Peru

Sierra-Natural Resources Management and Poverty Alleviation Project

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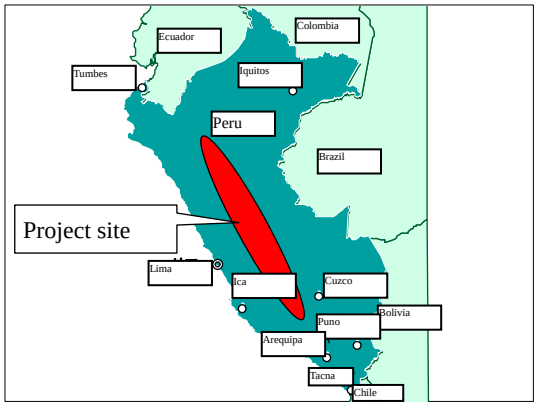
Field Survey: February-March 2006

1. Project Outline and Japan's ODA Loan



Map of project area

Terrace Created by the Project

1.1 Background

Peru's land area (1.29 million km^2) is about 3.4 times that of Japan, about which 6% (7.6 million ha.) is arable land (excluding pasture land). However, only a half of that (about 3.7 million ha.) is actually cultivated, which is less than Japan's 4.69 million ha. (in 2005). Agricultural production is concentrated in the plains region stretching north and south of the pacific coast ("coastal region"). Other regions, which are classified into the mountainous Sierra region and the Amazon region, are characterized by subsistence farming due to lower productivity. About one-third of the working population is engaged in the agricultural sector.

In 1995, about 4.5 million people, comprising 20% of Peru's total population, were classified in "Misery" or "Extreme Poverty"[1]. The second Fujimori administration (1996-2000) proclaimed that poverty reduction was its most important development agenda. Above all, in the Southeast Sierra region, comprising about 30% of the country's territory, about two-thirds of all households are in poverty, of which about half are in extreme poverty. The majority of these people were earning their livelihood through non-intensive farming in steep terrain. In that region, there were several problems; topsoil, which is crucial for agricultural production, run off and forest degradation caused deterioration of forest capability to replenish watersheds. It was increasingly difficult for farmers to continue settled farming. Insufficient natural

[1] "Misery and Extreme Poverty level" here indicates the class belonging to the Misery and Extreme Poverty level based on the poverty map by the Peru Indigenous Institute. The poverty map was produced based on rates of illiteracy, school attendance, sewage diffusion, water supply diffusion, infant mortality, and agricultural employment.

resource management in the region would cause abandonment of farming and migration to cities, requiring prompt development of infrastructure for agricultural production and distribution.

The Peruvian government established the National Project for the Management of Watershed Basins and Soil Conservation (PRONAMACHCS) in 1981. It has been working on rural infrastructure development projects in the rural areas. PRONAMACHCS has been devising projects tailored to each microbasin in the rural areas[2]. Under this plan, the government has been striving to raise productivity by developing rural infrastructure, as well as working to fundamentally alleviate problems of poverty and the environment by enabling sustainable agriculture.

1.2 Objective

The objective was to raise agricultural productivity and conserve soils and forests in 125 microbasins in Peru's Sierra region (altitude over 2,000m) through agricultural infrastructure development such as soil conservation, small-scale irrigation, tree planting, alongside activities such as agricultural instruction. The project was expected to contribute to poverty alleviation and environmental conservation in the region.

1.3 Borrower/Executing Agency

Republic of Peru/National Program for the Management of Watershed Basins and Soil Conservation (PRONAMACHCS), Ministry of Agriculture

1.4 Outline of Loan Agreement

Loan Amount Disbursed Amount	5,677 million yen/2,986 million yen
Exchange of Notes Loan Agreement	September 1997/November 1997
Terms and Conditions - Interest Rate - Repayment Period - Grace Period - Procurement	 2.5% p.a.(Project) 2.1% p.a. (Consultant Service) 25 years 7 years General Untied
Final Disbursement Date	February 2004

[2] A microbasin is a unit for the basin of a stream or branch of a large river. It has almost the same area as a town or village, but does not necessarily coincide with the administrative borders.

Main Contractor(s)	-
Consulting Services	None
Feasibility Study (F/S) etc.	Peru Ministry of Agriculture “Sierra Natural Resources Management and Poverty Alleviation Project Preliminary Study” (1996)

2. Evaluation Result

2.1 Relevance

2.1.1 Relevance at the time of appraisal

Under the first Fujimori administration (1990-1995), the priority tasks were economic stabilization and counter-terrorism. Therefore, to relieve the negative impact of structural adjustment reforms on poor people, the administration adopted a social policy focusing on urgent and direct support to the poor people. The second Fujimori administration (1995-2000) proclaimed that the most important policy agenda was “poverty reduction” that aimed at halving the population in poverty, a 20% of total population, by the year 2000. In the Sierra region, which comprises 30% of the country’s land area, the majority of residents are farmers, two-thirds of which are classified as those in poverty. PRONAMACHCS, which was established in 1981, has been a scheme to alleviate that poverty. This project had relevance, for it was an urgent task to support poverty reduction and conservation of natural resources by implementing subprojects such as participatory planning, rural investments (including soil conservation, irrigation development, and forestation), and training of community members.

2.1.2 Relevance at the time of evaluation

The Toledo administration (2000-) set the fight against poverty as its top priority, with the three objectives of: (1) Employment creation, (2) Access to health, education, and culture, and (3) A nation which serves people. Under that national policy, PRONAMACHCS is continuing to operate under the current administration. It has been advocating sustainable management of natural resources of Sierra basins, improvement of local people’s living standards, and promotion of environmental conservation. The situation has not changed since the appraisal. This project still has relevance, since there is, among farmers, significant demand for subprojects such as rural investment (including soil conservation, irrigation, and forestation), training of communities, and strengthening of PRONAMACHCS by provision of equipment. Also, when combined, these subprojects are expected to produce holistic effects.

2.2 Efficiency

2.2.1 Outputs

Subprojects were formulated with participation of community members, so in accordance with their demand, actual output differs from that at appraisal Also, for subprojects which required sizable amounts of investment, the project ended in smaller scope because of restriction on external debt. In particular, for some of the subprojects requiring large investment per case, such as reservoirs and small dams for small-scale irrigation, a small number of subprojects were commenced. On the contrary, subprojects that could be implemented through mobilization of beneficiaries had been implemented more than planned output.

Table 1. Comparison of Planned and Actual Outputs

Item	Planned	Actual (Percentage achieved)
1) Participatory studies and investment plan formulation		
(a) Microbasin studies	125 cases	0 case (0%)
(b) Participatory studies on current status	1250 cases	822 cases (66%)
2) Rural development investments		
(a) Soil conservation		
Terrace creation	2,290ha.	6,306ha. (275%)
Ridge creation	8,478ha.	24,551ha. (290%)
Rainwater infiltration trenches	13,194ha.	11,736ha. (89%)
(b) Small-scale irrigation facilities		
Aqueducts	865km	404km (47%)
Related facilities	25 cases	18 cases (72%)
Pressure irrigation	25 cases	22 cases (88%)
Reservoirs	320 cases	125 cases (39%)
Multipurpose irrigation systems	130 cases	82 cases (63%)
Small dams	15 cases	5 cases (33%)
(c) Afforestation, forest conservation		
Seedling field creation	510 cases	822 cases (161%)
Seedling production	19.3 million	44 million (228%)
Tree planting	18,200ha.	24,700ha. (136%)
Forest management	5,500ha.	12,800ha. (233%)
(d) Agricultural technical assistance	9,300ha.	10,911ha. (117%)
(e) Warehouse construction	570 cases	521 (91%)
3) Training assistance to cooperatives		
(a) Participatory promotion events	125 cases	10 cases (8%)
(b) Resident meetings	5,310 cases	2,967 cases (56%)
(c) Establishing natural resource committees	125 cases	0 case (0%)
	875 cases	334 cases (38%)
(d) Entrepreneurial development	1,250 cases	298 cases (24%)
(e) Entrepreneurial training for women		
(iv) Material provision to PRONAMACHCS		
(a) Information systems	1 system	1 system
(b) Technical management staff training	113 cases	113 cases
(c) Vehicles & Equipment to PRONAMACHCS	1 set	1 set

2.2.2 Project period

The planned project period was 5 years and 2 months. The actual period, however, was 6 years and 4 months. The main reason of delay was that the government changed its approach for poverty reduction[3] during the project implementation. At one time, consolidation of PRONAMACHCS and the National Fund for Social Compensation and Development[4], a government agency to implement social program was considered, therefore small budget for the implementation of subprojects was allocated to PRONAMACHCS.

2.2.3 Project cost

A principle for subprojects supported by PRONAMACHCS is that PRONAMACHCS provides beneficiaries with construction materials, and beneficiaries conduct construction by themselves. This principle also is applied to this project as well. For this reason, the matching fund of the project includes cost for labor of beneficiaries. Loan disbursement dramatically decreased (by about 50%) but an increase in the cost for labor of beneficiaries compensates this decrease. In the end, the total project costs decreased by about 10% (refer to Table 2). The reason for the decrease in ODA loan disbursement was mainly that the Peruvian government curtailed expenditure under tight fiscal policy, accompanied with restriction on external debt[5]. Expenditure cut to slash fiscal deficit and restriction on external debt were also applied to other projects. The loan extension was granted for infrastructure projects that require sizable scope of work for the incidence of effects. On the contrary, this project, in which each stand-alone subproject would bear result, ended without loan extension, with the loan disbursement below the agreed amount.

Table 2. Comparison of Planned and Actual Project Cost

Planned		Actual	
Loan disbursement:	5,677 million yen	Loan disbursement:	2,986 million yen
Domestic currency portion:	4,815 million yen	Domestic currency portion:	6,548 million yen
Total :	10,492 million yen	Total:	9,534 million yen

Source: PRONAMACHCS

[3] After inauguration of the Toledo administration, a policy was promoted to share the role of reducing poverty with the local governments.
[4] National Fund for Social Compensation and Development (FONCONDES) is an institution established in 1991 for reducing population in poverty. It is working to improve sanitation and economic infrastructure in the Amazon and Sierra regions.
[5] A contractive fiscal policy was introduced by the Toledo administration, and foreign borrowing restrictions were also established.

Fig. 1 Irrigation Aqueduct Inlet

2.3 Effectiveness

2.3.1 Productivity increase

PRONAMACHCS is not collecting data on project results for each microbasin where subprojects are implemented. So for this ex-post evaluation, project results were ascertained through a beneficiary survey. During the field research, a beneficiary survey was conducted for 13 communities in the regions of Ancash, Apurimac, and Cajamarca, which received replies from 246 households. Since multiple subprojects were implemented in some villages, the selection of communities was based on the implementation of a subproject, not on a type of subproject. According to responses to questions about the change in yield and cultivation area between now and ten years ago (before the project began), it is reasonably concluded that yields are generally improving.

Table 3. Land Productivity by Crop (Tons/ha.)

Crop	10 years ago	Current
Corn[6]	1.9	2.0
Potatoes	4.7	5.4
Wheat	1.5	1.5
Lima beans	2.1	2.9
Peas	2.2	3.0

Source: Beneficiaries Survey (13 communities, 246 households)

2.4 Impact

2.4.1 Poverty reduction

In Peru's rural areas, as Tables 4 and 5 indicate, the "Monetary economic basis

[6] Includes purple corn.

poverty rate"[7] is not showing a dramatic decrease, but the "Non-monetary economic basis poverty rate"[8] (which is calculated based on non-income indices), is dramatically decreasing. Sufficiency of basic human needs in poor communities progressed during this decade. Implementation of this project is supporting government policies for poverty reduction.

Table 4. Change in Rural Poverty Rates (Monetary Economic Basis)

	1993	2003
Regional Poverty Rate	72%	73%
Regional Extreme Poverty Rate	54%	43%

Source: FONCODES Annual Report (Memoria 2003)

Table 5. Change in Rural Poverty Rates (Non-Monetary Economic Basis)

	1993	2003
Regional Poverty Rate	90%	66%
Regional Extreme Poverty Rate	57%	24%

Source: FONCODES Annual Report (Memoria 2003)

2.4.2 Income increase

According to results from the beneficiary survey mentioned above (13 communities, 246 households), compared to 225 soles/month average household income before project implementation, average household income increased to 336 soles/month after project implementation. Discounted by the difference between the 1997 and 2004 consumer price, that constitutes a 17% rise[9]. This is a larger increase compared to the 6% rise of per capita GDP from 1997 to 2004. Considering beneficiary household composition (about 4.6 persons), however, per capita household monthly income still does not reach the poverty line (monetary economic basis), even after project implementation.

2.4.3 Living environment improvement

Through the above-mentioned beneficiary survey, concerning current living environment compared to before project implementation, it was ascertained that

[7] Determined from per capita monthly income according to the National Survey on Living Standards (ENNIV-1991) and the National Household Survey (ENAHO-2003). In 2003, poverty was defined as per capita household income below 170 soles , and extreme poverty as below 111 soles.

[8] Determined from insufficient basic human needs NBI(newly born infant mortality rate, literacy rate, water supply diffusion, electrification rate, etc.). The poverty rate has fallen in recent years through improvements in public services and social infrastructure.

[9] Infration is calculated from the National Statistics Office (INEI) Metropolitan Lima Monthly Consumer Price Index 1990-2005. Because of the lack of baseline data on income, an incrwsase in income is based on recalling.

respondents felt "quality of life"[10] improved more compared to other items ("employment," "household income," and "poverty").

Table 6. Living Environment Circumstances (Units: %)

	Much better	Better	A little better	Not better
Employment	1.8	15.0	50.3	32.7
Household income	1.4	20.3	41.0	36.5
Quality of life	2.4	33.7	34.5	29.0
Poverty	1.2	21.7	41.8	33.9

Source: Beneficiary Study (13 Communities, 246 Households)

Tables 7 to 10 compare the study results between households with income above or below 350 soles/month, which is almost the average beneficiary household monthly income. Generally, fewer low-income households had a positive (the sum of "Much better" and "Better") view compared to high-income households but, on "poverty", the number of low-income households with positive view is more than the number of high-income households with positive view.

Table 7. Regarding "Employment" (Units: %)

Household monthly income (soles)	Respondents (people)	Much better	Better	A little better	Not better
350 or less	328	2.4	11.9	48.8	36.6
350 or more	179	0.5	20.7	53.1	25.7

Source: Beneficiary Study (13 Communities, 246 Households)

Table 8. Regarding "Household Income" (Units: %)

Household monthly income (soles)	Respondents (people)	Much better	Better	A little better	Not better
350 or less	328	2.1	16.2	40.5	40.2
350 or more	179	0	28.0	41.9	29.8

Source: Beneficiary Study (13 Communities, 246 Households)

[10] In the beneficiary survey, "household income" is defined as household cash income, "quality of life" as community living environment (non-income living conditions such as access to basic infrastructure), "poverty" as income poverty and non-income poverty combined.

Table 9. Regarding “Quality of Life” (Units: %)

Household monthly income (soles)	Respondents (people)	Much better	Better	A little better	Not better
350 or less	328	3.4	29.8	30.5	36.0
350 or more	179	0.5	40.8	41.9	16.2

Source: Beneficiary Study (13 Communities, 246 Households)

Table 10. Regarding “Poverty” (Units: %)

Household monthly income (soles)	Respondents (people)	Much better	Better	A little better	Not better
350 or less	328	1.8	23.5	35.4	38.1
350 or more	179	0	18.4	53.6	26.2

Source: Beneficiary Study (13 Communities, 246 Households)

2.4.4 Other synergistic effects

As rural development investments, multiple subprojects have been implemented into one community, which were producing a so-called synergistic effect. Subprojects for creating terrace, ridge[11], and infiltration ditches were carried out for soil conservation, and afforestation was often conducted to reinforce those terraces. In that case, first of all environmental conservation effects were expected since soil runoff is prevented by terrace creation. Secondly, by planting bean pasture in terrace soil under agricultural technical support, the terrace can be used for pasture. At the same, moreover, the nitrogen fixation by nonleguminous plant and cow dung can change poor soil into rich one.

Moreover, by agricultural technical support to select and produce value-added commercial crops, farmers can receive higher incomes. Also, when irrigation facilities are built, the range of choices for crops expands substantially and includes crops requiring irrigation. In addition, several years after afforestation, farmers can thin out grown trees to obtain limbs. Up until then, it was necessary to buy limbs needed for housing or farmland. They could produce limbs for personal consumption, and the unused ones can be sold for income. The opinion among workshops with farmers was also favorable regarding the production of limbs.

Warehouse construction was one of the subprojects. Seeds and seed potatoes are stored in the warehouses built to ensure their safety. By using part of a warehouse, farmers raise small animals such as *cuy*[12], opening up another path to cash income.

[11] A stair construction that gradually piles up rocks and dirt.
[12] Guinea pig, which is a type of marmot reared for food in the Andes region.

Figure-2
Startup of Dairy Product Marketing Venture

Figure-3
Farmer Who Began Apple Cultivation

2.4.5 Environmental impact

Terrace construction and tree planting prevents soil runoff, so one can say that they have positive impacts from an environmental aspect. Area afforested under this project (24,700ha.) comprises about 34% of the afforested areas from 1998 to 2004 (72,058ha.) in the regions targeted for the project. As these regions are mountainous regions near the treeline, where natural forests form slowly, afforestation has a substantial impact on soil conservation. The following table shows the ratio of the afforested area to the area suitable for tree planting[13]. This ratio is becoming higher every year.

Table 11. Ratio of Afforested Area to Area Suitable for Tree Planting

Region	1998	2000	2002	2004
Ancash	9.3	11.3	11.7	11.8
Apurimac	69.5	74.5	76.6	76.7
Ayacucho	7.1	9.2	9.7	9.9
Cajamarca	7.8	9.3	10.2	10.4
La Libertad	6.9	9.2	9.7	9.9
Lima (Province)	2.3	2.5	2.7	2.7
Pasco	2.4	2.7	2.8	2.8
Subtotal	7.7	9.2	9.7	9.8
Peru National Average	5.8	6.8	7.1	7.2

(Units: %)

Source: Calculated from El Cuanto, Annual Statistics Peru in Numbers-2005 (Anuario

[13] This ratio shows how much tree planting has been done on land suitable for tree planting.

Estadistico Peru en Numeros)

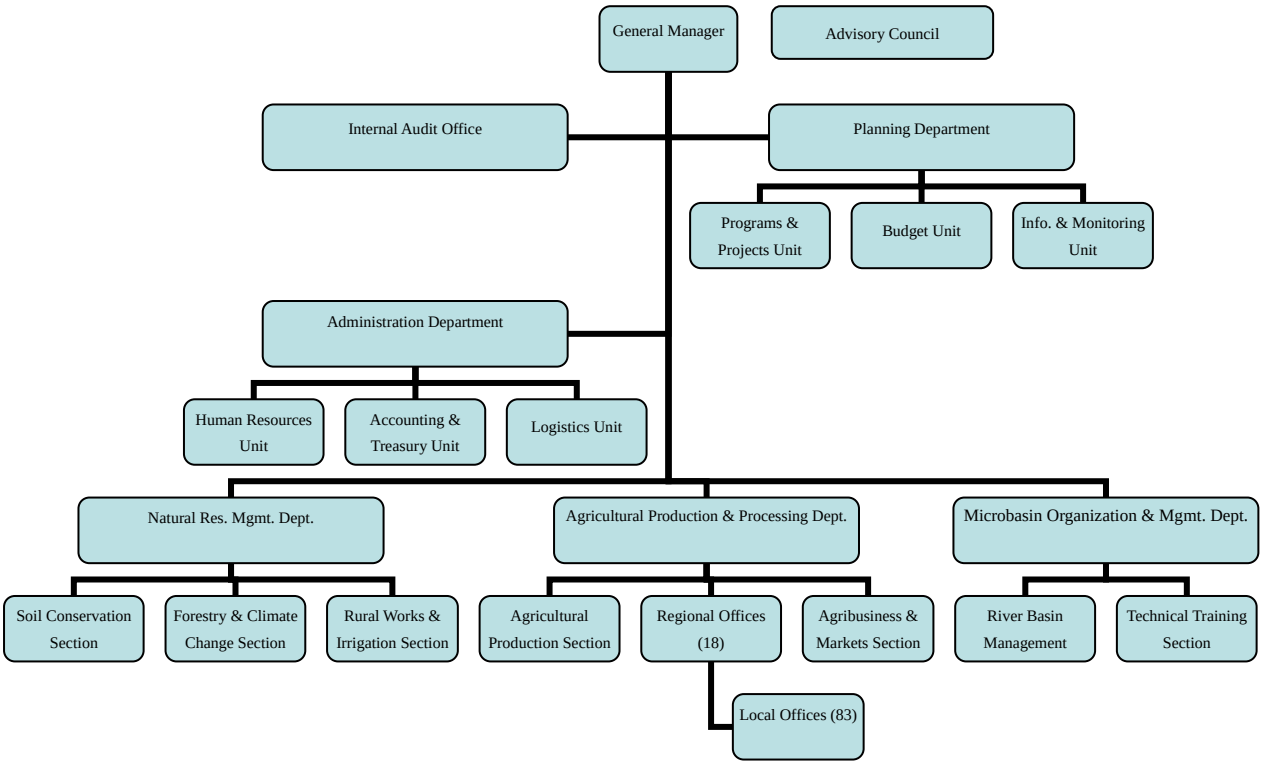
In order to implement this project, land acquisitions were marginally carried out. Since subproject execution was based on requests of beneficiary groups, land acquisition was smoothly executed.

2.5 Sustainability

2.5.1 Executing agency

PRONAMACHCS has 18 regional offices throughout the country, and has 83 local offices below them. According to the PRONAMACHCS Annual Report (FY2004), of the 906 PRONAMACHCS staff nationwide, 659 staff work full time in regional offices, 12 of which are office directors, 292 are experts in specialized fields, and 355 are technicians. It has multiple local offices in the same provinces, so that the staffs could frequently visit the subprojects, and perform follow-up tasks in project areas.

Fig. 4　PRONAMACHCS - Organization Chart



2.5.1.1 Technical capacity

As a principle, beneficiary groups carry out maintenance of subprojects after completion. Technical assistance for maintenance was also carried out under this project. Technicians are stationed in local offices of PRONAMACHCS. Looking at the contents of the manuals for facility operation and maintenance as well as agricultural technical assistance, one can surmise that they also have at least a certain level of technical capability[14]. Furthermore, there are staffs to provide agricultural instruction in these local offices. Combining agricultural instruction with infrastructure maintenance, they are providing instruction to improve the effects of subprojects.

2.5.1.2 Structure

Completed subprojects are independently maintained by beneficiary groups. Under decentralization[15], local governments themselves are also entrusted with the task of working on regional development and providing support for beneficiary groups. However, the reality is that local government often lacks technicians for tasks like agricultural technical assistance, so a large gap will remain for PRONAMACHCS to fill

[14] As decentralization was promoted under the Toledo administration, local government such as in the districts also began to employ technicians and provide technical support. But technology transfer effects are still insufficient. Local government are not expending sufficient budgets for agricultural instruction, and there are few agricultural technicians employed.
[15] Decentralization was promoted by Toledo administration policy.

with direct and indirect support to beneficiary groups. Also, the administrative boundaries of the local governments do not always match the areas of microbasins set for subprojects PRONAMACHCS. In some cases, the support by the local governments within their administrative boundaries may be inefficient.

After completion of the facilities, a trend of declining numbers of beneficiary cooperative members was seen in some subprojects. As a result, though this is not a large obstacle to realizing project results, there are a few examples where after farmers perform maintenance on their own terraces, but do not help maintain common areas and other famers' terraces. On the other hand, in the case where there is a benefit from participation, such as irrigation work, participation by farmers other than initial members of beneficiary groups was also be seen (also referred in 2.5.1.3 Financial Status). For some subprojects, in the case that the decrease of members continues, introduction of incentives to be a member continuously and solicit new member may become a task.

2.5.1.3 Financial status

As a principle, expenses for maintenance are borne by beneficiaries. A beneficiary group was established for irrigation facilities, often participated by farmers other than initial members. For maintenance, fees were levied from group members. Maintenance of other facilities is done through the labor of beneficiaries. Such is the case for reinforcement of stacked rock for terrace, and cleaning of drainage.

2.5.1.4 Operation and maintenance

Completed subprojects are satisfactorily maintained by beneficiaries themselves. During this site survey, critical problems which would jeopardize sustainability of subprojects were not found. For example, the irrigation facilities are being periodically cleaned from the water source to the aqueduct branches, and necessary repairs are also being performed. Also, beneficiaries are independently managing soil conservation facilities such as terraces, so problems such as soil and soil runoff were not found.

3. Feedback

3.1 Lessons Learned

None.

3.2 Recommendations

(For executing agency)

PRONAMACHCS has data only on project output. More specifically, PRONAMACHCS manages and discloses targets such as the land area of terrace construction and the number of seedling produced. It does not, however, set indicators of an increase in land productivity or farming income, nor manage actual subprojects by using these indicators. Therefore, it is desirable that PRONAMACHCS assess the feasibility of measures by which it can manage performance of subprojects.

As mentioned above, farmers are attempting the development of agriculture and agricultural business on a voluntary and sustainable basis. Such is the case for apple cultivation, small animal rearing, and dairy product development. However, local governments do not provide sufficient technical support (i.e., selection of variety, pest control, and marketing) to these agricultural activities. Therefore, for further improvement of project effects, there is a room for PRONAMACHCS to enhance its support for farmers' agricultural activities through its local offices.

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Project Scope		
1) Participatory studies and investment plan formulation		
(a) Microbasin studies	125 cases	0 case (0%)
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(a) Information systems	1 system	1 system
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(c) Vehicles & Equipment to PRONAMACHCS	1 set	1 set

(2) Project Period LA Project implementation	 November 1997 January 1998- December 2002 (5 years and 2 months)	 November 1997 January 1998- February 2004 (6 years and 4 months)
(3) Project Cost ODA Loan Portion Local currency Total	 5,677 million yen 4,815 million yen 10,492 million yen	 2,986 million yen 6,548 million yen 9,534 million yen