-TW2	1	130,000	130,000

Software for Swept-Area method	S-PLUS	1	270,000	270,000
Software for GIS	Arc View, Ver-3	1	304,900	304,900
Water-proof housing	Marine Pack	1	190,000	190,000
Accessories for satellite receiver	SU-18, 5 kinds	1 set	699,200	699,200
Sub-total				23,030,500
Project Office				
Personal computer (1)	TOSHIBA Dynabook EZ 425	1	193,500	193,500
Personal computer (2)	Mackintosh PowerBook 520	1	254,000	254,000
Personal computer (3)	Mackintosh Performa 6400	1	198,,000	198,,000
Personal computer (4)	COMPAQ ProLinea Mt	4	463,200	1,852,800
Personal computer (5)	COMPAQ DESKPRO 5140	1	672,000	672,000
Laser Printer	LaserWriter 320	2	186,000	372,000
Laser Printer	Hewlett Packard HP-4PJ	1	130,000	130,000
Laser Printer	Hewlett Packard LaserJet 4Ml	3	180,000	540,000
Computer scanner	Hewlett Packard LaserJet 4MC	1	211,800	211,800
Copying machine	XEROX 5050	1	137,300	137,300
Sub-total				4,561,400
Grand total				78,176,600

Remarks: All the items listed in the " Project Office" will be handed over to INIDEP when the Project is terminated.

Allocation of Budget for Local Cost by both the JICA Project and INIDEP

Appendix Table 6 (1/1)

Year Project/INIDEP	1994	1995	1996	1997	1998	1999
JICA Project [1]	General Expenditure for Local Cost at Site JPY ¥ 507,000	General Expenditure for Local Cost at Site JPY ¥ 5,261,000	General Expenditure for Local Cost at Site JPY ¥ 3,420,000	General Expenditure for Local Cost at Site JPY ¥ 3,000,000 Technical Exchange Planning Expenditure JPY ¥ 900,000	General Expenditure for Local Cost at Site JPY ¥ 3,000,000 Technical Exchange Planning Expenditure JPY ¥ 1,249,000	General Expenditure for Local Cost at Site JPY ¥ 2,535,000 Funds for Terminal Seminar JPY ¥ 4,385,000*) Funds for preparing Manuals JPY ¥ 726,000*)
INIDEP [2]	Cost of maintenance for Project Office, Domestic telephone charges, Running costs for the research vessels cruises, Fees for customs and for the transportation of machinery provided by JICA	same as the previous year	same as the previous year	same as the previous year	same as the previous year	same as the previous year

Remarks: 1) Japanese budgetary basis is on the Japanese fiscal year, from the beginning of April to the end of March next year. JPY ¥ indicates Japanese yen.

2) INIDEP's budgetary basis is on the calendar year, but it is difficult to count the amount of the cost for the Project separately from the total budget.

*) Applied budget for the operation, for which the operation will be expected to be implemented during the remaining period of the Project.

Allocation of Counterpart Personnel in INIDEP

Appendix Table 7 (1/2)

Field	Year / Month	1994	1995	1996	1997	1998	1999
		12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11
Fishery Ecology							
1	Dr. R. Sánchez	----	----□□----	----------	----------	----------	----------
2	Dr. N.E. Brunetti	----	----□□----	----------	----------	----------	----------
3	Lic. B. Jerez	----	----------	----□□□□□□----	----------	----------	----------
4	Lic. M.L. Ivanovic	----	----------	-	----------	----------	----------
5	Tec. G.R. Rossi			----------	----□□□□----	----------	----------
6	Lic. B. Elena			----------	----------	----□□□□----	----------
7	Lic. S.L. Pineda				----------	-	----═══000=

Fishery Biology							
1	Dr. L.B. Prenski	----	----------	----------	----------	----------	----------
2	Dr. R.P. Sánchez	----	----------	----------	----------	----------	----------
3	Dr. J.E. Hansen	----	----------	----------	----------	----------	----------
4	Dr. O.C. Wöhler	----	----------	----------	----□□□□----	----------	----------
5	Lic. M.C. Cassia	----	----------	----□□□□----	----------	----------	----------
6	Dr. M. Pájaro	----	----------	-	----------	----------	----□□----
7	Lic. M.F. Sánchez	----	----------	----------	----------	----□□□----	----------
8	Lic. N.R. Marí		----------	----------	----------	-	----------
9	Lic. L. Machinandiarena			----------	----□□□□----	----------	----------
10	Dr. G.J. Macchi			----------	----------	----------	----------
11	Dr. A.R. Giussi				----------	----------	----------
12	Lic. M.F. Villarino					----------	----------

Field \ Year	1994	1995	1996	1997	1998	1999
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Fishing Technology						
1 Lic. M.I. Bertolotti	----	----¤¤----------	----------	----------	----------	----------═══
2 Dr. N.E. Brunetti	----	----------	----------	----------	----------	----------═══
3 Dr. L.B. Prenski	----	----------	----------	----------	----------	----------═══
4 Eng. R. Ercoli	----	----------	----------	----------	----------	----------═══
5 Tec. A. Izzo	----	----------	----------	----------	----------	----------═══
6 Tec. J.C. García	----	----------	----------¤¤----------	----------	----------	----------═══
7 Dr. J.E. Hansen	----	----------	----------	----------	----------	----------═══
8 Dr. O.C. Wöhler	----	----------	----------	----------	----------	----------═══
9 Lic. N.R. Marí		----------	¤¤----------	----------	----------	----------═══
10 Tec. G.R. Rossi			----------	----------	----------	----------═══
11 Lic. S.E. Pineda				----------	----------	----------═══
12 Lic. A. Aubone				----------	----------¤¤¤--	----------═══
13 Mr. J.J. Buono					-	----------ooo═══
14 Lic. F.A. López					----------	---¤¤¤-----═══
15 Ing. C.D. Blaedel					----------	---------- *)

Remarks: ----------: confirmed during the reporting period, ═══: expected to be extended over the remaining period of the Project.

*) : separated from INIDEP.

¤ : Counterpart Training in Japan, implemented, o: Counterpart Training in Japan, expected to be implemented in the remaining period of the Project.

List of the Presentations made at Scientific Meetings, Papers published in Scientific Bulletins*), and Manuals prepared, by both the JICA Project and INIDEP Staff

I. Field of Fisheries Ecology

1. Presentations made at scientific meetings:

1) Jerez, B., M.I. Roldán y C. Pla (1995). Interpretación genética de los patrones electroforeticos del calamar argentino *Illex argentinus* (Castellanos1960). VI Congreso Latinoamericano de Ciencias de Mar, October 1995, Mar del Plata, Argentina.

2) Brunetti, N.E., M.L. Ivanovic, G.R. Rossi, B. Elena and S.E. Pineda (1996). Fishery biology and life history of *Illex argentinus*. International Symposium on Pelagic Large Squids. July 1996, Tokyo, Japan.

3) Brunetti, N.E., M.L. Ivanovic, B. Elena and A. Aubone (1997). Distribution abundance and growth of early life stages *Illex argentinus*. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

4) Brunetti, N.E., B. Elena, G.R. Rossi, M.L. Ivanovic, R. Gerrero and H. Benavides (1997). Summer distribution, abundance and population structure of *Illex argentinus*. on the Argentine shelf in relation to environmental features. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

5) Brunetti, N.E., B. Elena, G.R. Rossi, M. Sakai, SE. Pineda and M.L. Ivanovic (1997). *Architeuthis* in Argentinean waters. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

6) Brunetti, N.E., M.L. Ivanovic, B. Elena and G.R. Rossi (1997). Contribution to the biology of the ommastrephid squid *Martialia hyadesi* (Rochebrune et Mabille, 1889) from the southwest Atlantic. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

7) Pineda, S.E., D.R. Hernandez and N.E. Brunetti (1997). Statolith comparison of two southwest Atlantic loliginid squids: *Loligo sanpaulensis* and *L. gahi*. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

8) Sakai, M., Brunetti, N.E., B. Elena and Y. Sakurai (1997). Embryonic DEVELOPMENT OF *Illex argentinus* from artificial insemination. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

9) Yokawa, K. and B. Jerez (1997). A preliminary study on the biochemical genetic structure of the purpleback flying squid *Sthenoteutis oualaniensis* from the north Indian and south Pacific Ocean. Cephalopod-Biodiversity, Ecology and Evolution, International Symposium and Workshops, CIAC 97, August-September 1997, Cape Town, South Africa.

*): Papers include the "manuscript" for which editorial committee is editing or being printed, those have been indicated as "(in preparation)" or "(in press)".

10) Brunetti, N.E., B. Elena and M. Sakai (1979). Determinación de la edad mediante la lectura de incrementos diarios en estatolitos de *Illex argentinus*. VII Congreso Latinoamericano de Ciencias de Mar, Septmbre, 1997, Santos, Brasil.

11) Pineda, S.E., D.R. Hernandes and N.E. Brunetti (1997). Comparison de los estatolitos de dos especies de loliginidos del atlantico sudoccidental: *Loligo gahi*. VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos Brasil.

12) Jerez, B. y K. Yokawa (1997). Diferencion alozimica en sesi espeecies de la familia ommastrephidae (Mollusca, Cephalopoda). VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos, Brasil.

13) Sakai, M., N.E. Brunetti y B. Elena (1997). Inseminón artificial en *Illex argentinus*. VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos, Brasil.

14) Jerez, B. and A. Aubone (1998). Preliminary results on the population genetics structure in the shortfin squid, *Illex argentinus*. International Workshop on Marine Genetics-Rio 98, September 1998, Rio de Janeiro, Brazil.

15) Pineda, S.E., D.R. Hernandez, N.E. Brunetti y B. Jerez (1998). Identificacion y morfometria comparada de dos especies de loliginidos del Atlantico sudoccidentsal: *Loligo gahi* y *Loligo sanpaulensis*. Decimotercer Simposio Cientifico-Tecnologico, Comision Tecnica Mixta del Frente Maritimo, Noviembre 1998, Mar del Plata.

2. Papers published in scientific bulletins:

1) Brunetti, N.E. (1995). Cephalopod molluscus. INIDEP Inf. Tec. 5, 89-96.

2) Brunetti, N.E., M.L. Ivanovic, G.R. Rossi, B. Elena, R. Guerrero, H. Benavides, G. Blanco, C. Marchetti, N. Suekane, M. Kuroiwa and T. Murai (1996). Final report of the JAMARC-INIDEP joint research cruise on Argentine shortfin squid (*Illex argentinus*). JAMARC Report, 16: 42 p.

3) Pineda, S.E., A. Aubone y N.E. Brunetti (1996). Identición y morfomtria comparada de las mandibulas de *Loligo gahi* y *Loligo sanpaulensis* (Sephalopoda, Loliginidae) del atlantico sudoccidental. Rev.Invest.Des.Pesq., 10: 85-99.

4) Sakai, M. and N.E. Brunetti (1997). Preliminary experiments on artificial insemination of the Argentine shortfin squid *Illex argentinus*. Fish.Sci,. 63:664-7.

5) Brunetti N.E., B. Elena and M. Sakai (1997). Determinación de la edad mediante la lectura de incrementos diarios en estatolitos de *Illex argentinus*. VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos Brasil, 1: 118-9.

6) Pineda, S.E., D.R. Hernandez and N.E. Brunetti (1997). Comparison de los estatolitoss de dos especies de loliginidos des atlantico sudoccidental: *Loligo sanpaulensis* y *Loligo gahi*.. VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos Brasil, 2: 295-7.

7) Jerez, B. and Y.K. Yokawa (1997). Diferenciacion alozimica en sesi especies de la familia ommastrephidae (Mollusca, Cephalopoda). VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos Brasil, 2: 28-9.

8) Sakai, M., N.E. Brunetti and B. Elena (1997). artificial insemination of *Illex argentinus*. VII Congreso Latinoamericano de Ciencias de Mar, Setembre 1977, Santos, Brasil, 2: 380-2.

9) Ivanovic, M.L. and N.E. Brunetti (1997). Description of *Illex argentinus* beaks and rostral length relationships with size and weight of squids. Rev.Invest.Des.Pesq., 11: 137-46.

10) Haimovic, M., N.E. Brunetti. P.G. Rodhouse, J. Csirke and R.H. Leta (1998). *Illex argentinus*. FAO Fish.Tech.Pap.: 376, 27-58 .

11) Pineda, S.E. , N.E. Brunetti y N. Scalato (1998). Calamar loliginidos (Cephlopoda, Loliginidae). In El Mar Argentino y sus Recursos pesqueros Tomo 2 Los moluscus de interés pesquero. Cultivos y estrategias reproductivas de bivalvos y equinoideos. (ed. .Boschi), INIDEP, Mar del Plata, pp. 13-36.

12) Brunetti, N.E., M.L. Ivanovic y B. Elena (1998). Calamar omastréfidos (Cephalopoda, Ommastrephidae). In Mar Argentino y sus Recursos pesqueros Tomo 2 Los moluscus de interés pesquero. Cultivos y estrategies reproductivasn de bivalvos y equinoideos. (ed. .Boschi), INIDEP, Mar del Plata, pp. 37-68.

13) Brunetti, N.E., M.L. Ivanovic, G.R. Rossi, B. Elena and S.E. Pineda (1998). Fishery biology and life history of *Illex argentinus*. In Progress Report of the International Symposium on Large Pelagic squids, held in Tokyo by JAMARC in July 1996 (ed. T. Okutani), Tokyo, JAMARC.

14) Jerez, B., M.I. Roán y C. Pla (1998). Biochemical genetics in the Argentinean squid, *Illex argentinus*. Sci.Mar., 62: 141-49.

15) Brunetti, N.E., M.L. Ivanovic, B. Elena and Rossi (1998). Contribution to the biology of the ommastrephid squid *Martialia hyadesi* (Roschebrune et Mabille, 1989) from the southwest Atlantic. South African Fisheries Journal, 20.

16) Brunetti, N.E., B. Elena, G.R. Rossi, M. Sakai, S.E. Pineda and M.L. Ivanovic (1998). *Architeuthis* in Argentine waters. South African Fisheries Journal, 20.

17) Sakai, M., N.E. Brunetti, B. Elena and Y. Sakurai (1998). Embryonic development and hatchings of *Illex argentinus* from artificial fertilization. South African Fisheries Journal, 20: 255-65.

18) Pineda, S.E., D.R. Hernandez and N.E. Brunetti (1998). Statolith comparison of two southwest Atlantic loliginid squids: *Loligo sanpaulensis* and *L. gahi*. South African Fisheries Journal, 20.

19) Brunetti N.E., M.L. Ivanovic, B. Elena and A. Aubone (1998). Distribution, abundance and growth of early life stages of *Illex argentinus*. South African Fisheries Journal, 20.

20) Brunetti, N.E., B. Elena, G.R. Rossi, M.L. Ivanovic, R. Gerrero and H. Benavides (1998). Summer distribution, abundance and population structure of *Illex argentinus* on the Argentine shelf in relation to environmental features. South African Fisheries Journal, 20: (in press).

21) B. Elena, M. Sakai y N.E. Brunetti (1997). Informe campña estudio de reproducción del calamar (*Illex argentinus*). Informe Técnico 7(Programa Calamar) pp. 9.

3. Manuals prepared:

1) Brunetti N.E., M.L. Ivanovic y M. Sakai (1999). Atlas de calamar en Argentina. INIDEP.

2) Tsuchiya, K., N.E. Brunetti, S.E. Pineda and M.L. Ivanovic (1997). Reports on the squid biology in Argentina waters. INIDEP-JICA Project, December 10, 1997.

3) Nakamura Y., N.E. Brunetti, B. Elena and M. Sakai (1998). Manual for observation of growth increments in the statolith of *Ommastrephes bartramii*. JICA-INIDEP Project, November 18, 1998.

4) Nakamura Y., N.E. Brunetti and M. Sakai (1998). Observation of growth increments in the statolith of *Illex argentinus* artificially fertilized and hatched *in vitro*. JICA-INIDEP Project, November 18,1998.

II. Field of Fisheries Biology

1. Presentations made at scientific meetings:

1) Bianchi, G., H. Gislason, L. Hill, K. Koranteng, S. Manickchand-Heileman, I. Paya, K. Sainsbury, M.F. Sánchez, X. Jin and K. Swanenburg (1999). The impact of fishing on demersal fish assemblages of continental shelves. ICES/SCOR Symposium on the "Effects of Fishing on Ecosystem", Montepelier, France, 15-19 March 1999.

2) Cassia M.C. (1998). Age and growth of the southern blue whiting *Micromesistius australis* in the Argentine sea. An International Symposium on the "Fish Otolith Research and Application" Bergen, Norway, June 1998.

3) Cassia M.C. and S. Morioka (1998). Otolith daily increments and first annulus formation of *Micromesistius australis* in the Argentine sea. An International Symposium on the "Fish Otolith Research and Application" Bergen, Norway, June 1998.

4) Cassia M.C. (1999). Estructura poblacional de la polaca *Micromesistius australis* en el Atlantico sudoccidental. XIX Congreso de Cientifico del Mar, May 1999, Antofagasta, Chili.

5) Giussi, A.R., D. Hernandez and V. Avachian (1998). Differences in growth of long tail hake (*Macruronus magellanicus*) from several areas of southwestern Atlantic ocean. An International Symposium on the "Fish Otolith Research and Application" Bergen, Norway, June 1998.

6) Hansen, J.E., O.C. Wöhler and H.D. Cordo (1999). Evidencias acerca de la declinacion del effectivo de polaca (*Micromesistius australis*) en el Atlatico sudoccidental. XIX Congreso de Cientifico del Mar, May 1999, Antofagasta, Chili.

7) Machinandiarena, L. (1995). Identificacacion y distribucion de abadejo (*Genypterus* spp.) en el mar Argentino. XI Congreso Latinoamericano de Ciencias del Mar. October 1995, Mar del Plata, Argentina.

8) Machinandiarena, L. (1998). Presencia de estado iniciales de abadejo *Genypterus blacodes* en la zona comun de pesca Argentina-Uruguaya. 13 th Symposio Ciencitifico-Tecnologico de la Comision Mixta del Frente Maritimo, November 1998, Mar del Plata, Argentina.

2. Papers published in scientific bulletins:

1) Aubone, A., H.D. Cordo, , L.B. Prenski, y O.C. Wöhler (1999). Modelo dinámico de la biomasa de la polaca (*Micromesistius australis*) y evolución del recurso en el corto plazo. Informe Técnico, INIDEP, (in press).

2) Aubone, A., Cordo, y O.C. Wöhler (1999). El método de máxima verosimilitud y su aplicación a la estimación de parámetros de curvas de crecimient de von Bertalanffy. INIDEP Informe Técnico, (in press).

3) Cassia M.C. (1998). Comparison between age readings from scales and otolith of the toothfish (Dissostichus eleginoides) from South Georgia. CCAMLR Science, 5:191-203.

4) Cordo H.D. y O.C. Wöhler (1999). Indices de abundancia de polaca (*Micromesistius australis*) derivados de campañas de investigación y la flora comercial Argentina en el período 1991-1998. Informe Técnico, INIDEP, 36/99: 9 p.

5) Cordo H.D. y O.C. Wöhler (1999). Estimación de índices de abundancia de polaca (*Micromesistius australis*) en el Atlántico sudoccidental. (in press).

6) Garcia de la Rosa, S.B., M.F. Sánchez, and D. Figueroa (1997). Comparative feeding ecology of Patagonian toothfish (Dissostichus eleginoides) in the southwestern Atlantic. CCAMLR Science, 4: 105-24.

7) Hansen J.E., A. Aubone and O.C. Wöhler (1999). A review of two methodologies to biomass assessment of long tail hake from south western Atlantic (45°-55° S) based on swept area data. Fisheries Research (Netherlands, submitted in 1998, in press).

8) Hansen, J.E., O.C. Wöhler y H.D. Cordo (1999). Situación actual del recurso polaca (*Micromesistius australis*). Informe Interno, INIDEP, 114/98: 8 p.

9) Hansen J.E. y O.C. Wöhler (1999). Diagnóstico del recurso merluza de cola (*Macruronus magellanicus*). Informe Interno, INIDEP, 62/99: 6 p.

10) Machinandiarena, L. y M.D. Ehrlich (1999). Deteccion de area de cria de la merluza de cola (*Macruronus magellanicus*) en el mar argentino. Rev.Invst.Res.Pesq., 12: (in press).

11) Machinandiarena, L., M.F. Villarino, y G.J. Macchi (1999). Descripcion del estado de desove abadejo manchado *Genypterus blacodes* (Schneider, 1801, Pisces, Ophidiidae) en el mar argentino. Bol.Inst.Esp.Ocean., 14: 49-55.

12) Prenski, L.B., A.R. Giussi, O.C. Wöhler, S.B. Garcia de la Rosa, J.E. Hansen, N.R. Marí and M.F. Sánchez (1999). Southwest Atlantic long tail hake (*Macruronus magellanicus*). State of the stock and management. (in preparation).

13) Sánchez, M.F. y A. Colombo (1996). Estudio de los caracteres merísticos y morfométricos de la polaca (*Micromesistius australis*) en el sectir austral de la plataforma continnental argentina y aguas adyacentes. Informe Interno, INIDEP, 55.31/5/96.

14) Sánchez, M.F. Alimentación de abadejo (*Genypterus blacodes*) en su área de distribución. (in preparation).

15) Sánchez, M.F. Alimentación de merluza de cola (*Macruronus magellanicus*) en la región del mar argentno al sur del 45°S. (in preparation).

16) Wöhler, O.C., A.R. Giussi and J.E. Hansen, (1998). Análisis secuencial de la población de merluza de cola (*Macruronus magellanicus*) en el Atlántico sudoccidental. Período 1985-1996. Rev.Invest.Des.Pesq., 12.

17) Wöhler, O.C. y N.R Marí, (1999). Aspectos de la pesca de la polaca (*Micromesistius australis*) por parte de la flota Argentina en el período 1989-1995. Informe Técnico, INIDEP, (in press).

18) Wöhler, O.C., A.R. Giussi, S.B. Garcia de Rosa, J.E. Hansen, M.F. Sánchez, J.E. Hansen, H.D. Cord, G.L. Alvarez Colombo, S. Incorvaia, R. Reta y V. Abachian (1998). Resultados de la campaña de evaluación de peces demersales australes efectuada en el verano de 1997. Informe Técnico, INIDEP. (in press).

19) Wöhler, O.C. (1999). Rendimiento potencial e incertidumbre en la estimatión de puntos biológicos de referencia de la merluza de cola (*Macruronus magellanicus*) del Atlantico sudoccidental. (in Preparation).

20) Wöhler, O.C., H.D. Cord, J.E. Hansen y M.C. Cassia (1999). Análisis secuencial de la población de polaca (*Micromesistius australis*) en el período 1987-1997, ajustado con valores de rendiminiento por unidada de esfuerzo de pesqueros comerciales. (in preparation).

21) Wöhler, O.C., J.E. Hansen, H.D. Cord, y A.R. Giussi (1999). Evaluación del estado de exploitación y recomendaciones de manuejo de la merluza de cola (*Macruronus magellanicus*) del Atlántico sudoccidental. Perído 1985-1997. (in preparation).

22) Wöhler, O.C. y J.E. Hansen (1999). Caracterzación biológica y evaluación del estado de explotación de la polaca (*Micromesistius australis*) del Atlántico sudoccidental. Informe Interno, INIDEP, 59/99: 12 p.

23) Wöhler, O.C., A.R. Giussi, J.E. Hansen, S.B. Garcia de Rosa, M.F. Sánchez, J.E. Hansen, H.D. Cord, G.L. Alvarez Colombo, S. Incorvaia, R. Reta y V. Abachian (1999). Resultados de la campaña de evaluación de peces demersales australes efectuada en el verano de 1997. Informe Técnico, INIDEP, (in press).

24) Ehrlich, M.D., R.P. Sánchez, J.D. de Ciechomski, L. Machinandiarena and M. Pájaro (1998). Ichthyoplankton composition, distribution and abundance on the southern Patagonian shelf and adjacent waters. INIDEP Doc. Cient., 5: 33-61.

25) Macchi, G.J. and M. Pájaro (1998). Features of the reproductive biology of the southern blue whiting (*Micromesistius australis*). In "Reproductive habitat, biology and acoustic biomass estimate of the southern blue whiting in the sea of southern Patagonia", editted by Dr. R.P. Sánchez, Serie Doc.Cient. INIDEP, 5: 63-75.

26) Guerrero, R.A., A. Baldoni and H. Benavides (1998). Oceanographic conditions at the southern end of the Argentine continental slope. In "Reproductive habitat, biology and acoustic biomass estimate of the southern blue whiting in the sea of southern Patagonia", editted by Dr. R.P. Sánchez, Serie Doc.Cient. INIDEP, 5: 5-18.

27) Sabatini, M., G.L. Alvarez Colombo and F. Ramirez (1998). Zooplankton biomass in the reproductive area of the southern blue whiting (*Micromesistius australis*). In "Reproductive habitat, biology and acoustic biomass estimate of the southern blue whiting in the sea of southern Patagonia", edited by Dr. R.P. Sánchez, Serie Doc.Cient. INIDEP, 5: 19-31.

Following articles include the studies for the other species not specified in the R/D, but histological sample processing has been made by the Counterpart utilizing the machinery provided by JICA.

28) Macchi, G.J., E.M. Aca y C.A. Lasta (1996). Desove y fecundiadad de la corvina rubia *Micropongonias furnieri* Desmaresty, 1823 del estuario del Rio de la Plata, Argentina. Bol.Inst.Esp.Ocean., 12(2): 99-113.

29) Macchi, G.J., M.I. Iorio and A. Aubone (1999). Estimacion de la fecundiadad del langostino argentino (*Pleoticus mulleri* Bate, 1888) de Pataginia (sur de Argentina). Bol.Inst. esp.Ocean., 14: 19-29.

30) Macchi, G.J. (1998). Preliminary estimate of spawning frequency and batch fecundity of striped weakfish, *Cynoscion striatus*, in the coastal waters off Buenos Aires province. Fsh.Bull.,U.S., 96(2): 375-381.

31) Macchi, G.J. and E.M. Acha (1999). Spawning frequency and batch frequency of Brasilian menhaden, Brevoortia aurerea, of the Rio de la Plata estuary, Argentina-Uruguay. Fish. Bull.,U.S., (in preparation).

32) Pájaro, M., Macchi, G.J. ,™ R.P. Sánchez (1998). Fecudiadad frequencia reproductiva de las poblaciones y patagonica de la anchoita Argentina (Engraulis anchoita). Rev.Inves.Desall.Pesq., 11: 19-38.

3. Manuals prepared:

1) Morioka, S. Manual for otolith treatment and observation of daily growth increments fro large specimens of fishes. (in preparation).

2) Umeda, S. H.E. Cristensen, M. Paáaro and S. Morioka (1999). Manual of HE dyeing for histological section of fish larvae. (in preparation).

III. Field of Fishing Technology

1. Presentations made at scientific meetings:

1) Ercoli, R., L. Salvini, A. Izzo, J. García and J. Bartozzetti (1997). Selectivity experiences on hake (*Merluccius hubsi*) by means the use of single grid sorting device for the escape of juvenile fishes in trawl (DEJUPA). Annual Science Conference for 1997, International Council for the Exploration of the Sea, 25 September-3 October 1997, Baltimore, Maryland, U.S.A. (Presentation paper 8 p. with 1 Table and 7 Figures).

2) Mitsuhashi T., T. Tokai, R. Ercoli, L. Savini, J. Bartozzetti, J. García and R. Roth (1998). Evaluation of cod-end selectivity and escapement from cover net of insufficiently small mesh size. Fourth Asian Fisheries Forum, 8-16 November 1998, Bangkok, Thailand organized by the Asian Fisheries Society, Manila, the Philippines (Presentation paper 1 p.).

2. Papers published in scientific bulletins:

1) Ercoli, R., T. Mitsuhashi, A. Izzo, J.C. García y J.D. Bartozzetti (1998). Investigaciones sobre selectividad de merluza de cola (*Macruronus magellanicus*) con red de arrastre de fond. Informe Técnico, INIDEP, 20, 13 p.

2) Tokai, T. and T. Mitsuhashi (1998). Select model for estimating selectivity curve from comparative fishing experiments. Bull.Jap..Soc.Fish.Oceanogr., 62(3), 235-47.
3) Mitsuhashi, T., T. Tokai, R. Ercoli, Y. García, L. Salvini, J. Bartozzetti and R. Roth (1999). A method of estimating cod-end selectivity with fish escapement from cover-net of insufficient small mesh size. Submitted to the Fisheries Science of Japan for publication. (in preparation).

3. Manual prepared:
1) Method on estimating a selection curve of mesh-size applying the most likelihood approach on the Solver Function in software of MS-Excel in a personal computer. (in Spanish, in preparation).