Chapter 6
Conclusions and Recommendations

6.1 Conclusions

This research aimed to address the issue of irrigation water shortage in Thailand. The demand for the dry season irrigation has been growing, and farmers are competing for the limited supply of irrigation water. In general, there are three main factors contributing to the increasing demand for agricultural water:

1. "Free" water allowing farmers to over irrigate whenever possible so as to reduce management costs and reduce the risk of drought;
2. Farmers' lack of awareness of wasting of wasting scarce water resources; and
3. Inefficiency of irrigation systems in delivering water.

Pricing natural resources at appropriate levels is recognised as an effective economic means to control the increasing demand for resources. Pricing could also increase consumers' awareness of the value of resources, and raised funds could possibly be used for the better management of resources. In Thailand, the State Irrigation Act of 1942 authorises the Royal Irrigation Department to charge irrigation users for water up to 0.50 baht/m^3, though it has not been practised.

The objective of this research was to develop an irrigation water pricing mechanism for Nong Wai Irrigation, as a measure to control water consumption, with a focus on estimating full-cost prices of irrigation water. Average Incremental Costs (AIC) of water for Nong Wai Irrigation were calculated to be 1.486 – 1.791 baht/m^3 with the incremental investment costs for the main, secondary and farm level irrigation system; and 0.235 – 0.522 baht/m^3 with the incremental investment costs only for the farm level irrigation system.

Most of the calculated AIC figures are higher than 0.50 baht/m^3 that RID is legally allowed to charge irrigation users. On the other hand, these AIC figures are much lower than the present water rates for other uses of water such as domestic and industrial. For instance, the water rates set by the Metropolitan Waterworks Authority (MWA) were between 7 baht/m^3 to 14.30 baht/m^3 as of June 1999, and the MWA's board of directors approved the increase of the water rate by 1.50 baht/m^3 (Bangkok Post, 23 June 1999). The calculated AIC figures were multiplied by the official irrigation water requirement of paddy, 1,600 m^3/ rai for the rainy season, and 2,500 m^3/

rai for the dry season, to estimate the cost of water for one rai of paddy cropping. The estimated cost ranged from 376 baht/rai up to 4477.5 baht/rai.

The field test was conducted to make a preliminary assessment of farmers' willingness to pay for irrigation water if a water charge was to be introduced. Although the sample size was small, he responses to the questionnaire gave some indication of the farmers' perspective. The result was, on average, 10.65 baht/rai of paddy field for the rainy season and 17.48 baht/rai for the dry season. The field test suggests two possible reasons for this very low willingness to pay for irrigation water: one is declining revenue from paddy cropping; and the other farmers' lack of awareness of the value of water. Considering the net benefit from the rainy season paddy being 190 baht/rai and that from the dry season paddy 750 baht/rai, water charges should not be set very high. On the other hand, farmers spend over 1,000 baht/rai on other production inputs such as fertilisers and pesticides. Compered with the costs of other production inputs, farmers' willingness to pay for irrigation water appears disproportionately low. Irrigation water charge should not be argued on its own. Rather, it needs to be looked at taking a holistic picture of rice production.

6.2 Recommendations

Value of irrigation water needs to be recognised

The outcome of the interviews with 23 farmers using Nong Wai Irrigation shows that farmers are willing to pay for irrigation water at the average rate of only 11 baht/rai for rainy season and 17 baht/rai for dry season. Many of the interviewed farmers argued that production inputs for paddy cropping are already expensive, and they do not want to have water fees lift the production cost even higher. According to the information on agricultural production costs provided by the Office of Agricultural Economics (refer to Table 4-7), farmers are spending as much as 1,258 baht/rai of the production cost for rainy season paddy cropping, and 1,611 baht/rai for dry season paddy cropping.

It seems true that farmers have to spend much on expensive production inputs such as chemical fertilisers and pesticides. Comparing the prices that farmers are willing to pay for irrigation water to the production cost of 1,258 and 1,611 baht/rai, however, 11 and 17 baht/rai are disproportionately low. 11 baht for the rainy season is only 0.87% of the production cost for the rainy season paddy cropping, and 17 baht for the dry season is 1.06% of the production cost for the dry season paddy cropping.

Why are farmers willing to pay over 1,000 baht/rai for production inputs but only 11/17 baht/rai for irrigation water? This might be due to the prevailing notion that water is free. In Thailand, it has long been a development policy to provide free irrigation water to the underprivileged rural people. The low willingness to pay for

irrigation water may reflect farmers' resistance to paying for what used to be free. Some farmers mentioned in the interviews that they now have many kinds of expenditures such as electricity bills. They are accustomed to the idea that consumers of electricity have to pay for its price. As water and electricity are similar types of public services, it might be possible to treat irrigation water in the same way as electricity.

Willingness to pay for irrigation water seems to be influenced more by farmers' awareness of water being valuable resources, rather than by farmers' affordability. Willingness and affordability are sometimes discussed together as an issue, or affordability is said to have influence on willingness to pay. As the outcome of the interviews shows no correlation between financial well-being and willingness to pay for irrigation water. If farmers' awareness of the value of irrigation water was successfully increased, their willingness to pay might go up accordingly. In this sense, awareness raising for farmers of the value of natural resources that are currently undervalued may be important.

Clear linkage between water fees and good services may facilitate fee collection

According to the outcome of the interviews, satisfaction with irrigation services seems to be an important factor which influences farmers' willingness to pay for irrigation water. Although the majority of interviewed farmers are satisfied with irrigation services and some of the satisfied farmers are willing to pay nothing for water, a clear linkage between water fee collection and the use of collected money for good services would to be important.

There should be transparency in use of collected water fees. One farmer said in the interview that if water fees were to be collected, whoever collects fees must ensure the proper maintenance of irrigation canals and ditches. If farmers see their financial contribution being spent effectively for maintenance of irrigation facilities, there would be less resistance to the fee collection. When the idea of water users' groups was introduced under the Nong Wai Agriculture Development Project (1976-1983), water fees were collected by small scale water users' groups and sent to Nong Wai Agricultural Cooperative, which would approve the use of collected fees upon the receipt of work plans from the chief of each water users' group. If the arrangement for financial management were simplified to allow water users' groups to manage collected water fees at their level, farmers might see a clearer linkage between water fees and expenses on irrigation maintenance.

RID may need to promote capacity development of water users' groups

In order to create a clear linkage between water fee collection and improvement in operation and maintenance of irrigation, it would be favourable to have water users' groups to collect water fees and use them for maintenance of irrigation. As many as 13 out of 23 interviewed farmers think villagers/water users' groups should be responsible for the operation and maintenance of the farm level irrigation and use collected water fees to fulfil the responsibility.

According to the project feasibility study, the water users' groups were supposed to be responsible for the operation and maintenance of the farm level irrigation. In practice, water fee collection has been abandoned, and water users' groups do not have financial means to operate and maintain the farm level irrigation. The result of the interviews gives an impression that the institutional capacity and the functions of water users' groups may vary from group to group. Some farmers said that their water users' groups are functioning all right. On the other hand, some others do not have much confidence in their water users' groups. One farmer mentioned that her group does not have the group spirit it used to have when it was formed, and there are fewer meetings and less participation by members. Therefore she would not recommend water users' groups to collect and/or manage water fees.

There is one contrasting case. This farmer believes that his water users' group would be capable of collecting water fees and managing them for operation and maintenance of irrigation at all levels. This water users' group may be an example of one which functioning well. He advocates water users' groups to be the responsible organisation for irrigation management because members of water users' groups share common issues and problems about irrigation. This may be the major advantage of water users' group. Many of the issues and problems raised by interviewed farmers seem to happen along farm ditches and small canals. If the institutional capacity of water users' groups is strengthened, the farm level irrigation problems such as opening/closing of water gates and repairing of ditches may be effectively addressed by the groups.

RID officials could remain as advisors to water users' groups. Most of the interviewed farmers indicated their confidence in RID as the responsible agency for Nong Wai Irrigation. On the other hand, only one farmer out of 23 cases recommended Nong Wai Agricultural Cooperative as an alternative institute for the operation and maintenance of irrigation canals and ditches. Despite the past experience of having the Agricultural Cooperative as the coordinating organisation for the farm level irrigation management, farmers may not see the Agricultural Cooperative as a suitable mechanism for irrigation management.

Gradual introduction of water fees might be more feasible

It is clear that the full cost prices of irrigation water, 380 baht/rai for rainy season and 590 baht/rai for dry season, are unrealistically expensive for farmers. In contrast, the average willingness to pay for irrigation water among interviewed farmers, 11 baht/rai for rainy season and 17 baht/rai for dry season, appear to be rather too low. 11 baht is 2.89% of the calculated full-cost price of water for the rainy season paddy cropping, and 17 baht is 2.88% of the calculated full-cost price of water for the dry season paddy cropping.

If water fee collection were to be initiated under Nong Wai Irrigation, it would be recommended to start with small water fees, and as farmers/water users' groups become more accustomed to the collection and management of water fees, the rates of water fees could be gradually increased. Considering the fact that Nong Wai Agricultural Cooperative used to collect from farmers 30 baht/rai/year of water fees for the farm level irrigation management 10 year ago, the initial rates could be set slightly higher than 11 baht/rai for rainy season and 17 baht/rai for dry season. Water fees could initially be set at the same rate for all the households as willingness to pay seems insensitive to income and every farmer would be able to pay water fees as small as 11/17 baht. Assistance in technical aspects and financial management might be necessary to be rendered by RID or others. For the initial period, provision of matching funds to water users' groups might be a reasonable option to encourage farmers to contribute water fees and to secure enough financial resources for water users' groups to manage the farm level irrigation systems.

Promotion of income generation and reduction of production cost might be encouraged along with the introduction of water fees

It was mentioned by many of the interviewed farmers that the production cost of paddy cropping has increased whereas the farmers' selling price for rice has not been higher. As a result, the farmers' net revenue from paddy cropping is diminishing. It would be an extra burden for farmers therefore if they had to pay for irrigation water on top of other expenses.

One farmer said in the interview that RID encouraged farmers to grow 1-2 rai of cash crops aside from paddy so as to increase cash income. Mixed cropping, or diversification of the cropping pattern might be one strategy to cope with the diminishing profit from paddy cropping. Another strategy might be reduction of the production cost, especially chemical pesticides and fertilisers. On average, farmers are spending on the production inputs for paddy cropping as much as 1258 baht/rai for major rice in rainy season and 1611 baht/rai for second rice in dry season. According to the information provided by the Ministry of Agriculture and Cooperatives, over 70% of the revenue from second rice (dry season) is spent on production inputs, and nearly 90% of the revenue from major rice (rainy season) is used on inputs. If the production cost could be lowered, it would contribute very much towards improving the household

income of rice farmers. Compared to other production inputs, water fees would be a small fraction of their total expenditure and thus would have little impact on farmers' household economy.