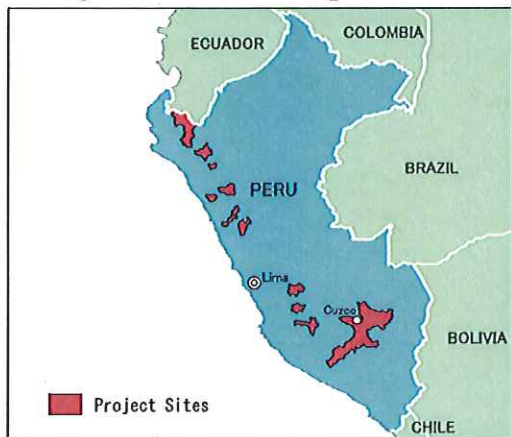


Peru

Sierra - Natural Resources Management and Poverty Alleviation Project (II)

Hajime Sonoda (Global Group 21 Japan)
Field Survey: March 2009¹

1. Project Profile and Japan's ODA Loan



Map of the Project Sites



Soil Conservation Facilities and Reforestation Work (Cajamarca)

1.1 Background

The Sierra in Peru which accounts for 30% of the national land area receives rainfall predominantly in a three month period, making the land vulnerable to landslides, debris flows and loss of the top soil. The indigenous people of Peru developed terraces covering some 1 million ha of steep slopes and utilised complex irrigation systems to farm in the Sierra. However, these traditional skills were lost during the Spanish rule (1532 - 1821) and many of these terraces were abandoned.² In more recent years, the increase of the population resulted in expansion of farm land by cutting down trees, resulting in a vicious cycle of soil loss, depletion of water resources, and declining agricultural productivity. Consequently, farmers in the Sierra were impoverished and many rural inhabitants who could no longer sustain their lives through agriculture moved to urban areas from the 1950's to the 1980's. As of 1995, farmers were engaged in traditional extensive farming in isolated settlements along the steep terrain amidst a harsh natural environment. Productivity was extremely low and poverty was both severe and widespread.³

In 1981, the Government of Peru established the Office of the National Programme for Water Resources and Soil Conservation (El Programa Nacional de Manejo de Cuencas Hidrograficas y Conservacion de Suelos: PRONAMACHCS) under the Ministry of Agriculture for the purposes of improving agricultural production and conservation of the natural environment in the Sierra where the concentration of poverty was apparent. The PRONAMACHCS was primarily engaged in promotion of

¹ The methodologies of the evaluation study included interviews with and data collection from the executing agency and a case study at ten villages in Cusco and Cajamarca through field inspection, interviews, workshop and household questionnaire survey (267 samples) with the beneficiaries as well as non-beneficiaries.

² The main reasons for this are believed to be (i) the migration of local farmers to avoid forced labour in mines operated by Spaniards and (ii) the destruction of the narrow terraces to accommodate the new farming practice of using cattle introduced by the Spaniards.

³ As of 1995, 10.5 million, accounting for nearly half of Peru's population, are classified as poor while two-thirds of the population in the Sierra are classified as poor, half of which are classified as extremely poor.

soil conservation through terracing, and, since 1997 with the assistance of the World Bank, the scope of its activities was expanded to aggressively invest in soil conservation, small-scale irrigation and reforestation projects as well as to strengthen farmers' organizations and the executing agency in a comprehensive and intensive manner while encouraging the active participation of local farmers.⁴ In November of the same year, the JICA offered an ODA loan of ¥5,677 million, targeting different areas from those of the World Bank, under the Sierra - Natural Resources Management and Poverty Alleviation Project (Phase 1). Two years later in 1999, Phase 2 of the Project (the subject of this ex-post evaluation) was implemented, followed by Phase 3 another two years later.

1.2 Objective

To conserve soil, forests and water resources along with improvement of the agricultural productivity in some 150 small river basins in the Sierra of Peru through investments in soil conservation, irrigation, forestation and capacity development of farmers' organizations and the executing agency, thereby contributing to poverty alleviation in the Sierra Area of Peru.

1.3 Borrower/Executing Agency

Government of the Republic of Peru/ PRONAMACHCS⁵

1.4 Outline of Loan Agreement

Approved Loan Amount / Disbursed Loan Amount	¥7,259 million (S/.147 million) / ¥2,856 million (S/.87 million)
Exchange of Notes/ Loan Agreement	April 1999/April 1999
Terms and Conditions	Interest Rate : 1.7% Repayment Period (Grace Period) : 25 years (7 years) Procurement : General Untied < Consulting Service > Interest Rate : 0.75% Repayment Period (Grace Period) : 40 years (10 years) Procurement : Bilateral Tied
Final Disbursement	September 2006
Main Contractors (contract amount of ¥1 billion or more)	None
Consultant (contract amount of ¥100 million or more)	Nippon Koei
Feasibility Study (F/S)	None

2. Evaluation Results (Rating: C)

2.1 Relevance (Rating: a)

This project has been highly relevant with the country's national policies and development needs at the times of both appraisal and ex-post evaluation, therefore its relevance is high.

⁴ In April 1997, the World Bank offered US\$ 51 million under the Sierra - Natural Resources Management and Poverty Alleviation Project (PO42442).

⁵ Since April 2008, part of the AGRORURAL: Rural and Agricultural Productivity Development Programme)

2.1.1 Relevance at Appraisal

The Second Fujimori Administration identified poverty alleviation as an issue of the highest priority and aimed at maintaining the social welfare expenditure at least 40% of the annual government budget. As described in 1.1 - Background, need for the project was high, as an increase of the agricultural productivity while ensuring environmental conservation was an important task in the Sierra where poverty was widespread and there was an overwhelming need for the Project.

2.1.2 Relevance at the Time of Ex-Post Evaluation

The government of President Garcia inaugurated in 2006 has also upheld poverty alleviation as a national priority with a target of reducing the poverty ratio to less than 30% by 2011.⁶ The agricultural policies of the present government emphasize poverty alleviation and the conservation and sustainable use of natural resources.⁷ The identified goals of these policies are i) improved competitiveness of the agricultural sector, ii) sustainable use of natural resources and biodiversity, and iii) improvement of basic services and support services for small farmers.

To achieve these policy goals, the Ministry of Agriculture integrated eight projects/programs, including PRONAMACHCS, into the AGRORURAL in 2008. The Ministry plans to invest some US\$ 500 million in impoverished rural areas throughout Peru over a period of five years.⁸ The Phase 3 Project scheduled to conclude in 2009 has been in progress following Phase 2. In areas which were not covered either by neither the World Bank nor the Japanese ODA loan, similar projects have been implemented with funding by the Government of Peru.

Based on these facts, the Project is considered to be highly relevant at the time of ex-post evaluation.

2.2 Efficiency (Rating: b)

Although the project cost was lower than planned, the project period was significantly longer than planned; therefore efficiency of the project is fair.

2.2.1 Outputs

(1) Target Areas and Target Villages

The Project was implemented as planned in 22 Provinces of 8 States⁹. Up to 1,380 villages received some kind of assistance and some 1,000 villages received assistance over three years, exceeding the original target of 867 villages.¹⁰

⁶ The Government of Peru defines poor households as those of which the income is below the level required for minimum consumer life. The reference per capita income level in 2007 was S/.229 (approximately ¥7,500) per month.

⁷ Ministry of Agriculture, Medium-Term Strategic Plan for Agricultural Sector 2007 - 2011, July 2008

⁸ PRONAMACHCS, the executing agency of this Project, accounted for 70% of the total budget of AGRORURAL (2008). Compared to the Fujimori administration, the AGRORURAL places greater emphasis on the improved coordination/linkage of products, distribution and marketing and the improved productivity and competitiveness of the agricultural sector.

⁹ States of Huancavelica, Cajamarca, Ayacucho, Ancash, Cusco, La Libertad, Piura and Arequipa.

¹⁰ The Project commenced in 1999 targeting 839 villages and was expanded to 1,380 villages in 2000. The number subsequently fell to 900 - 1,100 villages.

(2) Outline of Project Outputs

The planned scale of the Project at the time of appraisal was based on an estimate derived from the past experiences. The actual outputs were based on requests by local farmers, and therefore did not necessarily correspond to the planned outputs.

Table 1 Main Project Outputs (Original and Actual)

Components	Original	Actual
Soil Conservation		
• Absorption Terraces	4,335 ha	1,761 ha
• Slow Formation Terraces	17,340 ha	32,116 ha
• Infiltration ditches	26,010 ha	16,688 ha
• Installation of improved grass	3,289 ha	9,661 ha
• Installation of improved crops	15,173 ha	9,420 ha
Small-Scale Irrigation		
• Construction/Improvement of Irrigation Channels	521 km	324 km
• Pressurized irrigation	6 sites	48 sites
• Construction/Improvement of Reservoirs	219 sites	70 sites
• Multi-Purpose Water Supply	107 sites	47 sites
• Small-Scale Dams	20 sites	0 sites
• Special irrigation structures	102 sites	1 site
Forestry development		
• Nurseries	867 sites	1,158 sites
• Production of Forest Tree Seedlings	41,750,000	75,900,000
• Plantations	44,942 ha	40,897 ha
• Forest Management	8,350 ha	13,663 ha
Small Ware house	433 sites	514 sites
Support for Enterprise Initiative	350 cases	130 cases
Procurement of Vehicles, AV Equipment and Information Communication Equipment, etc.	Almost as planned	

Terracing and reforestation, which were components of the soil conservation and forestry development, were actually conducted by the farmers themselves using tools and seedlings provided by the executing agency. Therefore, the actual area of implementation increased or decreased depending on the actual amount of labour input by farmers. As explained later, the disbursement of the project funds were suspended by JICA for a period of 33 months from September 2003 in the fourth year of the Project and only 58.3% of the project budget was actually spent within the project period. Because of this, the actual outputs failed to achieve the planned outputs in the case of some components, such as small-scale irrigation where the amount of the outputs were roughly in proportion to the amount of financial inputs. Meanwhile, the actual outputs exceeded the planned outputs in the case of other components, such as soil conservation and forestry development where the amount of the outputs was depended on the amount of the labour input by farmers. Table 1 compares the planned and actual outputs for the main components of the Project.

(1) Soil Conservation

The following outputs were achieved under soil conservation using 32% of the total project cost.

Terraces

There are two types of terraces to reduce soil loss by surface erosion from the steep terrain, i.e. absorption terraces and slow formation terraces. Both types of terraces were constructed under

the Project by local farmers using tools procured under the Project. There were many cases where trees were planted along the terraces reinforcement as well as to protect the crops from frost and strong winds.

- Narrow absorption terraces are constructed on steep slopes with inclination of more than 30% and can be expected to achieve effects of soil conservation and increase in productivity. However, because of the high construction cost and unsuitability for cultivation using cattle, there was a growing tendency to avoid this type of terrace in the 1990's onwards.
- Slow formation terraces are constructed on gently sloping land. Ridges of up to 80 cm in height are made by stacking stones or piling dirt. Using the gradual downward shift of the top soil by rainwater, terraces are created over a period of 5 to 10 years. When a ridge is filled with soil after several years, a second ridge is created. By repeating this process, flat terraces are eventually formed.

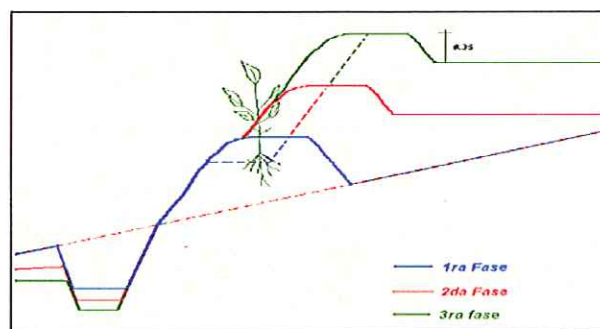


Fig. 1 Phased Formation of a Flat Terrace through Slow Formation Terrace
(Source: PRONOMACHCS Website)

Under the Project, 1,761 ha and 31,116 ha of farmland were conserved by absorption terraces and slow formation terraces respectively. While the actual output for absorption terraces was lower than the planned output, the actual output for slow formation terraces was far higher than the planned output. The main reasons for these results are (i) the farmers preferred slow formation terraces, which required a lower investment per unit area, meaning a larger area could be covered with the given budget and (ii) the labor input by farmers was greater than originally planned.

Infiltration Ditch

Level ditches were dug along the contour lines of gently or steep sloping land. These ditches reduce erosion of the top soil, retain rainwater for ground infiltration to increase the level of soil moisture and recharge aquifers to facilitate the growth of trees and crops at lower areas of the slopes. The ditches were dug by local farmers using tools provided under the Project. 16,688 ha of land was conserved under the Project.



Absorption Terraces
(PRONAMACHCS Website)



Slow Formation Terrace with Stone Wall
(Cusco)



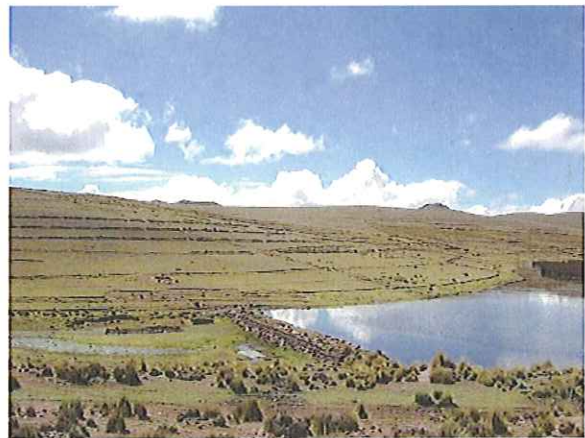
Combination of Slow Formation Terrace,
complemented with Trees (Cusco)



Combination of Slow Formation Terrace
and Pine Trees (Cajamarca)



Infiltration Ditch at Highland Swamp



Combination of Infiltration Ditch and Reservoir

Installation of Improved Grass and Crops

This component involved the planting of improved potato, maize and grass varieties at farmland where terraces and/or infiltration ditches were constructed. The seeds of improved varieties were procured under the Project and were distributed to farmers. The coverage under the Project was as much as some 19,000 ha and the improved grass in particular was planted in many more areas than originally planned because of the strong request from farmers. In contrast, the actual output regarding the planting of improved crops was lower than planned.

Small Warehouse

Using locally available material 514 small warehouses were constructed in order to adequately conserve seeds for potatoes and other agricultural inputs.

(2) Small-Scale Irrigation

Small-scale irrigation construction work was conducted at 359 sites, using 21% of the total project cost. The average irrigated area per site was approximately 64 ha.

Irrigation Channels

Irrigation channels were some 40 cm wide and made of concrete for gravity irrigation. At 35 sites, new channels (totalling 68 km) were constructed while existing channels (totalling 256 km) were improved at 158 sites.

Pressurized irrigation

The pressurized irrigation system achieved larger coverage with less water than open irrigation channels, by conducting water to sprinkler pipes through movable vinyl hoses. This system was appreciated by the farmers because of its efficiency, and due to the small scale and shorter construction period, pressurized irrigation systems were set up at 48 sites, exceeding the originally plan.

Others (Reservoirs, etc.)

The actual outputs for reservoirs, water channels, small dams and multi-purpose irrigation, the scale of construction of all of which was relatively large with a long construction period, were much lower than the originally planned outputs, partly because of the delay of budget execution resulting in a delay and/or increased cost of the construction work and partly because of the funding constraints explained later in section 2.2.2.1.¹¹

(3) Forestry development

Forestry development work was conducted using 19% of the total project cost.

Nurseries for seedlings

Nurseries were established in each targeted village to grow seedlings of several indigenous as well as other species depending on the local climate and soil. The other main species were pine and eucalyptus.

¹¹ The water supply facilities constructed under multi-purpose irrigation are not restricted to provide irrigation water but also to supply water for households as well as animals. In the case of special facilities, such as river crossing, the nominal output amount was small as many such facilities were actually constructed as part of the irrigation channel work.

Production of Forest Tree Seedlings

The actual output of 75.9 million seedlings far exceeded the planned output due to the strong demand and participation by farmers. Seedling production was also boosted by the fact that local public bodies in agreement with the AGRORURAL bore part of the seedling production cost.

Plantations (Reforestation)

In addition to the creation of small to medium-size forests on common or private land, plantation was conducted along terraces. While many of the newly created forests are production forests which are designed to produce timber in the future, there are cases in South-Central Peru where protection forests were created in water source areas. It is reported that plantation was conducted over some 41,000 ha of land under the Project but this figure includes those area equivalent of a large number of seedlings planted along terraces.

Forest Management

The main forest management activities were replanting after one year (to replace dead seedlings) and irrigation for young trees in dry period. Survival ratio of the trees after one year was 70 – 80%.

(4) Procurement of Vehicles and Equipment

Vehicles and a range of equipment were procured, using 14% of the total project cost. The actual quantities were 24 vehicles and 132 motorcycles as well as a number of PCs, printers and videos to assist the execution of the Project at the head office of the AGRORURAL and its branches at various project sites.

(5) Others

- Support for entrepreneurship primarily targeted women to help them start new businesses related to production of processed dairy products, trout farming and apiculture. The number of cases was lower than planned because of the funding restrictions and increase in the required funding size per case caused by the revision of the implementation process for new enterprise initiatives.
- Micro-watershed studies were not conducted as they were judged not worth the input based on the experience of other projects.
- Workshops to strengthen the capacity of AGRORURAL were held 65 times.
- Training to strengthen farmers' organizations and training for micro-watershed committees were conducted. The number of rural extension training sessions was far higher than planned because of the frequent implementation of small training sessions.
- Consulting services were provided to assist the executing agency in operational planning, management of ODA loan disbursement, financial management, supervision and evaluation of project performance, and coordination with JICA and the Ministry of Economy and Finance throughout Phase 1 and Phase 2 of the Project.



Small Warehouse (Cusco)



Comparison Between Improved Grass and Natural Grass (Indigenous Variety, Cajamarca)



Improved Irrigation Channel (Cusco)



Nursery for Forest Tree Seedlings (Cajamarca)



Support for entrepreneurs
(Production of Cheese and Yoghurt, Cusco)



Support for entrepreneurs
(Farming of Trout, Cajamarca)

2.2.2 Project Cost

The actual project cost was 38.8% of the planned cost at the time of appraisal. Translated to local currency, the corresponding figure was 58.3% of the planned cost at the time of appraisal. The reason why the actual cost was lower than the planned cost was the funding constraints described in section 2.2.2.1.

Table 2 Project Cost (Original and Actual)

Item	Original (Unit: ¥million)			Actual (Unit: ¥ million)			Actual / Planned
	Yen Loan	Executing Agency	Sub-Total	Yen Loan	Executing Agency	Sub-Total	
Soil Conservation	2,198	148	2,346	1,046	190	1,236	52.7%
Forestry development	1,920	421	2,342	616	133	749	32.0%
Small-Scale Irrigation	1,502	297	1,799	660	138	799	44.0%
Storage for Agricultural Input Materials	936	173	1,109	107	22	128	11.6%
Vehicles and Equipment	197	43	240	117	21	138	57.5%
Assistance for Strengthening of Organizations	0	1,487	1,487	145	456	601	40.4%
Consulting Service	194	43	236	165	37	202	85.4%
Contingency	312	68	381	0	0	0	0.0%
Total (Local Currency: million N.Sols)	7,259 (147.8)	2,681 (54.6)	9,940 (202.3)	2,856 (87.4)	997 (30.5)	3,853 (117.9)	38.8% (58.3%)

Planned: 1 N.Sol = ¥49.1 (July 1998)

Actual: 1 N.Sol = ¥32.7 (average through the project implementation period)

Source: AGRORURAL

2.2.2.1 Funding Constraints for the Project and Their Causes

The biggest problem in terms of project implementation was the fact that only 60% of the original project budget was actually disbursed due to various constraints originating from the following incidents.

- From late 1999 to December 2002, the use of foreign aid and counterpart funds was restricted by the Ministry of Economy and Finance because of the tight fiscal situation faced by the Government of Peru.
- Execution of the FY 2003 budget was temporarily suspended due to confusion arising from the planned integration of PRONAMACHCS and another organization (FONCODES)¹² based on a government policy.
- The FY 2002 audit report for the Project pointed out that there were many cases where local offices of PRONAMACHCS had not submitted reports and evidences of their expenditure. As appropriateness of spending could not be confirmed because of the absence of the reports and evidence, JICA took the decision in September 2003 to suspend disbursement for the Project. Disbursement recommenced in May 2006 after measures to prevent such delays were put in place but PRONAMACHCS was unable to implement the Project using the ODA loan in FY 2004 and FY 2005.

¹² The National Compensation and Social Development Fund (Fondo Nacional de Compensacion y Desarrollo Social: FONCODES) was established in 1991 to reduce the number of the poor and has since been engaged in the development of sanitation and economic infrastructure in the Amazon and the Sierra.

- Several factors of the project can be pointed out to explain what led to the suspension of disbursement. One is the huge volume of the project supervisory work required by the local PRONAMACHCS offices because of the individual participation of as many as 1,380 agricultural cooperatives in the procurement process. Another is the parallel implementation of the Phase 1 and Phase 3 Projects, both requiring similar project supervisory work. Furthermore, there was a significant decline of the capacity of PRONAMACHCS since 2001 due to the frequent transfer of personnel and curtailment of the budget and manpower.¹³ The consulting service was unable to sufficiently alleviate the problem.¹⁴

2.2.3 Project Period

The Project was originally planned as 66 months from April 1999 to September 2004. The actual period of 88 months from June 1999 to September 2006 was much longer (133% of the planned period). The reason for the extension in project period was the interruption in project implementation due to budgetary constraints mentioned above.

2.3 Effectiveness (Rating: b)

The Project is inferred to have achieved some 70 - 90% of the originally planned effects. However, given the fact that only half of the planned project budget was actually used, the effectiveness of the Project is judged to be medium as full spending of the project budget would have produced many more results.

2.3.1 Conservation of Soil, Forest and Water Resources

More than 90% of the area where soil conservation or forestry development was conducted (some 81,000 ha) under the Project has been properly maintained and is assumed to be producing the anticipated environmental conservation effects such as the mitigation of erosion, increase of the forest area and retaining of soil moisture. The actual area where these positive effects are believed to have emerged is some 95% of the planned area at the time of appraisal.

A beneficiary survey was conducted to 267 households in 10 villages in Cuzco and Cajamarca. According to this survey, some 30% of the farmland owned by these beneficiaries has been newly conserved under the Project and the number of trees owned by beneficiaries has quadrupled compared to 10 years ago. During the field visits, major changes of the landscape due to increased forests and trees, reduction of erosion due to terracing, increased soil moisture and spring water and better growth of crops and forest trees were seen confirming the environmental conservation effects of the Project.

¹³ Since the change of the government in 2001 until 2003, many senior government officials left their positions and many of their successors lacked sufficient experience and/or capacity. The arrangements to ensure the smooth handing-over of positions were often insufficient. Many field engineers in the field were also replaced. In subsequent years, having experienced confusion surrounding the proposed integration of the PRONAMACHCS and FONADODES, the Ministry of Agriculture and Ministry of Economy and Finance rapidly reduced the amount of budget appropriation for PRONAMACHCS of which the performance had declined and reduced the manpower of PRONAMACHCS along with the integration of local offices. Consequently, the budget size per local office of PRONAMACHCS was halved and the number of villages and farmers benefited from the Project fell to 70% of the 2001 level.

¹⁴ While the consulting services had been executed as planned, the Terms Of Reference (TOR) did not specified an assignment of financial management specialist. AGRORURAL is not satisfied with the outcomes of the consulting services as the chain of events leading to the suspension of disbursement was not prevented.

2.3.2 Improvement of Agricultural Productivity

(1) Area of Anticipated Improvement of Productivity (Yield per Unit Area)

The actual area (approximately 50,500 ha) covered by soil conservation by means of terracing and infiltration ditches was 106% of the planned area and the actual area (approximately 19,000 ha) covered through the introduction of improved grass/crops was 103% of the planned area at the time of appraisal. However, as explained in the section on sustainability, there is a possibility that some 15% of slow formation terraces have not been properly maintained. In consideration of the possible low sustainability of the communal fund linked to the introduction of improved crops (refer 2.5.3 (1)), the project's effect on productivity improvement is unlikely to have the level of sustainability anticipated at the time of appraisal.

The newly irrigated area under the small-scale irrigation component and area where the existing irrigation facilities were improved are estimated to be some 4,000 ha and some 19,000 ha respectively. Assuming an operating rate of these facilities of 85%¹⁵, the actual irrigated area is approximately 19,600 ha in total, consisting of 3,400 ha of new areas and 16,200 ha of existing areas. This is equivalent to slightly less than 60% of the planned area at the time of appraisal.

Based on the above, increase in agricultural productivity is expected to have been achieved at some 70,000 ha of farmland as a result of the Project.¹⁶ This is equivalent to some 80% of the plan at the time of appraisal.

(2) Mechanism and Effects of Productivity Improvement

According to the findings of the beneficiary survey, improved agricultural productivity and increased agricultural production are believed to have been achieved under the Project due to the following mechanism.¹⁷ However, it must be noted that quantitative data representing the effects of the entire Project could not be collected.

(1) Increased Productivity and Stable Production of Potatoes and Other Main Crops

- Both the absorption terraces and slow formation terraces have had the effect of controlling the decline of productivity due to erosion. In one village, slow formation terraces have increased the productivity of a native potato variety by some 10% while shortening the fallow period from the traditional 7 - 8 years to six years. The soil conservation effect of slow formation terraces is believed to emerge over a relatively long period of 5 - 10 years in accordance with the formation of the terraces.
- The hedges along terraces have had such effects as the mitigation of frost damage to crops, retaining of soil moisture and soil improvement by organic fertiliser (leaves of some species). While agricultural production in the Andean highlands is unstable because of vulnerability to frost damage, many farmers reported that the hedges have changed the micro-climate, reducing the risk of frost damage.

¹⁵ Based on a similar project of the World Bank.

¹⁶ The area of improved crops and grass are not included in this figure as they overlap with the soil conservation area.

¹⁷ A household survey involving group interviews and the use of a questionnaire was conducted in 10 villages in Cuzco and Cajamarca Provinces (total of 267 samples).