

5.2.2 Super goal

In this project, super goal is placed as **“Conservation of wetland ecosystem in Yucatan Peninsula is improved”** with indicators of “Habitat of flamingo is expanded” and “Conserved areas are increased in Yucatan Peninsula”.

Flamingo is a symbol of wetland ecosystem of Yucatan Peninsula and is said to have been distributed naturally along whole the coastal zones, i.e., up to Veracruz State in westward and to Honduras in eastward, about 100 years ago. However, due to deterioration of environment its stable habitat is now almost restricted to RBRC (mainly for feeding and growing) and RBRL (mainly for breeding). By improved conservation activities not only in RBRC but also in other ANPs, the stable and regular habitat of flamingo is expected to recover up to 50% of coastal wetland in Yucatan Peninsula after about ten years of the completion of this Project.

As a positive impact of the Project, conserved areas are expected to increase largely in Yucatan Peninsula. Those are not only ANPs and State Reserves but also areas covered by environmental management programs such as PRODERS, UMAs and lands declared for eco-tourism. Those areas shall be increased by 50% comparing to the present at the year as mentioned above for flamingo.

5.3 Outputs and activities

In order to accomplish the project purpose following four outputs and a series of activities are created. Those activities are implemented basically in collaboration with external relevant organizations, institutions and NGOs, which are specified preliminary as shown in PO (Annex 7). The project will also utilize sub-contract scheme with local resource persons or organs when its necessity is justified.

Two external assumptions shall be accomplished for achievement of outputs, namely “Counterparts work continuously at the office” and “Procurement of equipment and services is not delayed largely due to insufficiency of budget allocation for VAT (Value-Added Tax)”.

5.3.1 Output 1 and activities

Output 1: Information necessary for environmental management is obtained.
Activity 1.1: Carry out basic research and investigation
1.1.1 Prepare list of necessary research and investigation
1.1.2 Conduct collaborative research and investigation
1.1.3 Collect socio-economic baseline data of residents
1.1.4 Systematize geographical information

- 1.1.5 Inquire number and characteristics of tourists for RBRC
- Activity 1.2: Establish environmental information system
 - 1.2.1 Promote digitalization of existing environmental data
 - 1.2.2 Establish information analysis system
 - 1.2.3 Disclose information
- Activity 1.3: Carry out adequate monitoring.
 - 1.3.1 Investigate advanced monitoring method
 - 1.3.2 Prepare monitoring plan
 - 1.3.3 Carry out monitoring
 - 1.3.4 Improve quality of monitoring
- Activity 1.4: Examine environmental maximum capacity of RBRC

An advanced information system that shall be used practically for environmental management of RBRC will be established through collaborative basic research and investigation (Activity 1.1), establishment of digital information analysis system such as GIS (Activity 1.2), carrying out monitoring (Activity 1.3) and examination of environmental maximum capacity such as tourism (Activity 1.4).

Three indicators are created for Output 1, those are “Integrated database system for environment (GIS and simulation) is established”, “Information contained in the database is disclosed through internet and/or publications” and “Environment maximum capacity of tourism is clarified”.

About GIS system, PPY has established a pilot system. Referring partly such foregoing experience, the RBRC office has started preparation of comprehensive new GIS system. The Project aims at completion of this database system which will link to the main program of CONANP and will function as a hub system among the 17 ANPs of Yucatan State.

For disclosure of information, only pamphlets of RBRC are available now. CONANP has its home page for introduction of all ANPs but no digital link is established for RBRC. Through the activity of the Project, home page with sufficient information will be created, and official guidebooks on natural resources and eco-tourism for RBRC will be published. The above GIS system will also be disclosed on the internet.

Number of permission for tour boats is limited to be less than 81 now. However, this number is decided not based on logical examination of maximum capacity of tourism. For this context, PPY conducted preliminary examination, however more investigation and analysis are required to get understanding of stakeholders. Number of permissions (for boat, tourists, etc) shall be decided based on the analysis of a series of data that will be obtained in this Project.

5.3.2 Output 2 and activities

Output 2: Ability to plan and execute measures of RBRC is improved.
Activity 2.1 Make available appropriate management plan
2.1.1 Review existing laws and regulations on environment
2.1.2 Assist preparation of regional planning of municipalities
Activity 2.2 Establish measures to strengthen the regulation system of illegal activities
2.2.1 Refine surveillance program
2.2.2 Construct necessary facilities
2.2.3 Form collaborative surveillance system
2.2.4 Conduct training on the surveillance system
Activity 2.3 Encourage sustainable utilization of natural resources
2.3.1 Evaluate socio-economic value of natural resources
2.3.2 Carry out feasibility study for new productive activity
2.3.3 Support introduction of selected new productive activity
2.3.4 Examine appropriateness of traditional salt making activity
2.3.5 Examine appropriateness of small-scale fishing activities inside the Ria.
2.3.6 Examine feasibility of new ecotourism
Activity 2.4 Promote establishment of necessary facilities
2.4.1 Promote establishment of a field laboratory
2.4.2 Examine necessity of training center

The ability of the RBRC office on planning and execution shall be improved through the activities such as participation to regional planning (Activity 2.1), refinement of surveillance program and implementation of collaborative surveillance (Activity 2.2), encouragement of sustainable use of natural resources (Activity 2.3), and examination of necessity of field laboratory and training center (Activity 2.4).

There are four indicators for Output 2 such as “RBRC staff are trained”, “Surveillance routes and surveillance frequency are increased”, “Eco-tourism is diversified” and “Number of UMA is increased”. They are explained hereinafter.

The Project will support capacity building of counterparts not only on-the-job based technical exchange but also through counterpart training in Japan and other training opportunities. All the technical counterparts will be improved capacity through participation to those environmental training courses during the project period.

There are three surveillance routes adopted presently, and surveillance frequency is 2 times each a month. By the midterm of the Project, a total of more than five surveillance routes are established, and by the end of the Project surveillance frequency will be 4 times each a month. Those activities will be supported by construction of necessary facilities

in this Project such as watching huts, mile stones, prosecution posts on illegal activities, etc.

As for eco-tourism, only boat tour of flamingo is carried out, and average time of tourists to stay in RBRC is 3 hours only. In this Project, more than five alternative eco-tourism programs (such as participation to planting of mangrove seeds, bird watching, interpretative trail, sea turtle watching, kayak tour, "cenote" and "peten" diving, observation of wildlife, volunteering in research, etc) will be created, so that the average time of stay shall be increased to be one day by the end of the Project.

At present only one UMA for flamingo is adopted at RBRC. By the end of the Project more than three new UMAs are approved and introduced, and in addition another three UMAs are in approval stage with their draft management plans. Such UMAs are now in consideration: use of crocodile, deer, shrimp, palm, orchid, etc.

Apart from UMA, several other livelihood programs with little environmental impact should also be examined feasibility in this Project. Those are traditional salt production, small-scale fishery, *Artemia* culture, organic agriculture, honey production, commercial nursery, camping, etc. to be carried out in the buffer zones.

Necessary equipment such as computers for GIS system, and environmental survey and monitoring equipment like water quality checker will be provided in the course of the Project. In order to use effectively the equipment and maintain them well, necessity of field laboratory is examined and a part of its construction materials will be procured by the Project when justified. CONANP has a plan to establish a training center for environmental education and training. The Project will examine the necessity of such center.

5.3.3 Output 3 and activities

Output 3: Ability to provide advice and technical assistance against negative environmental impacts is improved.	
Activity 3.1 Implement possible restoration of natural environment	
3.1.1	Clarify and prepare required restoration program
3.1.2	Restore damaged mangrove vegetation
3.1.3	Restore damaged natural springs
3.1.4	Assist technically restoration of other environmental damages
Activity 3.2. Provide technical advice and possible support against pollution generated by community	
3.2.1	Prepare instructions to reduce environmental load
3.2.2	Cooperate for preparation of community-based environmental improvement program
3.2.3	Design and demonstrate small-scale model facility

3.2.4 Advise on adoption of adequate land use and regulation of construction

Output 3 aims at improvement of ability of the RBRC office concerning advice and technical assistance, particularly on community development issues, to other implementing organs such as federal and local governments or other responsible organizations. There are mainly two activities: one is implementation of possible restoration measures such as rehabilitation of damaged mangrove and source of spring (Activity 3.1), and the other is examination and development of countermeasures against pollutants generated by community (Activity 3.2). Examination of alternative facility design and installation of small-scale demonstration facility will be included in those activities.

Three indicators are prepared for Output 3 such as "Damaged mangrove are restored", "Manuals and guidelines of low-impact construction are elaborated" and "Municipalities adopt measures against pollution recommended by the RBRC office".

Small-scale mangrove nursery has been started operation by the RBRC office, but actual planting has not been carried out due to insufficiency of community participation. In this Project, nursery system will be improved and participatory planting of mangrove seeds will be encouraged with target planting area of 5 ha in Celestun. Damaged natural springs will also be restored after site survey in the Project.

In order to give proper advice to local governments, manual or guidelines of low-impact construction methods which are focusing on specific environment of RBRC will be prepared and distributed to relevant organizations by the midterm of the Project.

Community development program of Celestun or regional development programs of Yucatan and Campeche States adopt recommendations of the RBRC office by the end of the Project.

5.3.4 Output 4 and activities

Output 4: Ability concerning implementation of environmental education is acquired.
Activity 4.1 Provide environmental education for local residents
4.1.1 Prepare and utilize relevant training materials for residents
4.1.2 Conduct campaign for dissemination of knowledge
4.1.3 Evaluate degree of understanding by questionnaire survey
Activity 4.2 Provide environmental education for persons of tourism industry
4.2.1 Prepare environmental education program for eco-tour guides
4.2.2 Support implementation of the said environmental education program

Activity 4.3 Provide environmental education for tourists

4.3.1 Prepare and distribute pamphlet showing eco-tour rules for tourists

4.3.2 Support installation of necessary educational facilities.

The ability of the RBRC office on the environmental education will be improved through implementation of a series of environmental education programs including site visit for progressive ANPs in collaboration with NGOs. Major target groups are local residents (Activity 4.1), persons of tourism industry (Activity 4.2) and tourists (Activity 4.3).

The Output 4 will be evaluated by the four indicators such as "Environmental education manuals are elaborated", "Eco-tour guides are grown-out", "Local school teachers are trained on environmental education" and "Environmental courses for tourists are implemented".

Although there are several general manuals available on environmental education such as those prepared by NyC, manual to be applied for specific environment of RBRC has not been prepared. From this view, practical manual to be used in RBRC will be prepared and disseminated by the Project.

About 20% of boat operators (at present total number of operators is 81) have experiences of participation in environmental education courses managed by NGOs such as RARE or Amigos de Sian Ka'an. Those activities are often coordinated and supported financially by other NGOs such as PPY and NyC. However, a part of operators could not adopt well the instructions learnt. The Project will support further environmental education for all the present boat guides and 70% of people working in other eco-tourism business in terms of coordination and provision of a part of necessary expenses. The results will be evaluated by questionnaire survey to the tourists who joined the eco-tour, and feedback to relevant business associations for improvement of the moral of the members. Effect of practical environmental education will be improved accordingly.

Now only a few teachers acquire opportunity of environmental education. By the midterm of the Project, all the present school teachers in Celestun (total number is 30-40) are accomplished training for environmental education, and by the end of the Project joint environmental campaign together with the RBRC office will be conducted for the village people and students.

The Project will produce and distribute educational pamphlets about environmental conservation for tourists of RBRC, and provide such educational equipment as posters, guide-boards for tourists and multimedia projector, in collaboration with relevant organizations.

At the end of the Project, more than 30% of tourists for Celestun participate in educational tour that will be managed by the RBRC office, NGOs and/or municipalities.

5.4 Implementing Strategy of Activities

In order to prepare detailed plan of activities, it is essential to review available current information regarding RBRC. Accordingly, Activity 1.1 (Carry out basic research and investigation) should be implemented first, and the results shall be used for re-examination of other activities.

In order to achieve smooth implementation of the Project, it is important to stimulate the incentive of local people for participation to the Project. In this point of view, Activity 2.3 (Encourage sustainable utilization of natural resources) and Activities 4.1~4.3 (Environmental education) should be started strategically as early as possible.

5.5 Commitments from the Mexican Side

The Government of the United Mexican States, represented by CONANP in this Project, has committed to take necessary measures to ensure the self-reliant operation of the Project. Those are as follows:

- 1) Provision of buildings and facilities needed for implementation of the Project including office space and necessary facilities for Japanese experts.
- 2) Assignment of necessary number of counterparts
- 3) Budget allocation

For smooth and effective implementation of the Project, CONANP commits to allocate budget required for the local cost of the Project including VAT (Value-Added Tax) imposed in Mexico on the equipment and services to be provided for the Project.

The VAT budget for the next fiscal year will be allocated when the amount of equipment to be purchased and services to be contracted in Mexico is shown by Japanese side by the end of August.

5.6 Inputs

In order to implement this Project, Japanese and Mexican sides accomplish the following inputs. Tentative schedule of input is given in [Annex 8](#).

5.6.1 Inputs from Japanese side

- 1) Dispatch of Japanese experts
 - a. Long-term experts (Their required ability is shown in [Annex 9](#))
 - Chief adviser/Wetland Management
 - Project Coordinator/Environmental Education
 - b. Short-term experts
- Short-term experts will be dispatched when necessity arises.

2) Provision of machinery and equipment

The Government of Japan will provide equipment, machinery and materials necessary for the implementation of the Project. It shall be noted that the Mexican side will take responsibility for customs duties and paying VAT that may be charged to the equipment and machinery.

3) Training of Mexican personnel

The Government of Japan will receive Mexican personnel connected with the Project for technical training in Japan.

4) Local cost

Part of expenses for project activities will be provided.

5.6.2 Inputs from Mexican side

- 1) Assignment of Project Director as the Chairperson of the Joint Coordinating Committee (see, Section 5.8)
- 2) Assignment of Counterparts
 - a. Project Manager
 - b. Project Coordinator
 - c. Other technical counterparts
- 3) Secretary and administrative staff
- 4) Equipment including vehicles
- 5) Local cost

Necessary budget for project activities shall be allocated.

5.7 Analysis of Important Assumptions

- 1) Important assumptions of the activities for the outputs

Counterparts work continuously at the office

All counterparts will be regular staff of CONANP meaning that their contract status is stable. This indicates that unpredictable change of the position or sudden resign will not occur.

Procurement of equipment and services is not delayed largely due to insufficiency of budget allocation for VAT

One of serious problems occurring in previous JICA's technical cooperation projects has been lack of budget allocation for VAT by Mexican side. On the other hand, it is known that INE could allocate the budget for VAT in a recent JICA project. Since CONANP is recognized as the same position as INE, namely decentralized organization of SEMARNAT, and promises to allocate the budget on the Minutes of Meetings, necessary measures for counter budgeting for VAT is expected to be taken properly.