

The total released cost for the Project implementation between August 2006 and February 2011 was US\$. 808,168. Budget of activities and administration includes the costs of equipment supplied to farmers' groups, trainings and workshops for ANAM staff, and several printed materials (Extension Guidelines, posters etc.). For details, please refer to the Annex 5.

By the end of February 2011, eight Japanese experts in total were assigned in the fields of community development, environmental education, etc. There are also four Panamanian assistants for field activities were employed in total.

The provision of equipments by the Project has been US\$ 85,307 on basic instruments for field work and activities of the farmers' groups.

There are eleven project personnel in ANAM have been trained in Japan.

(2) Inputs from the Panamanian Side

The Panamanian government has assigned counterparts. The government also contributed for office facilities and partial cost for the Project's field activities, such as transportation and food. Total cost contributed by the Panamanian government is US\$ 249,327. For details, please refer to the Annex 6.

Nineteen counterparts were assigned to the project on permanent and temporary for management, technical work and administration.

3.2. Achievement of the Project Activities

The Project activities have been implemented according to the PDM and PO. The Project has also developed Annual Plan of Operation (APO) in accordance with the progress and situation of the targeted groups in the field. See the PO and the progress of activities attached (Annex 4).

3.3. Achievement of the Outputs

The achievement of each Output is shown below.

(1) Output 1: Self-active groups are organized by the participatory manners with gender equality.

<Indicators>

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- 1) By the end of the Project, there are at least 14 groups continuously working in the activities promoted by the Project.
- 2) By the end of the Project, at least 40% of members of all the groups, participating actively in the activities of the groups, are women.
- 3) By the end of the Project, all the groups become able to facilitate their monthly meetings by themselves.
- 4) By the end of the Project, all the groups become able to record their income and expenditure and keep their balance report by themselves.

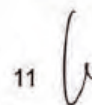
Output 1 has almost been achieved the target as planned.

Fourteen farmers' groups have been conducting group activities such as environment friendly agricultural production, soil conservation, food processing and environmental education with the support from extension service of the Project. Seven of them were newly formed, and others had already existed and strengthened by the Project.

Women are actively involved in the group activities. Among one hundred fifty four group members in total who are reported as active³ participants of the group activities in the fourteen groups, seventy of them (forty five percent) are women. In five groups, however, the rate of women's involvement is lower than the target (forty percent). There is one group composed only of female members. Women are also involved in the decision making of the groups. For example, half of the leaders of the fourteen groups are women, although there is one group where the voice of the female members are still less listened by male members. Gender trainings and self esteem seminars have enhanced the awareness of gender equality among the members.

All the groups are fairly managed through the weekly meeting, and keep their crop production note and accounts by themselves. According to the periodical (every six months) monitoring based on 'Group Maturity Indicators' by the Project, three fourths of the groups has already achieved to the level of self reliance in the group management. Nine of them have already obtained legal status from MIDA or IPACCOOP. The project has also enhanced the development of business plan for the economic incentive of the groups, such as chili source production and eco-tourism. Four groups have already developed their business plan and three others have made their draft version in order to apply for external funding for their

³ The project recognizes members of the group in two categories, 1) members who are registered and permanently participate the activities, and 2) members who are registered as members, but do not participate the activities. The achievement of the Project would only be assessed based on the information collected by the members in the first category.



group activities.

Although the active participants show strong commitment to the activities, reduction of the number of members⁴ is observed in many groups.

(2) Output 2: The group members are skilled in environment friendly production techniques.

<Indicators>

- 1) By the end of the Project, 100% of the groups obtain a satisfactory evaluation for the application of knowledge and techniques on environment friendly production introduced by the Project.
- 2) By the end of the Project, at least 12 "one week seminar" on environment friendly production techniques are executed.

Output 2 has partly been achieved as planned and is foreseen to be achieved in remaining period.

The Project provided one-week training on environment friendly production techniques twelve times. Various skills related to environment friendly production, such as environment education, agro-forestry, soil conservation, recycle handicraft and food processing were trained in the training. Topics on group management, such as gender awareness, leader training and facilitation, were also covered. One day seminars and workshops were also provided. The project has enhanced peer training for the information sharing among members, where two participants each were selected as participants of each training and the participants had responsibility to share the knowledge and information to other members in each group. Periodical advices from extension workers have also been key component of the technical transfer to the farmers in the Project.

Through these various training opportunities, forty types of environmental friendly production techniques were introduced. Techniques have been integrated in accordance with the condition of each farm. So far, thirty eight types of the techniques have been used in the groups' farms and individual farms of the members (Annex 7). Among the techniques introduced by the Project and utilized in the group farms, eighty six percent of them have been reached to the expected level of skill's acquisition⁵,

⁴ Currently, there are eleven members in a group in average. The biggest group has twenty five members and the smallest is composed of only five members.

⁵ The expected level means that the farmer is able to utilize the techniques and transfer them to others.

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according to the monitoring indicators developed by the Project. Twelve groups are assessed to have over two thirds of the members who have attained the expected level of the skill's acquisition. Remaining two groups are assessed not to have reached to the expected level.

Members report that these techniques have increased the productivity in limited areas in environmental friendly methods.

(3) Output 3: Farmland-use plans (PUF) that contribute to the territorial ordering of the watershed and the conservation of the Chagres National Park are elaborated and in process of implementation by the members of the groups.

<Indicators>

- 1) By the end of the Project, 100 % of the groups have their group farmland use plans in agreement with the institutional policies.
- 2) At the end of the Project, 100% of the groups implement the activities annually according to the farmland use plans.
- 3) By the end of the Project, at least 80% of the members of all the groups, who have private farmlands, have their individual farmland use plans in agreement with the institutional policies.
- 4) At the end of the Project, at least 60% of the members of all the groups, who have private farmlands, initiate activities according to the farmland use plans.

Output 3 has partly been achieved as planned and is foreseen to be achieved in remaining period.

Workshops to develop PUF of group farms' were held in each group. Trainings and technical advices on the skills required for the elaboration, such as usage of GPS (Global Positioning System) were also provided. Currently all the fourteen groups have maintained each PUF and applied to their group activities. Eighty one among one hundred thirty three (about sixty percent) members who own⁶ individual farms have developed their own PUF. Three groups have just started and three others have not started the activities for the elaboration of private land's PUF. By the end of the project, all the members' private farmland would be covered.

The Project has developed the outline of PUF in accordance with the related policies. The PUF developed by the Project is foreseen to be accepted as the farm management plan required for farmers in the Chagres National Park. The process of applying for PUF approval

⁶ Many households do not have land title in reality. However the term 'own' is used for convenience of discussion.

in the Park is still under discussion in ANAM. As soon as the procedure is fixed, the Project will support the groups and members for the application. Members who have developed their individual PUF have started utilizing them to their production.

Members of the groups think that the PUF is helpful and useful for organising their activities.

Although the role of the extension workers is crucial in the production and usage of PUF by group members, the Project was not able to keep them adequately updated about the related policies and regulations.

(4) Output 4: The forest coverage for the soil restoration in critical areas and important areas in common interest of group members and related authorities, are increased by the members of the groups.

<Indicator>

- 1) At the end of the Project, the group members have planted at least 2.0 hectares in critical areas and important areas.

Output 4 has been achieved as planned.

In total 2.1 hectares in critical areas in the targeted communities was planted. The Project also enhanced members to afforest in non critical areas (1.4 hectares). Other community people not belonging to the groups are also involved in these activities in relation with the environmental education (Output 6). There are also five communities where there is no land for planting in the critical area. The negative feeling of group members' to tree planting caused in the past experience⁷ has created difficulty for the Project to enhance afforestation in the area. Because of these backgrounds, there is one group which has not conducted any activities related to this Output.

(5) Output 5: Extension service in line with the needs of group members and the related policies is provided by extension members.

<Indicators>

- 1) By halfway through the Project, the first version of the Extension Guideline is prepared.
- 2) At the end of the Project, the second version of the Extension Guideline is prepared.

⁷ In the past there were cases in which local people contributed their labor to afforestation. However they were deprived of the access rights to the forest products.



- 3) All the extension members understand the related policies and provided knowledge and techniques in line with the related policies and the Extension Guideline to support group members.
- 4) At the end of the Project, 90% of the members of all the groups are satisfied with the extension service.
- 5) By the end of the Project, the extension system is established and functioning.

Output 5 has almost been achieved as planned.

Based on the experiences of the implementation of the Project activities, the Project has developed the first version of the Extension Guideline. After series of discussion and amendment among the Project team, two hundreds of copies of the first version was printed out and distributed to the Project staff and other department in ANAM in June 2009. The guideline contains the implementation process of extension services in the community level. It has been under revision and is to be finalized as a second version by the end of the Project.

Extension workers visit farmers' groups four days a week. About once a week or two weeks, groups receive the extension services. There are two teams providing extension services in the Project, participatory development and technical department. Participatory development team mainly works for the formation and management of groups, including gender, and environmental education. The technical team works on the technical transfer of environment friendly production techniques. Extension workers from the two teams have started coordination and worked together according to the recommendation in mid-term review. According to the monitoring conducted by the Project, about seventy six percent of the targeted beneficiaries have satisfied with the services and about seventeen percent feels fine with them. However, as referred to in Output 3, the Project was not able to keep the extension workers adequately updated about the related policies and regulations.

The mid-term evaluation team recommended that the concept of extension system to be established by the Project needs to be discussed and have consensus among the stakeholders. However, follow up discussion to this recommendation was not sufficiently conducted in the Project, as a result a consensus was not clearly made on this issue.

The Project has already established an extension procedure based on the experiences in two JICA assisted projects, PROCCAPA and Alhajuela project, which has been applied as the Project's extension system. This system has been reflected in the

Extension Guideline and utilized by the extension workers.

Although the Extension Guideline has been approved and distributed to the ANAM staff, discussions about how to utilize the procedures developed by the Project in ANAM as an organization have not been fully taken place⁸.

(6) Output 6: The community members are conscious of the importance of the appropriate use of natural resources and environmental conservation in the Project area.

<Indicators>

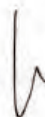
- 1) By halfway through the Project, there are materials which can be utilized for sensitizing local people on the importance of the use of natural resources and the environmental conservation in the Project area.
- 2) 80% of the participants in the environmental education activities are conscious of the importance of the use of natural resources and the environmental conservation in the Project area.

The Output 6 is almost achieved as planned.

Environmental education was provided to the farmers' group members through one-week training, seminar and workshops. The Project also approached to the community people, such as students at schools. In the latter half of the project period, these approaches to the communities were facilitated by the group members. According to the questionnaire conducted to the participants by the Project, seventy five percent of them answered that they increased their awareness of importance of environment conservation. Changes of the attitude of group members, such as reduction of slash and burn cultivation have also been observed.

The Project collected thirty two materials for environmental education for adults developed by other organization and utilized some of them. It developed three materials, 'Leaflet "Let's Keep Our Boquerón River Clean" (2007)', 'Environmental Lecture No.1 "Degraded Watershed and Conserved Watershed" (2009)' and 'Environmental Lecture No.2 "Organic Farming and Traditional Farming" (2010)'. It also collected fifty four kinds of materials for sensitization of environment conservation for students.

⁸ ANAM does not have a permanent office in charge of extension and the extension procedures and methodologies are decided in each project.



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3.4. Achievement of the Project Purpose

Project Purpose: Sustainable production techniques implemented using environment friendly and participatory methods are practiced by the established group members through extension system of ANAM.

<Indicators>

- 1) The members of the groups use, as a whole, at least 75% of the environment friendly techniques promoted through the extension system of ANAM.
- 2) At the end of the Project, 80% of the groups have an action plan for coming 3 to 5 years that incorporates environment friendly techniques.

The Project purpose has almost been achieved as planned.

Through various training opportunities, including extension services, forty types of environmental friendly production techniques were introduced and demonstrated in group farms. So far, thirty eight types of the techniques have been used in the groups' farms and/or individual farms of the members.

All the fourteen groups have elaborated their three to five year action plans for their group activities, which include a future vision, basic information, PUF and strategies for strengthening the group resources, network creation and training. They have been applying these plans to their group activities. Furthermore, over eighty percent of the member who own individual farms would develop their individual PUF by the end of the project.

All the Outputs will be achieved in remaining period.

3.5. Prospects of the achievement of the Overall Goal

Overall Goal: The environment friendly and sustainable production is practiced in middle and lower watershed of Alhajuela Lake.

<Indicator>

- 1) The numbers of the community members practicing at least two techniques promoted by the project is increased more than two times from the time of the project termination.
- 2) By 2014, the number of community members who practice farming activities according to PUF or 'farmland management plan' reaches at least one hundred in the Chagres National Park.

Prospect for achieving the Overall goal is good provided that dissemination effort will be continued based on the exit strategy produced by ANAM.

3.6. Assessment of Implementation Processes

The Project activities have been implemented without any big problems.

The PDM was revised twice in order to meet the situation in the field. The Project activities were monitored weekly, monthly, semiannually and annually. Monitoring indicators for group activities have been developed and utilized in the Project. However, there wasn't sufficient attention paid to regular checking, analysis and compilation of collected information on group activities and feedback to the implementation process. These could have been reflected to strategies for the achievement of overall goal.

Regarding inputs, the timing and amount of input is implemented without any big problem. Nine of nineteen counterparts in total have continuously worked for JICA projects since the PROCCAPA project started in 2000. Their deep understanding to the approaches and techniques enhanced implementation of the project.

There was a slight problem in communication between Panamanian counterparts and Japanese experts. Decision making based on better communication between the two sides could have resulted in better implementation of inputs and activities.

There are several donors and organization working in the target area of the Project, such as USAID and MIDA. Information sharing and coordination was conducted through JCC and CICH. Effort by the Project for establishment of the relationship and information sharing both in the Project area and at the central level seems to be limited to a certain degree.

Heavy rain in dry season in December 2010 damaged the facilities and group farms of some groups, which may cause delay of implementation of project activities.

4. Evaluation Result

4.1. Evaluation by Five Evaluation Criteria

(1) Relevance

The Team concluded that the Project was relevant.

The Project target area, middle and lower watershed of Alhajuella lake, is located in the Chagres National Park and the buffer zone, and recognized for its biological, hydrological and socio-economical importance in Panama. The Panamanian government focused on the protection of these area based on its Constitution, General Environmental Law (1998), etc. It has been high needs for ANAM to enhance the watershed management and environmental conservation in accordance with the newly developed plan 'Chagres National Park

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Management Plan' and other related policies through extension services to the people living in the area. JICA also considers environment conservation and rural poverty reduction as important cooperation issues in Panama.

The selection of the target area was relevant in terms of needs for environment conservation and watershed management, and for livelihood/production improvement of the people in the area.

Approaches adopted by the Project are based on the experiences of PROCCAPA. Given different socio-economic context of the target areas the Project's application of these approaches was not sufficiently flexible.

(2) Effectiveness

The team judges the effectiveness of the Project implementation is fairly high.

All the six Outputs have mostly been achieved through the Project activities. (Refer to 3.3 for detail). Based on the achievement of these Outputs, the Project purpose is to be achieved by the end of the Project period. Activities related to individual farms of the members have not been completed in some groups yet. Activities in the individual farms are planned to increase the number of adoption of the techniques introduced by the Project.

The Project has been designed to achieve the purpose through a synergy effect of the Outputs. For example, formation/strengthening farmers' groups (Output 1) enabled the Project to implement technical transfer and implementation of the environmental friendly agricultural techniques to the farmers (Output 2). Environmental education (Output 6) enhanced the farmers to adopt the techniques through the awareness of the importance of environment. Development of PUF (Output 3) has helped farmers to manage the groups (Output 1) and implement and maintain the knowledge and techniques acquired (Output 2). Implementation and monitoring of these activities through extension services has contributed to the establishment of extension system and development the guideline (Output 5). Training on gender and self-esteem and approaches and attitudes of extension workers to raise awareness of gender equality (a part of the Output 2 and 5) enhanced women's participation (Output 1). However the Output 4 could have been integrated in Output 2 and 3 in order to implement the Project more systematically.

Group approach enabled small farmers who have limited capacity to invest, to access to new equipment and techniques to ensure their livelihood better through participating in the Project.

Unexpected heavy rain in its dry season, December 2010, may cause some delay to the implementation because of the necessity of restoration of infrastructures damaged in some communities (groups). Other external factor which affect crucially to the Project has not been found.

However, the number of beneficiaries is relatively small at the end of the Project, which influenced its effectiveness.

(3) Efficiency

The Team judges that the efficiency of the Project implementation is relatively high.

Activities have been implemented as is planned to a certain extent. However, some activities have not been planned regardless of the necessity. For example, the opportunities for learning and updating knowledge about the policies and regulations were not sufficient. Other training opportunities, including field visits, about other communities in other regions or other countries, was limited to enhance the quality of the techniques and the motivation of the counterparts, although many of them have already received various training in PROCCAPA project. Activities to enhance the dissemination of the Project approaches which are to be planned related to Output 5 have not been fully conducted. Activities to secure the handover the Project activities to Chagres National Park are to be required during the Project period left.

The number of the beneficiaries is relatively small in relation to the amount of the input provided by the Project.

(4) Impacts

Following impacts are found through the evaluation study by the Team.

<Positive Impact>

Impacts to the awareness of importance and necessity of environment are observed by the extension workers. For example, the slash and burn cultivation is reduced in the target area. Participants of environmental education have felt that the community, especially the children, has started understanding the importance of protection of environment.

The participatory approaches through organizing community groups and environmental friendly techniques introduced has been approved the effectiveness and adopted by related organizations. For example, ACP adopted the participatory approaches and some

techniques in their program 'Program for Environmental Economic Incentives (PIEA)'. The 'Investment Program for Restoration of Watersheds in Panama' to be implemented by ANAM in other three watersheds will apply some components of the Extension Guideline developed by the Project.

The Project has developed the outline of PUF in accordance with the related policies. The PUF developed by the Project is foreseen to be accepted as the farm management plan required for farmers in the Chagres National Park.

The Project has started providing support to existing organization, such as three schools in remote communities that face serious difficulty in environmental conservation.

Through group activities, relationship and mutual understanding among the group members are strengthened. The various opportunities for working together with other groups, such as participation and training/seminar, field visits and labor exchange, also encouraged cooperation over communities in the area.

Mutual understanding among the participants and a positive change in attitudes is found. Because of the gender awareness activities through the Project, group members changing their attitudes and both women and men participated in activities promoted by the Project. For example, men cook for members and women work in farms. It also enhanced mutual understanding between female and male members, and sometimes between wife and husband in household.

Members have acquired skills to present their group activities and show their plans for business and future activities.

Fresh vegetables and other products became available for people in target communities to purchase from the group farm.

Group formation through the Project has provided a foundation for attracting resources from other donors.

There are cases of adoption of the techniques by other community people. This can be a good linkage to the achievement of the Overall goal of the Project.

The Project has also started its support to three communities by targeting schools without making any group apart from the target communities.

<Negative Impact>

Some groups had not settled the internal conflicts caused by the land-use right among the members. The activities in the Project have resurfaced some conflicts and affected the relationship between the current members and other members.

(5) Sustainability

The Team considers that the sustainability of outcomes from the Project will be ensured by implementation of the exit strategy.

Farmers' groups supported by the Project have improved their capacity to maintain the group's management and continue the group activities on their own. However, some of them have not matured enough to be managed by themselves and still need extension support. It will also be required to conduct periodical follow up and monitoring to their activity in order to provide technical support and monitor the maintenance of the materials provided by the Project. In order to enhance the watershed management and environmental friendly production techniques in the target area, dissemination of the approaches developed by the Project to non participants of the Project is also required.

Groups are also expected to receive supports from other organization because of the maturity of its organization. The activities to produce benefit to the participants may affect the sustainability of each group, because the lack of economic incentives affects the motivation of the members'.

The watershed management and environmental conservation of Panama will continuously be implemented by ANAM. The counterparts in ANAM have already improved the skills through the Project and have high capacity to conduct the follow up of the Project activities through the two projects, the Alhajuela Project and PROCCAPA in ten years. However, support to the community people through extension services is only provided in each project by ANAM. Therefore the majority of the counterparts are considered to be assigned to other Project or position in the head quarter. There is one extension worker who belongs to Chagres National Park. Follow up to the communities supported by the Project can be conducted by community development workers inside the Chagres National Park. Therefore, the follow up and dissemination activities in the area, including the buffer zone, could be conducted by the Park. However the capacity of the Park, including human and financial resources, means of transport for monitoring (vehicle and boat) and other materials, is limited to conduct the responsibility.

Dissemination in other watersheds also secures the sustainability of the approaches and techniques. Seminars to disseminate the finalized version of the Extension Guideline are planned. Donors and other organization which has potential to adopt them are also to be invited. Through the extension workers and staff of the Project who are to be assigned to other project or office, the approaches may also be disseminated.

Institutional set up and legal frame work to secure the sustainability of the approaches and techniques has some limitations.

4.2. Conclusion

The Team concludes that the Project purpose is to be achieved by the end of the Project. The Outputs have almost been achieved and some activities left will be completed in the remaining period.

The Project succeeded in formation of groups. The group organization became a basis for small farmers to acquire and experiment new environment friendly techniques for sustainable farming, which is pre-requisite for watershed management. These techniques are appreciated by these farmers as useful means of securing their livelihood. The Project also raised their awareness of environment conservation.

Through the Project, fourteen PUF for group farms have been developed and by the end of the project over one hundred PUF for individual farms are expected to be produced. Assistance in production of PUF by the Project is valuable contribution for ANAM to promote the approval process of farm land-use by farmers, which is essential for better watershed management, including Chagres National Park. The coverage of the development of PUF in the target area will be increased within three years by the follow up activities by ANAM.

Extension procedures were developed and compiled into a guideline by the Project. Simultaneously the capacity of the counterpart in ANAM was enhanced through the Project. The guideline and the experienced counterparts are assets for ANAM to continue and disseminate the extension service in the target area and beyond.

For ensuring sustainability of the outcomes from the Project and expanding the outcomes and approaches of the Project, strategic approaches need to be developed for remaining period and after the termination of the Project. The strategy will also produce the expected achievement of the Overall Goal.

5. Recommendations and Lessons Learned

5.1. Recommendations

The Team recommends the following.

(1) Expansion of extension service in the Project area

<During the Project period>

The Project should

- Collect and provide information to the formed groups about possible funding sources and extension service providers for sustaining their members' activities.
- Develop monitoring plan based on the analysis of the group in terms their organizational maturity, and carry out monitoring according to the plan.
- Ensure the completion of the development of individual PUF of the group members.

<During and post-project period>

The Project and ANAM should

- Develop and implement a strategy to increase the number of members in the existing groups and of beneficiaries outside the formed groups.

(2) Dissemination of extension procedures

<During the Project period>

The Project should

- Draw lessons learned by categorizing and analyzing experiences of fourteen groups. Categorization could be made by location of community, main means of livelihood, property rights, and history and characteristic of organization. (Comparison could be made with the experience of PROCCAPA as well.) Lessons could be incorporated into the Extension Guideline in the part of annex.
- Invite a wide range of audience including MIDA, ACP and other relevant agencies working in the region to the dissemination workshops/seminars for the Extension Guideline in order to share the information and strengthen the network for the future collaboration.
- Share the lessons learned from the Project in the final seminar with relevant agencies.
- Invite relevant organizations, such as MIDA, Natura Foundation, ACP, etc, for monitoring activities to enhance the future collaboration, particularly for effective utilization of PUF.

<During the Project period>

ANAM should

- Review and approve the Extension Guideline prepared by the Project by April to

enable the dissemination seminar to be held before the end of the Project.

<During and post-project period>

ANAM should

- Make effort for widely using the Extension Guideline at the training center of ANAM.
- Try to institutionalize the implementation of the Extension Guideline.
- Share the progress of dissemination of the extension procedure in CICH meeting and invite JICA at least once a year.

(3) Farmland-use Plan (PUF)

<During the Project period>

ANAM should

- Give respond as soon as possible to existing application for farm land use in Chagres National Park.
- Establish general procedures for approving applications for land use in Chagres National Park.
- Establish as soon as possible legal mechanism for unifying PUF produced by the Project with 'management plan' which is the official document required for applying for land-use in the Chagres National Park.

<During and post-project period>

ANAM should

- Provide technical assistance in developing the Plan to farmers without PUF in the Chagres National Park and those belonging to the groups established by the Project in the buffer zone
- Continue to collaborate with other institutions, such as MIDA and NGOs to promote elaboration of PUF as an effective tool for watershed management in the buffer zone.
- Continue and strengthen coordination with ACP for PIEA to be extended into the Chagres National Park.

(4) Mechanism of extension of ANAM

<During the Project>

ANAM should

- Clarify the responsibility of the extension services in the buffer zone between the regional office and the Chagres National Park.
- Make arrangement for the Chagres National Park Management Office to have access to equipments and materials provided by the Project including vehicle and boats for extension and monitoring activities.
- Have transfer period of the tasks and taken by the Project to the Chagres National Park

Management Office during the Project period.

- Allocate additional personnel (ideally from the Project counterparts) to the Chagres National Park Management Office for its taking over the Project.

<During and post-project period>

ANAM should

- Assign personnel for the dissemination of the extension procedures developed by the Project beyond the Project area. (Ideally those who are assigned to the Project as counterparts and/or employed by the Project as its assistants).

(5) Feedback of the Project experience into policy and plans

<During and post-project period>

ANAM should

- Make greater effort to promote integration of the Project experiences in the formation and modification of watershed management policies and plans of other institutions, particularly ACP.

(6) Development and implementation of 'exit strategy'

<During and post-project period>

Considering the recommendations presented above, ANAM should develop an 'exit strategy' which specifies concrete steps to take over and follow up the Project, ensuring sustainability and diffusion of its outcomes after JICA terminates its assistance.

5.2. Lessons Learned

(1) Project design

- Selection of target population and strategy: Although there was certainly a need for better watershed management in the Project area, sole focus on small farmers seems to have limited the impact on environmental conservation. It is because the number of such farmers is relatively small in the Project area and there are other groups whose conducts have adverse effects on environment at a larger scale (e.g. cattle raising farmers). For future projects, careful consideration in selection of target populations and strategies in designing the project is necessary.
- Sustainable extension service provision: Since ANAM does not have a permanent bureau in charge or an established system for extension services, there is a slight concern about future dissemination of the Project approach. When the implementing entity shares the extension responsibilities, the project should, under such conditions, mobilize other organizations with extension activities through agreements to work

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together from the beginning.

- Linkage between macro and mezzo, micro levels: The Project was designed to enhance capacity mainly at micro and mezzo levels (Project area). However, there are certain institutional set-ups including legal, organizational, policy and administrative frameworks which are required to support and sustain activities initiated by the Project. A component or approach to link up activities at micro and mezzo levels with macro level policies and institutions should be incorporated in the design of future project.

(2) Project Approach

- Utilization of asset accumulated in the past: The Panamanian side made use of human resources and organizations strengthened through past projects in implementing this Project. This has facilitated effective implementation and accomplishment in the Project. Future projects should make best use of assets built on in past similar projects.
- Adoption of approaches from past experiences: Many techniques and approaches including group approach experimented in PROCCAPA were adopted with some modifications in the Project. When applying an approach developed by a project carried out in the past, a future project should pay special attention to difference in socio-economic situation and make necessary alteration in the approach to suit to the context of a new project area.
- Effectiveness of group approach: The project is based on group approach. This approach was effective particularly for small farmers who have limited capacity to invest in equipment and new technology on an individual basis. On the other hand, group approach was not very familiar for population in the Project area who practice farming on individual family basis. As a result, the number of beneficiaries did not increase substantially through the group approach. It is important for a future project to comprehend patterns of collective actions of local people and to determine most appropriate approach(es) to fit them.
- Integration of bottom-up and top-down approaches: Bottom-up approach which was tried out under the Project is essential but not sufficient for ensuring desirable outcome to be produced in terms of environmental conservation. As already pointed out, macro-level policy and institutional set-up is important. Adequate legal and policy frameworks are necessary to control misconduct of local people and a system needs to be established for provision of incentives for farmers who are service providers for environmental conservation (Payment for Environmental Service: PES). Future activities should pay attention to how to integrate bottom-up approach and top-down approach.



(3) Monitoring and Evaluation

- Collection and utilization of baseline data for analysis: The Project has regularly monitored progress of activities in each group. However, in order to grasp its impact, the Project should have collected baseline data on income/consumption level of group members at individual and household levels. Future projects should ensure that baseline data collection is integrated in their activities so that project can analyze changes in socio-economic situation before, during and after project intervention.

(4) Group activities

- Norm creation and clarification in group formation: Some groups face difficulty in managing members and land due to different interpretation of group regulations among people. It is essential that all members have clear and common understanding of regulations to follow when they join or leave groups.
- Experience sharing between groups: Experience sharing through field visits enhances members' motivation and understanding for projects.
- Gender training and self-esteem training: These two types of training held at the early stage of group formation were effective to enhance women's participation and induce equal contribution from both women and men.
- Provision of incentives: Provision of economic incentives for the members, including business plan secures the sustainability of group activity.

(5) Others

- Although one-week training was effective, the length prevents some farmers, especially women, to participate because of the difficulty of leaving houses in such a long period. For conducting training, appropriateness of timing and duration should be well considered.
- Cooperation between the social development and technical department in the Project, which was recommended in the mid-term review was found to be effective. For future activities integration of these two components should be considered.

資料 17 収集資料一覧

番号	資料の名称	発行機関	形態	種類				取扱区分	図書館 記入欄
				収集 資料	専門家 成資料	JICA 作 成資料	テキ スト		
1-1	Manual de AGROFORESTERÍA	ANAM / CEMARE / JICA	図書					JR・CR()・SC	
1-2	Manual de VIVEROS FORESTALES	ANAM / CEMARE / JICA	図書					JR・CR()・SC	
1-3	Manual de PLANTACIONES FORESTALES	ANAM / CEMARE / JICA	図書					JR・CR()・SC	
1-4	Manual de MANEJO DE BOSQUES NATURALES	ANAM / CEMARE / JICA	図書					JR・CR()・SC	
1-5	ÁRBOLES DE INTERÉS FORESTAL EN PANAMÁ	ANAM / CEMARE / JICA	図書					JR・CR()・SC	
1-6	MANUAL DE CAMPO EN SILVICULTURA Y AGROFORESTERÍA	ANAM / PROCCAPA / JICA	図書					JR・CR()・SC	
1-7	AGRICULTURA ORGÁNICA	ANAM / PROCCAPA / JICA	小冊子					JR・CR()・SC	
1-8	ARROZ EN FANGUEO	ANAM / PROCCAPA / JICA	小冊子					JR・CR()・SC	
1-9	MANEJO DE FRUTALES	ANAM / PROCCAPA / JICA	小冊子					JR・CR()・SC	
1-10	PRODUCCIÓN DE CARBÓN Y VINAGRE DE CARBÓN	ANAM / PROCCAPA / JICA	小冊子					JR・CR()・SC	
1-11	MANUAL DE CONSERVACIÓN DE SUELOS Y AGUAS	ANAM / CEDESAM	図書					JR・CR()・SC	
1-12	PROCESO de Extensión de Técnicas Apropriadas para Pequeños Productores	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-13	Abonos Orgánicos	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-14	Conservación de Semillas	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-15	Conservación de Suelos	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-16	Insecticidas Orgánicos	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-17	Bomba ariete	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-18	Plantas Medicinales	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-19	Ricipiscultura	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-20	Rotación de Pollos Asociado con Cultivos	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-21	Tracción Animal	INA / PROCESO / JICA	図書					JR・CR()・SC	
1-22	Abono humus	INA / PROCESO / JICA	リーフレット					JR・CR()・SC	
1-23	Cria de Conejos	INA / PROCESO / JICA	リーフレット					JR・CR()・SC	
1-24	Tracción animal	INA / PROCESO / JICA	リーフレット					JR・CR()・SC	
1-25	La Bomba Ariete	INA / PROCESO / JICA	リーフレット					JR・CR()・SC	
1-26	Ricipiscultura	INA / PROCESO / JICA	リーフレット					JR・CR()・SC	
1-27	Establecimiento de lineamientos técnicos, sociales y	CATIE / DES-EX / NATURA	図書					JR・CR()・SC	

1-45	PISCICULTURA	UNA (Paraguay) Proyecto J-Green / MAG / UNA (Paraguay)	小冊子						JR · CR() · SC
1-46	ALMACENAMIENTO DE GRANOS	Proyecto J-Green / MAG / UNA (Paraguay)	小冊子						JR · CR() · SC
1-47	ALIMENTACIÓN Y SANITACIÓN DE AVES Y CERDOS	Proyecto J-Green / MAG / UNA (Paraguay)	小冊子						JR · CR() · SC
1-48	CULTIVO DE HORTALIZAS DE HOJAS	Proyecto J-Green / MAG / UNA (Paraguay)	小冊子						JR · CR() · SC
1-49	CARTILLA 2 PLAN DE MANEJO FORESTAL Cuidados de los árboles	Proyecto J-Green / MAG / UNA (Paraguay)	小冊子						JR · CR() · SC
1-50	Manual de Reforestación Cuenca Hidrográfica del Canal de Panamá Volumen 1	ACP (Unidad de Sensores Remotos)	小冊子						JR · CR() · SC
1-51	Manual de Reforestación: Especies Maderables Tradicionales Cuenca Hidrográfica del Canal de Panamá Volumen 2	ACP (Unidad de Sensores Remotos)	小冊子						JR · CR() · SC
1-52	Manual de Reforestación: Especies Maderables No Tradicionales Cuenca Hidrográfica del Canal de Panamá Volumen 3	ACP (Unidad de Sensores Remotos)	小冊子						JR · CR() · SC
1-53	Iguana Verde (Iguana iguana) GUÍA DE PROCEDIMIENTOS PARA INSTALAR ZOOCRIADEROS	GOBIERNO NACIONAL / ANAM	小冊子						JR · CR() · SC
1-54	Conejo Pintado (Agouti paca) GUÍA DE PROCEDIMIENTOS PARA INSTALAR ZOOCRIADEROS	GOBIERNO NACIONAL / ANAM	小冊子						JR · CR() · SC
1-55	PRODUZCA LAS MEJORES SEMILLAS ORGÁNICAS PARA SU FINCA	AECI	圖書						JR · CR() · SC
1-56	El Injerto Para el Manejo de Frutales	ANAM / PNCh	小冊子						JR · CR() · SC
1-57	Guía del Manejo Integrado de Plagas (MIP) para técnicos y productores Versión 1	MINSA / MIDA / MEDUCA / JICA	圖書						JR · CR() · SC
1-58	Proyecto Silvopastoril Subcuenca del Río Gatuncillo Propuesta Perfil Técnico	USAID / ARD / GEMAS	電子媒体						JR · CR() · SC
2-1	PLANIFICACIÓN AGRÍCOLA ECONÓMICA A NIVEL DE FINCA	MEDA (Bolivia)	圖書						JR · CR() · SC
2-2	Manual de Fincas Diversificadas	PROESA (El Salvador)	電子媒体						JR · CR() · SC
2-3	10 Lecciones Aprendidas en el Manejo Integrado de las Subcuencas de los Ríos Los Hules-Tinajones y	CICH / USAID / ACP	電子媒体						JR · CR() · SC

4-10	Ley No. 18, del 10 de abril de 2002: que declara el Águila Harpía como ave nacional.	Society ACP	ポスター					JR・CR()・SC
4-11	Corredores y corregidoras por un ambiente sano en sus corregimientos	ANAM / USAID	小冊子					JR・CR()・SC
4-12	DELITOS CONTRA EL AMBIENTE Y EL ORDENAMIENTO TERRITORIAL / TEXTO ÚNICO CÓDIGO PENAL DE LA REPÚBLICA DE PANAMÁ / Adoptado por la Ley 14 de 2007, con las modificaciones y adiciones introducidas por la Ley 26 de 2008 / TITULO XIII	GOBIERNO NACIONAL / ANAM	小冊子					
4-13	Documentales Conservación para el desarrollo sostenible (DVD)	ANAM	DVD					JR・CR()・SC
4-14	Canal de Panamá (DVD)	ACP	DVD					JR・CR()・SC
4-15	Guía de Visitantes Parque Nacional Chagres	ANAM	リーフレット					JR・CR()・SC
4-16	CHARLA AMBIENTAL MATERIAL No1 CUENCA CONSERVADA Y CUENCA DEGRADADA	GOBIERNO NACIONAL / Proyecto Alhajuela / ANAM / JICA	紙芝居					JR・CR()・SC
4-17	EL AGUA Si queremos tenerla, debemos cuidarla	ANAM	リーフレット					JR・CR()・SC
4-18	MISIÓN # 1 Calidad de Agua	ANAM/ACP / MEDUCA	ポスター					JR・CR()・SC
4-19	Día Mundial del Árbol	ANAM	リーフレット					JR・CR()・SC
4-20	Ciudad del Árbol	ACP/ Universidad de Panamá	小冊子					JR・CR()・SC
4-21	SEMILLAS DE CONOCIMIENTO	GOBIERNO NACIONAL / ANAM	紙					JR・CR()・SC
4-22	INVENTARIO E IDENTIFICACIÓN DE ÁRBOLES Y ARBUSTOS DEL PARQUE RECREATIVO OMAR	GOBIERNO NACIONAL / ANAM	小冊子					JR・CR()・SC
4-23	Consejos Útiles para Cuidar el Ambiente desde el Hogar	ANAM	リーフレット					JR・CR()・SC
4-24	Guía de Reciclaje de residuos sólidos domiciliarios	ANAM	小冊子					JR・CR()・SC
4-25	El Reciclaje	ANAM	リーフレット					JR・CR()・SC
4-26	El Deseño, un Tema Candente	ANAM / PNUJMA	ポスター					JR・CR()・SC
4-27	CHARLA AMBIENTAL MATERIAL No2 PRODUCCIÓN ORGÁNICA Y AGRICULTURA CONVENCIONAL	GOBIERNO NACIONAL / Proyecto Alhajuela / ANAM / JICA	紙芝居					JR・CR()・SC
4-28	Águila Harpía Ave Nacional de Panamá	ANAM	リーフレット					JR・CR()・SC

4-29	Primer Audiovisual de un Águila Harpía en su Habitat Natural (DVD)	ANAM / NHK - Japón	DVD					JR · CR() · SC	
4-30	Conoce tus derechos y deberes con el ambiente	ANAM/ USAID	ポスター					JR · CR() · SC	
4-31	¿Cómo presentar una denuncia ambiental?	ANAM / USAID	リーフレット					JR · CR() · SC	
4-32	Delitos contra el Ambiente	ANAM/ PGN	小冊子					JR · CR() · SC	
4-33	Programa de Voluntarios y Voluntarias Ambientales	ANAM	リーフレット					JR · CR() · SC	
4-34	Espacios de Participación Ciudadana	ANAM	リーフレット					JR · CR() · SC	
5-1	Guía Didáctica de Educación Ambiental:Nivel de Educación Inicial	MEDUCA / ANAM	図書					JR · CR() · SC	
5-2	Guía Didáctica de Educación Ambiental:Primer Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-3	Guía Didáctica de Educación Ambiental:Segundo Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-4	Guía Didáctica de Educación Ambiental:Tercer Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-5	Guía Didáctica de Educación Ambiental:Cuarto Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-6	Guía Didáctica de Educación Ambiental:Quinto Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-7	Guía Didáctica de Educación Ambiental:Sexto Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-8	Guía Didáctica de Educación Ambiental:Marina	MEDUCA / ANAM	図書					JR · CR() · SC	
5-9	Manual de Alternativas Pedagógicas	MEDUCA/ ACP / ANAM	小冊子					JR · CR() · SC	
5-10	Manual Didáctico – Pedagógico para la Educación Ambiental en la Cuenca del Canal	MEDUCA / ACP	図書					JR · CR() · SC	
5-11	Guía Didáctica de Educación Ambiental:Nivel de Educación Inicial	MEDUCA / ANAM	図書					JR · CR() · SC	
5-12	Guía Didáctica de Educación Ambiental:Primer Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-13	Guía Didáctica de Educación Ambiental:Segundo Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-14	Guía Didáctica de Educación Ambiental:Tercer Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-15	Guía Didáctica de Educación Ambiental:Cuarto Grado	MEDUCA / ANAM	図書					JR · CR() · SC	
5-16	Guía Didáctica de Educación Ambiental:Quinto	MEDUCA / ANAM	図書					JR · CR() · SC	

5-36	Renace un Bosque	ANAM	小冊子				JR・CR()・SC	
5-37	Convivamos con el Bosque	ACP / MEDUCA	ポスター				JR・CR()・SC	
5-38	Los Agroquímicos son sustancias venenosas jugar con ellos puede ser mortal ¡EVÍTALOS!!	ACP / USAID / CICH	ポスター				JR・CR()・SC	
5-39	Agroquímicos + Salud Trabajemos juntos con los guardianes para cuidar el agua de cuenca del canal	ACP / USAID / CICH	ポスター				JR・CR()・SC	
5-40	Los Agroquímicos afectan la Salud y el Ambiente	ACP / USAID / CICH	ポスター				JR・CR()・SC	
5-41	El Sueño que Cambió una Comunidad	ANAM	小冊子				JR・CR()・SC	
5-42	Globo terráqueo Mágico	ANAM	小冊子				JR・CR()・SC	
5-43	Fichas ambientales: La Basura	MEDUCA / ACP	カード				JR・CR()・SC	
5-44	La basura tiene vida Reduzcamos y Reciclemos Guía de acción ambiental para estudiantes y comunidades	ALCALDIA DE PANAMA / ASEO	小冊子				JR・CR()・SC	
5-45	La Basura: Un problema de todos	USAID / The Nature Conservancy / MEF / ANAM / FUNDACIÓN SMITHSONIAN DE PANAMÁ / AUDUBON / Fundación Natura	リーフレット				JR・CR()・SC	
5-46	EL CAMBIO CLIMÁTICO	ANAM	図書				JR・CR()・SC	
5-47	Biodiversidad	ANAM	小冊子				JR・CR()・SC	
5-48	Los Sapos dicen Túngara	ANAM	小冊子				JR・CR()・SC	
5-49	Guía de la Naturaleza para obtener colores	GOBIERNO NACIONAL / ANAM / MEDUCA	紙				JR・CR()・SC	
5-50	2o CONCURSO DE DIBUJO DEL MES DE LOS RECURSOS NATURALES RENOVABLES Y EL AMBIENTE 2004	PROCCAPA / ANAM / JICA	図書				JR・CR()・SC	
5-51	3er CONCURSO DE DIBUJO DEL MES DE LOS RECURSOS NATURALES RENOVABLES Y EL AMBIENTE 2005	PROCCAPA / ANAM / JICA	図書				JR・CR()・SC	
5-52	4to CONCURSO DE DIBUJO Y CUENTOS AMBIENTALES DEL MES DE LOS RECURSOS NATURALES Y EL AMBIENTE 2006	GOBIERNO NACIONAL / ANAM / JICA	図書				JR・CR()・SC	