# Thailand

# Small Scale Irrigation Programme (Stage IV ~ VI)

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## 1 Project Profile and Japan's ODA Loan

### 1) Background

This project was planned on the basis of the Fifth National Social and Economic Development Plan (1982~1986), which set promotion of rural development in under-developed areas as one of its key objectives. One of the means stated for achieving that goal was the development of small-scale water sources in poor rural areas which rely on rainfed agriculture. The Second Five Year Small-scale Irrigation Program (1982~1986) was drawn up on that basis, planning the construction of approximately 2,500 small-scale irrigation facilities, including this project. The area covered by this project did not receive enough irrigation water for rice cultivation in the rainy season, and in the dry season even irrigation for dry field farming was difficult to achieve. On occasions even water for household use was in short supply in times of drought. There was an urgent need in these areas for the construction of small-scale irrigation facilities and the storage of water.


### 2) Objectives

This project aimed to build large numbers of small-scale water supply facilities in rural areas which do not benefit from large-scale water supply facilities, in order to assure their supplies of water for irrigation, livestock and fish breeding and household use, thereby increasing and stabilizing agricultural production and raising living standards.

### 3) Project Scope

Following on from Small-scale Irrigation Projects I~Ⅲ, which were implemented between 1977 ~ 1981, this project aimed to build small-scale irrigation facilities (including reservoirs, levees, water volume


Surveyed Locations

adjustment facilities etc.), mainly in the North and Northeast of Thailand. Such facilities were to be built at 500 locations per year over three years, totaling 1,500 locations (2,094 locations were actually built). The project also included procurement of construction and repair equipment and spare parts, as well as consulting services. The ODA loan covered the entire foreign currency portion of the project cost.

### 4) Borrower/Executing Agency

The Kingdom of Thailand / Royal Irrigation Department (RID)

### 5) Outline of Loan Agreement

| | IV | V | VI |
|---|---|---|---|
| Loan Amount / Loan Disbursed Amount | ¥7,310 million / ¥6,707 million | ¥6,900 million / ¥5,787 million | ¥5,293 million / ¥4,448 million |
| Exchange of Notes / Loan Agreement | June 1983 / September 1983 | July 1984 / September 1984 | September 1985 / October 1985 |
| Conditions: Interest rate Repayment period (Grace period) | 3.00% 30 years (10 years) | 3.50% 30 years (10 years) | 3.50% 30 years (10 years) |
| Final Disbursement Date | September 1988 | September 1989 | October 1990 |

## 2 Project Impact Evaluation by Third-Party

### 1) Survey Objective

The project-based post-evaluation of this project was once done in 1999, but this impact evaluation is a comprehensive study to find what kinds of impact resulted from the implementation of the project. By carrying out a participatory survey, it was possible to incorporate the views of the beneficiaries into the evaluation and find how the impact on poverty alleviation[1] by this project was realized in the villages surveyed.

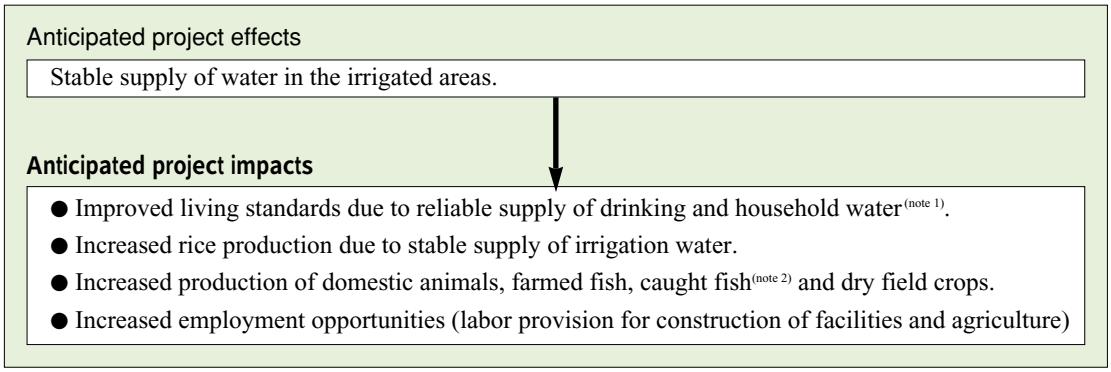
### 2) Survey Method

This evaluation combined quantitative method (a questionnaire survey) with qualitative method (Rapid Rural Appraisal, RRA) in a participatory survey. It was impossible to cover all the project sites in the survey (a total of 2,094 sites were covered over three years), thus the province of Si Sa Ket was chosen as the survey area. It was selected because it is located in Northeast Thailand, where the largest numbers of project sites are concentrated, and because, having the lowest per capita gross product of any province in the region, it could be regarded as a poor province. Project facilities were built at 67 locations in the province, of which 23 were selected based on consideration of their type, year of completion, distance from the village, geographical distribution of sites and the existence of various social groups within the village. The one village which benefited most from each facility was selected. Of the selected villages, questionnaire surveys were conducted in 16 and Rapid Rural Appraisals (RRAs) were conducted in ten (both were conducted in three of the villages).

1 The alleviation of poverty can be defined and interpreted in many ways, but in this case, rather than the narrow definition of increasing income levels or decreasing the population in poverty , this project took the broader definition of reduction or elimination of the poverty factors of which poverty is formed, such as, in this project, alleviation of water shortage for irrigation and household use . The reason for the choice is that even if improvement is seen in some of the poverty factors it is impossible to break out of the poverty trap, because other poverty factors are unchanged, and therefore there is no actual change in income levels. Thus even if the project makes a contribution to the alleviation of poverty, that contribution is often not manifested in the form of direct increased income levels for the poor or reduction of the population in poverty .

### 3) Summary of the Impact of this Project

The flow of initially anticipated project effects and impacts is as follows




**Note 1** **In this report, the term " household water " is distinct from drinking water and refers to water used for simple bathing, laundry, in the kitchen etc.**

**Note 2** **In this report, " farmed fish " refers to fish raised on irrigation reservoirs and canals, while " caught fish " refers to fish caught from open water in irrigation facilities, other than those that have been farmed.**

Of the above, the envisaged project effect of Stable supply of water in the irrigated areas has fulfilled its initial target, as most of the sites supply water, although there are some differences between sites in the volume of water storage and quantity of rainfall and there are also seasonal changes[2], and the irrigation facilities are being used in some form. As for the realization of anticipated project impacts, the impact has been considerable in improved living standards due to reliable supply of drinking and household water and in increased fish consumption and income due to fish catching , as described below.

■ Improved living standards due to reliable supply of drinking and household water

Around 30% of all households responding to the questionnaire survey used the water supplied as household water (for laundry and simple bathing) and approximately 20% also used it as drinking water. These respondents said that they were able to avoid the risk of water shortage in times of drought and saved time they would have had to spend getting water from a river or well.

■ Increased rice production due to stable supply of irrigation water

Some households and villages were able to double their rice production by using rainy season irrigation, and thus it could be said that the water supply certainly made rice production more widespread and stable. That also had the effect on increasing employment in busy farming seasons. The construction of irrigation facilities brought an overall reduction in drought damage, but in some cases the weather caused excessive water supply[3].

■ Increased production of domestic animals, farmed fish, caught fish and dry field crops

It was not possible to confirm a causal relationship between this project and the increase in domestic animal production. The effect on fish farming was limited, although there were some cases of the construction of ponds or simple breeding facilities. However, fish catching from the water surfaces of irrigation facilities had an impact in every village and on people of every class, whether they owned land or not. Residents consumed more fish in their homes, and there were also many reports that the extra income was earned from selling fish over what their family had consumed. Thus the increase in fish stocks generated by the construction of facilities for this project had a beneficial effect. On the other hand, the increase in fishing led to the emergence of some people who do not observe the

2 Si Sa Ket province, which was the subject area of this study, contains 67 project sites, of which six do not store water.

3 It was not possible to confirm the causal relationship with this project.

conventions agreed between the residents on fishing seasons and methods, and the resulting disputes over fish had a negative impact. As for the dry season crops, the use of water pumps enabled dry season irrigation, and there were cases of large revenues from the sale of chili pepper and other increased production effects. While some households directly cultivate dry fields, most provide their labor to others, rather than cultivating their own crops. They do so because of lack of labor, the high cost of related investments, and risks of insect damage and market changes.

■ Increased employment opportunities

According to RID staff, the expansion of employment opportunities associated with this project included the employment of adjacent local villagers for the construction of the facilities. However, this survey was unable to confirm actual construction workers due to the project in interviews with residents and village committees and inspection of employment records. That is probably due in part to the considerable amount of time that has elapsed since the implementation of the project. There is an increase in employment due to the use of irrigation facilities, because workers are needed for the cultivation of the dry season crops, which was made possible by this project. Before that, the unemployment rate was high in the dry season because there was almost no rice cultivation.

■ Other unanticipated impacts

Unanticipated impacts include the use of water in festivals (Loy kratong: water splashing festival), and improved transport convenience due to the access roads gained from the construction of the irrigation facilities. On the other hand, while it was not verified scientifically in this survey, there were reports that the construction of the weirs, which secured the water volume in the lakes, also harmed water quality due to increased water weed and inflow of agricultural chemicals as the water is shut in.

Based on the findings of this survey, the overall impact of the project are summarized as follows.

| | |
|---|---|
| Anticipated positive impacts<br>① Improved living standards due to reliable supply of drinking and household water.<br>② Increased rice production due to stable supply of irrigation water.<br>③ Increased income and employment opportunities due to dry field cultivation (chili peppers, beans, pumpkin etc.).<br>④ Increased laboring work in busy farming seasons.<br>⑤ Increased fish consumption (more fish and more varieties) due to increased fish catches.<br>⑥ Increased income due to fish catches.<br>⑦ Increased income due to catching other aquatic animals (note 1). | Anticipated impacts which were not realized<br>① Increased production of domestic animals (particularly water buffalo). |
| Unanticipated positive impacts<br>① Use of water in festivals (Loy kratong : water splashing festival).<br>② Improved transport convenience due to the access roads gained from construction of the facilities. | Unanticipated negative impacts (note 2)<br>① Flood damage and loss of land (low-lying land).<br>② Increased water weed and water quality deterioration due to the construction of the weirs.<br>③ Fishing disputes between residents.<br>④ Damage to rice due to increased numbers of golden snails. |

**Note 1** In this report," other aquatic animals "refers to edible aquatic animals besides fish, such as frogs.

**Note 2** Unanticipated negative impacts were reported through interviews with residents, and their actual relationship to the project was not confirmed.

As the above table shows, the irrigation facilities built under this project are used for many purposes and have an impact that is favorable overall.

### 4) Project Impact for Alleviation of Poverty

This evaluation survey examined how the impact of the project on residents varied with their wealth, with particular reference to the kind of poverty alleviation impact the project had on poor households.

This project targeted rural areas which were unable to benefit from large-scale irrigation facilities. In the Si Sa Ket province, which was the subject area of this survey, the per capita gross product of the province was 18,199 Baht (1 Baht = ·3.9) according to 1997 Interior Ministry statistics, making it a relatively poor region. Around 70% of the households participating in the questionnaire survey were poor, with annual household income of less than 40,000 Baht [4]. Meanwhile, the households identified as poor by the villagers themselves in the RRA survey were those lacking land and labor, besides having low income. (References to poor households below are based on this definition).

The RRA survey for this evaluation conducted interviews concerning the impact of the project on households identified by the village committees of each village as households which made good use of the opportunities offered by the project and as poor households . Based on interviews conducted in ten villages, the tendencies in impact manifestation can be compared between the two groups as shown in the table below.

According to this comparison, the households which made good use of the opportunities offered by the project were farmers who owned land, agricultural equipment and other assets and had sufficient labor, as well as being relatively prosperous so that they could bear the financial risks. They enjoyed a wide range of benefits, including effective use of land through irrigation, cultivation of dry season crops, increased income through the sale of fish catches and other edible aquatic animals, increased agricultural production through the purchase of tractors, fertilizer and other farming investment goods, and increased income through rice-related business (wholesaling, polishing etc.). Households deemed poor also derived some degree of benefit towards the alleviation of their poverty through obtaining household water supplies, nutritional intake from fish catches, and laboring work in busy farming seasons, but because they had no land (not even rented land) to utilize irrigation water and for other reasons, they gained limited economic benefit (such as increase rice production on owned land and cultivation of crops in the dry season) from direct use of the irrigation facilities.

Thus, from the overall findings of this evaluation survey, it is concluded that water supply due to small-scale irrigation facilities helped to raise living standards of beneficiaries by providing household water. However, since it is rare for the benefits of projects of any kind to be spread evenly between all the beneficiaries, consideration must be given to the large disparities in benefits from the project, depending on the circumstances of the beneficiaries.

### 5) Recommendations

■ Measures to deepen poverty alleviation impact (recommendations to the Thai government and RID)

Farmers with no land and low incomes have limited assets and labor and restricted access and opportunity to benefit from the project. It is important to find ways to enable them to make more use of the facilities. For example, pumps for household water could be installed at the expense of the counterpart country, and job opportunities could be created in the operation and maintenance of facilities (waged labor removing sediments or cutting grass in the facilities). The RID is mainly responsible for maintaining the functions of the facilities (repair works etc.), which limits the support given to beneficiaries in the use of the facilities. It should be possible for the RID to cooperate with the other agencies responsible

4 The poverty line set by the Thai government is 911 Baht / person / month, from which one can infer that the population below that poverty line is large in the surveyed villages.

for such activities in order to deepen the poverty alleviation impact of the facilities. For example, the Department of Community Development, which provides support for improving living standard in rural areas, could provide instruction in the use of water from the facilities as safe drinking water. The Department of Rural Development, which is responsible for providing agricultural support, could instruct landless farmers in techniques for growing crops in their own back gardens. Effective measures could be devised by considering each agency's range of activity. Furthermore, cooperation between these agencies, including the RID, and Tanbon Administrative Committees (organizing committees for each administrative zone composed of representatives from each village) could make Tanbon Committees into communications pipelines between the government and the villagers to gain a better grasp of the needs of the villagers.

| | Households which made good use of the opportunities presented by the project | Poor households |
|---|---|---|
| Improved living standards due to reliable supply of drinking and household water. | ○ Reliable supply of household water (Water supply is possible from privately owned wells). | ◎ Reliable supply of household water (avoiding the risk of water shortage in case of drought, reduction of the labor time required for water carrying, allowing more effective use of the time). |
| Increased rice production due to stable supply of irrigation water (rainy season). | ◎ Expanded area of irrigated cultivation.<br>◎ Increased production volume (Effective use of land through pump use and irrigation etc.). | ○ Increased opportunities for selling their labor, particularly in busy farming seasons ( they cannot make direct use of the irrigation facilities due to lacking land and other assets). |
| Increased income and employment opportunities due to dry field cultivation. | ◎ Increased area of dry season cultivation, and increased income from sale of crops (particularly chili peppers, beans, pumpkins, onions, green vegetables). | ○ Increased employment opportunities (mainly seasonal and day laboring). |
| Increased income due to fishing. | ◎ Increased income from sales. | △ Home consumption only. |
| Increased fish consumption due to greater fish catches. | ◎ Nutritional intake. | ◎ Nutritional intake. |
| Increased income due to catching edible aquatic animals. | ◎ Increased income from sales. | ○ Increased income from sales. |
| Other | ○ Wider opportunities for income.<br>○ Wider opportunities for income from rice-related business (rice trading, polishing). | ○ Improvements in living environment etc. due to better sanitation. |

**Note** **The evaluation criteria are as follows, based on group interviews in ten villages:**

- ◎ **A substantial level of impact was observed in nearly all households.**
- ○ **Impact was observed in some households.**
- △ **No impact, or apparently limited impact.**

# Comparison of Original and Actual Scope

| Comparison of Original and Actual Scope | Original | | | Actual | | |
|---|---|---|---|---|---|---|
| | SSIP(4) | SSIP(5) | SSIP(6) | SSIP(4) | SSIP(5) | SSIP(6) |
| I. Project Scope | | | | | | |
| 1. Civil works by facility | | | | | | |
| Reservoir (numbers) | 245 | 250 | 249 | — | 348 | 412 |
| Levee (numbers) | 190 | 185 | 195 | — | 233 | 221 |
| Water volume adjustment facility (numbers) | 65 | 55 | 56 | — | 141 | 79 |
| Total (numbers) | 500 | 500 | 500 | 660 | 722 | 712 |
| 2. Consulting service Total (M/M) | 203 | 90 | 74 | 62 (foreign consultants only) | 54 | 61 |
| II. Implementation Schedule | | | | | | |
| • Consulting service | 1984/10 ～85/9 | 86/1～ 86/12 | None | 85/2～ 86/6 | 86/7～ 87/10 | None |
| • Civil works | 1983/10 ～84/9 | 84/10～ 85/9 | 86/10～ 87/9 | 83/10～ 84/9 | 84/10～ 86/9 | 87/10～ 90/2 |
| • Procurement | 1983/8 ～84/4 | 84/10～ 86/9 | None | 85/2～ 86/6 | 86/7～ 88/9 | None |
| III. Project Cost | | | | | | |
| • Foreign currency (¥million) | 7,310 | 6,900 | 5,293 | 6,707 | 5,782 | 4,443 |
| • Local currency (million Baht) | 1,100 | 1,068 | 1,067 | 1,168 | 1,151 | 1,086 |
| • Total (¥million) | 18,306 | 17,686 | 15,001 | 16,399 | 15,336 | 10,208 |
| (Exchange rate: \ per 1Baht) | (¥10.0) | (¥10.1) | (¥9.1) | (¥8.3) | (¥8.3) | (¥5.3) |

BanYang Kut Reservoir Facility

Ban Muang Noi Weir Facility

A Meeting with Villagers

Farming Scene

An Interview with Farmers

Caught Fish