



**UNIVERSITI PUTRA MALAYSIA**

**COLLECTIVE PARTICIPATION OF WATER USERS  
IN IRRIGATION MANAGEMENT:  
A CASE FROM NEPAL**

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**FEP 1992 4**



COLLECTIVE PARTICIPATION OF WATER USERS  
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BY

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Thesis submitted in Fulfillment of the Requirements for the  
Degree of Doctor of Philosophy in Rural Sociology  
in the Faculty of Human Ecology  
Universiti Pertanian Malaysia

September 1992



**Dedicated**

**to**

**my much revered late grandmother  
Shreemati Damber Kumari Devi Khadka**



## ACKNOWLEDGEMENTS

I profoundly thank the Malaysian Government for granting me a scholarship through the Malaysian Technical Cooperation Programme that made my doctoral studies possible. Sincere gratitude is expressed to the Agricultural Projects Services Centre for granting me study leave and to Winrock International for providing financial support to conduct the field research of this study.

I express sincere appreciation and deep gratitude to Assoc. Prof. Dr Nazaruddin Mohd. Jali, chairman of my committee for his wise counsel, guidance, support and encouragement throughout the entire graduate programme. Grateful appreciation is extended to Assoc. Prof. Dr Abdul Halin Hamid and Assoc Prof. Dr Ghazali Basri for serving on my committee and providing invaluable support, suggestions and comments at the various stages of this study.

My special thanks goes to Assoc. Prof. Dr Mohd. Fadzilah Kamsah for advising on the statistical procedures and Mr. Zahid Emby for providing useful comments and suggestions during the earlier phase of the study. Sincere appreciation is also expressed to Mr. Abdul Aziz Bahsir, Senior Assistant Registrar



and Miss Fadzlun for their comments that improved the manuscript of this dissertation.

Sincere appreciation is extended to Mr. Uday Gurung Executive Director / APROSC and Dr Gerald J. Gill for providing much needed encouragement and support when I needed most at the last moment.

I am very much grateful to Prof. Dr Ahmad Mahdzan Ayob Dean of Graduate School and external examiners Dr Mohammad Halib and Dr Groenfeldt for providing enlightening scholastic comments that improved the quality of this dissertation at the final stage.

A grateful thank you is extended to Dr Durgesh Man Singh, former Member of the National Planning Commission for providing much needed academic encouragement. My thanks also goes to Dr Ganesh Thapa, Dr Govinda Koirala, Dr Lokendra Poudyal, Dr Janardan K. C. and Dr Ujjwal Pradhan for helping me to locate new literatures relating to irrigation management in Nepal.

I am very much grateful to many people, particularly the Project Manager, Mr Purushottam Mishra, and the officials of various government agencies who helped me in various ways while conducting field survey in Nawalparasi District. The good grace of the farmers of the study site in allowing us to



instrument their responses and for patiently answering all the questions is notable and appreciated. I am also thankful to Mr. Ramesh Gharti and Mr. Sushil Gaditaula for their assistance in data collection.

Fellow students Shree Chandra, Fayyaz, Thakur, Suresh , Indu, Neeraj, Ram and Ramesh provided encouragement and warm friendship. In particular, Banik lent considerable support and offered some help in computer work. In addition, the kindness and hospitality of Jasbir and his brother Sarjit Singh is well remembered. Thanks to you all.

Sincere appreciation is extended to Ms. Yee Leng for so ably putting the manuscript into the word processor and to all the staffs of the Department of Social Sciences especially, Ms. Normah, for their support and friendship.

Finally, I am deeply appreciative of my wife, Shanta for her sacrifices, understanding and support throughout the entire period of my graduate study. Finally, I am especially grateful to my loving daughters -- Sworupa and Pranisha -- who, with their patience and understanding, were a constant source of inspiration.

Above all, my humble praises to "THE GODDESS OF LEARNING" and "MANAKAMANA MAI" who made it possible.

Once again THANK YOU SO MUCH.



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## **LIST OF ABBREVIATIONS**

<b>ADB</b>	<b>=</b>	<b>Asian Development Bank</b>
<b>ADBN</b>	<b>=</b>	<b>Agricultural Development Bank of Nepal</b>
<b>APROSC</b>	<b>=</b>	<b>Agricultural Projects Services Centre</b>
<b>BC</b>	<b>=</b>	<b>Branch Canal</b>
<b>CBS</b>	<b>=</b>	<b>Central Bureau of Statistics</b>
<b>FEWUG</b>	<b>=</b>	<b>Federation of Water Users Organizations</b>
<b>FD</b>	<b>=</b>	<b>Farm Ditch</b>
<b>HMGN</b>	<b>=</b>	<b>His Majesty's Government of Nepal</b>
<b>ILO</b>	<b>=</b>	<b>International Labour Organization</b>
<b>IIMI</b>	<b>=</b>	<b>International Irrigation Management Institute</b>
<b>LO</b>	<b>=</b>	<b>Local Organization</b>
<b>MFD</b>	<b>=</b>	<b>Main Farm Ditch</b>
<b>MC</b>	<b>=</b>	<b>Main Canal</b>
<b>VDC</b>	<b>=</b>	<b>Village Development Committee</b>
<b>WEC</b>	<b>=</b>	<b>Water Resources and Energy Commission</b>
<b>WGIP</b>	<b>=</b>	<b>West Gandak Irrigation Project</b>
<b>WUG</b>	<b>=</b>	<b>Water Users Group</b>





Abstract of thesis submitted to the Senate of Universiti  
Pertanian Malaysia in fulfillment of the requirements for the  
degree of Doctor of Philosophy

COLLECTIVE PARTICIPATION OF WATER USERS  
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A CASE STUDY FROM NEPAL

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September 1992

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The study examines the factors associated with the process of collective participation among the members of the water users group (WUG) in irrigation management in one of the government-managed irrigation projects in Nepal.

Two hundred randomly selected respondents from 40 WUGs were interviewed on a pre-tested schedule. Additional insights and data were derived from official records, direct observation, informal interviews with officials and key informant farmers.

Level of participation among the members of the WUGs as measured by their involvement in group decision-making in four major tasks of irrigation management and actual resource committed (labour, cash and material) for the maintenance of tertiary structures were found to be relatively low. It was found that the way the WUGS had been structured and its



existing leadership pattern could in part be attributable to this state-of-affair.

Three sets of factors namely situational, structural and interaction process were included and their relationships with the level of participation in irrigation management examined in the study.

The findings of the study indicate that while each of the three groups of factors has its own merit in explaining the process of collective participation in irrigation management, there was greater explanatory power when all three sets of factors were combined and their relationships examined.

Among the three sets of factors examined, the strong predictable observed relationships between the level of participation and structural factors as well as interaction process variables draws attention all the more to the design and restructuring of the WUGs -- factors that can be influenced by government agencies, non-government organizations and donor agencies. The study recommends that for the structural relations that can be made to work effectively for eliciting and sustaining collective participation among water users in irrigation management, provision of predictable water supply and flexible attitude on the part of the irrigation authorities to work with the water users and their groups (WUGs) are strongly called for.



Abstrak tesis yang dikemukakan kepada Senat Universiti Pertanian Malaysia sebagai memenuhi keperluan ijazah Doktor Falsafah

**PENYERTAAN KOLEKTIF PENGGUNA AIR DALAM  
PENGURUSAN PENGAIRAN: SATU KAJIAN KES DI NEPAL**

Oleh

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SEPTEMBER 1992

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Kajian ini menyiasat faktor-faktor yang berkaitan dengan proses penyertaan berkelompok petani dalam pengurusan pengairan di kalangan kelompok pengguna air (KPA). Kajian dijalankan di salah sebuah projek pengairan yang ditadbir oleh kerajaan di Nepal.

Sebanyak 200 responden daripada 40 buah KPA telah dipilih secara rawak untuk ditemubual. Satu jadual temubual yang sudah diuji digunakan untuk tujuan ini. Maklumat dan pemahaman lebih mendalam telah diperolehi melalui dokumen-dokumen rasmi, pemerhatian, serta temubual dengan pegawai-pegawai dan informan.

Tahap penyertaan ahli-ahli KPA diukur dari segi penglibatan mereka dalam membuat keputusan mengenai empat tugas utama bersangkutan dengan pengurusan pengairan. Di samping itu sumbangan langsung mereka dalam sumber sebenar



(tenaga kerja, wang dan bahan) untuk menyelenggara pengairan di peringkat sawah, juga dimasukkan ke dalam pengukuran ini. Keputusan yang didapati menunjukkan aras penyertaan mereka amnya rendah. Juga didapati bahawa cara KPA sendiri disusun dan pola kepimpinan semasanya, sangat dipengaruhi oleh aras penyertaan yang rendah itu.

Tiga set faktor telah digunakan dalam kajian ini: faktor situasi, faktor struktur dan faktor proses interaksi. Ketiga-tiga faktor ini dikaji dari segi hubungannya dengan aras penyertaan di dalam pengurusan pengairan.

Hasil kajian ini menunjukkan, walaupun setiap set faktor itu mempunyai kelebihannya, bagi menerangkan proses penyertaan kolektif dalam pengurusan pengairan, namun terdapat satu penjelasan yang lebih kuat apabila ketiga-tiga set faktor itu digabung sekali.

Di antara tiga set faktor itu, hubungan yang kuat dapat dijangkakan ialah di antara tahap penyertaan dengan faktor struktur dan faktor proses interaksi. Ini menekankan tentang peri mustahaknya reka bentuk dan struktur KPA itu sendiri. Kajian ini memperakukan agar pembekalan air dapat dijadualkan secara tepat, dan juga agar pihak berkuasa pengairan mengambil sikap lebih terbuka di dalam kerja sehari-hari mereka dengan pengguna-pengguna air dan KPA.



## CHAPTER 1

### INTRODUCTION

#### Background

Situated 26° 22' north to the equator, Nepal is a small landlocked country which lies between China in the north and India in the south, east and west. It is conventionally divided into three ecological zones: the Mountains in the north; the Hills -- extending across the centre from west to east; and the Terai -- a narrow strip of flat land between 10 and 30 km wide, that abuts for 850 km on to the Indo-Gangetic plain in the south. The topography thus varies from the Terai Plains, with an elevation of 60-300m above sea level, to the deep valleys and high mountains of the northern region, rising to over 8,000m in elevation. As a result, there are several climate varieties, ranging from sub-tropical to the Alpine. In all, Nepal covers an area of about 1,47,181 sq. km with an estimated population of more than 18 million people (CBS, 1990).

Administratively, Nepal is divided into five development regions, which are sub-divided into 14 zones and 75 districts. Each district is composed of several Village Development Committees (VDCs). The Village Development Committees are the grass-root politico-administrative units of the government.



Each VDC encompasses several villages with a total population of 2000-4000 persons. In total, Nepal has 3995 VDCs and 36 Municipalities.

According to the Nepal Agriculture Sector Strategy Study (ADB/HMGN, 1982), more than 90 percent of the total population of Nepal is dependent upon agriculture for subsistence. Food grains production dominate agricultural activities and account for the major part of the agricultural production in the country. Small subsistence farms predominate in the country where more than 94 percent of the households own less than 2.67 ha of land (ADB/HMGN, 1982). A survey carried out by the National Planning Commission in 1977 revealed that more than 40 percent of rural families had incomes below poverty line.

The Nepal Agriculture Sector Strategy Study reports that the per capita food production has declined during the past few years. The same study elaborates that the overall yields per unit area have not increased and may even have declined during the past 20 years. The decline in yields of major food crops has been brought about by, interalia, increased cultivation of marginal lands and the inability to replenish soil nutrients with the available manure and fertilizer. While Nepal had among the highest rice yield in South Asia in 1960s

enabling her to export rice, Nepal became net importer of food grain by late 1970s (ADB/HMGN, 1982).

Nepal is thus faced with the three major problems viz., (i) attaining rapid and sustained increase in agricultural production to meet a growing demand for food in the country; (ii) raising of income; and (iii) providing employment opportunities for more than 90 per cent of the country's population. To overcome these problems, the intensification of agricultural production on currently cultivated land becomes an objective of paramount importance.

With the advent of Green Revolution technologies, His Majesty's Government of Nepal (HMGN) has increasingly realized that the greatest opportunity for increased agricultural production lies in the provision of perennial irrigation facilities for most of the cultivated land in Terai region. Terai has about 70 percent of the total arable land and is regarded as the "granary" of Nepal because it produces the bulk of the country's food grain. The concern for developing Terai region with the provision of supplementary irrigation facilities for increased agricultural production was further reinforced by the World Bank, the Asian Development Bank and other donor agencies by funding major irrigation projects in Terai in the 1970s and 1980s.



According to Irrigation Sector Review (WEC, 1981), about 60 percent of the arable land in Nepal has potential for irrigation at least part of the year. It is estimated that about 500,000 hectares of the country is served by irrigation. This constitutes nearly 22 percent of the cultivated land and 26 percent of the irrigation potential (WEC, 1981). Up to the end of the Third Development Plan in 1970, the government completed most of its irrigation targets measured basically against the completion of the construction work and not necessarily the accomplishment of project's agricultural production goals. During the subsequent two plans of the 1970-80 decade, however, the achievement fell far short of the goals. This was due to an ambitious programme introduced in 1970s where many incompleting projects were carried over for implementation in succeeding plan periods (ADB/HMGN, 1982). By the end of the Sixth Five-Year Development Plan (1980/81 - 1984/85), HMGN provided irrigation facilities for a total area of 371,130 ha of land. During the Seventh Plan Period (1985/86 - 1989/90), the government plans to expand irrigation facilities for an additional area of 217,845 ha of which 85 percent falls in the Terai region of the country (WEC, 1981). By far run-of-the-river diversion with gravity distribution system mainly providing supplementary irrigation during the monsoon (wet) season has been the dominant mode of past irrigation development efforts in Nepal.





A more serious problem than the lag in the completion of government-built projects, is their performance after completion. There are enough evidence to indicate that there is only a marginal improvement in agricultural production in the project areas over that of the neighbouring areas not receiving irrigation water from the project (APROSC, 1978; APROSC, 1982; WEC, 1981). In many cases less than half the proposed command areas has received water. The reasons for this bleak performance are attributed to ill-conceived, poorly designed, unsound construction, inefficient operation and negligible and untimely maintenance of the physical structures (WEC, 1981; MOA/APROSC/ADC, 1983).

It is reported that the expenditure for the operation and maintenance of completed projects has been far from adequate and has actually declined on a per hectare basis as new projects are completed (MOA/APROSC/ADC, 1983). The basic principles of Sixth Five Year Plan document recognized that the target set for irrigation development exceeded the capability of the central government acting alone (NPC, 1979:34). The document states:

According to the highest priority given to the irrigation programs within the agricultural sector only government efforts will not be enough to launch the programs. Hence, maximum importance will be given to peoples' participation.

