

Country Name	Capacity Development of Fisheries Resources Monitoring for Sustainable Management of Small Pelagic
Kingdom of Morocco	Resources in the Kingdom of Morocco

I. Project Outline

Background	<p>In Morocco, fisheries were one of the most important industries to earn foreign currency and to provide means of livelihoods for many coastal communities. However, in recent years, fish production showed a decreasing trend. The Government of Japan had undertaken a series of cooperation to Morocco for capacity enhancement of fishery resources management. These included, inter alia, the construction of a research vessel “Al Amir Moulay Abdallah” in 2001 for the National Institute of Fisheries Research (INRH) and a dispatch of experts to strengthen INRH’s capacity for operation and maintenance of acoustic fishery survey devices in 2001-2003. Although INRH had developed its institutional capacity to conduct fishery resources monitoring and assessment based on the knowledge and skills obtained through the above-mentioned cooperation among others, technical issues were still remained with small pelagic resource monitoring/assessment due to highly migratory and naturally fluctuating nature of these resources. In order to improve the accuracy and reliability of the resource monitoring capabilities, it was necessary for INRH to introduce a comprehensive assessment of the small pelagic resources through improving accuracy of acoustic survey and analysis along with integration of supplemental information.</p>				
Objectives of the Project	<p>Through technical transfer to INRH on improving accuracy of acoustic survey and analysis along with integration of supplemental information, the project aimed at strengthening INRH’s capacity on comprehensive assessment of the small pelagic resources, thereby contributing to realization of appropriate management measures for small pelagic resources in Morocco.</p> <ol style="list-style-type: none"> Overall Goal: Appropriate management measures for small pelagic resources are formulated and implemented based on the comprehensive assessment. Project Purpose: Comprehensive assessment of the small pelagic resources * is continuously implemented by INRH. <p>*Target Species are (i) <i>Sardina pilchardus</i>, (ii) <i>Scomber</i> spp. (<i>Scomber japonicus</i> and <i>Scomber scombrus</i>), (iii) <i>Trachurus</i> spp. (<i>Trachurus trachurus</i> and <i>Trachurus trecae</i>), (iv) <i>Sardinella</i> spp. (<i>Sardinella aurita</i> and <i>Sardinella maderensis</i>), (v) <i>Engraulis encrasicolus</i></p>				
Activities of the Project	<ol style="list-style-type: none"> Project site: Atlantic Part of the Moroccan Waters Main activities: (i) development of a Target Strengths database for the five target species, (ii) review and implementation of acoustic survey, (iii) collection and integration of supplemental data for resources assessment, (iv) review and implementation of analysis and assessment of status of the target species by revised protocol, and (v) sharing of the project outcome with domestic and international stakeholders. Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Japanese Side</p> <ol style="list-style-type: none"> Experts: 13 persons Trainees received: 17 persons Equipment: Acoustic processing equipment, acoustic analysis software, GIS software, workstation, database server, vehicle, etc. </td> <td style="width: 50%; vertical-align: top;"> <p>Moroccan Side</p> <ol style="list-style-type: none"> Staff allocated: 57 persons Land and facilities: Project offices in INRH headquarters and Agadir regional Center Local cost: Salaries of C/P staff, utilities (water, electricity, telephone charges), meeting and workshop costs </td> </tr> </table> 			<p>Japanese Side</p> <ol style="list-style-type: none"> Experts: 13 persons Trainees received: 17 persons Equipment: Acoustic processing equipment, acoustic analysis software, GIS software, workstation, database server, vehicle, etc. 	<p>Moroccan Side</p> <ol style="list-style-type: none"> Staff allocated: 57 persons Land and facilities: Project offices in INRH headquarters and Agadir regional Center Local cost: Salaries of C/P staff, utilities (water, electricity, telephone charges), meeting and workshop costs
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Project Period	July 2010 – June 2015	Project Cost	(ex-ante) 350 million yen, (actual) 286 million yen		
Implementing Agency	National Fisheries Research Institute (Institut National de Recherche Halieutique: INRH)				
Cooperation Agency in Japan	Ministry of Agriculture, Forestry and Fisheries (MAFF)				

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Morocco at the Time of Ex-Ante Evaluation and Project Completion></p> <p>The project was consistent with Morocco’s development policies of “Plan Halieutis (Fishery Plan)” (2009-2020) emphasizing on promotion of sustainable fisheries resources management on a commercial and quota basis as a natural heritage.</p> <p><Consistency with the Development Needs of Morocco at the Time of Ex-Ante Evaluation and Project Completion ></p> <p>The project was consistent with Morocco’s development needs of strengthening INRH’S capacity on comprehensive assessment of the small pelagic resources for appropriate management of fisheries resources in Morocco.</p> <p><Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation></p> <p>The project was consistent with the Japan’s ODA policy for Morocco at the time of appraisal in 2010 putting priorities on (i) assistance for development and promotion of agricultural and fisheries sectors and (ii) assistance for environmental protection for sustainable development¹.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact

¹ Source: Ministry of Foreign Affairs, Japan, “ODA Country Data Book 2010”.

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was partially achieved by the time of project completion. Although, at least 2 sets of new parameters were not incorporated for the resource assessment (Indicator 1), a comprehensive database for small pelagic resources was being established by the project completion (Indicator 2). A required budget for the assessment was approved within the INRH (Indicator 3), and an institutional mechanism for the assessment report was established (Indicator 4). An annual assessment report of the small pelagic resources was planned to be submitted to MAFF at the time of project completion (Indicator 5).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have been continued after the project completion. Among the 4 parameters used in the project, three parameters such as Recruit per Spawner (RPS), Acoustic Data Analysis Methods (Echoview), Design Survey were incorporated for the resource assessment. The comprehensive database for small pelagic resources was established, and it has been used to the extent possible. Total 4 annual assessment reports were prepared between 2015 and 2018 and were submitted to MAFF. A certain amount of budget is approved within the INRH for the assessment, but it is limited. On the other hand, four implementation plans proposed at the 6th Joint Coordination Committee (JCC) on 11 March 2015, and INRH has carried out three out of four implementation plans such as (i) Plan of the Regional Program to disseminate the project outcome to regional partners of Morocco, (ii) Implementation Plan of the Improved Resource Assessment to improve the resource assessment report, and (iii) Implementation Plan of the Socio-Economic Studies after the project completion.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been achieved by the time of ex-post evaluation. The resource management measures applied for small pelagic species are: (i) Fishing limitation (determine a certain type of species to be caught), (ii) Catching sizes (allowing only a certain size to be caught), and (iii) Seasonal closing of fishing areas to preserve sensitive areas (biological rest).

<Other Impacts at the time of Ex-post Evaluation>

No other positive or negative impacts of the project were confirmed at the time of ex-post evaluation.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) Comprehensive assessment of the small pelagic resources is continuously implemented by INRH.	Indicator 1: At least 2 sets of new parameters are incorporated for the resource assessment.	Status of the Achievement: not achieved (achieved) (Project Completion) <ul style="list-style-type: none"> • Specific parameters were not newly incorporated into the resource assessment from the Project yet, due to the necessity for INRH to scientifically, administratively validate new parameters, and build comprehensive consensus from multidisciplinary perspectives as a national scientific research institute. • Application would be made based on the implementation plan after the activities of resource assessment methodology sector in 2014. • Adequacy of the parameters and applying methodologies would be satisfactorily made by INRH based on the developed capacity through the Project in timely manner along the developed implementation plan. (Ex-post Evaluation) <ul style="list-style-type: none"> • Among the 4 parameters used in the project, RBS (Ratio of Biomass Estimation), Acoustic Data Analysis Methods (Echo view), Design Survey were incorporated for the resource assessment. • Regarding Target Strength (TS), it is not fully used as INRH does not have enough experience and they consider that the collected data related to TS is not sufficient to ensure the operational aspect of this parameter. • However, INRH has been organizing several events and seminars to discuss this TS parameter with the sector's operators to examine its relevance and the way forward to optimize its use within Morocco as well as other African countries in consultation with the African Maritime Institutes.
	Indicator 2: Comprehensive database for small pelagic resources is established and in use.	Status of the Achievement: partially achieved (continued) (Project Completion) <ul style="list-style-type: none"> • An integrative database was under development by INRH. The Project's analytical database was developed in each research action then integrated as MDB file (a file-extension used in certain versions of Microsoft Access databases), compatible with GIS and the other common database software. The database had been kept upgrading as the analyses and would be transferred to the developing INRH integrative database. (Ex-post Evaluation) <ul style="list-style-type: none"> • Comprehensive database for Biological Parameters, Size Frequencies, AS Density (Absolute Salinity), Oceanography, etc. was fully established. • The database has been used to the extent possible under the current institutional arrangement of INRH.
	Indicator 3: Required budget is approved within the INRH for the assessment.	Status of the Achievement: achieved (partially continued) (Project Completion) <ul style="list-style-type: none"> • Sufficient budget was approved for resource assessment with improvement. The improvement activities of the resource assessment would be carried out with the 2015 implementation plan of the Project outcomes. Furthermore, relevant surveys for small pelagic fishes was conducted by INRH on their own budget. (Ex-post Evaluation) <ul style="list-style-type: none"> • A certain amount of budget is approved within the INRH for the assessment, but it is limited (Also see Financial Aspect of "4. Sustainability").
	Indicator 4:	Status of the Achievement: achieved (continued)

	Institutional mechanism is established for the assessment report.	(Project Completion) <ul style="list-style-type: none"> Institutional mechanism was established for the assessment reporting with necessary improvements. With the Project outcomes, obtained approaches and methodologies and experiences as integrative team for the assessment or associated research questions the mechanism would be reinforced with necessary improvements in the practices from 2015. (Ex-post Evaluation) <ul style="list-style-type: none"> The assessment reports prepared by INRH was submitted to a validation mechanism, then presented to the Steering committee as well as to the Board members of INRH
	Indicator 5: Assessment report of the small pelagic resources is annually submitted to the Ministry.	Status of the Achievement: partially achieved (continued) (Project Completion) <ul style="list-style-type: none"> Annual routine of developing and submitting assessment report was established. The report in 2014 was submitted based on the improved capacity through the Project activities. With the implementation activities of the project outcomes with aforementioned improvements in the institutional mechanism, C/Ps would start submitting the reports, beginning from 2015, on a yearly basis. (Ex-post Evaluation) <ul style="list-style-type: none"> 4 annual assessment reports have been prepared between 2015 and 2018 and were submitted to MAFF.
(Overall Goal) Appropriate management measures for small pelagic resources are formulated and implemented based on the comprehensive assessment.	Indicator 1: Resource management measures for small pelagic species are in place.	(Ex-post Evaluation) achieved <ul style="list-style-type: none"> The resource management measures applied for small pelagic species are: <ul style="list-style-type: none"> ➢ Fishing limitation (determine a certain type of species to be caught). ➢ Catching sizes (allowing only a certain size to be caught). ➢ Seasonal closing of fishing areas to preserve sensitive areas (biological rest). ➢ Control of fishing efforts (Fixing a certain limit of the catch volume per each fisherman or fishing company).

Source: Terminal Evaluation Report, Answer to the questionnaire by INRH.

3 Efficiency

Both the project cost and project period are within the plan (ratio against plan: 82% and 100% respectively), and the outputs were produced as planned. Therefore, the efficiency of the project is high.

4 Sustainability

<Policy Aspect>

The existing “Plan Halieutis (Fishery Plan)” (2009-2020) addresses on promotion of sustainable fisheries resources on a commercial and quota basis as natural heritage. In addition, several thematic meetings and seminars with different partners and industries have been held frequently to structure the sustainable resource management activities of small pelagic species.

<Institutional Aspect>

There has not been any change in the institutional structure for the fisheries resource management in Morocco. INRH is the only research institution in the fisheries sector in Morocco and its headquarters is in Casablanca with 6 regional centers. Agadir Regional Center (INRH Agadir) has 42 staff including 30 researchers and possesses 7 laboratories including the Acoustic Laboratory, the Sclerochronology Laboratory for process of age assessment, and the Economics Laboratory for socio-economic monitoring of small pelagic sectors. Even though INRH has been trying to maintain consistent actions for the project sustainability, however, the lack of staff within INRH due to the small size of the Institute itself and its limited resources, as well as the unavailability of a dedicated organization planning for the project activities due again to the multitasking of most of INRH’s personnel to work on several projects and in several laboratories at the same time, remains as a challenge. Acoustic analysis activities and workshops are organized occasionally but still INRH can reinforce their actions by speeding up the pending procurement of two new submarine for acoustic survey.

<Technical Aspect>

INRH maintains the skills and knowledge transferred by the project through self-training, internal and external training, and exchange with other partners as well as through practice. The equipment procured by the project such as acoustic processing equipment, acoustic analysis software, software, workstation, database server, and so on. have been maintained sufficiently except Geographic Information System (GIS) software.

<Financial Aspect>

INRH received approximately 173-204 million Moroccan dirham for its annual budget during the period from 2015 and 2018, and approximately 17-30% of the operation budget are used for a comprehensive assessment. It is not fully sufficient to conduct a comprehensive assessment of the small pelagic resources as well as to maintain the project equipment and software appropriately.

Budget for INRH

(Unit: Millions of MAD)

Item	2015	2016	2017	2018
Operation Budget	104.0	107.0	104.8	108.3
- Budget for comprehensive assessment	23.0	18.0	31.0	26.0
- Maintenance budget for project equipment	-	-	-	-
Investment Budget	69.0	97.0	87.0	92.0
Total	173.0	204.4	191.8	200.3

<Evaluation Result>

Therefore, the sustainability of the effects through the project is fair.

5 Summary of the Evaluation

The project has partially achieved the Project Purpose and achieved the Overall Goal to formulate and implement the appropriate management measures for small pelagic resources based on the comprehensive assessment through strengthening INRH’s capacity. Regarding the sustainability, INRH has a room for improvements in organization capacities, setting up of necessary equipment such as submarine stars and budget allocation for operation and maintenance of a comprehensive assessment of the small pelagic resources as well as the project equipment and software. On the other hand, no major problems have been observed in the policy aspect.

Considering all of the above points, this project is evaluated to be highly satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

- Setting up of a clear organizational planning including an appropriate allocation of researchers/laboratories along with INRH's organizational priorities can contribute to improve the sustainability of the project impact in the upcoming years. Therefore, INRH is recommended to setup a task team that will be in charge of monitoring of development of the planning as well as considering some training sessions for its staff.
- INRH has cumulated a sufficient experience in acoustic surveys and analysis, and is able to share its experience with other African countries through a South-South cooperation program.

Lessons Learned for JICA:

- Given that the executing agency may face continued challenges on limited personnel, it's essential to develop technical manuals, monitoring and post-project planning during the project implementation period to support the work of new staff and to ensure sustainability.