



Faculty of Social Sciences

**THE IMPLEMENTATION OF IRRIGATION SYSTEM
THROUGH STAKEHOLDERS PARTICIPATION IN B8A
SECONDARY CANAL, CHU RIVER AREA, THIEU HOA
DISTRICT, THANH HOA PROVINCE, VIETNAM**

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Master of Environmental
Management in Development Planning
2005

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CHU RIVER AREA, THIEU HOA DISTRICT,
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ABBREVIATION

AC	Agricultural Cooperatives
ADB	Asian Development Bank
B/C	Benefit – Cost Ratio
CBA	Cost Benefit Analysis
CVM	Contingent Valuation Method
FIOP	Farmers Irrigation Organizing Programme
FMIS	Farmers Managed Irrigation System
ha	Hectare
IA	Irrigation Association
ICMs:	Irrigation Management Companies
ICOP	Irrigation Community Organization Programme
IDMCs	Irrigation and Drainage Management Companies
IRR	Internal Return Rate
kg	Kilogram
km	Kilometer
Md	Million <i>dong</i>
NGOs	Non Government Organizations
NIA	National Irrigation Administration
N ₀	Number
NPV	Net Present Value
O & M	Operation & Maintenance
PBV	Present Benefit Value
PCV	Present Cost Value
PIM	Participatory Irrigation Management
PLI	Poverty Line Income
r	Discount rate
S.M.A.R.T	Specific, Measurable, Assignable, Realistic, Time
SLUSE	Sustainable Land Use and natural Resources Management – Malaysia
SPSS	Statistical Package for Social Science
TA	Technical Assistance
VND	Viet Nam dong (Vietnamese currency)
UN	United Nation

UNIMAS	University Malaysia Sarawak
WTAC	Willing To Accept
WTP	Willing To Pay
WUAs	Water User Associations
%	Percentage

ABSTRACT

Following the policy on “the state and people working together”, farmers in different regions of Viet Nam have contributed significantly in investing, operating and maintaining irrigation systems at various levels. Thanh Hoa province is one of the first districts that have been implementing this policy in the North of Viet Nam, which focuses on B8A Water User Association (WUA) establishment. The purpose of this study is to find out the status and to assess the performance of the WUA through participation of the local people after seven years of operation. Cost - benefit analysis was performed to evaluate the efficiency of the project in terms of economics. The results show that this project bring not only private benefits but also public benefits to the community with value of NPV and B/C ratio of greater than 0 and 1 respectively. The efficiency of farmers’ participation is clearer through results of socio – economic perspectives. In terms of participatory irrigation management, users are actively involved in planning and implementing the process regardless of age. Results of correlation analysis found that there is no significant relationship between age of respondents and the participation of water users in various activities and function of the WUA. The study was also determined and comparing the difference of socio-economic aspects before 1998 (before the project) and present. The results of the correlation analysis were positive in terms of the total paddy production and the percentage of irrigated area in 2004, the average income, and the total agricultural production. A t-test was applied to analyze the significant difference in the level of income during the time before 1998 and 2004. The finding shows that there was difference between two average income levels at the two periods (before 1998 and now). In 2004, the average income was higher than that before 1998. The WUA establishment also had reduced conflicts and health care problems significantly.

ABSTRAK

Mengikuti polisi "the state and people working together", petani di pelbagai wilayah Viet Nam telah memberi sumbangan yang signifikan dalam melabur, menjalan dan menyelenggarakan sistem perairan di pelbagai tahap. Thanh Hoa adalah satu daripada wilayah yang pertama menggunakan polisi ini di, yang tertumpu kepada BSA Water User Association (WUA). Objektif kajian ini adalah untuk mengenalpasti status dan menilai prestasi WUA melalui penglibatan masyarakat tempatan setelah ianya beroperasi selama tujuh tahun. Analisis kos taedah telah digunakan untuk menilai keberkesanan projek tersebut dari segi ekonomi. Dapatan kajian menunjukkan bahawa projek ini bukan hanya membawa keuntungan kepada individu persendirian tetapi juga kepada komuniti secara keseluruhan dengan nilai NPV dan B/C ratio lebih dari 0 dan 1. Keberkesanan penglibatan para petani dalam projek tersebut adalah lebih ketara dari dapatan perspektif sosio-ekonomi. Dari segi penglibatan dalam pengurusan pengairan, para pengguna melibatkan diri secara aktif dalam proses perancangan dan implementasi tanpa mengira perbezaan umur. Analisis korelasi menunjukkan tidak ada perhubungan yang signifikan di antara umur responden dan penglibatan para pengguna air dalam pelbagai aktiviti dan fungsi WUA. Aspek sosio-ekonomi juga telah diaplikasi di dalam kawasan kajian untuk menentukan perbezaan di antara sebelum 1998 (sebelum projek bermula) dan sekarang. Keputusan dari analisis korelasi adalah positif dari segi jumlah pengeluaran padi dan peratusan kawasan pengairan pada 2004, purata pendapatan, dan keseluruhan pengeluaran pertanian. T-test telah digunakan digunakan untuk menganalisa perbezaan yang signifikan di antara tahap pendapatan sebelum 1998 dan 2004. Hasil kajian ini mendapati perbezaan diantara kedua-dua tahap purata pendapatan pada dua masa tersebut. Pada tahun 2004, purata pendapatan adalah lebih tinggi daripada 1998. Pertubuhan WUA juga telah mengurangkan konflik dan masalah kesihatan secara signifikan.

CHAPTER 1

INTRODUCTION

1.1 Background

Water resources play a key and important role in our lives, especially for agricultural activities. Moreover, water resources are limited although renewable, they are depleting by the day without well-controlled management. This has been expressed in many researches, which have reported that water resources should be valued as one kind of asset.

Nowadays, the world population growth is increasing very fast. In 1999, the world population was about 6.0 billion and the number would reach to around 7.5 billion in 2020 (UN, 2000). With the increasing population and food shortage, the situation may worsen in the absence of rational water management policies. Hence, the challenge face by the irrigated agriculture today and in the future is how to produce more food and increase farmer's income with less water. Therefore, the water works play a key role in managing and controlling water resources efficiently in terms of water demand and supply towards food security.

Viet Nam is considered as one of nations that have developed irrigation system in ASEAN region. Irrigation systems are not only supplying water for agriculture but also for industries, transportation and improving living standards. Hence, hydraulics construction plays a significant in the development of agriculture and rural areas in Viet Nam.

However, finding way and means of improving the productivity of overall water resource has become a critical need for achieving sustainable improvements in irrigation performance (Bruns, et al., 2001). Nowadays, stakeholders are encouraged to use the irrigation systems efficiently through participation in irrigation management (Svendsen, et al., 1997). The Participatory Irrigation Management (PIM) plays an important role in meeting the need of water in a sustainable and efficient way.

1.2 Participatory Irrigation Management in Viet Nam

First of all, the term PIM term can be defined as the involvement of irrigation users in all aspects and at all levels of irrigation management (Groenfeldt, 2000). "All aspects" means all works, which relate to irrigation management such as planning, designing, construction, improvements, financing, operation, and maintenance. Irrigation management is carried out at "all levels" that is multilateral, running from the bottom upwards. Participation focuses on increasing stakeholders responsibility in development initiatives with decision-making involving farmer beneficiaries, staffs of irrigation agencies and other who are effected like water users.

There were major institutional and economic reforms as well as changes in agricultural policies in Viet Nam in the late 1980s. The promotion of the responsibility system in cultivation and the allocation of land allow farmers to choose input supplies and secure of land tenures. As the result, the economy was strengthened and the condition for sustained economic growth. The economics system has also changed from centralized to market - based economy , in early 1990s. At present, Viet Nam is self - sufficient in term of food supply and is one of the world's leading rice exporters. Focusing on the sustainable development of agriculture is still one of the government's

main strategies to develop the country. In order to achieve goals of this plan and also to ensure food security, water conservation and environmental protection, hydrological systems have been developed and improved continuously.

Nowadays, there are 130 State owned enterprises or Irrigation and Drainage Management Companies (IDMCs), which not are including the irrigation management stations and the management boards of separate hydrological works which cover 91% of irrigation system and serving 80% of total irrigated area. More than 10,000 agricultural cooperatives are taking responsibility in managing the irrigation systems and also the large and medium – scale drainage systems. Another 2,000 WUAs are working as a “bridge” between IDMCs, local authorities and farmers. There is only 9% of the irrigation system, which account for 20% of the total irrigated areas are managed by the farmers (Pham, 2004: 27).

Awareness of the government on the roles played by the farmers resulted in the development of a few specific policies to fortify PIM development as follow:

- Revolution No 6 dated October 11, 1998 by the Political Bureau on agriculture and rural development issues promote *policies on encouraging the participation of farmers in investment and irrigation system management.*
- Resolution No 6 dated on March 18, 2002 issued by the Central Party Committee to put emphasis on the development of WUAs and water management by farmers.
- Decision No 58/2002/QĐ – TTg date on April 26, 2002 by Prime Minister emphasizes the role of specific organization, especially structures within a village or commune in managing irrigation structures.

Parallel with the government monitoring, there are various supports from international organizations in PIM implementation such as ADB, World Bank, DANIDA and various NGOs. From 1993 to 2003, ADB has financed 40 major projects that focus mainly of agricultural activities on irrigation, rehabilitation and strengthening of drainage (Tran, 2004).

In term of PIM, there are several models, which have been implemented under different organizations in different localities as following:

- Inter - commune model (3-4 communes each): this model is a combination of three or four communes which out of administrative boundaries aim to manage large and medium - sized (300 –500 hectares) canal system. This model is practiced in Thanh Hoa, Nghe An, Thai Binh province under the names: Water Use Cooperatives (WUCs), and Water User Association (WUAs), or Agricultural Cooperatives (ACs). The application of the model has reduced the number of redundancy of IMCs as well as strengthening the role and interest of the water users.
- Inter – commune model (1- 2 communes each). One or two communes are combined together to control the smaller irrigated area (less than 200 hectares). This model is very common in Tuyen Quang, Thai Binh provinces under the Management Units or Cooperatives. The principle action of the Management Units action is similar to ACs, but it is more independent because they have their own bank accounts at the State treasury.
- One – commune or inter – village model: This model is applied within the administrative boundary of one commune or village. They manage a large or medium- sized to small one such as pumping stations or reservoirs under the

different name like ACs, WUAs and WUCs. However, ACs are the most known in this model.

In this paper, inter – commune model within three – four communes each is applied for Thanh Hoa province under B8A WUA. The operation of this model is simple. WUA is a farmer's organization whose main functions are to operate, maintain, and manage the irrigation system. The water users in the irrigation districts or units select the WUA's board of directors who will represent their rights in the communities.

Under the resolution No 9 of Thanh Hoa province in 1995 about improvement of cooperative society and economic development in rural area, official letter No 851 on the implementation of TA 1968 - VIE project on 10th May 1996 was issued. B8A WUA was established in 1998 under cooperation between TA 1986 VIE office of Ministry of Agriculture and Rural Development, and managed by the Chu River Irrigation Management Company and legally licensed by Chairman of Thieu Hoa district People's Committee. The WUA covers three communes Thieu Chinh, Thieu Hoa, Thieu Toan, which are located in the northwest of Thieu Hoa district in Thanh Hoa province. The B8A secondary canal with the length of is 4km, running through the three communes with the main purposes of supplying irrigation water for 401 ha of 11 hamlets as well as providing domestic water to more than 10,000 local people (Nguyen, 2004).

1.3 Location

The project site is located at the Chu River area in Thanh Hoa province, Thieu Hoa district (Figure 1.1). Chu River system is on latitude 19°45' to 19°55' and longitude 105°30' to 105°50'. Chu River irrigation system supplies water for agricultural

activities in whole Thanh Hoa province. With the topography characterized by sloping terrain from the North West to the South East, which is in the same of direction Chu River's flow, it can really suitable for supplying water resources under itself-sufficient manner.

Thanh Hoa province has a tropical monsoon climate with a warm and rainy season from June to November and dry season from December to May in the following year. The mean of annual rainfall is about 1,591mm, that occurs mainly between May and November which account for 85% total flow of rainwater in this area (Thanh Hoa Statistical Year Book, 2004).

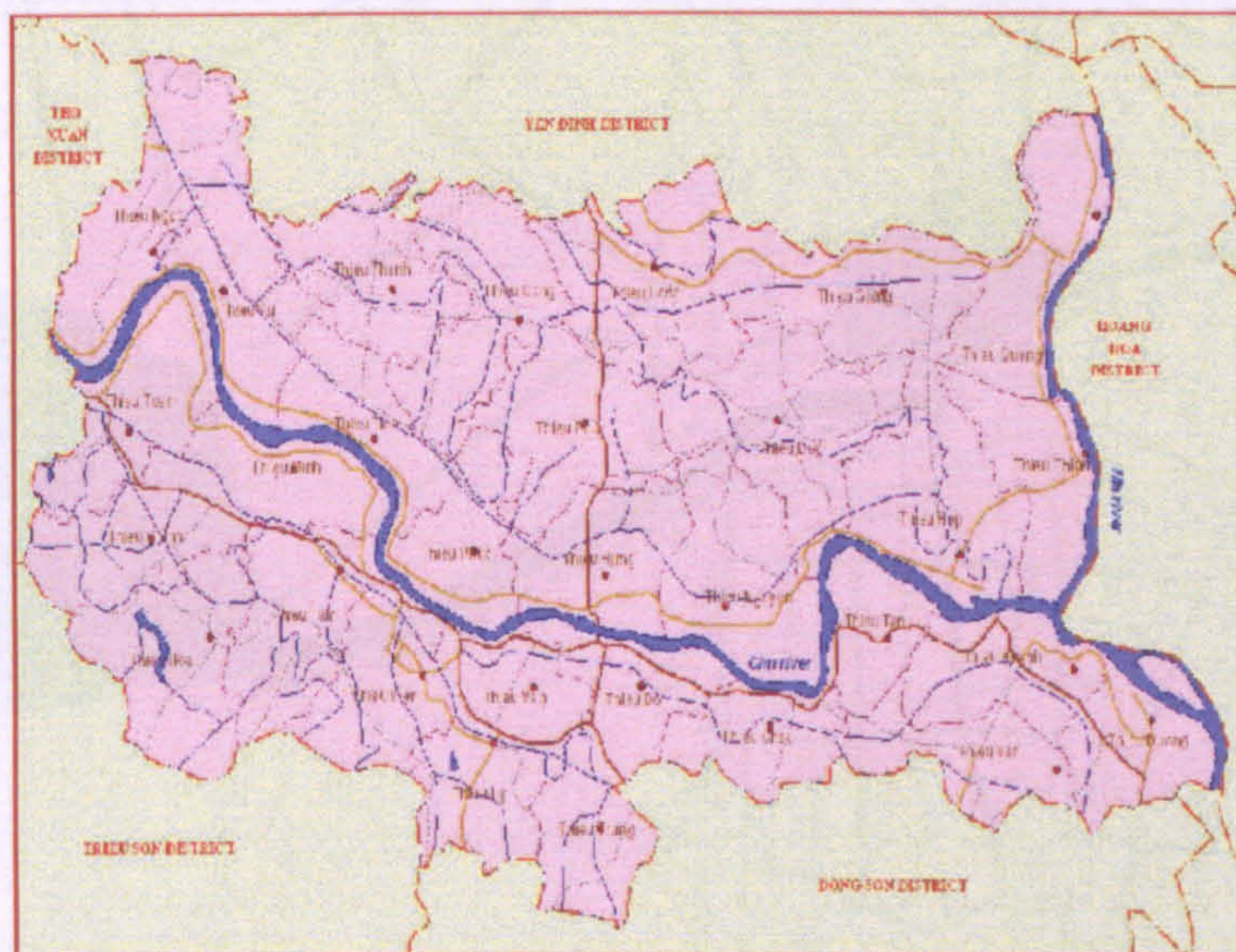
This study focuses on the B8A secondary canal (Figure 1.2), which belong to the Chu river irrigation system and beneficiaries in three communes of Thieu Chinh, Thieu Hoa, Thieu Toan in Thieu Hoa district, Thanh Hoa province. The study location is selected because it is one of the first places to implement an irrigation management through WUA.



Viet Nam Map



Thanh Hoa Province



Thieu Hoa District

Figure 1.1 Vietnam , Thanh Hoa province, Thieu Hoa district map

1.4 Problem Statement

Most of the irrigation systems in Viet Nam are funded and built by the government, while the Irrigation Management Companies (ICMs) are put in charge of the operation and maintenance of the irrigation. Farmers are charged for water usage and this fee depends on the size of their land. This means the bigger the land they have, the more they have to pay. However, as some farmers do not have the means to pay in cash, they are allowed to pay in kind or barter trade. Maintenance of the irrigation canals are costly, hence there are needed of prompt payment from the users. Unmaintained canals would mean less water and thereafter loss in crop production. Local people, however, they still believed that the canal should be maintained by the government. Therefore, they pay little attention to payment of water fees and canal maintenance. Moreover, the local authorities and farmers are likely to get subsidy and benefits from the government. These factors place the government in a difficult situation to manage the irrigation systems.

The fact is, an average irrigation system cannot be used efficiently and only operates at 50% – 60% of its designed capacity. This is an issue of great concern in the inter – commune canals, especially when water wasting phenomenon occurs in the upstream communes causing shortage of water in the downstream areas. The shortage of water causes the increase of service costs as well as disputes between water users in these communities. Consequently, irrigation systems are deteriorating and hence low in efficiency (Nguyen, 2004).

The irrigation capacity is also influences by the weather and geographic conditions. In Thanh Hoa province, most canals in the Chu River irrigation system are prone to erosion and siltation. Usually, from the April to November the canals are filled to

about 85% of its capacity. However due to the poor management practices, the canals would be dried from December to March in the following year. Thus, a proper water resources control and management is important to ensure that the canals are well filled throughout the year to keep the crop production at its full capacity.

A collaborative efforts of the government and each individual farm household is need since the operational and maintenance problems of the irrigation system cannot be solved by either one of them alone. Therefore, it is a necessity for the local communities and government to work together to maximize the benefits from the irrigation systems. According to Meizen - Dick (1997), there are various examples in the world that emphasized on the involvement of farmers in irrigation schemes. The efficiencies under economic and social aspects are obtained through participation of water users. One of the most readily apparent visible effects on farmers' involvement in irrigation management is the decrease in the government costs and reduced administrative budget. Furthermore, the improvement in water delivery services has helps to reduce the conflicts and creates equality of water distribution between users. With a better water delivery services, farmers' productivity as well as their income will be improved.

1.5 Purpose and Objectives

1.5.1. Purpose of the study

The purpose of this study is to assess the implementation of the B8A irrigation system through participation of the local stakeholders communities in Thieu Hoa district, Thanh Hoa province, Viet Nam.

1.5.2. Specific objectives:

The objectives of the study are as follows:

- i. To determine the socio – economic status of the people in the study area,
- ii. To identify the legal institutions and regulatory of the WUA of the study site,
- iii. To assess the level of community participation in the planning and implementation process,
- iv. To evaluate the benefits and costs of the irrigation project (NPV, B/C. IRR of this project), and
- v. To identify and evaluate the social and economic impacts of the irrigation schemes on the stakeholders based on the following parameters: agriculture production, standard of living, water supply, and health care.

Hypothesis: It is believed that there is a significant relationship between irrigation management and participation of water community in various activities and function of the association. In order to assess the efficiency of B8A WUA establishment and perception of participants, the following hypotheses were formulated:

1. There is a significant relationship between the total paddy production and the percentage of irrigated land in 2004.
2. There is a significant relationship between the mean income and the total agricultural production.
3. There is a significant difference in the levels of income during the time before 1998 and 2004.
4. There is a significant relationship between age and the participation of water users in various activities and function of the WUA.