People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan Project

Inner-Mongolia Loess Plateau Afforestation Project

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0. Summary

The project aimed at the afforestation of 11 districts of 4 major cities[1], i.e. Hohhot, Baotou, Ordos and Bayannur in the Loess Plateau. These were covered with protection forest and economic forest, in order to increase the forest cover ratio, to protect surface soil erosion and to increase farmers' income by selling their products such as fruits from the planted trees. The project was implemented in accordance with national policy of China and is contributing to the improvement of the ecological environment, one of the important policies at present in China. The project is also consistent with Japan's ODA policy to China. In this sense the relevance of this project is evaluated to be high. The project was implemented just as planned and contributed to the improvement of the environment of project areas by increasing the forest cover ratio. It also had a certain protection effect against desertification. Therefore, effectiveness and impact of the project are high. With regard to project cost, although a detailed track record could not be analyzed, the project cost was lower than planned. On the other hand, the implementation period was delayed significantly compared to the original schedule because of the influence of drought, and so forth. This resulted in the extension of the disbursement period by two years. From this point of view, the efficiency of the project is evaluated to be fair. With respect to operation and maintenance after the project completion, farmers are responsible for their own economic forests, and the department of forests, for protection forests. To date, no major problems have been observed in the operation and maintenance system.

In light of the above, this project is evaluated to be very high.

[1] The detailed names are referred to Table 4. Within Chinese administrative divisions, there are counties, county-level cities and city districts under prefecture-level cities. In this report, the local government of the counties, county-level cities and city districts is given as county-level local government.

1. Project Description

Project Location

Protection forest of poplar near the Yellow River

1.1 Background

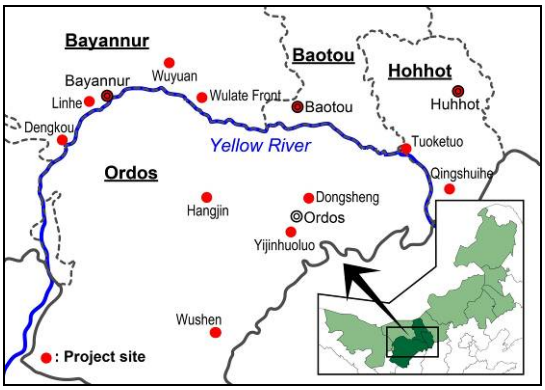

Figure 1: Project site

Although China has set the afforestation of land as a national basic policy, the fast economic development has contributed to increasing the demand for lumber and pulp, which has led to reckless deforestation. Population increases have also brought about disordered expansion of cultivated land. This has kept the forest cover ratio (forest land area/total land area) low, i.e. from 8.6% in 1949 when the People's Republic of China was founded to 13.9% in 1999. This forest environment has caused frequent shortages of water in the lower reaches of the Yellow River since the 1970's due to the current shear flow of the Yellow River and floods have occurred where the riverbed has risen due to inflow sediment flowing into the Yellow River. In addition to this, the situation has deteriorated due to damage inflicted by clouds of sand caused by an acceleration in desertification, which has led to an increase in natural disasters and deterioration of the natural environment. In the summer of 1998 a serious flood, which was said to have been caused by excessive deforestation, occurred in the upper reach of the Yangtze River. It took the lives of about 1,300 people and resulted in over 220 million victims.

With these circumstances in mind, and especially triggered by the 1998 Yangtze River flood, the Chinese government shifted the weight of forest development from its economic aspect to its environmental aspect and set "the National Program for the Construction of an Ecological Environment" in November 1998 to oversee forest development of the nation until 2050. Under this National Plan the government made "the 10th Five Year Plan of National

Forest Development (2001–2005)" in which "Six Key Forestry Projects[2]" were to be implemented. Loess Plateau Afforestation Projects using Japanese ODA Loans in the Inner-Mongolia Autonomous Region, Shanxi Province and Shaanxi Province were requested by the Chinese government in accordance with the plan and program mentioned above. It was decided to provide the 4th round Japanese ODA Loan package to these eligible projects targeting priority areas for the fiscal year 2000.

The Inner-Mongolia Loess Plateau Afforestation Project was implemented, in accordance with Japanese ODA Loan policy of protection against desertification and the prioritization of the projects in inner areas of China. Its purpose was to place the Loess Plateau where the forest cover ratio was still at the low level of about 6% as a core area, to prevent desertification of the area and to control topsoil outflow so that the environment of the area could be improved.

1.2 Project Outline

The objective of this project was to increase forest cover ratio, to prevent soil erosion, and to generate income for farmers by planting trees in the area of about 106,000 ha of 11 districts in 4 cities on the Inner-Mongolia Loess Plateau i.e. Hohhot, Baotou, Ordos and Bayannur, thereby contributing to social and economic stabilization in the planted areas, improvement of the living environment in the planted area, including in the lower reaches of the Yellow River, and improvement of ecology in the planted area.

Loan Approved Amount / Disbursed Amount	3,600 million yen / 3,599 million yen
Exchange of Notes Date / Loan Agreement Signing Date	March 2001 / March 2001
Terms and Conditions	Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) Conditions for Procurement: Bilateral tied
Borrower / Executing Agency	Government of Republic of China / Inner-Mongolia Autonomous Region People's Government
Final Disbursement Date	July, 2010
Feasibility Studies, etc.	Feasibility Report on the Inner Mongolia Afforestation Project for Yen Loan by the Forestry Reconnaissance Designing Institute of the Inner Mongolia Autonomous Region (June 2000)

[2] The "Six Key Forestry Projects" consolidated the "National Ten Key Forestry Projects" in 2001 and consist of 1) The Natural Forest Conservation Project, 2) The Three Northern Regions and the Yangtze River Basin Protection Forest Project, 3) The Grain for Green Project, 4) The Wildlife Protection and Nature Reserves Construction Project, 5) The Anti-desertification Project around Beijing and 6) The Fast-growing Timber Forest Base Development Project.

Related Projects	[Japanese ODA Loan Projects] - Shaanxi Loess Plateau Afforestation Project (Loan Agreement, March 2001) - Shanxi Loess Plateau Afforestation Project (Loan Agreement, March 2001) - Inner-Mongolia Afforestation and Vegetation Cover Project (Loan Agreement, March 2003) [Technical Cooperation] - Watershed Management Training Project on Loess Plateau (January 1990 – January 1995) - Forestry Development Project in Fujian Province of China (July 1991– June 1998) - Forest Protection Research Project in Ningxia-Hui Autonomous Region (April 1994 –March 2001) - Hubei Province Forest Tree Improvement Project (January 1996 – January 2000) [Grant Aid] - The Project for Improvement of Forestation Equipment for Conservation of Water and Soil in the Upper Stream of the Hanjiang River (FY 1998) [Other Donors] <World Bank> - Forestry Project (June 1985) - National Afforestation Project (May 1990) - Forest Resource Development and Protection Project (June 1994) - Loess Plateau Watershed Rehabilitation Project (June 1994) - Forestry Development in Poor Areas Project (May 1998) - Second Loess Plateau Watershed Rehabilitation Project (May 1999) [Others] - Afforestation Projects by Obuchi Fund[3]

2. Outline of the Evaluation Study

2.1 External Evaluator

Hiroshi Oita, OPMAC Corporation

[3] The Prime Minister, Obuchi, who visited China in July 1999 after the 1998 Yangtze River flood established a support fund of 10 billion yen in order to promote exchange between the people of Japan and China through afforestation activities. These were to be carried out by Japanese private groups in cooperation with their Chinese counterparts. The fund is officially called as Sino-Japan Greening Communication Fund.

2.2 Duration of Evaluation Study

Duration of the Study: September 2012 – September 2013

Duration of the Field Study: March 10, 2013 – March 22, 2013,
May 26, 2013 – June 1, 2013

2.3 Constraints during the Evaluation Study

It took a very long time to collect data and information on the past track records of the project due to the fact that the project location and local forest bureaus are widely scattered. The division of works between the financial sections and technical sections and the personnel changes of the people in charge of the project also hindered efficient collection of data. In particular, since financial data was only available for the limited areas, it was not possible to analyze changes in the cost.

3. Results of the Evaluation (Overall Rating: A[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of China

The National Plan for Ecological Construction, established in November 1998, is a long term plan covering a period up to 2050 and was the basic policy document for the forestry sector even at the time of this evaluation. The long term afforestation plan within the framework of the National Plan mentioned above, i.e. the "National Afforestation Plan (2011 – 2020)" has aimed at expanding forest areas together with an improvement in the quality of forests. The target forest cover ratio in 2015 is estimated at 21.7% and over and 23% and over in 2020.

At the time of the ex-post evaluation "the 12th Five Year Plan for the forestry sector (2011 – 2015)" has been implemented as the mid-term plan for the forest sector. Under the plan 30 million ha will be afforested and a forest cover ratio of 21.7% will be achieved by 2015, as mentioned in the National Afforestation Plan above.

The 12th Five Year Plan for the forestry sector of the Inner-Mongolia Autonomous Region also has a target afforestation of 60 million mu[6] (4 million ha) for the purpose of ecological improvement. The Six Key Forestry Projects mentioned above have a close relationship with the Inner-Mongolia Autonomous Region. Among others, the "Grain for Green Project" and the "Natural Forest Conservation Project" have extended their target year of 2010 to date and are still regarded as important projects in the Inner-Mongolia Autonomous Region.

From a legal point of view, the Law on Water and Soil Conservation (enacted in 1991 and amended in 2010) stipulates in its Article 16 that each local government shall take every

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[5] ③: High, ②: Fair, ①: Low

[6] "mu" is used in China as a measurement of area. 1 mu is equivalent of 1/15 ha.

measure such as protection with enclosure, natural restoration, etc. together with expansion of afforestation and vegetation cover by individuals and institutions and watershed protection, in order to prevent and lessen soil and water erosion. In addition, the Law on Protect and Control of Desertification was enforced in January 2002 which stipulates the responsibility, area of management, preferential treatments etc. of each local government in order to prevent desertification, to manage deserted land and to maintain ecological security.

As above, the development of the forestry sector, which centers on afforestation, has been regarded as an important policy issue in the Inner-Mongolia Autonomous Region as well as in China, and remains so at the time of this ex-post evaluation.

3.1.2 Relevance to the Development Needs of China

According to the 7th National Forest Inventory (2004 – 2008), the forest coverage area in China was 195 million ha and the forest cover ratio was 20.4%. This forest cover ratio is still low compared to those countries with the same latitude such as the United States of America (33%), Canada (34%) and Russia (49%). As clearly stated in the National Afforestation Plan (2011 – 2020), China has a target of 23% as forest cover ratio by 2020, which means that the needs for afforestation in China are still high.

In the Inner-Mongolia Autonomous Region, the forest coverage area was 23.66 million ha and the forest cover ratio was 20.0% in 2010, as shown in the statistic year book of Inner-Mongolia. The target for the forest cover ratio under the 12th Five Year Plan for the forestry sector (2011 – 2015) is 21.5% by 2015.

3.1.3 Relevance to Japan's ODA Policy

Based on the Japan-China Treaty of Peace and Friendship in 1978, Japanese ODA Loans to China have been provided since 1980 in tandem with the Chinese Five Year Plans to support modernization efforts (Reform and Opening-Up Policy). Under the 4th round Japanese ODA Loan package, which included this project, both governments agreed that the emphasis of support should be attached to the environment, agriculture and inland development in order to ease the disparity between the regions.

In the Medium-Term Strategy for Overseas Economic Cooperation Operations announced by the then Japan Bank for International Cooperation in 1999, one of the basic policies was to tackle global issue including environmental issues. With regard to assistance for China, environmental measures as well as increase in agricultural productivity and improvement of infrastructure in inland areas were important issues.

In light of the above, this project has been highly relevant to the development plan of China, development needs, as well as to Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness[7] (Rating: ③)

3.2.1 Quantitative Effects

The quantitative effects of this project were represented by the increase of the forest cover ratio in the total area, including the target area of this project. The forest cover ratio as the evaluation indicator was 12.0% before the implementation of the project and was estimated at 15.8% after the implementation of the project at the end of 2005. Judgment of the forest cover ratio was based on the 3rd year survival rate after afforestation. In China, if the survival rate is 60% and over, afforestation is judged to be successful. According to this scale, the actual forest cover ratio at the end of 2005 was 17.4% as against the estimated rate of 15.8%. Based on this result it can be said that the target was achieved. However, this must be counted against the fact that the forest cover ratio includes not only afforestation areas covered by Japanese ODA Loan but those areas covered by the government budget. (the forest cover ratio by region is referred to Attachment 1.) The most recent data of the survival rate provided by the Inner-Mongolia Forest Department in the targeted area shows 66% for protection forest and 62% for areal seeding forest areas.

Table 1: Forest cover ratio Target and Actual

Indicator	Baseline At Appraisal	Target End of 2005	Actual End of 2005	Actual End of 2012
Forest cover ratio	12%	15.8%	17.4%	24.3% estimate

Source: Appraisal documents and data provided by the Inner-Mongolia Forest Department
Note: The actual value of the end of 2012 is the estimation by the Inner-Mongolia Forest Department

With regard to the afforestation area covered by the project, the afforestation work in the target area of 106,465 ha was completed as scheduled. The total incremental area calculated by the forest cover ratio was 346,770 ha. and it is equivalent to 30.7% of the total incremental area. According to the executing agency, the area with a survival rate of 60% and over under the project was estimated at 80% of the total target area[8]. Taking this figure into consideration, afforestation under the project contributed to an increase of the forest cover ratio by 25% (30.7% x 80%) in the total incremental area.

In addition to the above, those farmers who planted apple trees or vine as part of economic forest were able to earn their income directly from the sale of crops[9]. No indicator for income

[7] The Sub-rating for Effectiveness is to be put with consideration of Impact.

[8] The project area belongs to an arid zone. The annual precipitation in the Loess Plateau ranges between 200 mm and 500 mm depending on the site. The rainfall is concentrated from July to September and therefore droughts occurs frequently in this area. Even during the afforestation of the project droughts occurred in 2004 and 2005. Due to the drought, there were areas where the survival rate did not reach the acceptable criterion.

[9] The target area of the project is rich in resources in the Inner-Mongolia where coal, rare earth elements, natural gas, cashmere etc. are produced. The household income from agriculture is supposed to be relatively small. The majority of agricultural household in the target area is supported by nonfarm income which is undertaken by the elderly, mostly parents. Their children who are working in the cities can provide support in the harvest season.

was set under the project, but in the case of apples, a broker will buy apples at 2 yuan per kg. Since the harvest of apples is expected to be 1,000 to 1,500 kg per mu, a farmer can get an additional income of about 2,000 yuan per mu[10].

At the same time, Chinese wolfberry (Lyciumchinense) and Salix psammophila, both of which were planted as economic forest as well as protection forest against wind and sand, also provide farmers with an additional income. Since Chinese wolfberry can grow even in places with a higher salinity and less water, it has become one of the specialties of Inner-Mongolia. The crop is around 200 kg per mu and is traded at 25 to 30 yuan per kg. An income of about 5,000 yuan per mu is expected after deducting labour costs at the time of harvest. The average income of a household in the inspected area is said to be 30,000 yuan and over. The production of Chinese wolfberry has played an important role as a source of income[11].

Chinese Wolfberry at Wulate Front County

Salix psammophila for fixing sand areas at Hangjin Banner

Salix psammophila, which was planted to immobilize sandy soil, needs to be cut every 3 to 4 years for better growth and maintenance. In the Ordos area it produces 1 ton per mu and is used as fuel for the thermal power plant. Currently the market price is 400 to 500 yuan per ton. It is said that a stable demand for Salix psammophila depends on the development of the wood processing industry.

3.2.2 Qualitative Effects

At the appraisal the qualitative effects were referred to as “improvement of the natural environment at sites”, “indirect contribution to lessen the shear flow of the Yellow river”, “improvement of the living standards of the poor in mountain areas” and “protection effects against global warming through carbon fixation”. Most of these are recognized as impacts and had the effects as stated below.

[10] This information collected at the time of the ex-post evaluation in March 2013.

[11] This Information collected at the time of the ex-post evaluation in March 2013.

One of the direct qualitative effects of the project was the change of mind of the part of farmers regarding the ecological environment through afforestation. Afforestation so far had been implemented by the Government of China and was not at the initiative of farmers. This time farmers have afforested areas at their own volition realizing that they are able to increase their income directly and improve their living environment. This was referred in answers to the questionnaire[12] (See the Attachment 2).

In addition, the officials of the Forest Department have also learned detailed supervision methods through the project and this experience will provide the base for successive afforestation activities under government projects.

3.3 Impact

3.3.1 Intended Impacts

The project area is 106,475 ha, which accounts for 1.7% of the total target area of about 6.17 million ha[13]. Out of the total target area, the area available for afforestation was about 2.31 million ha, which includes the one already afforested. Even compared to this area the project area is only 4.6%. The project area is also scattered over 11 sites. This means that the project has had a relatively small influence on the project area. It is also difficult to generalize the impact as each project site has a different climate and vegetation. The following evaluation is based on data and information provided by the Forest Department of the Inner-Mongolia Autonomous Region. The overall result shows favorable effects in the area.

Taking the example of protection against topsoil outflow, the afforestation has shown a certain positive impact. There is no overall data on topsoil outflow but in the case of Dengkou in Bayannur the outflow of soil per year in the early 2000s was estimated at 100 million tons. The person in charge explained that the volume has now decreased to 6,900 tons. According to the survey in Dengkou the number of sandstorms also decreased from 11 in 2002 to 8 in 2011. Table 2 illustrates the number of sandstorms at Tuoketuo in Hohhot and shows that the number decreased dramatically from 20 before afforestation to 2 recently. By comparison, data for Qingshuihe, also in Hohhot, shows that the number of sandstorms has been low from the beginning (Table 3). This seems to be because the forest cover ratio in Qingshuihe was higher than that of Tuoketuo (19.8% in Qingshuihe and 11.9% in Tuoketuo. See the Attachment 1) and topography is different.

[12] Responses to the questionnaire were collected from 106 farmers of which 38 were from Ordos, 37 from Bayannur, 17 from Hohhot, 10 from Baotou and 4 from other places.

[13] This area is equivalent to an area with a size between Hokkaido (8.35 million ha) and Kyushu (7 prefectures) (4.22 million ha).

Table 2: Number of Sandstorms and Precipitation (Tuoketuo)

Unit: Upper: number of sandstorms. Lower: annual average precipitation (mm)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
19	21	15	8	5	4	2	1	2	2
n.a	391	418	365	248	408	346	458	492	469

Source: The documents from the Forest Department of the Inner-Mongolia Autonomous Region (Tuoketuo forest bureau)

Table 3: Number of Sandstorms and Precipitation (Qingshuihe)

Unit: Upper: number of sandstorms. Lower: annual average precipitation (mm)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
3	1	-	1	-	2	-	-	2	2
291	207	331	251	73	184	256	267	172	197

Source: The documents from the Forest Department of the Inner-Mongolia Autonomous Region (Qingshuihe forest bureau)

3.3.2 Other Impacts

There is no issue related to land acquisition in this project as the target places were selected in cooperation with farmers and where afforestation was possible. In this regard, there was no negative impact. On the other hand, there was a positive impact on the improvement of the ecological environment. According to the results of the questionnaire survey, most respondents replied that the number of sandstorms decreased and that the microclimate of the afforested areas changed for the better.

The development of cultivation between the protection trees is also counted as a positive impact. Since the protection trees, such as poplars, are planted at intervals, there is a room to cultivate vegetables or pasture between the trees. This has resulted in the side effect of diversifying agriculture products and increasing the income of farmers.

In light of the above, this project has largely achieved its objectives, therefore its effectiveness is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

This project was implemented at eleven districts in four major cities (Yikezhao, Bayannur, Hohhot and Baotou). The afforested areas were same as planned but some of the names of the areas were changed from League to City or City to District because of administrative reorganization.

Table 4: Target Afforestation Areas

Project Area	Counties/Cities/Banners	Note
Yikezhao League	Hangjin Banner, Wushen Banner, Yijinhuoluo Banner, Dongsheng City	Yikezhao was renamed as Ordos and become a City from a League. Dongsheng was changed from City to District.
Bayannur League	Dengkou County, Linhe City, Wuyuan County, Wulate Front County	Bayannur was changed from League to City.
Hohhot City	Qingshuihe County, Tuoketuo County	
Baotou City	Suburb of Baotou City	Suburb of Baotou City was changed to Jiuyuan District.

Source: Appraisal documents and the documents from the Forest Department of the Inner-Mongolia Autonomous Region

The output of the project is described below. The Inner-Mongolia Forest Department and each regional forest bureau explained that the project was implemented based on the original plan in accordance with the feasibility study. The ex-post evaluation mission visited 2 to 3 sites per district, that are representative of each target area. All the sites were afforested as planned in the feasibility study. The equipment procured for administration and monitoring, such as PCs, has come to the end of its service life but some of the equipment is still utilized. With regard to training, it was explained that the total number of participants was more than one thousand and a variety of training courses has been provided with an emphasis on plantation techniques and measures against damage by blight and insects.

Table 5: Original Plan and Actual Output

Items	Plan	Actual
1. Afforestation	106,465 ha	As planned
- Plantation	80,222 ha	As planned
Of which Economic Forest	53,233 ha	As planned
Of which Protection Forest	26,989 ha	As planned
- Regeneration by Enclosures	10,018 ha	As planned
- Aerial Sowing	16,225 ha	As planned
2. Rebuilding / Expansion of Nurseries	10 lots	As planned
3. Forest Protection	Facilities for forest protection	As planned
4. Environment Monitoring	Equipment for monitoring (PC, GPS, etc.)	As planned
5. Office Equipment and Vehicles	4WD vehicle, PC, Photocopy etc.	As planned
6. Technical Training	Training including equipment	As planned

Source: Appraisal documents and the documents from the Forest Department of the Inner-Mongolia Autonomous Region

Note: “Regeneration by enclosures” means to fence the afforestation area so that sheep cannot enter that place. “ Aerial sowing” means to sow bush seeds from the air. These methods are usually applied to stabilize sands.

Table 6: Afforested Places and Areas

Unit: ha

Place \ Total	Afforested area	Artificial forest	Of which economic forest	Of which protection forest	Fenced afforest-ation	Aerial seeding afforest'n
Total	106,465	80,222	53,233	26,989	10,018	16,225
Ordos City (subtotal)	42,586	27,681	20,328	7,354	3,194	11,711
Dongsheng district	10,646	7,452	4,840	2,612	1,065	2,129
Yijinhuoluo Banner	10,647	7,453	4,841	2,613	—	3,194
Wushen Banner	10,647	6,388	5,807	581	1,065	3,194
Hangjin Banner	10,646	6,388	4,840	1,548	1,064	3,194
Bayannur City (subtotal)	31,939	27,418	12,339	8,224	2,136	2,385
Dengkou County	9,239	6,854	4,113	2,741	—	2,385
Linhe City	6,854	6,855	4,113	2,741	—	—
Wuyuan County	6,855	6,855	4,113	2,742	—	—
Wulate Front County	8,991	6,854	—	—	2,136	—
Hohhot City (subtotal)	21,293	16,605	11,614	4,991	2,559	2,129
Tuoketuo County	8,500	7,650	4,636	3,014	—	850
Qingshuihe County	12,793	8,955	6,978	1,977	2,559	1,279
Baotou City (Jiuyuan District)	10,647	8,518	4,840	3,678	2,129	—

Source: Appraisal documents and the documents from the Forest Department of the Inner-Mongolia Autonomous Region

Note: The net total may not be the same as the total for each figure due to rounding off.

Aerial Sowing Site at Wushen Banner

Regeneration by Enclosure Site at Dongsheng City

Nursery at Tuoketuo County

3.4.2 Project Inputs

3.4.2.1 Project Cost

The project cost was estimated on the condition that most of the expenditure would be paid in local currency except for vehicles (82 million yen). The Japanese ODA Loan was allocated to costs directly related to the afforestation (3,346 million yen not including unexpected expenses). According to the Forest Department of the Inner-Mongolia Autonomous Region, the Japanese ODA Loan was outlaid within the original budget and expenditure from the Inner-Mongolian government and local governments were also made within the original budget.

The actual project cost (4,907 million yen) was mostly as planned according to information from the executing agency (the ratio between plan and actual is 100%)[14].

Table 7: Breakdown of Expenditure

Unit: Million Yen

Item	Plan					Actual		
	Local Currency		Foreign Currency	Total	Of which Yen loan	Domestic budget	Yen loan	Total
	Million Yuan	Yen equivalent						
Afforestation	277	3,597		3,597	3,346 include*	711	3,272	3,983
Nursery	6	81		81		15	66	81
Forest protection	5	71		71		17	54	71
Environment monitoring	1	18		18		4	14	18
Vehicles	1	9	82	91	82	9	86	95
Training	11	141		141	*	33	108	141
Others	3	32		32		0	0	0
Labour costs	24	317		317	—	317		317
Management expenses	8	100		100	—	100		100
Price escalation	10	129		129	*	-	-	-
Unexpected expenses	17	225	4	229	172	-	-	-
Interest during construction	8	101		101	—	101	-	101
Total	371	4,821	86	4,907	3,600	1,307	3,599	4,907

Source: Appraisal documents and the documents from the Forest Department of the Inner-Mongolia Autonomous Region

Note 1: With regard to the local currency of the plan, the net total may not the same as the total for each figure because of exchange rate between the Yuan and Yen and round offs. (1 US$ = ¥108, 1 yuan = ¥ 13, as of July 2007)

Note 2: The details of local expenditure were not confirmed by the Finance Department of the Inner-Mongolia Autonomous Region.

[14] The ex-post evaluation mission confirmed the project cost by questionnaire. The answer to the questionnaire by the Inner-Mongolia Forest Department was “as planned”.

3.4.2.2 Project Period

The implementation of the project was scheduled from January 2001 to December 2005 (60 months). The actual data shows that it started in March 2001 and ended in December 2009, 106 months, which was far behind the schedule (177% compared to the original period).

Project completion was defined as achieving a survival rate of 60% and over in the whole afforested area. The survival rate is measured 3 years after plantation. At the time of appraisal it was planned that the afforestation works would be complete by the spring of 2003. The inspection of the survival rate would then be done in 2005 after the 3rd growing period and the project would be complete after confirming that the total area of 106,465 ha had passed the criteria of the survival rate.

However, since the signing of the loan agreement was delayed to March 2001, preparatory works could not be implemented before the rainy season between April and June. Afforestation in 2001 was therefore insufficient. In addition, the drought in 2004 and 2005 required additional plantation in 2006 in areas making up about 20% of the total afforested area where a survival rate of 60% and over could not be achieved. Because of this, the survival rate was measured again in 2009, 3 years after the additional plantation. This is why the original loan period to July 2008 could not be kept. Therefore the loan disbursement period was extended for 2 years to July 2010, which included the adjustment time for disbursement after plantation. The survival rate of 60% was finally achieved in the whole afforested area by the end of 2009[15].

3.4.3 Results of Calculations of Internal Rates of Return (IRR)

Due to difficulties in appropriately calculating direct economic benefit derived from the project, a quantitative analysis of both the Economic Internal Rate of Return (EIRR) and the Financial Economic Rate of Return (FIRR) was not completed at the time of appraisal. In addition, it became more difficult to recalculate economic benefit as output data for economic forest belonging to the project was not collected. Therefore the calculations of FIRR as well as EIRR are not made in this ex-post evaluation.

In light of the above, although the project cost was within the plan, the project period exceeded the original schedule, therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

In principle, the operation and maintenance of economic forest (apple trees, vine, etc.) after afforestation is left to farmers. The farmers maintain their economic forests cooperatively as well as individually. With regard to protection forest, such trees as Chinese wolfberry, which

[15] It was estimated that additional plantation was necessary but the period was scheduled between February and April. It seems that February was still cold and the scheduled period was not right time to prepare plantation.

also have economic value as economic forest, are left to farmers. Other protection forests are maintained by the Local Forest Departments who water the trees and take care of damage caused by blight and insects.

The operation and maintenance system in the Forest Department and its divisions after the completion of disbursement of the project remained unchanged in three layers. Specifically, the Forest Department of the Inner-Mongolia Autonomous Region supervises the Forest Department of each city or league which in turn supervises the Forest Department of each county or banner. Local Forest Departments hire forest rangers, who are responsible for protecting from fire, insects and illegal logging, patrolling protection forests and controlling cars which approach the forests. After completion of the project, the number of staff belonging to the forest management sections, such as national forest farms, forest product stations and forest disease protection stations, was 37,522 in 2010 and 36,674 in 2011 which remains at the same level[16].

3.5.2 Technical Aspects of Operation and Maintenance

In order to implement afforestation successfully, farmers received not only technical trainings on plantation techniques but also trainings on cultivation, care, maintenance, protection from damage by blight and insects, protection from damage by animals, such as hares or field mice, and countermeasures against drought and fire. These trainings took place regularly (about twice a year) and on an ad hoc basis. Those trained ensured operation and maintenance after afforestation. The staff in the Forest Departments were also trained in forest management, afforestation techniques for protection against desertification, nursery management, measures against harmful organism and so on, in the Forest Department of the Inner-Mongolia Autonomous Region and National Forestry Department. Recently GPS and satellite pictures have been used as the afforested areas are widely scattered.

3.5.3 Financial Aspects of Operation and Maintenance

Economic forests generate income for operation and maintenance from their products, such as apples, vines, Chinese wolfberries etc. Protection forests can receive a subsidy for maintenance when the forests are acknowledged as used for public benefit and these forests are designated as public forests in accordance with the “National Forest Division Measures”. Specifically, those forests which are used as windbreaks, for the prevention of flying sand, the protection of watersheds and banks, conservation of environment, national defense and science experiment can be public forests. Local governments can also designate forests as public forest to their standards.

[16] Source: National Forestry Department: “China Forestry Statistical Yearbook 2010” and “China Forestry Statistical Yearbook 2011”

When forests are designated as national public forests, 5 yuan per mu is provided for those forests as a subsidy. In the case of local public forests, the subsidy is 3 yuan per mu for maintenance and administration. These subsidies are reviewed from time to time.

The investment budget for forest management in the Inner-Mongolia Autonomous Region, which is the total for the nurturing of forests, protection from forest fires and protection from damage by blight and insects, has increased from 73 million yuan in 2009 to 232 million yuan in 2010[17].

3.5.4 Current Status of Operation and Maintenance

According to the results of visits to 11 representative sites in 4 cities, forests are well maintained through measures as regular watering, periodic cutting, such as in the case of Salix psammophila for 3 to 4 years, and protection measures against damage by blight, insects and forest fire. In this regard no problems have been observed in operation and maintenance. Since the project area belongs to an arid zone, there is a possibility in future that drought could cause a problem of water. In the meantime, the recent survival rate after inspection has been 66% for protection forests, and 62% for aerial sowing forests which is not a problem for now.

In light of the above, no major problems have been observed in the operation and maintenance system, therefore the sustainability of the project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project aimed at the afforestation of 11 districts of 4 major cities, i.e. Hohhot, Baotou, Ordos and Bayannur in the Loess Plateau. These were covered with protection forest and economic forest, in order to increase the forest cover ratio, to protect surface soil erosion and to increase farmers' income by selling their products such as fruits from the planted trees. The project was implemented in accordance with national policy of China and is contributing to the improvement of the ecological environment, one of the important policies at present in China. The project is also consistent with Japan's ODA policy to China. In this sense the relevance of this project is evaluated to be high. The project was implemented just as planned and contributed to the improvement of the project areas by increasing the forest cover ratio. This also had a certain protection effect against desertification. These results show the high effectiveness and impact of the project. With regard to project cost, although a detailed track record could not be analyzed, the project cost was lower than planned. On the other hand, the implementation period was delayed significantly compared to the original schedule because of

[17] National Forestry Department: "China Forestry Statistical Yearbook 2010" and "China Forestry Statistical Yearbook 2011"

the influence of drought, and so forth. This resulted in the extension of the disbursement period by two years. From this point of view, the efficiency of the project is evaluated to be moderate. With respect to operation and maintenance since implementation of the project has been the responsibility of farmers for their own economic forests and the Forest Departments for protection forests. To date there has been no problem which has jeopardized the sustainability of the project.

Based on the above results, this project is evaluated to be very high.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Nothing to mention

4.2.2 Recommendations to JICA

Nothing to mention

4.3 Lessons Learned

(1) Comprehensive Support to the Executing Agency (Project supervision based on the detailed plan)

The Forest Department of the Inner-Mongolia Autonomous Region has appreciated the continuous support of the JICA (then JBIC) Beijing Office from the beginning. JICA has supervised the project in a comprehensive manner through extending its support to the executing agency from their standpoint. This has included the provision of manuals necessary for the implementation of the Japanese ODA Loan project, regular supervision at sites and the conducting of an intermediate evaluation in cooperation with the National Forestry Department. This direct support by JICA has had a positive effect on farmers as well as on the executing agency and has helped the project be a success.

There are cases even now where a borrower or executing agency receives a Japanese ODA Loan for the first time. Mostly, in these cases, a consultant will be employed using the Japanese ODA Loan, or JICA will hire a consultant to support the borrower or the executing agency. The lesson learned from this project is that, when extending a loan to an executing agency who is not familiar with Japanese ODA Loan, it is very effective that JICA initiates the support plan and has frequent communication with the executing agency.

(2) Preparation of Maps for the Supervision of a Project over a Wide Area

In this project, maps which showed the location of the afforested sites, the houses of farmers and the location of protection forests were not made. Sign boards which identified that the forests had been planted were provided with the Japanese ODA Loan, but if there had been maps at the implementation stage, it would have been easy to compare the scenery before and

after afforestation, at the time of supervision and to date. In fact, the JICA supervision mission later had to use GPS to confirm the sites.

In case like this, when a project is implemented in a wide area, a project site map to identify the detailed places of implementation should be prepared in advance in order that the concrete situation of the project at site can be easily grasped.

(3) Setting of the Project Implementation Period under Severe Natural Conditions

It was agreed at the appraisal regarding the project completion time that a survival rate of 3 years after the first plantation should be the yardstick for judgment. Inner-Mongolia, Shanxi and Shaanxi were implementing afforestation projects at the same time and therefore a unified criteria had to be set.

However afforestation is influenced by natural conditions such as climate, quality of the seedlings, etc. which cause differences in growth. There is a limit to how much the same criteria can be applied in areas where natural conditions are different. In particular, the weather is extremely dry in the Inner-Mongolia, compared to other areas, and the natural conditions are harsher. In addition, afforestation needs complementary planting as not all the trees can survive after the first plantation. Therefore, the timing and period for complementary planting should also be taken into account.

It is recommended that at the appraisal for the same kind of project, the completion time be decided taking into account the necessity for, and the workload related to, complementary plantation, and that the climate and environment of the project sites are examined.

End

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	See Table 4 through Table 6	As planned
2. Project Period	January 2001 – December 2005 (60 months)	January 2001 – December 2009 (106 months)
3. Project Cost		
Amount paid in foreign currency	86 million yen	86 million yen
Amount paid in local currency	4,821 million yen (371 million yuan)	4,821 million yen (n.a)
Total	4,907 million yen	4,907 million yen
Japanese ODA loan portion	3,600 million yen	3,599 million yen
Exchange rate	1 yuan = 13 yen (As of September 2000)	1 yuan = 14 yen[(1)] (Average between 2001 and 2010)

Note (1): The exchange rate was calculated from a yuan/yen cross rate which was derived from the middle rate of yuan/US$ and yen/US$ in each year in IFS.

Attachment 1

Change of Forest cover ratio in the Inner-Mongolia Autonomous Region
and Project Afforested Areas

	Start of the Project		Middle of the Project		Ex-post Evaluation		12th 5year Plan
	%	Survey year	%	Survey year	%	Survey year	Target %
Whole Inner-Mongolia	14.8	1999~ 2000	20.0	2010~ 2011	n.a	n.a	21.5
Total Project Area	11.8	2000	17.4	2005	24.3(est.)	2012	n.a
Baotou City (Jiuyuan District)	9.9	2000	n.a	n.a	19.2	2012	20.0
Bayannur City	8.7	2000	14.5	2010	15.4	2012	15.0
Wuyuan County	8.5	2000	10	2010	11.2	2012	n.a
Dengkou County	12.3	2000	16.5	2010	17.9	2012	n.a
Linhe City	6.0	2000	15	2010	17.8	2012	22.9
Wulate Front County	9.5	2000	13.3	2010	15.5	2012	n.a
Ordos City	12.2	2000	22.2	2009	n.a	n.a	n.a
Hangjin Banner	7.3	2000	14.6	2010	15.2	2012	n.a
Dongsheng district	17.1	2000	33.0	2010	16.9	2012	n.a
Wushen Banner	25.2	2000	30.9	2010	32.3	2012	36.0
Yijinhuoluo Banner	30.1	2000	39.9	2010	39.9	2012	42.0
Hohhot City	15.9	2000	23.4	2007	27.1	2012	n.a
Qingshuihe County	19.8	2000	29.7	2007	32.9	2012	n.a
Tuoketuo County	11.9	2000	12.1 17.1	2002 2010	21.3	2012	22.3

Source: Forest Department of the Inner-Mongolia Autonomous Region (each Local Forest Department)
Note: The forest rate was rounded off to one decimal place.

Attachment 2

Answers to the Questionnaire

Questions were raised about "the cases in which the environment was improved". Freely written answers were collected by the Department of Forest of the Inner-Mongolia Autonomous Region as follows. 106 samples were collected.

	Answer	No. of answers
1	Cultivated area for Chinese wolfberry in the whole village increased.	2
2	Natural disasters decreased. The climate improved a little.	21
3	Plantation areas increased. The air was cleaner.	1
4	The number of sandstorms decreased. Plantation areas increased. Income increased.	9
5	The number of sandstorms decreased. There was protection against surface soil erosion. Environmental beautification was promoted. The air was cleaner.	25
6	The areas were effectively protected from erosion by water and wind. Plantation areas increased	7
7	Timber forest area increased. The number of sandstorms decreased. The natural environment was improved dramatically. The micro climate changed for the better and the number of wild animals and wild plants increased substantially. Income increased to some extent.	11
8	The number of sandstorms decreased. Rainfall increased.	9
9	The number of sandstorm disaster decreased. Floods decreased.	1
10	Humidity became higher. Dry hot winds decreased. The environment improved.	5
11	The micro climate improved. Humidity became higher.	2
12	The micro climate improved. The sand fixation effect was remarkable.	1
13	Disaster days caused by sandstorms decreased. Flood protection dams in the Yellow River were guarded. There was protection against surface soil erosion.	2
14	Agriculture was protected. Agricultural products increased. The micro climate was changed for the better. Income increased.	5
15	Before afforestation the area was of fluid sand and barren. After afforestation the vegetation coverage rate exceed 80%. The micro climate changed for the better. The living environment of farmers improved. Houses were no more buried in sand after strong winds like in the past.	4
16	No answer	1
	Total	106

Note: The questionnaire was distributed to farmers in the project areas (11 sites in 4 cities, 169 in terms of banner) through the Department of Forest of the Inner-Mongolia Autonomous Region. 100 households were expected to answer the questionnaire but 106 answers were collected. The answers were 38 from Ordos, 37 from Bayannur, 17 from Hohhot, 10 from Baotou and 4 from others. The survey was conducted from March to April 2013.