PROPERTY RIGHTS AND STATE INTERVENTION IN HILL IRRIGATION SYSTEMS IN NEPAL

A Dissertation

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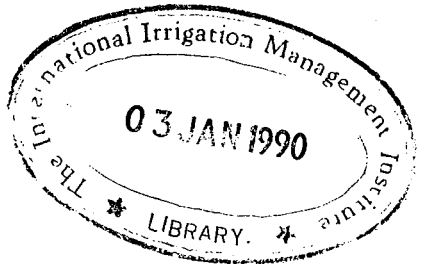

by

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The thesis underlying this study is that irrigation development is the result of actions of both local groups and the state. In intervening in user-managed irrigation systems, national governments and agencies often experience unexpected problems. Some of these difficulties arise from the alterations in property rights that occur during project implementation.

In this dissertation, I first examine the concept of property in irrigated agriculture. Secondly, I examine the historical role of state intervention in irrigation development in Nepal. Finally, I analyze the interplay of state intervention with existing property relations, using two case studies of user-managed hill irrigation systems in West Nepal.

In sociology, property rights are conceptualized as institutionalized means of defining who may control different classes of valuable objects for a variety of present and future purposes. Together with an understanding of the role of the state and its agencies in shaping development actions and outcomes, this conceptualization of property rights constitutes the framework of this study.

I gathered data through nonparticipant observation of the functioning of the irrigation systems in their natural settings, and in-depth interview with bureaucrats and key informants of the irrigation systems. I observed irrigation practices and tasks over a period

of eighteen months, analyzed both historical and contemporary documents, and elicited oral accounts of the evolution of the irrigation systems.

The study confirmed that hill irrigation systems in Nepal are based on an intricate set of property rights and obligations. This structure of property rights can be hierarchical and differentiated. These property arrangements are the products of both community and state actions. In a traditional irrigation system water is allocated according to property rights acquired either through initial investment in the system, inheritance, or purchase of land or water. Obligations in the form of contributions to the maintenance and operation of the system are often based on watershares. Government intervention in the form of investments in physical facilities often disrupts existing property rights and relations, thus resulting in conflicts over water allocation. Therefore, for interventions to be effective, they have to be based on prior assessments of property relations.

BIOGRAPHICAL SKETCH

Ujjwal Pradhan was born February 9, 1958 in Kathmandu, Nepal. After secondary education in Kathmandu, he joined St. Stephen's College in Delhi and was graduated with a B.A. in Liberal Arts in 1980. He then joined Delhi School of Economics, University of Delhi to pursue his M.A. degree. In 1982, he was graduated with a M.A. in Sociology.

After graduation, he worked on irrigation related issues as research assistant with the Nepal Irrigation Research Project and subsequently as consultant to Rapti Integrated Rural Development Project in Nepal. In 1984, he registered as a graduate student at Cornell University in the field of Development Sociology. He returned to Nepal in 1986 to carry out his dissertation research.

In dedication to

my parents,

my Anita,

and

in loving memory of my brother, Prajwal

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CHAPTER I

INTRODUCTION

> Water determines whether there is a harvest or not; Fertilizer determines whether the harvest is big or small[1]
>
> --Yamamoto, 1965

In Nepal, as elsewhere in Asia, the state is increasing its assistance to existing user-managed irrigation systems -- usually small in scale of command.[2] National governments and agencies involved in irrigation development have frequently experienced unexpected problems and outcomes from their intervention in such user- or farmer-managed irrigation systems. Several causes of these problems and unintended results have been identified, e.g., poor technical design, agency inefficiencies, non-existent local organization. Consequently, governments and agencies have been perplexed as to how best to work with community- or user-managed irrigation systems.[3] It has been suggested that a cause of these difficulties may be the alterations in

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[1]Quoted by Tamaki (1977). Tamaki points out that this is the basic characteristic of irrigated agriculture not only in China but in all of Asia.

[2]Under the current Basic Needs Programme, the Nepali government has a mandate to provide new irrigation to 68,000 ha annually as compared to 15-20,000 ha in the past under its production strategy (IBRD, 1988).

[3]I have used the terms farmer-managed, community-managed and user-managed irrigation systems interchangeably. They all denote control at the local or user level rather than by a higher authority, e.g., the local government or irrigation bureaucracy. See Coward (1980); Kelly (1983); and Uphoff (1986) for concepts used in understanding the socio-technical aspects and functions of irrigation systems. Uphoff (1986) provides a good review of such approaches and presents an elaborate one himself.

property rights that often occur during project implementation (Coward, 1986; 1988). This study examines the interrelationships between state intervention and property rights and relations as they affect the structure and functioning of irrigation systems.

Theoretical Foundations of the Inquiry

This dissertation studies two small-scale hill irrigation systems of Western Nepal. This inquiry began with a concern with property, a theoretical concept of long-standing interest in sociology. During the initial formulation of my research, Coward and several others were beginning to explore systematically the use of property concepts for understanding continuity and change in the context of irrigation systems.[4]

Sociologists have viewed property as a social relationship among people with regard to the use of a wide range of objects having both use and/or exchange value. Property is a complex system of recognized rights and duties with reference to control over valuable objects. The processes of social interaction for control of such objects are validated by traditional beliefs, attitudes, and values and are sanctioned in custom and law. Property rights are therefore institutionalized means of defining who may control various classes of valuable objects for a variety of present and future purposes (Hallowell, 1955:246). Property rights also outline the conditions under which this control may be exercised. I adopt this sociological

[4]See Coward (1986; 1986a; 1988); Martin and Yoder (1983); Meinzen-Dick (1983); Siy (1982); El-kholy (1985); Martin (1986); Vermillion (1986).

convention and apply it to an analysis of irrigation change in Nepal. An elaboration of sociological treatments of property in irrigated agriculture is presented in Chapter II. This view of property will be examined in the two case studies in relation to state actions.

Recent theoretical writings in development sociology have given more attention to the role of the state and its agencies in shaping development actions and outcomes. Such attention to the state is reflected in this research as well. Indeed, there are significant connections between the two concepts of state and property, and these connections are closely examined in subsequent chapters. For one, property within a national jurisdiction has to be legitimized in the eyes of the state, and the claim of eminent domain can restructure or destructure local or national property relations and rights. Property is normatively sanctioned by the state. In Chapter III, I present a discussion of the theoretical literature examining the role of the state as it concerns our understanding of irrigation processes.[5] In the same chapter, I will outline briefly the historical periodizations regarding state involvement in irrigation in Nepal after the unification period, which historians have termed the birth of modern Nepal (Regmi, 1975).

Lastly, both theoretical writings and the real world debates regarding Third World debt have raised the awareness of everyone regarding the impact of international capital on state actions and

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[5]The term "processes" is used to denote irrigation dynamics whether it be development, expansion, rehabilitation, or even its persistence and reproduction.

development activities.[6] In an era of direct penetration of international capital and state expansion, the role of external financing and lending policies cannot be ignored in the study of irrigation processes because many of the new facilities have depended on external resources and financing.[7] These relations of external financing and pressures are also examined in Chapter III. In Chapter V, I return to these issues to examine the relationships between state intervention with external financing and property rights in one of the research irrigation systems.

In this thesis, these theoretical ideas are applied to the actual activities of irrigation development in Nepal. As discussed in the subsequent chapters, the development of numerous irrigation systems in Nepal has long been an enterprise of local communities and the state.[8] Irrigation development has been the product of the interplay between actions of both the state and local organizations (Coward, 1986). In recent years, especially after the Rana overthrow and the opening of

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[6]International capital can be represented in many forms, e.g., multinational corporations investments, donors' aid, bank loans. Here we will be focussing on the latter forms.

[7]Between 1980 and 1985, in Nepal the allotted foreign financing as a percent of total project cost in the irrigation sector was an alarming 80% (IBRD, 1981). The actual percentage expended was unavailable through secondary sources. In 1975/76 the foreign aid disbursement for irrigation was 24 million Nepali rupees and in 1986/87 it had risen to 515 million rupees, a twenty fold increase within a decade. In fact, the foreign aid disbursement for irrigation had been increasing each year except in 1986/87, when it dropped by 62.5 million (10%) from the previous year (IBRD, 1988).

[8]The inventory of irrigation systems according Water and Energy Commission of the government of Nepal reports that 62% of the irrigated area falls under farmer-managed systems (WEC, 1981).

Nepal's door to foreign aid and advice,[9] irrigation systems have been major elements of the state's development portfolio, much of the construction funded by international donors or lenders of various origins. Therefore the relations among state intervention, property rights, and the community are defined in the structure and functioning of the irrigation system.

Research Objectives

The above theoretical and conceptual framework has been implemented with the following objectives in mind:

1. to examine historically the role of state intervention in irrigation particularly since Nepal unification, and
2. to examine the interlinkages between state intervention and existing property rights and the resultant consequences for the structure and functioning of the irrigation system.

Research Methodology

The setting of the dissertation is in the Western Development Region of Nepal where the two irrigation systems studied lie on the terraced banks of the Kali Gandaki river in the Parbat and Palpa districts. These systems are small-scale, gravity-flow, hill irrigation systems initiated nearly half a century ago. This time span was useful for the study of the systems with some historical depth. These systems were purposefully chosen because each had experienced government intervention, direct and indirect, and conflicts over property

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[9]The Rana regime lasted for over a century ending in 1951. It was an autocratic family-run regime that had rendered the monarchy a sham.

rights had occurred.[10] These cases involving state intervention and conflict were chosen to gain a better understanding of irrigation processes affected by state actions and local reactions and property rights.

The irrigation system in Palpa (Brangdhi Tallo Kulo) was one where the state through indirect investment extended an existing canal, and after completion of the project, the new "beneficiaries" and the old members became locked in water allocation disputes. The case in Parbat (Phalebas Tallo Kulo) involves direct state intervention and investment where the plan by the government to extend an existing canal with international financing backfired; a new canal built above the existing one touched off continuing conflict regarding water acquisition, construction of facilities, and later on, water allocation. These conflict cases were chosen to act as prisms for an understanding of the existing property structure and the impact of state intervention on them. For this fieldwork, the unit of analysis was the irrigation system itself.[11] The field research was conducted from March 1986 through August 1987, living for most of the time at the research sites.

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[10]Intervention can occur in many forms and at many levels. The type of intervention referred to in these cases is financial investment. Other forms of intervention could be organizational, legal, technical advice, etc. Direct intervention in this study context refers to the state undertaking irrigation investment directly through its irrigation-implementing bureaucracy with limited involvement of the existing users of the system in the planning or implementing process of the investment. Indirect intervention refers to the channelling of the investment through the local groups mainly consisting of the grantees. This group then carries out implementation and accounting while being monitored by the state's local development office at the district. See also Coward (1986a).

[11]The boundaries of an irrigation "system" are not self-evident and are often ambiguous.

The research methodology used was nonparticipant-observation and the study was conducted in its natural settings (Lincoln and Guba, 1985; Lincoln, 1985). The author was present during the key irrigation tasks and activities including maintenance and emergency repair works, irrigation rituals, meetings, and negotiations with irrigation officials. In-depth informal interviews on irrigation organization and state intervention were conducted with key informants and irrigation officials. Local historical documents, documents kept by the irrigation officials, and oral reports were analyzed. Archival work was conducted in the British Museum and the National Archives in India and Nepal to explore the role of the Nepali state and British India in the functioning of irrigation systems in Nepal.

Significance of the Dissertation

The significance of this dissertation can be considered at two levels: one for Nepal, and the other for the sociological literature of irrigation. To date, studies of irrigation systems from a historical perspective and treatises on the role of state and international capital impinging on irrigation development in Nepal seems to be nonexistent. The past has obviously shaped the contemporary situation and this historical depth is essential for understanding the dynamics of irrigation processes anywhere.[12]

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[12]See Abrams (1982) on historical sociology who cautions us that we cannot do without historical answers when we ask serious questions about the contemporary world. See Coward (1978); Harriss (1978); and Kelly (1978) on documentary and historical research methodology in the study of irrigation organizations.

The means and ways in which peasants, the state, and local elites competed and interacted in irrigation processes can contribute to our understanding of the crucial elements of an agrarian economy: state-peasant relations or integration, and local power struggles as manifested through local elite competition. The strength of a historical perspective for the analysis of irrigation systems and the inclusion of the role of the state can enrich the growing sociological literature on irrigation. The evolutionary role of state and property rights for the structure and functioning of irrigation system has key policy implications regarding domestic and international development which could prove useful for those in the applied action-oriented world of irrigation processes.

Outline of the Dissertation

Chapter II examines the conceptualization of property in general and property in irrigated agriculture in particular. Chapter III offers an exposition of the role of the state and its resource mobilization for irrigation expansion in Nepal. The state-locality interaction from a broader national perspective is explored, undertaking a historical analysis of the state policies and the state apparatus regarding irrigation and agriculture development. It also explores the role of the state in Nepal regarding property rights in irrigated agriculture at a macro level.

Chapter IV presents a detailed case study of the Brangdhi Tallo Kulo irrigation organization in Palpa. The history of the formation of Brangdhi Tallo Kulo is detailed.

Chapter V presents a systematic discussion of the structure and functioning of the three main parts of the Brangdhi Tallo Kulo system. The chapter concludes with a discussion of the interrelationships between property rights and state actions in that system.

Similarly, Chapter VI gives a detailed case study of Phalebas Tallo Kulo irrigation organization in Parbat. First, the history of the system's formation is presented, followed by a systematic discussion of its organization and functioning. The chapter concludes with findings on the interrelationships between property rights and the state in Phalebas Tallo Kulo.

Chapter VII, the concluding chapter, first presents the unique finding from Brangdhi Tallo Kulo of a hierarchy of property rights and its associated generalizations regarding property rights in irrigation. Other findings from this study are then related to generalizations drawn from previous literature on property in irrigation development and hill irrigation in Nepal. Finally, several policy implications are drawn from the interrelationships among state, locality, and irrigation property.

CHAPTER II

PROPERTY RIGHTS IN IRRIGATED AGRICULTURE

INTRODUCTION

This chapter examines the conceptualization of property so as to deduce certain key elements of this concept. This is followed by a general exposition of the three dominant types of property, namely private, common, and state property. The relations between these types of property and state activity are explored. Some important literature on the specific relationship between property and social organization in the context of irrigated agriculture is examined. This chapter concludes by arguing that a useful way of looking at irrigation systems is through a property perspective.

CONCEPTUALIZING PROPERTY

Property is pivotal to many current debates regarding capitalism, socialism, the rights of individuals, corporations, the state, and eminent domain.[1] Property is also part of the debates regarding both the appropriation of natural resources as well as the effects of new technology.

Concepts of property vary over space and have changed over time.[2] It is essential to note that they vary across cultural

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[1]For a review of the concept and theories of property, both mainstream and critical, see Macpherson (1978); Parel and Flanagan (1979); Hollowell (1982); Suvorova and Romanov (1986).

[2]Macpherson (1978:1) points out that property is both an institution and a concept and that over time the institution and the concept influence each other.

boundaries too. Hirschon cautions:

> Inevitably for us as westerners [our notions of property] are rooted in our own particular historical experience. Broadly speaking, our attitudes to property are associated with development of capitalism and with the notion of commodity. Property for us is based on the idea of "private ownership" which confers on the individual the right to use and disposal...But what we take for granted -- the idea of an individual actor having defined rights vis-a-vis others, and the notion of property as consisting in objects or things -- is far from being universal. On the contrary, these concepts are historically and culturally situated in the western tradition. This very familiarity may blind us to fundamental differences in concepts of "property" and "persons" in other social groups." (Hirschon, 1984:2)

Macpherson (1978:2) points out two interrelated difficulties regarding the meaning of property and hence in the comprehension of the types of property. Regarding the first difficulty that coterminates property with things, he writes:

> ... In current common usage, property is <u>things</u>; in law and in the writers [i.e., philosophers, jurists,and political and social theorists], property is not things but <u>rights</u>, rights in or to things. We shall see that the current usage is the product of some particular historical circumstances, and that it is already growing obsolete.

Regarding the second misconception of property that treats it as exclusive private property, he elaborates:

> ... Another difficulty is that property, in the works of most modern writers, is usually treated as identical with <u>private property</u>, an <u>exclusive</u> individual right, my right to exclude you from some use or benefit of something. This usage like the other, can be seen as the product of a particular set of historical circumstances.

Both these usages can be traced to the period of the rise of the free capitalist market society. In this period, the concept of property narrows down to include only private property and common property is seen as a contradiction in terms (Macpherson, 1978:10). In

order for the capitalist market economy to operate fully and freely, it was necessary for labour and other resources to be converted into private objects of property. Private property relations were essential: exclusive rights were necessary. As the role of the market in resource allocation increased, Macpherson (1978:10) relates that "it was natural that the very concept of property should be reduced to private property, an exclusive, alienable, 'absolute' individual or corporate right."

Though concepts of property are diverse, one key sociological characteristic that emerges from the property literature is that property is about social relations: relations among people, not between people and things (Ely, 1914:108; Hallowell, 1955:246; Macpherson, 1978:3; Coward, 1986:493). The distinctions between objects of property and property relations is pivotal (Goody, 1962; Bohannan, 1963:102; Coward, 1986:493).

Objects of Property

Objects of property are the things or objects over which property rights are extended (Hallowell, 1955). For example, in an irrigation system, these valued objects would be the irrigated fields whose owners have access to the irrigation water, the hydraulic structures, and the water itself. Land, labour, capital, water, implements, and means of production can be objects of property in an irrigation system.[3] The

[3]If slaves were used for constructing irrigation systems, then labour takes the form of objects of property. In the case of Nepal, it was easy to enforce corvee labour on the peasants because they could be evicted if they did not provide their labour. The burden of providing for subsistence fell on the peasants themselves rather than

intake, canal alignment, aqueducts, siphons, weirs, dams, tools, all form part of the means of production.

The nature of the object, whether it is mobile or not, tangible or intangible, influences the character of the bundle of property rights. That is, the nature of the property relations among people is influenced, in part, by characteristics of the objects of property involved. In order to transport water from the stream to a distant command area, as the topography in hill Nepal demands, rights-of-way have to be obtained for the construction of the hydraulic artifacts so as to convey the water. The associated objects of property in an irrigation system may fall under various jurisdictions and control e.g., the national government, local government, another community, temple endowments, local administration, or individuals. The land that the alignment has to cross may belong to many owners: joint or single.

Property Relations and Property Rights

Not only is it important to focus on property objects but also on the relationships between people with regard to a certain object. In short, these are the property relations.

To Marx, social relations were basically property relations and different material conditions and technologies resulted in different property relations (Dobb, 1970). A clear interaction existed between the means of production and the relations of production. His

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on the slave owners if indeed slaves would have been used for irrigation construction. However, if there is a shortage of manpower for irrigation construction, it may well be that slaves may have been used. I have not come across such secondary data in the economic history of Nepal.

materialist interpretation of history basically focuses on these interactions and dynamics. However, one should be able to separate property relations and social relations. Property relations can be treated as a subset of broader social relations. Then it will be easier for us to study property relations in communities or even irrigation schemes because the type of property relations existing are, and have been, influenced by the larger social relations as well as by the articulation of various modes of production. It is thus possible to have interactions between the larger social structure and the property subset that lead to changes in the wider social context.

Hallowell (1955:246) explains the social relations associated with property:

> If the core of property as a social relation lies in a complex system of recognized rights and duties with reference to the control of valuable objects, and if the roles of the participating individuals are linked by this means with basic economic processes,and if, besides, all these processes of social interaction are validated by traditional beliefs, attitudes, and values, and sanctioned in custom and law, it is apparent that we are dealing with an institution extremely fundamental to the structure of human societies as going concerns... property rights are institutionalized means of defining who may control various classes of valuable objects for a variety of present and future purposes and the conditions under which this power may be exercised.

Property is a set of social relationships: relationships among people regarding certain valued objects. An important element of property relations is the right of exclusion (Pfief in Barnes, 1942:160). Thus, where there are no people to exclude, the right of exclusion cannot be exercised and property relationships are unnecessary.

Two other salient features of the social relationship among people over objects of property are i) the nature and means of the creation or acquisition of property rights and ii) the nature and means of the transferability or alienability of the established property rights.[4] "Acquisition" means both the act of acquiring what had been someone else's property object as well as original creation of a property object. In legal terms, this would mean acquiring "title" to some property object. The transfer of property can take place during a person's lifespan (inter vivos) or after death. The original creation of property objects by individuals or groups is usually through resource mobilization and investment. For example, in many irrigation systems, the initial investment in the construction of the systems guaranteed the original investors property rights in the hydraulic structures built, and the water supply created (Coward, 1986; 1986a; 1988; Martin and Yoder, 1983). The state in mobilizing its own resources or external resources in the form of bilateral or multilateral grants and loans invests in creating property objects in irrigation systems which it may hand over to the consumers.

When social relations are of primary importance, we typically use the concept of property rights (Bohannan, 1963; Coward, 1986). As Coward (1986:493) indicates:

> ...property relationships are a subset of social relationships which are based on the position of two or more individuals in relation to some property object. A basic

[4]These are the two more important features regarding the dynamism of property rights and relations. Interconnected with these are other features such as the nature and means of sanctions, liabilities, constraints, duties, and obligations. See Reeve (1986) for more details on these features.

> assumption of the property literature is that the nature of this social relationship (i.e., the nature of property rights) will be an important determinant of how the resources that are the property object will be used.

Furubotn and Pejovich (1972:1139) interpret property rights as:

> ...the sanctioned behavioral relations among men that arise from the existence of things and pertain to their use. Property rights arrangements specify the norms of behaviour with respect to things that each and every person must observe in his interaction with other persons, or bear the costs of nonobservance.

Demsetz (1967:350) hypothesizes that property rights arise when a group that has created some property object wishes to exclude others from using that object. When this is not possible, i.e. when costs of internalization are more than the gains of internalization of externalities, those property objects may not be created.

Property rights in irrigated agriculture can be more complex than either rain-fed or swidden agriculture as " claims on the natural resources come about when people mix their sweat with soil" (Stinchcombe, 1983:113).[5] Analyzing the case of Karimojong, Stinchcombe points to how water, which is at one level a "public resource " belonging to the whole tribe gets transformed into "equipment" over which people enter into more specific and firmer property relations. Only when a person has employed his or her labour to digging a water hole for his or her animals is it possible for the person to accuse another of stealing his or her water; only then does it become like

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[5]People mix their sweat with soil even in swidden or rain-fed agriculture. The emphasis here is on the initial creation of property with the use of different types of objects necessary for irrigated agriculture as mentioned earlier.

"stealing equipment " rather than stealing the resource (Stinchcombe, 1983: 145).

The difference between property institutions and other social institutions like that of the familial, political or religious kind is that the social relationship relates to objects of various kinds. We thus see that property is a triadic relationship. The conditions under which someone is enabled to assert and maintain certain claims to an object in question, and the kinds of rights that the person can exercise are the most fundamental aspects of property institutions.

Property often includes more than a single, absolute right. For example, one who has water rights may use that water for irrigating rice but not vegetables, or for that matter, if the person does not want to use the water, he may not waste it. The usufructuary rights may belong to someone, while ownership is vested in another. This owner may contract his or her water to someone else who in turn rents it out to a third person. There are multiple claims, enforceable and at times mutually agreed on the same object of property. Such coexisting claims and possible transfers relegate the object of property to have only use-value or also exchange-value.[6] When both use and exchange-values are present in the object of property, the object becomes a commodity. Water can take both these forms. In situations where water can be sold and bought apart from land, water is a commodity. However, in a communal land ownership pattern, if water or land cannot be exchanged, then they have only use values.

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[6]Any object that satisfies some human want has use-value and if it can "command" certain other objects in exchange it has exchange-value as well (Rosdolsky, 1968).

The power relations among people with and without rights interrelated through property is an important element in the control of the rights. For example, dominant social groups within an irrigation system shape the nature of property rights by their influence over the irrigation organization, leaders, or through good representation during meetings when decisions are made. Some of the property relations and control of irrigation systems are negotiated in advance (Pradhan, 1987).

FORMS OF PROPERTY

An important element in the conceptualization of property is the jurisdiction of a certain object of property. Three dominant types of property can be outlined: i) common property, ii) private property, and iii) state property. Each type of property has a different set of rights and obligations, enforceable claims, and alienation from the original possessor. However, in each of these cases the state or at times the society itself becomes the final arbiter.

Private Property

The private property rights which an individual or a group has is "the right to the use and benefit, and the right to exclude non-members from the use and benefit, of the things to which the group has legal title." (Macpherson, 1978) The state or the larger community creates and enforces the right which each individual has in the things it delineates to be for public use. Similarly, the state or the

community creates and enforces exclusive rights which are private or individual property.[7]

Common Property

Common property refers to a distribution of property rights in resources in which a number of owners are co-equal in their rights to use the resource (Ciriacy-Wantrup and Bishop, 1975).[8] Therefore, common property is not everybody's property. The potential resource users who are not members of a group of co-equal owners are excluded. Oakerson (1986) indicates that common property can be open access, while Runge (1986) and Bromley (1986) argue that the two concepts are mutually exclusive (NRC, 1986). One of the few points of agreement in the common property literature is that the resource is subject to individual use but not individual possession.

Using common property as the focal point, Geisler (1988:233-235) rightly indicates that "the commons (as opposed to open access properties) occur where communities are highly stratified and where they are not, where local conflict is both rampant and absent, where privatization is accepted and where it is unknown, and where the resource ranges from marine and forest products to cattle, groundwater,

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[7]The right may be held by an artificial person, e.g., a corporation, university, or an unincorporated grouping created or recognized by the state as having similar property rights as a natural individual. Corporate property is thus an extension of individual private property (Macpherson, 1978).

[8]They note that the rights are not lost through non-use. The co-equal owners are not necessarily equal with respect to the quantities or other specification of the resource each uses over a period of time. The concept employed refers to resources subject to the rights of common use and not to a specific use right held by several owners.

and farmland." The commons, as he points out, are "ubiquitous in time and place and neither inferior nor superior to private forms of tenure."

State Property

Macpherson (1978) points out that apart from use derived from ownership, the community or the state may declare that some things are for public use, e.g., parks, highways, city streets.[9] Each member of the society has an enforceable claim to use them, but the claim need not be an unlimited claim.

State property consists of rights which the state has not only created but has kept for itself or has taken over from private individuals or corporations.[10] The state may delegate authority over such rights to a local governing body or a community, but the ultimate owner of the objects of property would be the state.

Open Access Systems

Recent studies on common property resources mention a fourth type of resource whose access is open and therefore no secure claims on resource services exist (NRC, 1986; Kendrick, 1988). There is no property in an open access situation (Bromley, 1986).

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[9]The distinction between common users and common property needs to be made so as not to confuse the two. These objects of property, e.g., parks, highways are usually state property where the general public is allowed use or access.

[10]Examples of state property would be the rights to use the airwaves for radio and television communication, railways and airlines, etc.

The different types of property examined above can be simultaneously intermingling, coexisting, changing and functioning. The common or state property therefore need not be contradictions in situations dominated by capitalist relations.

The jurisdiction and control over objects of property can change from one group or person to another resulting in a change in the types of property themselves. The transition of objects of property from one type to another is everocurring. For example, water at the watershed may be state property under the local regional authority, but as it is tapped by a community of irrigators for irrigation, it becomes common property for that group. However, the allocation of water and individual distribution at the farm level changes the jurisdiction and control from community to individual with certain impositions and responsibilities. In Nepal, some types of government intervention and investment in farmer-managed irrigation systems change the type of property ownership from the community to the state. Now, the Nepal Government is considering "turning over" these systems to the users themselves.[11] The negotiations and agreements between communities of irrigators lay down the terms for the transfer or use of certain objects of property from one group to another.[12]

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[11]This approach grants the users themselves the control and management of the irrigation systems from which they tap their water. However, the issue of the irrigation systems as the property of the users themselves has not been specified as yet. The possibility of the irrigation system "reverting back" to the state is always there. It seems that as long as the state deems a certain irrigation system is being managed well by the users, the users enjoy defacto usufructuary and ownership rights. Availability of resources and manpower within the irrigation bureaucracy are two conditions that encourage the process of "turning over " the systems to the users or the systems "reverting back" to the state.

[12]See Pradhan (1987).

PROPERTY AND THE STATE

The role of the state in shaping and honouring various types of property is paramount. At a given time, the state may not exercise its authority over certain resources, or may choose to do so minimally. In such a situation, individual or common property may remain intact or develop on its own. However, the potential for state regulation and control regarding access and use of such valued objects exists. We have also noted the role of the state in creating such property through its own investments. Not only through investment alone, but also through legislative acts, policies, and intervention approaches, the state creates, reproduces, and modifies property rights and relations.

Summary

Thus far, we have reviewed the salient features of property within a sociological treatment of property. We noted how property has been misconceived as a thing or as limited to private property. We have argued instead that property is a social relationship among people over valued objects. There are different types of property and we saw how they could change from one domain to another and coexist at the same time and space. The nature and means of creation as well as its alienability were seen as fundamental elements to property analysis.

Having said that irrigation is a property-creating process, I shall now substantiate this point by moving to a body of literature

dealing with the relationship between property and the social organization of irrigated agriculture.

PROPERTY AND SOCIAL ORGANIZATION IN IRRIGATION

Irrigation property analysis examines the different kinds of property relations, property rights, and objects of property within an irrigated agricultural system and its related context. The need for greater co-ordination, labor, physical interdependence as well as high investment to keep the system going all strengthen the operationalization of property rights in irrigated agriculture. For example, local groups in irrigation systems enter into property relations with groups from other irrigation or water utilizing systems like mills or hydroelectric plants within a common watershed or with neighbouring communities. Within an irrigation system itself, there are various types of property rights. Thus levels of property rights, both within and between systems, have to be clarified for analytical purposes.

Coward (1986; 1986a; 1988) has reviewed several irrigation case studies in Asia from a property perspective. He concludes that developing irrigated agriculture is not only a property creating process, but that in many instances, irrigation development is the resultant of activities by both the state and the locality.

A property rights analysis seeks to explain not only how certain irrigation systems work but why, and also to explore the basis for such arrangements. Rules and tools in an irrigation system can be explained in terms of the property perspective (El-Kholy, 1985). The system tasks are carried out for the persistence and reproduction of

objects and relations of property; hydraulic facilities are constructed to enhance the relations of property; rules and roles are set for the perpetuation and enforcement of property rights and relations; and dominant social groups and the state shape and control the nature of property relations and rights. Changes in property rights define certain adjustments in the social relationships among people.

Irrigated agriculture demands constant investments and resources for its perpetuation. Both the irrigation system and the irrigated land require regular inputs. Tamaki (1977:11) has proposed that a key characteristic of irrigation is terre capital formation: the continuous investments made in land. The function of terre capital stock formation, according to him, is to integrate labor into land so that 'past labour' can be used to facilitate 'present labour' in the process of production (Tamaki, 1977:11). This reflects the high investment necessary for irrigation as well as the reinforcing property creating process. Thus the physical as well as the economic nature of the 'irrigation' enterprise intensifies the social interaction among people: both present users as well as their forbearers.

Leach (1961) in his study of Pul Eliya (a village in Sri Lanka) shows that property rights determined the relationship between people of the rice cultivating village. The critical factor was whether or not a man could assert a claim to any property right. Leach concluded that kinship reflected property relations and was highly flexible and constantly being readapted to fit the relatively "immutable physical facts" of the agricultural terrain and the irrigation system. Leach also shows how property rights influence the operation of the

irrigation system. He (1961:64-66) notes that under the traditional system, land holders owned rights in a certain length of irrigation ditch rather than rights in a particular area of ground. Having owned rights in water, the plot-holder could cultivate as much or as little as he chose. Regarding maintenance, he notes that each plot-holder must maintain that part of the main irrigation ditch which passes by or flows through his plot.

Bloch (1975) studied the Merina and Zafinamiry, two groups in Madagascar. One was dependent on irrigation and the other on swidden agriculture. He reports how irrigation creates powerful forms of property relations and has a significant impact on the entire social structure of the community. Irrigation enhanced the predominance of property in determining social relations. In the case of the Marina, the scarce rice lands supported endogamous principles of marriage. This keeps outsiders out and prohibits their claims to the highly valued rice lands that are invested with the work of their ancestors.

In his analysis of community irrigation systems, Coward (1986a) states that the group must have the capacity to mobilize labor for its initial property creation and the capacity to regularly repeat this labor investment to sustain and elaborate what initially had been created. The relationship among the participants in a community irrigation system and between these participants and the group leaders are basically property relationships -- specifically, they reflect the rights and privileges that these parties have to the common property of the irrigation works (Coward,1986a).

Coward (1986:492) writes:

> ...This property-creating process has two linked meanings. On the one hand, it means that irrigation development leads (1) to the creation of new objects of property (weirs, canals, water rights, etc.) and (2) to the possibility of new property relations. The latter point refers to the fact that as new objects of property are created, the relationships among people related to that property object may also be adjusted or created de novo.
>
> ...Beyond the matter of property creation, one can also then consider property maintenance. Based on a review of the local irrigation sector in parts of Asia, I have argued that these experiences suggest that "ownership of and responsibility for irrigation works invariably coincide" (Coward, 1986a:232)... one could see that the group making the original irrigation investment also had the responsibility for the upkeep of the facilities they had constructed. Their efforts to maintain these works could then be viewed as rational economic behaviour aimed at protecting prior investments. (emphasis added)

In other words, the initial investment granted entitlements to the original investors. Continued investment reproduced such rights for the right holders. Rights and duties or obligations are the two sides of the same coin.

Coward (1986:496) cites the time share in the warabandi system of water allocation prevalent in Northern India and Pakistan as a property right created and legitimized by the state in large government-managed irrigation schemes. He writes:

> ...The theory of the warabandi arrangement is that each cultivator is assigned a turn, represented by a specific period of time -- a time share -- and the volume of water available during that slice of time is his to use. This time share becomes a property right legitimized by the State through the creation of a formal, and legal, warabandi roster for the delivery channel in question. The warabandi share, as a property right, then serves to organize the social relationships of irrigation among the cultivators and between them and the irrigation agency. While the original warabandi holders may not have obtained their shares through investment in the hydraulic works, they may have invested in land development (which can be seen as a prerequisite to

enhancing the water right with actual value). (emphasis added)

Recently, there have been numerous field oriented studies of common property arrangements in irrigation (NRC, 1986). Key concepts that can be unearthed from these studies are the importance of studying irrigation systems from a property perspective because property arrangements and social action are highly interdependent. Coward (1986a:227) notes that "... the creation of the irrigation works establishes among the creators, property relations, which relations become the social basis for their collective action in performing various irrigation tasks."[13]

SUMMARY

This chapter began with a sociological treatment of property. The different types of property and their relations with the State was also explored. In exploring property issues in irrigation, it was noted that irrigation development itself was a property creating process that led to the emergence of new objects of property and new relations. In order to enjoy a continuous stream of benefits from these property rights, these rights and relations have to be persisting and reproducing themselves: their longevity and cohernece have to be assured.

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[13]Coward (1986a:227) notes that the property relationship is evidenced not only in their social actions regarding irrigation tasks, but also in the various normative aspects of their association. "Ritual activities may also reflect these basic property relationships ---not surprising if one recalls Leach's suggestion that rituals are activities 'through which the members of a society manifest to themselves the model schema of the social structure in which they live' (1961:299)".

The organizational and physical tasks in an irrigation system lend support to such reproductions of rights and relations. The social basis for collective action in irrigation systems is property. As Coward notes (1988:333):

> ...a number of the organizational arrangements and processes observed in Fai Muang Mai [and other irrigation systems] are expositions of an underlying property grid. That property grid, formed during the initial period of constructing the hydraulic works and continually reproduced, provides the logic both for the persistence of certain old practices and the creation of new procedures as circumstances require (emphasis added).

The concluding section of this chapter proposed that a useful way of looking at irrigation systems was through a property perspective. Since irrigation development, in many instances, is a result of the interaction between state and locality (or the local property structure), the next chapter will examine this interaction in the context of irrigated agricultural development within the different periods of the history of Nepal.

CHAPTER III

STATE AND IRRIGATION DEVELOPMENT IN NEPAL

The focus of the previous chapter was on property rights and relations in irrigation, while the focus of this chapter will be on state involvement in shaping, modifying, or creating such property-based irrigation systems. State policies and intervention in irrigation change the property rights and relations in existing systems, as well as create new ones where none existed before. It is thus important to examine the nature of policy formulations and their implementations. Anderson (1988:334) notes that "by following specific policies of regulation, arbitration, selective outlawing of pressure and political groups, infrastructure development, and so on, the government can act on the economy."[1]

If on one hand, the actions of the state become crucial for irrigation development, the actions of local groups and organizations in conjunction with the state or alone become equally important for irrigation development. Coward (1986) notes that "irrigation development is the result of activities by both the state and the locality and that improving irrigation development outcomes is dependent upon discovering (and using) better means for joining state and locality

[1]The government acts often by preventing many courses of action rather than by advocating specific courses of action alone.

actions."[2] He states that even in state initiated and controlled irrigation schemes, significant local tasks still remain to be carried out. Furthermore, there continues to be a "dynamic local irrigation sector supported largely by local resources."[3] The property system in irrigation at a given time must be seen as a result of the interplay of local conditions and actions and the broader state policy context.

This chapter examines the role of the state in irrigation expansion in Nepal. The state-locality interaction from a broader national perspective will be explored undertaking a historical analysis of state policies and the state apparatus regarding irrigation and agriculture development during the successive political periods.[4] Due to lack of historical data on local actions regarding irrigation development in the early periods, the emphasis will be on state actions.[5]

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[2]By locality, Coward refers to various forms of local organizations, or combinations thereof. Local irrigation sector therefore refers to irrigation facilities created by localities.

[3]As Coward points out, this local sector may be supported by the State in spite of the State's dominant involvement in irrigation. The government of Nepal's new approach towards irrigation is of this nature.

[4]State apparatus includes state elites, bureaucrats, urban as well as local elites and state functionaries. The judiciary, legislative, and the executive wings are also included in the apparatus. Media that propagate the dominant ideology, the police, and the military forces are also included.

[5]This is not in any way to undermine the importance of local actions. In fact the subsequent chapters on the case studies will deal in length with local actions interacting with the state's. This chapter will be more macro-oriented while the subsequent chapters will be grounded in the case studies themselves.

INTRODUCTION

A process that typically characterizes the agrarian economy of Nepal is economic underdevelopment (Shrestha, 1981). The political economic analysis of this process should encompass both external and internal policies. Internally, the focus is on the institutional policies of the early Shah and the Rana regimes that were responsible for economic backwardness and the ongoing struggle for development. Externally, the focus is on British India's policies towards Nepal and those of India. In recent years, Nepal has been fostering greater relationships with agencies that embody international capital for the country's infrastructural development. The emphasis in this chapter is on the internal institutional policies during the different political periods.[6]

Nepal's land tenure system prior to the 1951 revolution is represented in Figure 3.1. The basic forms of land tenure were Raikar and Kipat. Regmi, a noted Nepali economic historian states:

> "Raikar lands belong to the state, according to the theory of state landlordism, whereas Kipat lands belonged to the community under a customary form of land tenure that was gradually merged into the state tenure system. Raikar land was known as Birta when it was alienated by the state in favour of individuals, and as Jagera when it was assigned as emoluments to government employees and functionaries. Guthi tenure originated from the alienation of Jagera, Birta, or Kipat lands by the state, or by private individuals, for religious and charitable purposes. Fiscal and tenurial concessions granted to cultivators of Jagera, Guthi, Jagir,

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[6]My emphasis on the internal policies is because of unavailability of data on British India's relations to Nepal regarding domestic production. The focus of this study is on the internal situations. It is true, however that internal and external policies interact resulting in future policies. Internal policies cannot be studied alone but for analytical purposes, this "imaginary" dichotomy is made.

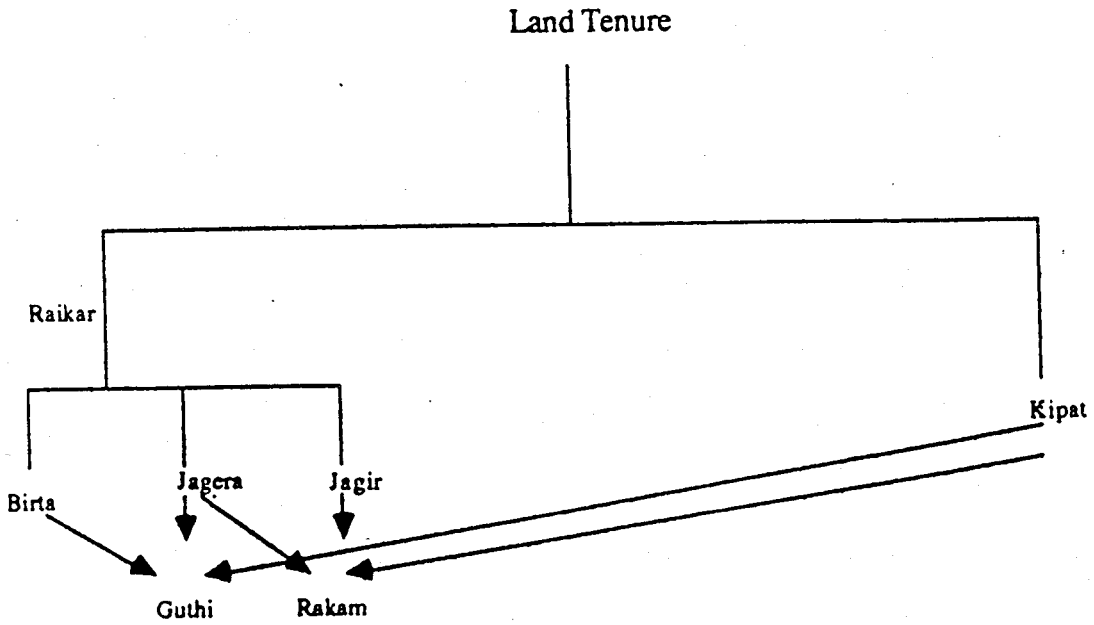

Figure 3.1 Land Tenure System in Nepal (Pre-1951).

Source: Regmi (1976).

> and Kipat lands led to the emergence of Rakam tenure. Although Raikar was a reflection of the unlimited prerogative of an absolute government which identified landownership with sovereignty, its secondary forms were basically a response to the need to adapt the land system to different economic, political, social, religious, and administrative requirements. The Birta system thus helped to create a feudalistic class that gave social and political support to the rulers; the Guthi system contributed to the satisfaction of religious propensities of both the rulers and the common people; and the Jagir and Rakam systems enabled the government to support an administrative structure without the use of much cash in a situation where an exchange economy had not yet fully developed." (1976:20)[7]

Birta, Jagir, and Rakam tenures have now been abolished and the Kipat system is slowly being replaced by individual ownership. It was only in 1923 that individual private rights were legally recognized.

Rural areas in Nepal are presently being transformed rapidly. This is indicated by remote communal villages and individual smallholders becoming increasingly tied to the urban market and to an increasingly commodified economy. Their potential for maintaining subsistence levels of income is being threatened and squeezed by population growth. Land has been central to rural conflicts, social relations, and peasant political behaviour (Seddon, Blaikie, and Cameron, 1979). State policies aimed at promoting development or reform have played critical and multiple roles in shaping the current conditions in the country.

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[7]Rakam tenure is designated to lands tilled by certain groups of people who were ordered by the state to provide specific services to the state. The fisherpeople in most of West Nepal had to provide ferry service across major rivers to government officials and travellers. They were exempt from other types of corvee labour. However, their produce from the land was taxed by the state.

The state of Nepal, in the past several decades, has been strongly interventionist; but incapably so. Various governments have tried to organize and plan national political life with the purpose of maintaining economic growth and social order. There has been an infusion of foreign aid both as grants and loans for these purposes too. However, often, the preoccupation with social order has taken precedence over economic growth activities. For instance, after the 1951 political changes in Nepal when the Rana autocratic regime was ousted by the people backed by the monarchy, conflicts between peasants and Jimindars (who collected land tax from the villages in the Terai for the Ranas) erupted in several Terai districts. The demand for the abolition of the Jimindari system gradually gained momentum.[8]

A CONCEPTUALIZATION OF THE STATE AND POLICY FORMULATION

Certain state policies have consistently favoured a small group who are the owners of foreign and national industrial, commercial, agricultural, and financial capital.[9] Such state actions and policies have led to the belief and assertion that there is a close alliance between the domestic national and foreign international capitalists. This group is believed to control and dominate the state and prescribe and proscribe the nature and direction of state policies.

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[8]See Land Reform Commission, "Reports of the Land Reform Commission," mimeographed (Kathmandu: the Commission, 1953).

[9]Tax-breaks, low interest rates, high import duties and low export duties are examples where certain sectors gain or lose by government policies regarding domestic production and foreign investments.

On the other hand, as Grindle (1986) points out, states can pursue reformist policies that impinge directly on dominant class interests. She elaborates that state institutions have used a variety of policy carrots and sticks to shape the activities of these same groups -- regulating foreign investment, expropriating underutilized landholdings, nationalizing financial institutions, developing public sector enterprises that compete with those of the private sector, and imposing export and import control. Policies to incorporate non-elite groups into national political and economic systems have also been pursued through affirmative actions. Quota-wise representation in various political offices and educational institutions has been provided by the state. Pursuit of such policies has not always resulted in widespread unrest.

To elucidate the genesis of development policy becomes formidable, given the fact that a state's policies juxtaposed synchronically and diachronically appear to be contradicting, inconsistent and at times not easily identified. The ramifications of a given state policy are multifaceted: there are always losers and winners--one policy may benefit a certain group, while another policy may challenge directly that group's interests (Grindle, 1986). Policies adopted may have unintended consequences and/or contradictions. Policies may be formulated but not implemented and remain mere political rhetoric (Regmi, 1984) or they may be implemented very loosely, inefficiently, or inconsistently. Policies may have both implicit and explicit goals. Actualization of certain policies may increase or decrease the

power of the various groups or of the state itself (Macpherson, 1982; Grindle, 1986).

Two distinct conceptualizations have been proposed in the ongoing discussion and debate of the origin and nature of state actions. One conceptualization following the tradition of Marxist and dependency analysis defines state as "an alliance for social control which reflects and reproduces class relationships in the society; it takes the form of institutions to achieve legitimation and coercion; its purpose is to maintain the dominance of a given mode of production and the specific class relations that this implies." (Grindle, 1986)[10]

A second conceptualization defines state as an enduring executive and administrative apparatus that makes authoritative decisions and exercises control over a given territorial entity. For Weber, the state can be defined only in terms of its means and not in terms of its ends. Skocpol (1979) adopts this perspective in discussing the state and its autonomy. The state is "no mere arena in which socioeconomic struggles are fought out. It is, rather, a set of administrative, policing, and military organizations headed, and more or less coordinated by, an executive authority." For Stepan (1978), the state is "the continuous administrative, legal, bureaucratic and coercive systems that attempt not only to structure relations between civil

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[10]Marxist theories of the state are usually coined in terms of dichotomous categories like the "instrumentalist" (the state serves the interests of the ruling class) versus the "structuralist" (state is the mechanism through which structural constraints that contradict the process of accumulation are overcome) positions, or "class logic" (the state's role in mediating class struggle) or "capital logic" (state's role in producing and reproducing the dominant social relations) perspective. See De Janvry (1981: 182-201) for an overview of this debate.

society and public authority in a polity but also to structure many coercive relationships within civil society as well."

The state interest perspective within the Weberian tradition focuses on the role of the state elites and the implementation of public policies.[11] This perspective accounts more fully for the linkages between the state and the society in terms of the changing autonomy of the state. It accepts the possibility that the state has identifiable and concrete concerns about the definition and pursuit of "national development" (Grindle, 1986). These concerns may be independent of, but not necessarily opposed to or different from, the immediate interests of any particular group (Baer, Newfarmer, and Trebar, 1976; Canak, 1984). Grindle (1986) argues:

> This perspective (state interest perspective)....provides a framework for focusing on the development belief systems (development ideologies) of policy makers and planners, on the formulation and implementation of specific decisions, and on the skills and influence of particular political leaders. Insights into these issues allow us to analyze the extent to which "the technocrats and public managers form an 'independent state' ... and allocate resources in a way that expands their own power and wealth (Baer, Newfarmer, and Trebar, 1976)." Such a framework also provides an alternative to understanding the state as little more than an arena for class, interest, or bureaucratic conflict. In addition, it encourages an analysis of the impact of ....the enormous expansion of the state apparatus itself.
>
> ....the relative autonomy of the state is assumed to be a desirable condition sought after by state elites insofar as it presents them with greater flexibility to pursue policies that will engender economic growth and social stability and thus help legitimize and prolong the life of the regime they serve.

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[11]See Grindle (1986) and Alford and Friedland (1985) for a review and detailed examination of the other perspectives within the Marxist and Weberian traditions.

> ....they expound theories of development, attempt to put together supportive coalitions, legislate reforms, and create new bureaucratic entities. ....their potential autonomy is clearly bounded by the characteristics of social groups that support or oppose the state, by the international context of state action, and by the historical development and efficacy of the state and regime in question. Moreover, the state interacts with society in a specific historical context in which previous policy, experience, ideology, and expectations must be considered.
>
> .... At any given moment or for any given policy area, development policies may coincide with the interests of dominant groups in society. This may be the result of a weak state that is in fact dominated by societal interests, it may be the result of the conviction on the part of state elites that these policies are in fact the best (or most feasible) means of achieving national development, or it may be a result of interactions of bargaining, conflict, and compromises between state elites and social classes.

The expanding state apparatus, bureaucracy and the role of development ideologies, planning and administration can be better grasped by this perspective. The last paragraph of the above quote summarizes the utility of this approach. The nature and the role of the state are fundamentally conditioned by the changing balances in the wider society, and by its own internal cleavages and divisions (Seddon, 1987).

Dealing with all aspects of the nature and role of the state is beyond the scope of this study. This study will focus on state policies and approaches towards irrigation development. Therefore, by state intervention or involvement in irrigation, we mean the specific ways the state acts in irrigation development. These specific actions are the sanctioning of rules and policies, the financing of irrigation, and also the implementation of irrigation projects.

THE CONTEXT FOR NEPAL

The State of Nepal has had an increasingly important role in sanctioning and creating property within irrigated agriculture through enactment of policies, implementation, and finances. As noted earlier, the actions of both locality and the state have been crucial in irrigation development. State's actions set the parameters for local actions. Conversely, the existing property systems in the irrigation systems and the community also impact on and shape the nature of State's involvement. This state-locality interaction is intensified especially due to scarcity of virgin land that can be reclaimed now. Nepal government's express intent on "assisting" local sector irrigation forces state-locality interactions not only with existing systems' members, but also between future members and present members, the state and the two sets of members. In recent years, state's involvement has been more dominant.

Irrigation-development activity is a part of the national government's development policy with regard to the rural areas and agricultural production. Governments top priority is to keep the national economy running. This national economy however is intimately related to the international capitalist market and its own functioning is based on the principles of a commodity economy (Eggink and Ubels, 1984).

In the context of Nepal, irrigation policies should be viewed within agricultural policy, in fact, within the broad development policy as embodied in a certain historical period of socio-economic relations. The study of its interrelationships with other policies,

those of water resources, energy and electricity, forestry, and land, would also become crucial because these can negate one another or in fact strengthen and support one other.

In attempting historical enquiry into irrigation policies in Nepal, it would be useful to understand the emergence of such policies, or the lack thereof. Examination of government's rationale for intervention, the rise of the modern irrigation bureaucracy, the dominant role of bilateral or international aid and capital and their strength in shaping domestic agricultural or irrigation policies need to be made for the proper understanding of irrigation dynamism in Nepal.

HISTORICAL ANALYSIS OF AGRARIAN RELATIONS AND IRRIGATION POLICIES IN NEPAL (FROM PRE-UNIFICATION ONWARDS)

Shrestha (1985) notes that it has been a common practice among contemporary development planners and researchers to find an explanation for the perpetual underdevelopment of the Nepali agrarian economy in the low levels of modern technical inputs, in the lack of capital accumulation and in high rates of population growth. He rightly argues that although these factors along with the geographical conditions do influence the process of development, they are themselves determined by the existing social relations of production and thus cannot provide anything better than a secondary explanation.

I shall now turn to four distinct periods in Nepal's history to examine state's involvement in irrigation. The logic for such periodization is the extent of incorporation in the global economic system and the nature of the state. The four distinct periodizations

are: i) pre-unification where small kingdoms functioned with relative autonomy, ii) Post-unification where Nepal follows an expansionist policy in search of more land and confronts British imperialism, iii) a century of Rana autocracy where Nepal's only outside contact southwards is through the British and the Nepali rulers needed British blessings to be in power, and iv) modern period with the overthrow of the Ranas, the rise of the bureaucracy, and a dominant role of international capital.

Legacies of the Past: Nepal's Agrarian Economy

Pre-unification

Present day Nepal is a seventeenth century amalgamation of several tens of small principalities and kingdoms by Prithvi Narayan Shah and his followers from the Gorkha Kingdom in present day West Nepal. The size and power of any of the kingdoms depended on the ability of the ruling class to appropriate, in the form of taxation, surpluses produced by farmers and others, on their ability to maintain an effective army to defend the borders and encroach upon the territory of other rival states, and on their capacity to control and exploit strategic resources, such as mineral deposits or trade routes (Seddon, Blaikie, and Cameron, 1979).

Several irrigation systems date back to the pre-unification times and are still functioning.[12] Historically, irrigation

[12]Raj Kulo of Argali in Palpa district was constructed during the Sen dynasty long before it was conquered by the Gorkha kingdom. Some people in Argali have documents dating B.S. 1844 (1787) during the Sen period that mentions this kulo.

development falls under several domains: a) religious trust, b) individual initiatives (primarily of the local elites), c) community efforts, and d) royal directives.

As certain temples, both Hindu and Buddhist, were endowed with land by someone influential, irrigation systems were built for lands endowed to the temple (e.g., Raj Kulo of Argeli in West Nepal). Temples needed a steady income for financing the services of a priest, some caretakers, its maintenance, and for daily offerings. The irrigation system would irrigate the endowed lands and the resulting higher produce could finance the needs of the temples better. The priests and the caretakers would sometimes be the very tenants of the land endowed in this manner and the yield would be shared among them as remuneration for their services.

Throughout the different historical periods, local elites have organized and financed irrigation construction in several parts of west Nepal (Martin, 1986; Pradhan, 1982; Yoder, 1986). In the Rapti Zone, communities have organized to build systems at their own cost (Prachanda Pradhan, 1986).

In Kathmandu valley during the Malla dynasty (before 1768 A.D. and before its conquest by the Shah dynasty of Gorkha), several irrigation systems were built under royal directives very likely with state funds. The names of these systems are prefixed with either Raj or Rani.[13] Here, elaborate arrangements existed for the maintenance and repair of

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[13]Raj and Rani mean king or queen, basically meaning royal.

irrigation channels.[14] Rights to utilize irrigation facilities were also carefully regulated.[15]

The edict of King Ram Shah of Gorkha (prior to the unification of Nepal by King Prithvi Narayan Shah) states that water disputes are not to be brought to the courts for adjudication (Regmi, 1971). Conflicts were resolved locally under accepted customary tradition or it resulted in being settled through existing power relations and not in the state courts in obedience to the king's directives.[16] Communal irrigation systems were more autonomous and its functioning was not intervened by the state or government.[17]

Each kingdom had its own way of dealing with irrigation development and functioning. Some had explicit policies regarding state intervention, others were left to function under customary norms. Naturally, the many irrigation systems dating back to the pre-unified Nepal have had different histories of resource mobilization for their initial and continued development (Regmi, 1971; Poudel, 1965).

Post-unification (1779 - 1845)

By the end of the 18th century, virtually the entire area that is now Nepal had been incorporated into a loosely articulated state i.e.,

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[14]See Campbell's "Notes on the Agriculture and Rural Economy of the Valley of Nipal," February 20, 1837, pp. 163-220.

[15]See Poudel (1965). Several irrigation systems of Bhaktapur in Kathmandu valley during the Malla period were owned and operated by the state.

[16]Ram Shah of Gorkha (1662-1690) was known for having introduced the first legal code within the Shah dynasty. See Regmi, 1971.

[17]See Regmi (1971).

a single administrative apparatus. The state was maintained largely by the appropriation of surplus in the form of taxes from the direct producers, the peasantry -- often through local lords granted the right to collect those revenues and appropriate for themselves a significant portion. Those granted these rights were required to maintain local law and order too (Seddon et al., 1979).

In the hills, agricultural production was barely adequate for a regular market after subsistence needs and deductions for taxes (Seddon et al., 1979). Thus, accumulation by farmers was minimal. The local lords themselves were not legally landowners, but only granted temporary and alienable rights to appropriate surpluses produced in their domain. Consequently, they were not inclined to invest heavily in the lands themselves, or even to promote productivity among the peasantry.

The campaign of territorial expansion by Prithvi Narayan Shah and his successors required an enormous supply of labour for the army, and for transport of military and other supplies long distances. Regmi (1984) points out that Nepal's need for strategic materials such as copper and iron outweighed its need for cash revenue during its invasions. The state of Nepal (1768 - 1816 A.D.) would have been able to increase its revenue to a considerable extent had it not been for these strategic needs. The conditions of warfare made it essential to accept commodities rather than cash in fulfillment of labour and tenurial obligations. Forced unpaid labour known as jhara or rakam in the face of a low population density was used for the construction of palaces, temples, forts, irrigation systems, and the numerous needs of

the royal palaces (Regmi, 1971). The peasants who were not serving in the army were obligated to provide jhara and had to bring their appropriate tools like khukuri, hoe, spade, sickle etc. and their own food too. Many a time, people from far away would be conscripted for a specific jhara work and would be allowed to commute such obligations into cash or to provide some other services.[18]

Since the labour shortage was so acute, jhara had to be exacted on a regular compulsory basis. At times, peasants were prevented from tilling their fields because of forced labour obligations.[19] Shrestha (1985) notes that such lack of time, surplus and incentive to improve their land or to acquire technical labour skills prevented them from contributing to agriculture development through increased productivity.

P. Pradhan (1986) notes that the legal tradition and local administrative structures during early unification have over time enabled farmer-managed irrigation systems to operate without interference from the irrigation agency or other administrative units at the district level. The irrigators or the community have been able to

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[18]See Regmi Research Series (1981) for various royal orders impressing jhara labour. Jhara was imposed nation-wide for the construction of a bridge in the name of a late king. The Amali of Chainpur represents to Kathmandu office that it takes too long to get to Kathmandu and suggests instead if jhara labour could be commuted to a cash levy thus freeing the peasants to continue work related to land reclamation. Land reclamation meant clearing virgin or waste land for cultivation. Usually it meant converting land into rice-lands. The army stationed nearby was ordered from Kathmandu to collect the cash levy.

[19]However during land reclamation and the construction of irrigation canals, those ordered to provide jhara for irrigation construction were sometimes exempted from other jhara obligations like transporting government goods, constructing bridges or trails, etc.as . See Regmi Research Series (1981) and Shrestha (1985).

institute their own rules and regulations as well as customary rulings.

Historically, agricultural lands, mines, and forests have been regarded as the property of the state in Nepal. Regmi (1984) notes that the ownership of these natural resources was an essential attribute of the sovereign authority of the Nepali state and virtual private ownership and usufructuary rights were privileges granted by the state through specific grants.

The Gorkhali rulers who unified Nepal attached considerable importance to converting wasteland into irrigated land. Since there were very few sources of revenue besides land and indirectly from forced labour, land was considered to be the most important source of revenue to finance the state apparatus. King Prithvi Narayan Shah directed: "In case there are houses on lands which can be converted into fields, these shall be shifted elsewhere: irrigation channels shall be constructed, and the fields shall be cultivated" (Regmi, 1971:143). The primary objective of land reclamation was to increase revenue in order to finance the growing military expenditure.

Simultaneously, the contradiction from the point of revenue generation for the state lay in the fact that large tracts of agriculture land were granted for loyalty or good service on a tax-free basis to the elite strata of the society and therefore the state was unable to mobilize resource from such lands through taxation and other means. Regmi (1984:9) sums up this territorial expansion era succinctly:

> The political unification of the Kingdom was achieved under the leadership of political elite which used its authority as a means to attain economic power. For this reason the economic policies and programs of the state were geared

> primarily to the task of extracting economic surplus from producers and traders. The state, naturally, was a beneficiary of such extractive policies and measures, but so were the political elites, in perhaps greater measure. Indeed, Nepal's political and economic system during this period might aptly be described as an agrarian bureaucracy, or a system that depends upon a central authority for extracting the economic surplus generated by producers and traders. Seldom do we find steps taken purely with the objective of increasing production or improving the condition of the producer. In other words, the economic policies of the state were determined primarily to suit the interests of the political elites, not those of the producer or the trader.

Regmi (1971) points out that officials were sent to eastern terai districts from time to time after 1793 to make arrangements for irrigation facilities in order to promote irrigated agriculture. Settlers were attracted from what is now India to farm in Nepal territory due to shortage of labour. Local prominent functionaries were allotted waste land for reclamation on a compulsory basis. Government expense for irrigation construction in the hills and the terai was provided too. The government appointed an officer in Kathmandu to coordinate land reclamation and settlement of waste lands all over the country in 1811 A.D.

At certain places, reclaimed land through forced labour left the reclaimed land without any one to cultivate them. Financial incentives were provided in the form of free rent for the initial one to four years according to local conditions. Tax-free land grants were provided for those who undertook irrigation projects on their own. The government provided funds for building irrigation facilities and supplied credit to settlers. Regmi (1971) writes that individual reclamation enterprises were not very successful because it was difficult to organize the provision of credit and other facilities to

individual settlers, since suitable administrative machinery was not available. Like Regmi, P. Pradhan (1986) notes that this very lack of administrative machinery forced tenants to maintain the irrigation facilities that irrigated their "land" so as to pay the land rent either to the birta owner or jagirdar, or to the state itself. The control of the systems lay in the hands of the irrigators.

The credit for reclamation was issued with strict terms thus dissuading incentives. A yearly interest of 12.5% was charged and the total loan was to be recovered by the government within a year thus providing little time for settlers to take advantage of such facilities. The loan was sanctioned only if some respectable local persons provided surety without financial consideration. The government obviously desired to minimize financial obligations in the implementation of irrigation projects especially when the administrative machinery was lacking at the local level.

Another financial arrangement that the state provided was contracts to individuals for land reclamation. These individuals who agreed to undertake irrigation projects for reclamation did so at their own expense without incurring any on the part of the state. The contractor provided the stipulated revenue to the government which increased every year for the prescribed number of years and in consideration of this payment, the contractor was permitted to appropriate all taxes and other revenues paid by settlers on the lands reclaimed by the contractor. This arrangement was mutually beneficial to both the government as well as the individual contractors. This was such a profitable enterprise that Regmi (1971) observes that not only

did the local revenue functionaries, but also senior government officials including the Prime minister (1808) took up contracts for the reclamation of waste lands in the terai.

Another incentive that the government provided the confirmation of the very land that a person reclaimed. If the initial investor had reclaimed a large tract of land, he was to procure settlers from India, collect taxes from them, deduct his irrigation investment and transmit the proceeds to the government. As an added incentive, he was permitted to retain the best land for his own use and guaranteed security of tenure unless he committed a major crime.[20]

In sum, the unification and expansion of Nepal relied heavily on land revenues and forced labour. Active state involvement in land reclamation through jhara took place earlier during the initial unification. Those who were conscripted for the labour had to come with their own implements and tools for irrigation construction. It may be inferred that the knowledge base of irrigation physical technology was local and traditional. After the construction of the irrigation systems, it was left to the local tax-collectors to ensure steady flow of land revenues to the state.

However, in spite of coercion, direct supervision and control in executing irrigation projects by the government, the main difficulty it faced was the low density of population. Officials and functionaries that were responsible for irrigation schemes were commanded to procure settlers from India and Tibet, or even Birta or Jagir land. However, Birta owners were not allowed to attract tenants from Jagir or Raikar

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[20]See Regmi (1971) for this government order promulgated in 1793.

lands. The government needed tenants to till the new reclaimed land for revenues. The produce from Birta and Jagir did not go to the state treasury.

Incentives in the form of tax-breaks, confirmation of occupancy and usufructuary rights, profit from taking out a contract, choice of best land were carried out as experiments for irrigation expansion in Nepal along with direct government involvement and supervision. The lack of an administrative machinery from the centre to the local level for irrigation construction and supervision forced the state to seek indirect methods of enhancing irrigation expansion for the sole purpose of revenues. This indirect incentive method however was biased towards those who already had wealth and could take the risk of financing the enterprise or could invest and wait for the profits. Senior government officials, local revenue functionaries, and the already wealthy benefitted from incentives geared towards individual enterprises.

In sum, this era witnessed a continued policy of using forced labour for infrastructural development in the economy. Local resources were mobilized through such state enforced corvee labour by state functionaries. Though state did directly finance and construct irrigation facilities, the maintenance of such state created facilities were left in the hands of the tenants and revenue collectors. The accountability or liability lay in the burden of paying rents on registered irrigated land. Though a sizable and capable administrative machinery existed for purposes of the army and revenue collection, day to day maintenance and operation of all of the state-created irrigation

systems were beyond the capability of the administration. Apart from direct financing of irrigation system constructions by the state, policies of financial incentives to irrigation entrepreneurs were formulated by the state as noted earlier.

A Century of Rana Autocracy

During the Rana regime (1846-1951), revenue for loyal subjects, civil servants, and kin was also collected through land reclamation (Regmi, 1978; 1988).[21] During the Rana period, there were many types of land grants, land titles and tenure systems.[22] The political and administrative system that the Rana regime inherited possessed the fundamental characteristic of sovereign authority. This implied that ownership rights in land were vested in the king and that administrative functions were delegated to revenue collectors, land assignees and local functionaries. The Rana rulers created a civil administration which replaced the delegated authority of local functionaries. Distinct and separate organs of administration for

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[21]After the dismissal, imprisonment, and death of Prime minister Bhim Sen Thapa in 1837, there was political instability in Nepal at the hands of factions headed by different members of the royal family. In 1845, Mathbar Singh Thapa who had been appointed as Prime minister less than two years previously was assassinated. Political conflict and intrigues continued which culminated in a massacre of leading members of important nobility and the flight or exile of many others. Jung Bahadur was appointed as prime minister on the eve of September 14, 1846 and this marked the emergence of the Rana regime (Regmi, 1958).

[22]Birta and Jagir systems of land grants and assignments were extensively used in many of the petty nations even before the unification. Birta were land grants made by the king to individuals on an inheritable and tax-exempt basis; while jagir were land assigned to state employees in lieu of their emoluments (Regmi, 1978). Once someone forfeited his job, his jagir land was taken away from him. The attachment to jagir lands was insecure and temporary.

various government functions emerged.[23] A system of revenue collection through salaried functionaries of the government was laid down. Most of these functionaries belonged to Kathmandu or the hills so that their personal property could easily be impounded or confiscated, if necessary. A central office in Kathmandu to maintain records of all employees was established so as to facilitate the possibility for the leave, dismissal, and other conditions of service of even remote district-level employees to be controlled directly from Kathmandu.

The infrastructure of jurisprudence which these administrative arrangements necessitated was established as a legal code (Muluki Ain) enacted in early 1854 for the first time in unified Nepal (Regmi, 1978). The code retained customary practices relating to land tenure, land reclamation and irrigation, and also the traditional customs of different local and ethnic communities in Nepal. The legal code of Nepal on land reclamation outlines rights in water for irrigation.

The present Law on Reclamation of Wastelands (effective with amendments ever since 1853) outlined in the Legal code of Nepal (Regmi, 1978:244), the basis for all acts portrays some of the resource mobilization obligations and property rights to be honored at the local level. These rules regarding irrigation have been the same during subsequent amendments to the legal code. Specific rules regarding irrigation systems are:

1. Water shall not be available for others until the requirements of the person who constructed the irrigation channel at his own expense or with his own physical labour are first met. In places where water has been shared in the past, no one shall

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[23]See Kumar (1967); P. Pradhan (1970); and Agrawal (1976) for the historical perspective of the Nepalese bureaucracy during this time.

be allowed to withhold the usual share of the water, thus making a field uncultivable. After the field at the source of the water is irrigated, the next field shall use the water. If the owner of the field at the source is confronted with any difficulty, the owner of the next field shall use the water for cultivation. A new irrigation channel may be constructed at a point higher than the existing one only if the amount of water available to the field irrigated by the old channel is not reduced.

2. If an irrigation channel tumbles down or the field is damaged by streams or washouts, the landowners (Mohi) themselves shall repair it as far as possible, or do so by jointly providing labourers. They shall not share in the water supply unless they themselves make repairs or provide labourers. If the strength or resources of the landowners prove inadequate, the Talukdar shall ascertain the resources required to repair it and report to the Government office. When the channel is repaired with means provided by the Government, the existing landowners shall not be evicted. If the irrigation channel is not repaired by either the Government or the tenant for three years, and the local Talukdar repairs the land or channel at his own cost after reporting the matter to the central government office, he may take eviction measures. The existing landowner shall not be allowed to complain that he has been evicted from the land.

3. Dams or irrigation channels may be constructed on any land, cultivated or uncultivated,... to bring into cultivation any land....No obstruction shall be caused. The owner of the land shall be compensated with the value of the cultivated land taken up by the dam or irrigation channel, or given other land in exchange. But if the land that is thus taken up in uncultivated land not liable to taxation, no compensation shall be paid. When landowners incur expenditure on irrigation works to bring waste land into cultivation, if the tax on the newly cultivated waste land is double that being paid on the cultivated land taken up by the dams or irrigation channels, the tax for the land taken up by the dams or irrigation channels shall be remitted.

In this case the state recognizes specifically those who have priorities in the use of irrigation water over others. It recognizes that benefits should accrue to those who had invested in the irrigation works first. Irrigation water cannot be withheld and therefore ensures that all possible irrigated land continues to be so. This ensures

steady revenues for the state. If someone upcanal faces problems with applying water, the next person has the right to apply water without waiting for the upcanal person.[24] Rules for sharing water, provisions for rights-of-way, forfeiture of water rights, and obligations associated to justify the possession of rights are also outlined. The state was cognizant of customary rights over water at the source as well as allocation, and has incorporated stipulations for water allocation and use with the intent of curtailing potential water conflicts over priorities. Measures for the maintenance and repair of the canals and procedures for government assistance are also outlined. Justification for eviction of peasants if they did not repair their canals or if they let their lands remain fallow whether or not the state provided resources for the repair. The onus lay on the peasants. The Talukdars channeled state power for effective revenue generation. The state laid down both positive and negative sanctions that directly and indirectly facilitated irrigation use and maintenance. Measures for rights-of-way and compensation were also outlined.

The agrarian institutions of nineteenth century Nepal were designed primarily to enable the government to augment its revenue, as well as the income of the landowning elite (Regmi, 1978). Nepal then really did not face real choice between increasing productivity per unit of the cultivated area, or by extending the area under cultivation. Since land was relatively abundant compared to labour and

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[24]The word upcanal has been used similar in context to upstream only that it denotes the canal alignment as its reference point rather than the stream or the intake of the canal.

capital, measures to increase agricultural production were confined mostly to the extension of the area under cultivation.

The development of railway facilities in northern British India which touched the Nepal-British India border at several places led to the demand for timber and boulders that were readily available in the Nepal Terai. Regmi (1978:140) reminds us:

> Of greater importance was the fillip the new transport facilities gave to the production and export of such agricultural commodities as rice and jute from the Tarai [terai] region. These developments opened up unprecedented prospects for agricultural expansion in the Terai region. The Rana rulers took prompt advantage of the situation, inasmuch as the land and other natural resources of that region constituted a major source of income not only of the landowning elite but also of the government.

The main element of agricultural development policy of the Ranas were measures to extend the area under cultivation. Private enterprise was encouraged through fiscal concessions. The legal code prescribed an incentive of tax-exemption for three years in the hill region, and for five years in the Terai to any person reclaiming adjoining cultivated holdings (Government of Nepal, 1870). The main thrust of land reclamation policy in the terai was to encourage private enterprise in the reclaiming large tracts of forest and other uncultivated lands whose development was beyond the means of the local farmers. Legislation was enacted to provide additional concessions and privileges to individuals who undertook reclamation projects. Settlers were procured from India and provided with permanent allotments with full tax-exemption for the first five years. These concessions were necessary to compensate the initial overhead investments made in clearing

forests, digging irrigation channels, building huts, and procuring bullocks and agricultural implements (Regmi, 1978).[25]

These policies provided full scope for private enterprise and capital investment without imposing any cost on the government. But the government also often took a direct initiative in the development of irrigation facilities. Regmi (1978) states that the government appears to have taken this direct initiative only during the 1860s after widespread drought and famine. The policy in east terai was that the government would meet half the cost of irrigation facilities constructed by the local farmers or revenue collector.

In the hills, land was contracted by the state to certain officials (known as Dittha in some places).[26] These officials were designated caretakers for parcels of land and had the responsibility of seeing that irrigation facilities were provided and repaired. Failure to do so resulted in forfeiture of his jagir (land assigned to government employee as remuneration).[27] Orders from Kathmandu substantiate this point (Regmi, 1984a :108-109):

> December, 1833
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> Royal order to the Jagirdar (Amali), Dware, Thari, and common people (raiyat) of Arghaun in Kaski District:

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[25]A gradual development towards de facto private rights in land was taking place. In 1923, individual private rights in land was legally recognized.

[26]This was practiced even before the rise of the Ranas.

[27]The Dittha was a supervisor to irrigation systems supplying water to jagir lands that other jagirdars or military battalions had claims. The Dittha ensured that cultivation did occur with the irrigation system being operative and that the shares of the produce did reach the other jagirdars.

"The local tenants (mohi) have come here that the Vijaypur irrigation canal (in Kaski district) has been damaged by floods, and that they are not capable of repairing it through their own labour. We therefore hereby order the inhabitants of Arghaun, which consists of 2000 households, to provide labour for the repair and renovation of the Vijaypur irrigation canal as directed by the Dittha Jagirdar Shahi, and grant them exemption from the obligation to provide compulsory and unpaid labour (jhara) services elsewhere. Any person who does not provide labour services accordingly for the repair and renovation of the Vijaypur irrigation canal shall be punished with a heavy fine."

This suggests that the canal was seen as a state asset to be maintained through the state's ability to mobilize peasant labour.

Similarly, on December 1846

"On Thursday, Poush Sudi 4, 1902 (December 1846), Rup Narayan was appointed Dittha of the Vijaypur Canal at Arghau in Kaski District, succeeding Mahabir Thapa.[28] He was granted 380 muris of rice-lands as jagir. The royal order of appointment contained the following instructions:

1. Receive picks, spades, axes and other tools from the outgoing Dittha.

2. Repair and maintain the dam and the irrigation canal through the labour of the tenants cultivating lands in the command area. Let not rice-fields remain uncultivated for lack of water.

3.Reclaim waste lands wherever possible in the command area and register such lands at the Sadar Dafdarkhana (in Kathmandu).

4. You shall be held personally liable if no water is supplied through the canal and rice-fields consequently remain uncultivated, and if jagirdars complain that they are not getting rents. You shall also be dismissed if you cannot repair and maintain the canal and supply water for irrigation."

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[28]Ditthas were high ranking officials in the executive or judicial hierarchy. Such officials were also appointed as supervisors of irrigation facilities.

During this era, tenancy rights of the peasants were insecure. Land could be used but not owned, since the state (i.e., the military-administrative elite) owned it. Land use and cultivation rights changed hands from one government and military employee or tenant to another. Water was usually tied to land-use rights. The construction of irrigation systems was also undertaken through forced labour. Investments were made by the state and some irrigation systems like the Vijaypur scheme mentioned above were state-operated too.[29] State jurisdiction over irrigation was exercised through officials so that effective land revenue could be amassed (Pradhan, 1984).

Both the district administration and the district land revenue office were directed by Sadar DafdarKhana office (responsible for land revenue matters) in the central government in Kathmandu. These two district offices were responsible for monitoring irrigation facilities so that additional land reclamation continued. They were to check whether orders granting permissions or commanding certain local functionaries to mobilize resources through jhara for irrigation works were actually carried out or not so that land revenue collection was not hampered or depreciated.[30]

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[29]These may or may not have royal directives unlike the ones we find during the pre-unification era. The orders were issued by the government of Nepal in the name of the ruling king or the prime minister bearing his seal.

[30]See Appendix B and C. The Hill Administration and Tarai [terai] Administration Offices fell within the jurisdiction of the Sadar Dafdarkhana office. See Agrawal (1976).

Ranas and British India

The Rana regime and the British in India had a symbiotic relationship. Good relations with the British meant a blessing for the Ranas to be in power in Nepal, and Ranas' military support helped sustain and enhance British imperialism in South Asia.[31] Nepal was kept strictly isolated from foreigners including the British Resident in Kathmandu whose travels were confined virtually within the valley. This legacy of isolation predates even the Rana times.

King Prithvi Narayan who brought about the unification of Nepal states in Dibya Upadesh (his thinking and administrative orders) realizing well the weak economic condition of his newly acquired Kingdom:

> "Do not let foreign merchants come beyond Parsa Gadhi. In case they come here, they will make our people destitute.... Ban the use of foreign cloth. Train our own weavers by showing them samples, and make them weave cloth according to such samples, so that our money might not flow abroad. Export herbs, drugs, and other indigenous commodities, and thus draw money. The palace will become strong if the subjects are fat. The king's store-house is the people..."

This policy of controlled contact was also carried out by the Ranas. The entry of British officers and merchants was permitted only when absolutely necessary. The British resident was told by the then Rana Premier in 1864:[32]

> I know very well that advantage would accrue to Nepal for a few years if we were to open the country to British officers and to British merchants, but even supposing that we were to

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[31]See Husain (1970) and Mojumdar (1973).

[32]See Oldfield (1880) (reprint 1974, p.46).

> double our revenue for ten or twenty years, what good would that do to us? At the end of that time you would probably take the country.

Landon (1928) observed that the Ranas

> ..peremptorily forbade the entrance into Nepal of any visitor of any western race unless he had both the invitation of the Nepal government and the Indian government and the guarantee of the Indian government, nor was the visitor permitted to see any part of Nepal except the valley of Kathmandu and the road to it.

The demarcation of the Nepal-British India boundary directly affected irrigation systems in the terai. Correspondence between the two governments exist regarding the settling of the boundary, irrigation headworks, complaints from the peasants who had been deprived of water by the neighbouring country's peasants or irrigation systems. A series of treaties for sharing the waters of major rivers were made during the Rana period and is still upheld.[33] The channel of communication with the Nepal government would be through the British Resident. The procedure followed by Nepal was basically as stipulated in Clause 1 and 2 of the Administrative Arrangements for the Tarai [terai] Region.[34]

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[33]See Annonymous in Jhilko, vol 9, No.10, 1988 for a reference to the unequal treaty regarding Mahakali river. World Bank's staff appraisal report on Mahakali Irrigation Project in Nepal mentions that riparian concerns may limit development of new surface irrigation projects and that this was perhaps the most difficult constraint facing HMG/N's long term irrigation strategy (IBRD, 1988, Report No. 7174a-Nep.).

[34]Following is an order issued from the centre to a chief administrator of a terai district regarding inter-country relationship over irrigation water:

On Kartik Badi 7, 1923 (October 1866), Prime Minister Jung Bahadur sent the following order to Surya Pratap Shah , chief administrator of Rautahat district.

The use of British expatriates for agricultural and irrigation purposes also began during the Rana regime. The Krishi Parishad or the Board of Agriculture was organized with British expertise.[35]

"Traditionally, the Bakaiya river had been dammed in the bhathe region (i.e., the region adjoining the border with India) for purposes of irrigation. But now the river has been dammed in the sira region (i.e., the northern portion of the Tarai [terai] strip at the foot of the Siwalik hills), so that land belonging to ryots on the British controlled side of the border have remained uncultivated.

"These ryots then submitted a petition to the local magistrate, who informed the Bada Shahib (i.e., the British Resident at Kathmandu) accordingly. The Bada Shahib has now presented a memorandum to us on this issue."

Colonel Surya Pratap Shah was then ordered to take action as follows:

"Maintain the dam that has already been constructed on the Bakaiya river. Dig irrigation canals through the dam at suitable places and release one-third of the water in the river. The matter concerns two governments. If you make any delay, and any adverse consequence follows, you shall be held personally liable."

Kartik Badi 7, 1923
(October 1866)
Regmi Research Collection, vol. 63, pp. 303 -5.
Regmi Research Series (1981:58).

See also Political A. November 1877, Nos. 169-179 prohibiting erection of new dams in the Patnapura and Digulbank streams which form part of the inter-country boundary. National Archives of India, New Delhi.

See Appendix B and C.

[35]Following are excerpts from the Rana Premier regarding the establishment of the Krishi Parishad on Dec. 2, 1937.

"Agriculture is the main occupation of the people of our country and the major portion of the government's revenue is derived from the land tax. however there has been no improvement in agricultural methods.....

"A deputy director with twenty or twenty-five years experience was therefore procured from the United Provinces, India, to study the

The local inhabitants or agris who were knowledgeable about tunnel digging and alignments were consulted for irrigation works before. But the Ranas had marvelled at western scientific engineering feats in British India with the construction of big barrages and had requested help of engineers to help build irrigation systems in the terai. The British were more than happy to oblige as the following quote in a letter from the British Resident to the deputy secretary of the British India administration in 1909 illustrates:

> "... I think it will be a good thing to send an expert canal officer to see the place where the Nepalese propose to make their canal. It may not be necessary from the point of view of the safety of the adjoining Indian districts but it can do no harm (I presume that there will be no difficulty in sparing the services of a thoroughly reliable canal engineer whose opinion will be worth having?) while it may do Nepal good. The greatest advantage however will be that it will be a 'precedent' which (if not suggested to them again) the Nepalese will follow of their own accord in the event of their own wishing to make any more canals and thus, we shall get all information we want about their irrigation schemes, and their probable influence for good or ill on the adjoining country. I make this assertion because I was very careful not to suggest anything of the sort to the Prime Minister and the Nepalese, seeing in it their own idea, will think it

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pitiable condition of agriculture and farmers resulting from these factors, and recommend measures for their improvement.

"The Deputy director submitted a report for the districts of Khajahani and Seoraj. The report was discussed at the Udyog Parishad (Board of Industry). The following programme was then recommended:

(1) A Krishi Parishad (Board of Agriculture) shall be established to make arrangements for irrigation facilities, improved seeds, etc. for the development of agriculture, and rehabilitate moujas where land taxes have not been collected.

(2) Branches of the Krishi Parishad shall be opened in the following regions:
1)Khajahani -Sheoraj
2)Janakpur
3) West # 1-3
4) East # 1-3"

> quite all right:- but ofcourse everything may depend on the result of the inspection report. If the opinion of the reporting officer is justified by results, all will be well - but if the results should belie his opinions then I fancy that it will be difficult to get the Nepalese to believe in any Engineer's reports in the future!! (This has always been and still is their invariable attitude towards the medical profession also!)"[36]

When the British Resident did know of some major irrigation works in the border area, he would approach the Nepali government regarding the construction. The Prime Minister would write to him about the development letting him know that the intake is in Nepal and that it will not hinder cultivation downstream in British India territory.

After the Nepal-British India war in 1816, both countries learnt to command respect for one another. The Ranas who were in power understood the British imperialistic power. The blessings of the British was very important for their power. Nepal was seen as more than an eager ally by the British. The Ranas' help to the British during the Indian Sepoy Mutiny in 1857, Nepali recruits in the British Indian army, military support during the two World Wars are testimonies to the Ranas' strong support and admiration for the British.

Contact with the British marked the advent of expatriates into the country for its infrastructural development. Cross-country water sharing were negotiated during this era too. The fate of many of the peasants residing and cultivating at the borders were decided by this international relations. The government did not want trouble with the British and therefore promulgated clear cut procedures for cases involving subjects of the two nations over water use.

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[36]See Nepal Collection, National Archives of India, New Delhi.

In this era, the formulation of the penal code laid down the legal recognition of property rights in irrigation and canals. Both tenants as well as villagers from nearby were mobilized by the state through local functionaries to repair and maintain canals that were under the jurisdiction of state functionaries like the Ditthas. A unique symbiotic relationship between the British and the Ranas ruling Nepal shaped intercountry watersharing and conflicts over irrigation. It was also in this era that expatriates with western scientific knowledge were invited into Nepal for her infrastructural development in irrigation technology. A distinct type of project implementation was carried out with British expertise and technology.

The Rise of the Bureaucracy (1951--present)

After the Rana overthrow in 1951, and the subsequent take-over by the king from the Nepali Congress Government in 1960, the monarch was the source of all power in Nepal. A triadic relationship was established among the King , His Majesty's Government, and the Royal Palace.[37] The present day partyless panchayat system has been in effect ever since the royal take-over.

Since 1951, land reforms to protect tenancy rights, control of rents and interest rates, and imposition of ceilings on landholdings have been implemented but with little success (Zaman, 1973; Seddon, 1987). The practice of assigning Ditthas for the supervision of

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[37]See Pradhan (1970).

irrigation systems have been abandoned, and development programs are being carried out under one development ideology or another.[38]

Regarding the politics or the political system of Nepal, Seddon (1987:219-220) points out:

> "...In the absence of legal political parties, able to articulate distinctive programmes and policies and to represent the broad interests of various different sections of Nepalese society, the system known as "panchayat democracy" -- introduced at the beginning of the 1960s by the king in order to "restore to Nepal a more suitable form of democracy based on "the traditional practices of the Nepalese people" (Blaikie, Cameron and Seddon, 1980:90) --provides the only way in which the majority of the Nepalese people may legitimately involve themselves in political activity and in efforts to change the economic and social structures that characterize contemporary Nepal. However, real access to positions of power and influence in the panchayat democracy is effectively limited to those already having power and influence through the informal relations that permeate village society and beyond that the entire structure of the Nepalese society.
>
> In the system of panchayat democracy, it is only at village level that the ordinary people may vote to express their views; higher level councils (at the district and national levels) are elected or appointed without a mass popular vote..."

Various measures for the alleviation of poverty and basic needs, not to mention the structural adjustment stringencies undertaken by the government, seem to have had impetus and coercion from the donor community whose ability to influence official policy is closely related to their substantial financial contribution to Nepal's economy. Since the 1960s, efforts have been made to rationalize and improve the quality and capacity of the state bureaucracy for devising and implementing effective development projects and programmes. This expansion of the bureaucracy has helped fulfill the role of the state

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[38]See Banskota (1983).

as the key employer. In this process of recruitment, some allegiance from or cooptation of the discontent mainly from the middle classes has occurred. Such expansion of the bureaucracy and the proliferation of the local branches has exceeded expenditures over the revenues collected. Much of this financing has been "diverted" from foreign aid. Contemporary Nepal faces a fiscal crises and relies heavily on foreign aid.

I shall now present the various institutions involved in irrigation development in Nepal, followed by an examination of the role of foreign aid and policies relevant to irrigation development and planning. I shall also examine the relationship between local government and local power structures in reference to decentralization measures the Nepalese government is implementing through the Decentralization Act of 1982.

GOVERNMENT AGENCIES AND IRRIGATION DEVELOPMENT IN NEPAL

Several government agencies have provided technical and financial input for irrigation development. The approaches and procedures guiding their public interventions have varied. Table 3.1 shows the distribution of irrigation intervention or expansion carried out by different government agencies. Administrative juggling has been a bureaucratic approach to achieving enhanced irrigation involvement. Agencies have been either amalgamated, separated, or fragmented within and between ministries. The approaches and organizational structures of these government agencies are briefly outlined below.

Table 3.1 Irrigation Development According to Institution

Institution	Area Irrigated (ha)	Percentage of Irrigated area
DIHM	179,000	27.8
FIWUD	15,000	2.3
MPLD	2,000	0.3
ADB/N	48,000	7.5
Farmer-managed	400,000	62.1
Totals	644,000	100.0

Source: Adapted from Small et al. (1986).

Department of Irrigation, Hydrology, and Meteorology (DIHM).

From 1926 to 1951, an Agriculture Council was responsible for state irrigation activities. In 1952, with technical assistance from India, the Irrigation Department was established. This department has had the extra burden of overseeing drinking water projects since 1955. In 1966 it assumed responsibility for undertaking minor irrigation projects, and, in 1968, a ground water projects component was added. In 1972, its name was changed to Department of Irrigation and Meteorology under the Ministry of Agriculture and Irrigation. However, in 1979, a Ministry of Electricity and Irrigation was created and the Irrigation Department was moved to it. In 1980, this Ministry was renamed the Ministry of Water Resources. In 1987, the department was renamed the Department of Irrigation, Hydrology, and Meteorology under the Ministry of Water Resources. The most current change has separated the DIHM from its

hydrology and meteorology components and joined it with the Farm Irrigation and Water Utilization Division (FIWUD) of the Ministry of Agriculture (MOA) and the small irrigation programs of the Ministry of Panchayat and Local Development (MPLD) in compliance with the urgency of having to expand irrigation coverage at the herculean rate of 68,000 ha yearly under the new Basic Needs Programme.[39]

Previously, these three agencies had different approaches to irrigation development prior to their amalgamation. DIHM used to lead all other agencies involved in irrigation in terms of capital investment. It carried out investigations, design, construction, rehabilitation, operation and maintenance of various irrigation systems. DIHM limited its activities mainly to systems that were more than 500 hectares in the terai and 50 hectares in the hills. Activities were financed through foreign loans and grants as well as by national treasury funds channeled through the Finance Ministry. Project beneficiaries normally received funding as outright grants, except for the payment of water taxes after the completion of the project. These taxes did not however, replenish the irrigation development funds.

DIHM operated through its central office, five regional directorates, and project boards which are semi-autonomous units. On the whole, DIHM's manpower was mainly civil engineers and its approach to

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[39]See The Rising Nepal, Dec. 23,1988. The required acreage has been calculated by the conversion of required calories per person by the year 2000. The population projection and the food requirements for that population have been translated into acreage-production and the needed irrigation expansion calculated without regard to enhancing the existing systems or the administrative capacity of the irrigation bureaucracy. The basic needs policy embraced by the government has serious implications for the expansion of the irrigation bureaucracy and the government's approach to irrigation development.

irrigation had been construction-oriented. In its implementation work, there had been minimal involvement of the beneficiaries in any of the stages of the project cycle. DIHM certainly lacked manpower in the social and agricultural sciences for effective management of the systems. It was thus little wonder that problems regarding timely delivery of water, formation of effective water users groups, and conflicts with irrigators occurred.

Irrigation Systems under the Development Board Act. Some large projects, particularly those that are funded through foreign loans, are governed by a project board formed under the Development Board Act of 1956. These boards are made up of representatives from departments of the water resources, finance, Planning Commission, agriculture, and irrigation. The Regional Directors of DOI and DOA may also be included. The secretary of the Ministry of Water Resources is the chairman of each of these boards, and the Project Manager who is a DOI engineer is the member-secretary. A major purpose of the boards is to provide coordination among the various agencies involved in a particular project during the construction and implementation phases. The boards enjoy relative autonomy in personnel selection and financial flexibility. They are also empowered to set their own water charges and to prescribe the mode of collection.

Ministry of Panchayat and Local Development (MPLD). This ministry looked after small-scale development works at the district and village levels. The MPLD supervised most integrated rural development projects

and looked after small scale irrigation which were less than 50 hectares.[40] Most of the irrigation projects MPLD handled were part of integrated rural development projects. These were to be implemented by the District Technical Offices under the Local Development Officers of MPLD.

MPLD limited its irrigation activities to providing technical and financial assistance to existing farmer-managed irrigation systems, whose origins were varied as discussed before, or extending them. Beneficiaries were required to provide some voluntary labour if the cost was high.[41] However, the mix of beneficiary and government contributions, as well as levels of beneficiary involvement varied from one project to another. For project implementation, a committee was usually formed that included Panchayat leaders and beneficiaries. Unlike DIHM, MPLD did not manage irrigation systems after construction was complete. Management was left to local user committees.

Agricultural Development Bank/Nepal (ADB/N). The Agricultural Development Bank has been involved in irrigation through its loan programs since 1968, but most of its intensive irrigation activity began after 1981. In that year, a pump irrigation program was

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[40]In 1970, a Department of Minor Irrigation was established under the Local Development Ministry. Responsibility for implementing small irrigation projects was given to the chairman of the District Panchayat. However, due to lack of professional manpower, the Department of Minor Irrigation was merged with the Department of Irrigation. Projects under 50 hectares were to be handled by MPLD, but those above 50 hectares fell within Irrigation Department's jurisdiction.

[41]The cut off limit for funding was usually Rs.100,000, but depended on a case to case basis. A labour contribution from the grantees was always a stated stipulation so that more projects could be funded by the district panchayat.

initiated; an estimated 45,000 hectares have been served by some 11,000 shallow tubewells between 1981 and 1986.

ADB/N also provides loans to individuals and groups of farmers for constructing or rehabilitating irrigation systems. It has institutional linkages with CARE/NEPAL and FIWUD through which farmers with CARE/NEPAL or FIWUD projects can qualify for loans. CARE project farmers have to match the donor's 50 percent subsidy with a 20 percent of labour contribution and 30 percent in loans which can be borrowed from ADB/N. In the FIWUD projects, the farmers concerned are required to form a construction committee and deposit 5 percent of the total estimated cost with the Bank. In turn, FIWUD deposited 70 percent, the remaining 25 percent was to be borne by the farmers through labour contribution or as a loan from the Bank. Upon completion of the project, the maintenance and operation responsibilities are handed to the construction committee. Now that FIWUD has been merged with DIHM, future ADB/N projects will be financed differently.[42]

Farm Irrigation and Water Utilization Division (FIWUD). In 1973, FIWUD was established under the Ministry of Agriculture. It began its work in the terai with pump systems and so far has installed approximately 46 public tubewells for some 7000 hectares. Prior to its merger, FIWUD installed the tubewell, the pump house, and the water measuring tank. In addition to these, it constructed a network of field channels for both irrigation and drainage, carried out a land improvement program that was concerned with shaping, leveling, and

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[42]The detailed procedures were not available to the author during the time of writing.

consolidation. It also introduced programs to increase cropping intensities and yields. The operation and maintenance of these tubewells were left to the farmers whose land the pump served.

FIWUD expanded its work into the hills with construction and rehabilitation of small-scale irrigation schemes, that were to remain farmer-managed after implementation. Recently, it was involved with on-farm water management programs in some larger surface irrigation systems of DIHM in the terai.

The scenario regarding irrigation development by the government was that there are several agencies drawing from different sources and types of funding and a multiplicity of approaches regarding the implementation of the projects. Project financing was in the form of outright grants, or partial loans with a substantial grant component, or a combination with grantees' contribution usually in the form of labour. Varying input levels - financial or otherwise - were required from the beneficiaries. The degree of beneficiary involvement during the projects differed from one agency to another and even from one project to another. Different agencies approached the issue of maintenance and operation of the systems after completion differently. Some handed the irrigation systems over to the users, while others continued to control with minimal farmer input.

In spite of the irrigation bureaucracy being relatively new, with some thirty years of experience, there has been a steady increase in government involvement and assistance in irrigation system construction or rehabilitation. Table 3.2 lists the area irrigated by projects undertaken by the government during the various development plans

Table 3.2. Government Developed Irrigation(cultivable command area in hectares).

	Targeted[a] Development	Completed[b] Command	1980 Irrigation
Prior to 1st Plan 1956			
Specific projects	13515	16645	6500
1st Plan 1956-61			
Specific projects	18625*	11508*	1685
Other Small Schemes	2160	2160	800*
	20785	13668	2485
2nd Plan 1962-65			
Specific projects	28544	17927	3141
Channel Renovation	4000	4000	1200*
	32544	21927	4341
3rd Plan 1965-70			
Specific projects	12010	8340*	5926
Minor Schemes	38644*	35130	14004*
	50654	43470	19930
4th Plan 1970-75			
Specific projects	251460	97093	2482
Minor Schemes	2271*	1282	1022*
	253731	98375	3504
5th Plan 1975-80			
Specific projects	222349	43464	58383
Small Schemes	2471	1394	1140
Channel Renovation	5400	0	2210
	230220	44858	61733
Totals up to 1980			
Total Terai (T)	563308	216443	84427
Total Hills (H)	26581	16340	9856
Undesignable (T&H)	11560	6160	4210
Grand Totals	601449	238943	98493

Source: Adapted from WEC (1981).

a. These figures include considerable double counting due to redevelopment of existing schemes and double entry of behind schedule development into successive plan period targets.

b. These figures are often much larger than potentially irrigable areas due to design overestimates.

* Asterisked figures are estimates made in the absence of better information.

through 1980. Table 3.3 shows irrigation development expenditures for the last four five-year plans. There has been a steady increase in government irrigation financing in Nepal.

Table 3.3. Irrigation Development Expenditure (in millions of rupees)

	Irrigation Development Expenditure	Percent of Development Expenditure
Sixth[a]	3130	14.4
Fifth	864	9.8
Fourth	265	4.9
Third	61	2.4

a. Data for Sixth Plan are budget figures. The others represent expenditures.

Source: Nepal. WEC. 1981. "Irrigation Sector Review".

IRRIGATION TARGETS AND RESOURCE ALLOCATIONS

The total targeted development of irrigation coverage for the Sixth Plan was 219,000 hectares. Out of this total target, 70 percent were projects carried over from the fifth five year plan of which over 80 percent were initiated ten or more years ago. The achievement during this plan was approximately 93,000 hectares (Poudel, 1986). For the Seventh Plan (1985-1990), the target has been set to provide additional irrigation facilities to 235,493 hectares of land. The Department of Irrigation, Hydrology, and Meteorology (DIHM) of the Ministry of Water Resources (MOWR) is responsible for 135,493 hectares;

the remaining 100,000 hectares are the responsibility of the Ministry of Agriculture (MOA). Out of this, MOA will have to account for 40,000 additional hectares and DIHM for 14,437 in the hill and mountain region to alleviate food deficits in those places (NPC, 1985). During the Seventh Plan, MOWR is to complete on-going projects, repair and maintain systems, undertake irrigation projects that help the development of hill areas, and also develop large irrigation projects. Table 3.4 shows the allocation of development expenditure in the public sector for the current Seventh Plan; irrigation accounts for 11.4 percent of the total development expenditure with a sum of 3296.3 million rupees.

Table 3.4. Allocation of Development Expenditure in the Public Sector for the Seventh Plan (1985-1990) (at 1984/85 constant price).

Title	Amount	Percent
Agriculture, Irrigation & Forest	**8875.9**	**30.6**
a) Agriculture	3983.0	13.7
b) Irrigation	3296.3	11.4
c) Land Reform	27.2	0.0
d) Co-operative	17.7	0.0
e) Cadastral Survey	202.4	0.8
f) Forest	1257.0	4.3
g) Resettlement	41.0	0.2
h) Meteorology	52.3	0.2
Industry, Mining and Power	7546.5	26.0
Transportation and Communication	5132.5	17.7
Social Services	7329.7	25.3
Miscellaneous	115.4	0.4
Total	**29000.0**	**100.0**

Source: Adapted from National Planning Commission (1985).

Nepal's development plans have relied heavily on foreign assistance.[43] In the Sixth Plan, foreign aid contributed to approximately 60 percent of the development expenditures; while in the Seventh Plan, foreign aid has been earmarked to finance nearly 70 percent of the development expenditures. Previously, most aid came in the form of outright grants. Later, with the increasing role of banks, the loan share has steadily increased (Pant, 1983). On a sector basis, irrigation and agriculture have received nearly 20 percent of foreign aid in the different development plans from 1956 to 1980 (Dharmadasani, 1984). In the case of irrigation, foreign aid is solicited from major donor countries such as India, China, and the USA. Small donor countries like West Germany, Switzerland, Japan, and Britain have provided indirect aid to irrigation through rural development projects. The International Labour Organization (ILO), CARE, and United Mission to Nepal (UMN) among other non-governmental organizations (NGOs) and the United Nations system have also provided aid for irrigation. During the past decade and a half, the international banks have stepped in to provide loans. As of 1981, World Bank's loans amounted to $83 million.[44] Similarly the Asian Development Bank (ADB) has provided roughly $50 million in loans to the irrigation sector alone (Dharamdasani, 1984). A greater portion of the expenditure in foreign aided irrigation projects is on construction (Pant, 1983).

Expenditures for irrigation development have increased both in absolute terms and as a percentage of the development budgets of the

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[43]See Table 3.5.

[44]See WEC (1981).

Table 3.5. Foreign Aid (FA) Contribution to Nepal's Development Plan Expenditures (millions of rupees).

Plan	Total Expenditure (TE)	Foreign Aid Contribution to TE	Percent Foreign Aid
1st	214.4	382.9	100.0
2nd	596.7	476.0	76.0
3rd	1779.0	967.8	54.4
4th	3315.5	1508.9	45.5
5th	8870.6	4240.8	47.8
6th	21750.0	13920.0	60.0

Source: Adapted from Dharamdasani (1984).

five year plans. Costly rehabilitation of systems that have become inoperable due to inadequate maintenance or poor design and construction has resulted in escalating development expenditures. Much of the regular budget is used to cover the salaries of the staff at the central and regional levels. Where systems are operating but incomplete, operation and maintenance expenses and salaries of regular DIHM personnel operating the system tend to be charged as development expenditures. Thus, it has been nearly impossible to break out expenditures by administration, construction, operation and maintenance allocation and actual use from the available secondary data (Small, Adriano, and Martin, 1986).

Nevertheless, the trend during the past three decades has been towards greater state mobilization of resources to finance irrigation

administration and projects. A significant amount comes from foreign aid, a source potentially unreliable. Nepal's budget is being squeezed by poor performance in generating internal revenues and by a debt burden. Expenditures can be cut, but this option has been ruled out by political and social realities. It has been suggested that internal mobilization could be pursued, especially since the ratio of taxes to GDP is relatively low at only about 8 percent, but in the short run there are also limits to this alternative (Schroeder and Wozny, 1987).

In order to lessen the government's fiscal burden, already exacerbated by higher overhead costs and insufficient and untimely operation and maintenance financing, policy makers and researchers have suggested that other alternatives be sought. Researchers have stressed examples of better management capabilities within farmer managed irrigation systems to suggest a shared division of labour and financing between the state and the beneficiaries. Researchers and some government officials have suggested the possibility of the farmers themselves maintaining the government intervened systems. The government's mechanism of funding from the national treasury under the Ministry of Finance to the individual government departments and then to the individual projects for operation and maintenance has been inadequate and untimely. In cases where a water charge or water tax has been instituted, its collection has been very low compared to operation and maintenance costs, and the collection itself has been very costly. Yet the need for more operation and maintenance funds is rising.[45]

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[45]Very little information is available on the cost of irrigation fee collection. For the Narayani irrigation development project, Pradhan (1985) reports that the salaries of the field staff alone

LEGISLATIVE ACTS AND POLICIES

Legislative acts and regulations have been formulated by the state in recognition of the changing times as well as for laying down procedures for government interaction with the irrigators. The government can operate under the umbrella of these acts that grants the unquestioned authority within eminent domain. With respect to property rights in water, the state has enacted several legislations that sets the parameters for these property rights and relations in Nepal. One such piece of legislation is the Irrigation, Electricity, and Related Water Resources Act of 1967.[46] This Act presents a new role for the state in creating infrastructural development for surplus generation, compatible with the planned mode of development exclusively undertaken by the state apparatus.

The act outlines what is permissable at the local level and the state locality interaction in irrigation development. Though the act recognizes the right of the individuals and groups to construct irrigation systems, the realm of eminent domain is manifest in this act. The paramount power of the state over existing irrigation systems if it "hinders" government actions is evident by the above Act. It also lays down the authority to control irrigation facilities once state investment has been made. The specific amount of compensation

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amounted to 71 percent of the amount collected and the net contribution of water charges towards the cost of operation and maintenance is very low.

[46]See Appendix D for the relevant clauses of this Act of 1967. Earlier, we reviewed the Law on Reclamation of Wastelands that is still effective since 1853, as one of the important legislation during the period of Rana administration.

for nationalizing private or communal irrigation systems is not laid out. Nor is the specific procedure to be followed outlined. This act was legislated within the political context of post-1951 Nepal.

As pointed out earlier in our general discussion of property, local rights or customary rights had meaning only as long as they were legitimized by the state. However, as these research cases will show, traditional rights holders resist outright denial of their rights by the state. The recent flurry of development activities, the opportunity of alternative and competing uses of water, and different technologies available for extraction of water have warranted changes in this Act.

A recent formulation of rules and regulations based on this Act grants legal recognition to water users associations. The legal recognition of water users is a timely step in guaranteeing incentives for users to organize and mobilize resources for their systems.

The state has enacted a decentralization policy whose objectives are promotion of popular planning of local level public works, intersectoral coordination and balanced development throughout the country, strengthening of local development institutions, and the maximization of local resource mobilization to carry out development works. The implementation procedures of irrigation projects are affected by this act.

One can note several theoretical reasons for such a decentralization plan. Local residents will have better knowledge of their own special needs and of the local environment and, thus, will be able to allocate resources in such a way that it reflects those needs. When

decisions are made locally, they are more likely to gain the local support and participation conducive to successful project design and implementation. Such involvement would be vital for continued mobilization of local resources (goods, services, labour, information and leadership) for the operation and maintenance of such projects.

Thus, a primary issue is how local resources can be mobilized for irrigation project development with a view to building the local institutional capability for sustaining the system through consecutive investments in operation, maintenance, and rehabilitation. A related concern is how local resource mobilization can be enhanced or achieved for continued operation and maintenance of systems already in operation or nearly built.

The 1982 Decentralization Act requires users groups to be organized for all projects. Most agencies are ill prepared to create effective user groups capable of mobilizing their own resources and have resorted instead to setting up token users groups just because the Act demands it. This is not surprising, given the minimal involvement of beneficiaries in each phase of the project cycle. More often than not, beneficiary participation is limited to a voluntary labour contribution and non-hindrance of the "development" project. There is no deliberate attempt to use the knowledge, planning, information, and leadership capabilities of the beneficiaries. In some situations, government intervention upsets prior arrangements and fuels conflicts between communities, or even between the community and the government agencies (Pradhan, 1982).

Seddon (1987) notes that state machinery and state bureaucracy have a relative autonomy, but in the last resort are strongly conditioned by the balance of social forces in the wider political economy and that this is true at the local level as it is for the national state. The bureaucrats ability to act in a certain way or even simply to act at all sometimes is importantly conditioned by the local power structures. The local or district bureaucrats have to work in close connection and cooperation with the elected district council or panchayat. The majority of these elected are local notables from wealthy landowning or bourgeois families. Therefore given the local power structures, decentralization might further consolidate inequalities and "ensure that whatever planning takes place serves the interests of the local notability above all" (Seddon, 1987). Gaige (1975:143) has rightly pointed out that in order to establish the groundwork for any kind of fundamental change, the panchayat system must provide those who have not heretofore shared in the decision-making process an opportunity to share authority with those who have maintained exclusive control over that process.

In summary, the present scenario consists of increasing state intervention in irrigation development, fiscal constraints to achieving national development plans, and a need for planning and mobilizing resources at the local level. At the agencies level, we find several institutions involved in irrigation joining together, fragmenting again, and merging together. This is an attempt on the part of the state to coordinate irrigation activities but grappling with the issue of the right agency within the right ministry. This administrative

juggling is reflective of the changing notions of irrigation development too.

This era has also witnessed a multitude of irrigation financing strategies, both direct and indirect, implementation of irrigation projects, formulation of certain macro policies like decentralization and basic needs that impinge upon irrigation development, and the sanctioning and enactment of rules and regulations regarding property rights in irrigation. The direct involvement of the state in irrigation development through legislations, financing, and project implementations has been dominant in the post-1951 era.

SUMMARY

In this chapter we examined in historical perspective, the role of state intervention in irrigation particularly since Nepal unification. In each periodization of Nepal, we examined the policies and implementation procedures for irrigation expansion. The states of non-unified Nepal and later on the state of unified Nepal had been involved in creating these property infrastructures in varying degrees.

The process of irrigation expansion is tied to the tenurial relations existing at the local level. We noted how state control and supervision of irrigation works was necessary on Jagir lands. Irrigation systems were seen as a vital state asset through which state could mobilize peasant labour for surplus generation. Forced unpaid labour was used for irrigation construction and repair. It can be inferred that insecure tenancy and fear of eviction forced tenants to maintain their systems. However, jhara obligations elsewhere for other

purposes during cultivation times proved detrimental to the proper functioning of irrigation and the resultant land revenues. Indirect means of facilitating irrigation expansion were adopted through credit, contracts, tax-exemption, guaranteed occupancy and usufructuary rights, allotment of best land to those who invested in irrigation facilities. These policies and procedure favoured the wealthier personnel who had initial capital for such investments. Birta owners shared yield with the tenants and it was usually the tenant who bore the irrigation maintenance costs. The insecure jagir , insecure tenancy and high turnover of jagirdars for a particular jagir land contributed to bare minimal maintenance of the irrigation facilities.

The nature of property rights in land had great impact on the construction and maintenance of irrigation systems. In Raj Kulo of Argali in Palpa district, irrigators reported that after the land reforms that guaranteed secure tenancy, irrigators invested more on their canal. Fear of eviction and loss of continued investment in irrigation system had deterred tenants from mobilizing more of their own resources for canal maintenance. The fear of eviction was not great as long as population was low. However, population was increasing and after the 1816 Nepal-British India war which resulted in Nepal losing a substantial portion of the terai to the British, agriculture production had to be increased within the country since more land could not be conquered. A substantial portion of the previously lost terai to the British was restored to Nepal in 1860 for Nepal's help to the British during the Indian Sepoy Mutiny.

The expansionist policy had triggered land reclamation for revenues so that the standing army and bureaucracy could be supported. Kipat lands in the domain of communal ownership had very little government involvement in irrigation. Kipat owners paid a fixed sum of money to the state as tax, irrespective of the area of the rice or other land in their possession; therefore revenues would increase if kipat lands were converted into raikar. The Guthi system has been left basically untouched because of traditional religious consideration. Guthi lands at times had state involvement but on the whole irrigation tasks were carried out by the tenants who gained by higher yields for the services rendered to the temple since it was usually land that was allotted to them rather than a fixed payment in grains.

Regmi (1976) noted that the jagir land-assignment system fulfilled several political and administrative exigencies of the government during Nepal's phase of territorial expansion and consolidation during the late eighteenth and early nineteenth centuries. The state's employees and functionaries could be compensated without direct payment in cash. The state anxious to develop a centralized system of administration found this jagir system uneconomical because a major part of the revenue from land was spent in maintaining the revenue collection structure before it reached the treasury. The Ranas held most of the Jagir and Birta lands. After the Rana overthrow, many Ranas resigned from their posts and therefore forfeited their jagirs. Those who had not were a minority and could not resist the abolition of jagir land assignments. Jagir lands were converted to Raikar and occupancy, usufructuary rights were given to the tenants or the

functionaries. Birta was abolished in 1959 on political and economic grounds of justice throughout the kingdom. Birta lands were converted into raikar and taxes collected by the state.

Due to changes in the political climate and power structures within Nepal, the state changed occupancy and usufructuary rights in land so as to realize more taxes for the treasury. This privatization of property rights in land had consequences for irrigation expansion. Jagir lands had government interventions while other lands had individual initiatives. During much of eighteenth and early nineteenth century, private property in land had not developed and therefore water was tied to land. However, it is in cases where raikar land was de facto private property that water could be separated and alienated like land. The cases of this study affirms such a proposition.

The nature of Nepal's external relations with the British and the rulers' perception of the British was instrumental in resolving water use issues along and across the border. Perceived technological advances of the west by the rulers and the state was instrumental in inviting expatriates for the first time in the development of the nation's economy. This trend has accelerated with an infusion of international capital too.

Development ideologies have been imported from the west and policies have been shaped and implemented by the state elites through the state apparatus.[47] The nature of state intervention depended very

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[47]See Stone (1989). Both the Western influence and its acceptance by the host country's government is crucial to the adoption of a certain development strategy or ideology. As an example, she points out that "the government of Nepal's Acceptance of participatory approaches in development is not simply the result of Western

much on the nature of development ideology, capital, and the structure of the implementing agency within the state apparatus.

The state apparatus, armed with legislations such as the acts as mentioned above and policies such as decentralization and the basic needs approach could undertake its activities as Grindle (1986) notes:

> ....Once armed with legal, organizational, and legitimate presence, state agencies seem to have taken on their own rationales and orientations, which guided their subsequent activities and helped shape their relationships with elite and non-elite social groups.

What we have examined in this chapter is the role of the state in shaping property rights as they affect irrigation, the steady rise of the irrigation bureaucracy, the rise of foreign capital in financing irrigation projects, as well as state power and autonomy. The role of legislations and policies as well as the nature of state intervention in irrigation historically has been examined. It is evident that the state has been a mediator in development works and has the power of eminent domain. The task remains to see how effectively this power can be used by the state in mediating local power struggles for the search of a better economic standing for the less privileged. Creating irrigation infrastructure can accentuate the local conditions or in fact help those that have been less fortunate.

We asserted in the beginning of the chapter that the state of Nepal has had an increasingly important role in sanctioning and

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influence, but also reflects the Government's awareness of the inadequacy of previous development efforts that failed to communicate effectively with local persons and consider their felt needs and potential contributions." (1989:212) However, some of these previous development efforts fall within the rubric of earlier external influences too.

creating property within irrigated agriculture through the enactment of policies, implementation and finances. We demonstrated this by reviewing specific state actions related to irrigated development through sanctions, legislations, policies, finances, and implementation procedures during the various historical periods. In addition to state actions, we also proposed that the locality too has been involved in irrigation development in Nepal. In many cases, it is this interaction between state and locality that determines the nature of irrigation development. The focus of this chapter has been mainly on state actions.

The next three chapters will be case specific and the interaction between state actions and locality will be examined. The nature of state policies, project implementation and financing, and local reactions and impacts of government involvement will be examined. The following chapter will examine the history of Brangdhi Tallo Kulo of Palpa district. The nature of state intervention and property rights, and their relations for the functioning of the irrigation system will be examined in each of the two case studies over the following three chapters.

CHAPTER IV

PROPERTY AND STATE IN BRANGDHI TALLO KULO
PART I

The preceding chapter examined the role of state intervention in irrigation particularly since Nepal unification. The relationship between changing property rights in land and associated state intervention in irrigation was outlined for the Pre-1951 period. The states of non-unified Nepal and later on the state of unified Nepal had been involved in creating these property structures in varying degrees directly and indirectly.

Direct measures included state supervision through government officials and forced labour. Indirect measures were financial incentives providing avenues for individual initiatives in irrigation development. One such incentive was the contract mode of irrigation expansion as outlined in the earlier chapter. Phalebas Tallo Kulo, studied in this research, was constructed under this mode during the Rana period. Brangdhi Tallo Kulo, the second irrigation system studied, was constructed under the initiative of the local elites. In both these areas, the land was not jagir lands, but either birta or kipat, and mainly raikar. De facto private property in raikar land had occurred by the time the canals were constructed. This facilitated the sale and purchase of water due to some security of occupancy rights and usufructuary rights in raikar lands. We also examined the nature of policies, development approaches, and the various agencies involved in irrigation during the distinct periodizations of Nepal. Irrigation

systems were seen as a vital state asset through which state could mobilize peasant labour for surplus generation.

We also noted that the present day State of Nepal has widened its sphere of activities to include planned development rather than mere law and order and revenue extraction. The availability of international capital and expertise, dominant ideology of a developmentalist state, and an expanding state apparatus are new elements in the history of Nepal. The two systems studied lend testimonies to this trend of state expansion.

This chapter will focus on the history of Brangdhi Tallo Kulo's formation and the organizational structure. The chapter following this will elaborate on the tasks of the system and conclude with a discussion of state intervention and property rights in Brangdhi Tallo Kulo.

HISTORICAL INTRODUCTION

Brangdhi Tallo Kulo (lower canal) currently encompasses four distinct command areas along the alignment at various places.[1] These four command areas, namely Taplek, Pokhariya, Chherlung, and Artunga

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[1]The irrigators of this canal call it by this name after the amalgamation of distinct command areas. Previously the separate canals were denoted by the area the canal served, e.g., the canal serving Chherlung was called Chherlung Tallo Kulo. Tallo in Nepali means lower. This distinction is very important property-wise because the position of a lower intake usually implies that the intake of another canal had already been constructed upstream. It is customary in the hills in Nepal that new intakes can be placed upstream only if it does not lower the water supply for the intake already built. A distance of at least 100 yds. has to be honoured. The other canal that had been built prior to Tallo kulo is Chherlung Thulo Kulo.

After the different command areas were linked together by a single canal, the irrigators began to call it after the river Brangdhi from where the water was tapped.

have come under one irrigation water source through processes of extensions and amalgamation of two irrigation systems.

In addition to the Tallo Kulo, there is currently one other major canal known as the Chherlung Thulo Kulo (larger canal) which is parallel and slightly above Tallo Kulo (See Figure 4.1 for the relative position of the canals). This was built before the Tallo kulo.

The very first canal ever to be built, even before the Chherlung Thulo Kulo, in the vicinity of Chherlung, Artunga, Taplek or Pokhariya was the Taplek canal tapping water from the Brangdhi stream. It served only the Taplek area with a present command area of nearly two hectares.

Taplek area was the first command area to be reclaimed as khet land along the Brangdhi Tallo Kulo. According to local oral history, in 1792 King Datta Sen of Tansen granted the land of Taplek as birta to a certain Brahmin named Mana Gaire.[2] Mana Gaire along with his five sons began to reclaim the land mainly for rice cultivation. They spent sixty rupees on Agris who were expert miners and tunnel diggers to construct a canal along the adjoining cliffs and hard rocks. At places where skills were not necessary or where it was easier to dig the canal, the Brahmin family provided their labour. During the first year of operating the canal for Taplek and after having harvested one crop of rice, Mana Gaire passed away in his house. His death was seen

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[2]The ownership rights of nearly all land within a certain state belonged to the state and the king enjoyed virtually uncontested power over it and therefore would grant land use rights to various subjects for duties performed, loyalties portrayed, or grants made out of sheer charity or for the sake of donations to be made to Brahmins to attain religiosity.

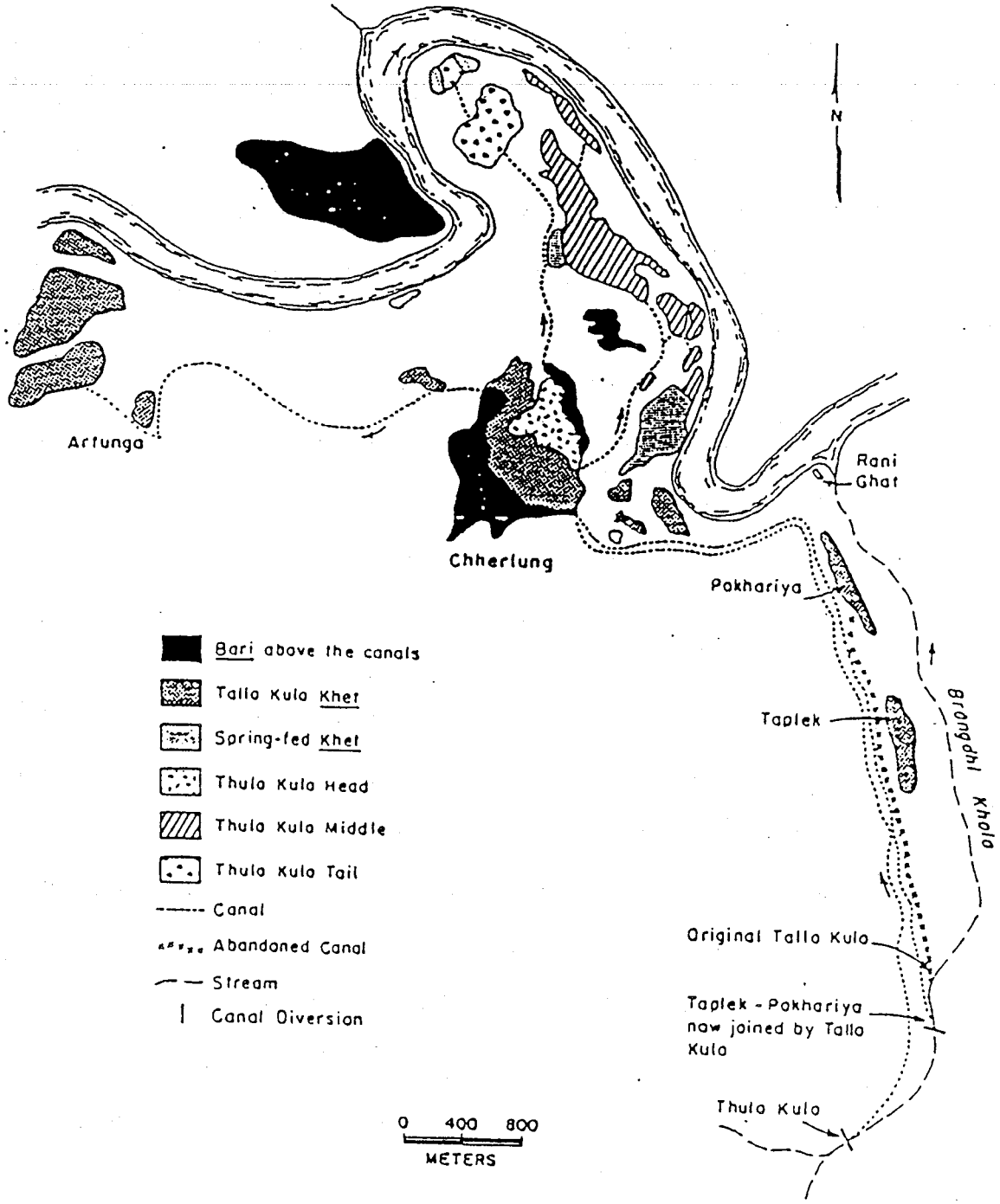

Figure 4.1 Relative position of Brangdhi Tallo Kulo.

Source: Yoder (1986).

as a bad omen resulting from their association with Taplek and therefore they sold their land to a Bhattarai in Chherlung.[3] This Bhattarai lived in Taplek and cultivated his newly acquired land. Villagers say that he was scared by supernatural beings at Taplek and therefore he sold his land to the Magar (an ethnic group in Nepal) of Gumha whose descendants still continue cultivating Taplek.

There was very little organizational management of the Taplek irrigation system prior to it being extended to Pokhariya during 1932. All the land in the Taplek area belonged to the families of a single household.[4] The members of this household cleaned, maintained, and repaired the canal. Since very few people were involved and that too from the same household, strict complex organizational tasks were unnecessary. The irrigation system was managed by the household very informally. Land is fragmented in Taplek and due to the topographical conditions it is not possible to consolidate the smaller plots into bigger ones, nor is there additional land to reclaim. There has been no change in the amount of land cultivated for quite some time as far back as 1974 when the last cadastral survey was undertaken in Palpa. Three years after the survey, this canal was amalgamated with Chherlung Tallo kulo and in doing so the alignment of the canal was raised at Taplek area. This permitted three farmers to reclaim their unirrigated bari lands into khet land. Strict water allocation amongst the Taplek farmers was not adhered to because there was plenty of water for them

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[3]This Bhattarai is an ancestor of many of the brahmin Bhattarais of present day Chherlung.

[4]Due to inheritance, the land at Taplek is now cultivated by nine related households.

and according to the Taplek farmers the extension project did increase the volume of water in their share.

Building of the Chherlung Thulo Kulo irrigation system for lower Chherlung village was financed by some 27 villagers under the initiative of two village elites in 1928. The cost of the construction was Rs 5000 and water was divided into fifty shares, each share representing one hundred rupees. Each person who contributed to the construction of the canal received shares in proportion to the investment he had made. Those who had surplus shares, i.e., the water delivered by their shares was more than they needed --were able to sell part of their shares to others consequently increasing the number of shareholders in the system.

The original investors had their land and settlement in lower Chherlung village. As partial compensation for rights-of-way through the upper Chherlung village, those investing in the system agreed to sell some water to the upper part. However, they would not sell nearly as much as the upper village wanted. Irrigators who were present during the construction of the canals and are still alive reported that this single canal could not irrigate both the upper and the lower villages then. Therefore, under the leadership of two Magar leaders, one of them the father of the present mukhiya (leader of the Chherlung command area of the Brangdhi Tallo Kulo), a second canal known as the Tallo Kulo was financed and constructed during 1932. Through mobilization of their personal funds and loans from businessmen in Tansen, they raised Rs. 5500 for the construction of the canal.

The Tallo Kulo builders had to divert water from a point lower on the stream than the Thulo and Taplek Kulos because they built their canal last. Under customary rights, backed by the civil code of Nepal at that time, if intakes were constructed upstream they had to be more than 100 yds away from the preexisting ones. The distance of an intake placed downstream did not matter. The distance between Thulo Kulo (placed upstream) and Taplek Kulo intakes is 280 meters, while that between Taplek and Tallo Kulos (placed downstream) is only 42 meters. Customarily, in this area, an upstream intake has the right and the privilege to dam the whole stream and divert all the water. Additional springs downstream have lessened the potential conflicts over acquisition of water from the stream.[5]

Construction began for this Tallo Kulo in 1932 and water was finally delivered in 1938. Traditional tunnel diggers known as agris were employed.

The village elders have local documents showing that the construction work was stopped for nearly three years by the regional administration when Tansen municipality complained that the road to Ranighat, their cremation bank, would be spoiled by the canal work and seepage. The work was resumed only after Pratap Singh, one of the two Magar leaders, got permission from the Public Works Department for the Hills under the Rana commander-in-chief. This gave them clearance for a three-yard-wide right-of-way. The construction party was to regulate traffic while the construction was going on.[6]

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[5]However in a nearby stream where such multiple water sources do not exist, processes of negotiations regarding water sharing at the stream has taken place several times during the past several decades.

[6]The present mukhiya has this document.

When the conflict with the municipality occurred, the Rana administration considered having the Thulo Kulo (serving lower Chherlung village) widened, but the water supply from this canal could not possibly irrigate upper and lower Chherlung. Furthermore, the villagers had already spent Rs 3,600 in constructing the Tallo kulo, now two-thirds complete. Also, added irrigation of land meant more revenue for the "national" treasury. So the administration decided that the canal people would be responsible for maintaining and repairing the road if damaged by the canal, and would also have to compensate reclaimed land in Taplek that falls along the alignment.[7] Permission to continue work was granted along with provisions for rights-of-way. The Tansen municipality declined the option of having to reimburse Rs. 3,600 if they really wanted the work stopped. Thus, the state played an active role even then, in deciding the canal's fate.

Initially, the two Magar leaders had requested Taplek irrigators to extend the Taplek canal to the upper part of Chherlung village but Pokhariya, an area just beyond the Taplek command area, had objected and demanded that since their land was nearer to Taplek, they should have prior rights to using the extended canal if it was ever to be extended. So, in the same year as construction for Tallo Kulo began, an extension was made from Taplek to Pokhariya. By then, the people of the upper part of Chherlung realized the futility of negotiating with the people from Taplek, so they began constructing the Tallo Kulo.

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[7]Taplek farmers had thrown away the tools of the agris and stopped the work because rights-of-way through their land had not been negotiated.

The mutual agreement between Taplek and Pokhariya regarding the sharing and acquiring of newer water rights after Taplek canal was extended to Pokhariya was that Pokhariya was not to damage the canal or waste the water that Taplek had been using. Pokhariya also was to broaden the canal and acquire only the increased discharge brought about by the improvements. Furthermore, Pokhariya was not to use force to acquire water and both parties were to clean and maintain the canal. If Pokhariya did not abide by the conditions then Taplek had the right to render this agreement null and void.[8] Pokhariya farmers spent nearly 1,400 rupees in the extension and divided the water among themselves in accordance to their investments. In due time, they also bought rights to additional water from Taplek.[9]

In 1970, flood caused havoc along the Brangdhi stream, washing away the intakes. In the same year, a landslide occurred near the intake of Tallo Kulo. It was not possible for the Chherlung farmers to overcome the damage caused by the landslide and for almost two years winter irrigation was nearly impossible in the area served by the Tallo Kulo. Due to the flood, a spring just below the Taplek intake which was Chherlung Tallo Kulo's main winter water source had shifted downstream.[10] For some time, water was brought by means of an aqueduct from the stream itself near the previous washed away intake, but that too was carried away in a landslide. At times the Tallo Kulo shared

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[8]Minutes of Canal meetings, 1932 A.D.

[9]After Taplek canal was extended to Pokhariya, the canal was renamed as the Taplek-Pokhariya kulo.

[10]Rearrangements of the intakes were around the same relative positions after the flood.

water from the Thulo Kulo but mainly they stole water from the Taplek-Pokhariya and Thulo Kulos. Illegally, irrigation carried on.

Initial attempts by the Chherlung farmers to negotiate with the people using the Taplek-Pokhariya Kulo did not bring results. At one time, the village panchayat intervened but the Taplek Pokhariya irrigators felt that it was an internal matter for them to settle by themselves. External intervention or pressure was not tolerated. Seeing no other way out, the Chherlung Tallo Kulo people went humbly and gave a lavish feast to the Taplek-Pokhariya people. In time, they were won over and an understanding about sharing water was reached.

Taplek-Pokhariya people had also feared that in the future, the government administration might take sides with Chherlung people and help them construct a canal above theirs. They realized that this would either lead to more conflicts or reduce Taplek's and Pokhariya's water supply. Linking the Taplek-Pokhariya canal with the Chherlung canal allowed several farmers in the Pokhariya command area to irrigate their bari land and convert them into khet. These farm plots were between the two canals, and since the Chherlung canal (which was now going to be the water supplier) was higher up and the farmers did not have entitlements to the water, the amalgamation entailed new beneficiaries and new water-right holders in this area. An agreement was signed in 1977 whereby the Tallo Kulo shareholders were to repair and broaden the Taplek and Pokhariya canal and were to place a proportioning weir of 40 inches at Taplek with arrangements for 8 inches of water for Taplek and 12 inches of water for Pokhariya and the remaining 20 inches for Chherlung, i.e., half the water was to go to Chherlung.

As compensation for giving water to Chherlung, the Taplek and Pokhariya irrigators were to be exempt from all canal maintenance work, except during emergencies when all the shareholders of the system that includes the different amalgamated previous autonomous systems and their organizations would be summoned. Those not turning up were to be fined according to the canal rules. If water was in excess at Taplek and Pokhariya, it was not to be wasted. Rather, the excess water was to flow along the canal to Chherlung. If it was found that water was being wasted, then Taplek and Pokhariya would bear the necessary punishment as laid down by the canal rules. In years of water shortage, the total amount of water was to be used by Taplek and Pokhariya during the day , and Chherlung was to use all the water during the night.[11]

It was also agreed that if there was water shortage during wheat sowing, maize planting, or during nursery preparation for rice, the different sub-command areas of the irrigation system would rotate the total amount of water by turns. However, the first priority is to go to Taplek, then to Pokhariya, and finally to Chherlung. After this agreement, approximately Rs. 18000 was invested in making the improvement. Rs. 7250 was raised as cash and the rest as labour contribution from all Chherlung irrigators according to their shares. Water is tightly controlled by the Chherlung organization so that no one, not even those in Taplek and Pokhariya--the places that gave water to

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[11]Minutes of joint Taplek, Pokhariya, and Chherlung irrigators' meeting, 1977.

Chherlung, is allowed to use the canal water for early (premonsoon) rice due to water shortage.

Extension to Artunga

The Artunga command area constitutes the latest addition to the system of the Tallo Kulo.[12] When the canal was to be extended to Artunga with government assistance, the elected panchayat leaders of both village panchayats had to endorse the sanctioning of the project as well as approve disbursement of funds to the construction committee during the process of implementation. Some of the panchayat functionaries were also committee members.

Prior to the delivery of water to Artunga from Tallo Kulo, hardly any irrigation was practiced in the Artunga tar. Some of the fields had been levelled for rice cultivation, but the majority of the fields were unirrigated bari. Some monsoon irrigation was practiced by tapping a summer spring known as Bhulke. The quality of the water was not conducive to good irrigation since it hardened the soil due to salt deposits. Thus, most of the reclaimed khet plots in expectation of good irrigation during summer from Bhulke unfortunately had to revert back to bari.

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[12]Artunga is a tar flanked by Kali Gandaki river. It is also one of the wards of the Argeli Village panchayat whereas the rest of the command areas of the Brangdhi Tallo Kulo are within Bougha Ghumha Village Panchayat. Artunga is separated from Argeli tar by the Kurung Khola stream. Since it is not geographically contiguous with Argeli, it has substantially been isolated and neglected by Argeli's politicians. It has therefore received less funds from the village panchayat development budget and has been under represented in development initiatives for the ward. The villagers of Artunga have not been an influential group in their panchayat's politics.

The funds for an extension project for Tallo kulo was sanctioned by the district panchayat secretariat in 1978. The Tallo kulo was to be improved and extended so that Artunga (ward 7 of Argeli Village Panchayat) could be irrigated too. This was a project within the realm of Panchayat and Local Development. The project was sanctioned with a political move. One of the panchayat members wanted to be reelected for political office and he influenced the district panchayat to endorse this project for Artunga. He hoped for votes from this vicinity. This person was an influential powerful person and the farmers of both villages trusted that it would be a beneficial project.

A meeting of the canal shareholders of Chherlung, future beneficiaries of Artunga, the two panchayats' members, district panchayat members, and the engineer who had carried out the survey, was held in March of 1979 under the aegis of the district panchayat. The irrigators from Taplek and Pokhariya were not included. Key people in the social relations over Tallo kulo were not involved or ignored right from the beginning. This reflects a lack of understanding of the social organization of irrigation and property structure as it existed around Brangdhi Tallo kulo. The decision of this meeting was the only agreement made between Chherlung and Artunga. It was decided that a "Chherlung-Artunga Irrigation Reconstruction Canal Committee" was to be constituted for the work. Surprisingly, there were members in this committee who were not even shareholders or would be future beneficiaries of the irrigation system. The chairman of the committee himself was not a water user of the canal but the vice pradhan-panch (village panchayat chairman) of Bougha Gumha panchayat where Chherlung is

situated. A key panchayat personnel was made the link to government financed project by the district administration. It was decided that after the reconstruction, land areas in Taplek, Pokhariya, Chherlung, and Artunga could be irrigated "better", so the district panchayat was to be asked for the "proper, just allocation" of water taking into consideration the land areas of the respective places. Both Artunga and Chherlung were to contribute equal labour and inputs from the panchayat boundary to the intake.[13]

It was reported by Tallo kulo leader (mukhiya) that the engineer from the ministry surveyed the alignment for the proposed extension on a higher level than that actually constructed later on. The engineer had proposed this higher alignment so that the upper part of Artunga could also be irrigated. This meant however that the proposed canal to Artunga had to pass through some existing houses and goths (cow and buffalo sheds) in Chherlung. The farmers from Chherlung forced the engineer to abandon his survey. The proposed beneficiaries from Artunga tried to persuade the farmers from Chherlung and tried to convince both the farmers and the engineer that for the greater good, the proposed alignment should be followed. They could not however overcome the demands of Chherlung. Chherlung adamantly refused to give the rights-of-way for the extension of the canal if the proposed alignment was to be followed. This is again a reflection of not assessing preexisting property rights and relations that have a bearing on the proposed investment in irrigation facilities.

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[13]Chherlung and Artunga are in two different panchayats. Taplek, Pokhariya, and Chherlung are situated in the same Bougha Gumha village panchayat.

By chance, Man Bahadur Sunar, one of the leading agris of that region who had originally led the construction of Tallo kulo happened to be passing that area. He was consulted by the Chherlung farmers about the alignment. He said that both the upper and the lower areas of Artunga could be irrigated by following the present alignment. The farmers were more willing to trust the experienced agri rather than the engineer and thus dug the extension along the alignment that did not dislocate the houses. After the extended canal was dug, it was found out that the upper area could also be irrigated.

The canal was widened and several places cemented. The canal was extended to Artunga with Artunga's labour. A total expenditure of nearly Rs. 150,000 was incurred. Rs. 95,000 was the actual cash given by the district Panchayat and the rest was mobilized as labour contributions from Chherlung and Artunga. The work was completed in May 1981. With the work complete, it was time to decide the water allocation to Artunga. Several meetings were held over the next two years for this purpose and because of serious disagreements all was in a stalemate. Chherlung resisted the district panchayat's adjudication because it felt that it was their system's fate that was being decided and they preferred to settle the debate internally. There was no consensus on how the water was to be allocated. External presence and interference was not wanted. Since no actual water measurements were taken before and after the project, it was impossible to tell how much more water was delivered by the project.

Chherlung stated that Artunga could take water only after the water demand of Chherlung was fulfilled. Chherlung's interpretation of

a just water allocation according to land was meeting the total water demand of Chherlung for its irrigated land. However, Artunga claimed that the development activity was undertaken for the benefit of all, and that their input also went into the project. Since they had as much irrigable land as Chherlung they were entitled to at least one-fourth if not one-third of the water supply. Taplek and Pokhariya did not want to be included in the dispute. They said that the agreement was between Chherlung and Artunga and that they were to be left alone. According to the earlier agreement with Chherlung, Taplek -Pokhariya insisted that they were entitled half of the canal's water for their land and Chherlung should take the remaining half and reach a settlement with Artunga.

In the case of this canal, ownership of the system entails many consequences for effective resource mobilization and management. Chherlung irrigators felt that because of their continual investment and control over the canal that it was their private canal and not a state-owned or state-constructed one. It was thus quite irreconcilable for Chherlung people to give water to Artunga simply because of a development program of Rs. 95,000. Chherlung felt that it was their duty to be responsible for their system and would thus take all measures to safe-guard what they owned.

The role of the district panchayat should be seen in the light of this dispute. The ambiguity of the previous agreement for water allocation and its inability to arbitrate over this case clearly shows its lack of farsightedness, and knowledge of the social dynamics of development activities. The existing property rights and relations

were not taken into consideration during the sanctioning of the project. The district panchayat tried to make both sides happy and seek solutions elsewhere. Panchayat leaders made Artunga happy by letting the farmers know that until other projects materialize, Artunga was entitled to water; and Chherlung was told that although they could not give much water, they should give some. Chherlung, Artunga, and the district panchayat fell into this deadlock. If a formal agreement that was unambiguous had been made before starting construction, these problems could have been avoided. The different groups that enter into the property relations should have been involved right from the beginning negotiating for future rearrangement and sharing of water-shares from the system. Only after such negotiations, the project should have been sanctioned.[14]

Finally in 1983 an agreement was reached between irrigators of Chherlung and Artunga. The claims on water allocation or water rights put forth by each group was not acceptable to the other. The district panchayat tried to be involved but was not allowed by the irrigators of Chherlung. Until then, Artunga had received water only for winter irrigation and was not allowed to contribute labour during maintenance work days because that would entitle them to the canal and water rights. The agreement stipulated that it would have no effect on the previous agreement made between Taplek, Pokhariya, and Chherlung during

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[14]The farmers from Chherlung and Artunga did not argue for this earlier because, as noted earlier, the project was sanctioned with a political move. Little had the conflict been anticipated. The influential person was able to hold sway over the village panchayat leaders into accepting the project. These leaders need political "allegiance" with the powerful political leader rather than worry about being accountable to a small group of villagers of the irrigation system.

their amalgamation process. Due to the grant by the district panchayat and mutual labour contribution from both Chherlung and Artunga, Artunga irrigators were entitled from that day onwards to be co-shareholders in the Tallo kulo.

According to the original agreement with Taplek and Pokhariya, half of the water in the Tallo kulo was to flow to Chherlung. From the time that Chherlung farmers built the Tallo Kulo they have divided the water arriving at their command area into 55 shares represented by 55 inches of opening in the first proportioning weir. In the agreement with Artunga this was changed to 59 inches and the four "increased" shares (four inches of water from the first proportioning weir) are to be given to Artunga

For the four inches of water, Artunga is to provide 16 labourers during maintenance work while Chherlung provides only one labourer per inch of water. Artunga farmers were responsible for allocating the four inches of water among themselves and submitting their agreement to that effect to the canal committee. They also had to obtain water registration forms from the Chherlung mukhiya to be registered for individual water rights in the Tallo Kulo. The proportioning weir that was to deliver the four inches of water for Artunga would be installed at the border between Chherlung and Artunga. If Artunga irrigators want to increase their share of water, they can purchase water from Chherlung farmers at the current price. If these conditions are not adhered to, then the agreement will be null and void. If Artunga manages to arrange for a separate canal, then they will forgo the four inches of water without condition. It is also stated in the agreement

that besides the conditions laid down in the agreement, both parties will abide by the rules and regulations of the canal. These asymmetrical relationship reflects junior and senior rights as well as the locus of power for deciding property issues being vested in the senior rights holders. This power can be exercised because of the capability and solidarity of the senior rights holders which in this case is the irrigators from Chherlung.

As noted earlier, prior to irrigation water being delivered to Artunga from Tallo Kulo, irrigation was carried out very informally from the Bhulke stream. Several farmers who wanted water would clear the small canal that tapped water from Bhulke. There no one designated leader to coordinate the activities. A couple of active landowners would maintain the system partially but no form of organization existed. Irrigation activities were carried out very informally to such an extent that the individual residents had problems in using water after one another. A few always ended up using nearly all the water. Field channels were constructed at the middle part of the tar. The plots that did use irrigation from Bhulke had rice, followed sometimes by wheat and then by maize. Unirrigated bari had maize and lentils or Bengal gram and peanuts.

Several residents of Artunga had experiences with rice cultivation and irrigation. They owned rice plots in the terai, Argeli, or in nearby Malunge or Chherlung. These plots were imbedded in irrigation systems with irrigation organizations or were parcels that had irrigation from individual sources because not many owned land near the water source as in Malunge. The landowners of Artunga collectively did

not have experience working as an organization though they might have had experiences individually working with other organizations where their rice plots were located. Shortage of irrigation water as well as lack of organizational norms led to conflicts over use of water. Some of the residents migrated from Artunga because of conflicts with neighbours over irrigation water acquisition.

Therefore, prior to obtaining irrigation water from Tallo Kulo, there was hardly any rice grown in Artunga. Chief reasons for this were the inability to prepare nurseries just on the basis of rainfall, the salt content of the water from Bhulke, and the lack of organizational capacities to coordinate water use from Bhulke.

Currently, a total of 15.4 hectares of land have water rights in Artunga.[15] After the extension of the Tallo kulo from Chherlung, 3.3 hectares of bari were reclaimed as khet in preparation for rice cultivation after the delivery of water. However, only 2.85 hectares had rice planted during the time of the study. The villagers attribute this to inadequate supply of water from the canal. During rice season, the remaining 12.5 hectares had maize and millet or lentils growing. Nearly all of the 15.4 hectares of land grew wheat. Artunga does receive adequate water for the wheat season. The whole supply of water is delivered from Chherlung. The water allocation for rice is different and inadequate for all the plots to grow rice.

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[15]The total water shares for this area is four inches.

ORGANIZATIONAL STRUCTURE OF BRANGDHI TALLO KULO

Now that we have seen the processes over time that resulted in the establishment of Brangdhi Tallo Kulo through amalgamation and extensions of pre-existing systems, let us look at the organizational structure as an outcome of these processes.

As noted in Chapter two, a property rights analysis seeks to explain not only how certain irrigation systems work but also why, and to explore the basis for such arrangements. Rules and tools in an irrigation system can be explained in terms of the property perspective. The system tasks are carried out for the persistence and reproduction of objects and relations of property; hydraulic facilities are constructed to enhance the relations of property; rules and roles are set for the perpetuation and enforcement of property rights and relations; and dominant social groups and the state shape and control the nature of property relations and rights. Changes in property rights define certain adjustments in the social relationships among people.

I shall examine the roles within each command area of the Brangdhi Tallo Kulo. The duties and responsibilities of these functionaries will be presented. The change in responsibilities because of the merge or extension will be examined too. In a well functioning community of users, meetings provide forums for rules and regulations regarding the functioning of the system. The proper functioning of the irrigation system is necessary for the perpetuation of community's and the individual's property rights in irrigation systems. Records of entitlements, negotiations, resources mobilized, and meetings help

ensure accountability of the functionaries as well as the individual right holders. Records provide socially recognized proofs of events or entitlements registered. This helps in the proper accounting of each ones rights, obligations, and sanctions.

Brangdhi Tallo Kulo serves the farmers of Taplek, Pokhariya, Chherlung and Artunga. But the system is operated and maintained by the farmers from Chherlung and Artunga and is controlled by the Chherlung farmers. In matters of water allocation and distribution, as well as command area channel maintenance, each system has its own autonomy and rules. However when the main canal is concerned, the control and obligations are in the hands of Chherlung and Artunga. I shall now examine the various roles in each of the systems and the types of meetings held and records kept.

Organizational Structure in Taplek-Pokhariya

Taplek Functionaries

Taplek has a mukhiya who informs other shareholders of the Taplek area when labour is to be contributed for work on the canal. He also informs them of joint meetings with Pokhariya shareholders and also with the shareholders from Chherlung and Artunga now. He is the official contact person of Taplek for the shareholders and mukhiyas of the other sub-commands in the system.

Prior to the amalgamation with Chherlung Tallo Kulo, resource mobilization and canal maintenance was done jointly with Pokhariya shareholders. The mukhiyas of the two commands would get together and hold joint meetings for the annual canal maintenance. Nowadays, the

canal maintenance is borne by shareholders from Chherlung and Artunga areas. Prior to rice nursery preparation, the farmers from Taplek clean their field channels.

Pokhariya Functionaries

Prior to the Taplek-Pokhariya extended canal being amalgamated with the Chherlung canal, the mukhiya of Pokhariya had the major role of managing the Taplek-Pokhariya canal. It was the duty of this mukhiya to consult with the Taplek mukhiya and inform the Pokhariya shareholders about meetings, canal maintenance, field channel cleaning and water distribution. He also informs the shareholders the date for the canal worship. He keeps the attendance of the labour provided for canal work. The mukhiya is exempt from contributing labour for a share of Rs. 100. This particular person was chosen as mukhiya because he has Rs. 200 worth of watershares and would thus take care of the canal better because of his own stake as well as because of the fact that he still will have to contribute to canal work even after his exemption.

Currently, there are thirty shareholders in the system totalling Rs. 1935 of water shares irrigating 6 hectares of khet.

Meetings

Formal meetings take the form of joint ones during canal worship along with the Pokhariya people. During this time, the nature of additional work to be done on the canal is discussed and fines collected. This meeting just before rice transplanting has proven to be an effective forum for outsiders to negotiate with Taplek and

Pokhariya. Since nearly all shareholders of Taplek and Pokhariya would be present, issues that had a bearing with relations with other canals or villages could be discussed and deliberated effectively. Rules and negotiations were made and anyone who had grievances could expect to seek redress in such meetings. Furthermore, canal worship during the meeting reinforced the belief in the necessity of the canal and irrigation for part of their livelihood. Irrigators sacrifice chickens and offer milk to serpent gods to protect their canal and bless them with good yields.

The worship cum organizational meeting of Taplek and Pokhariya was capitalized by Chherlung farmers prior to their being grafted to the Taplek-Pokhariya Kulo to negotiate and request for water for their nurseries preparation. Prior to the canal being extended to Chherlung, there was inadequate water in the previous Chherlung canal during June for nursery preparation. The spring that fed the intake of the then Chherlung kulo would still be inactive and whatever water that could be diverted from the stream would not make it to Chherlung either due to evaporation or leakages. Taplek kulo spring would not dry up during then and therefore had adequate water for irrigating nurseries. During this time, a pale would be commissioned to keep guard the water from Chherlung irrigators who might steal the water. One of the Brahmin women from Chherlung would come to this meeting and provide liquor for the irrigators from Taplek and Pokhariya and request water from them. The Taplek and Pokhariya irrigators allowed Chherlung people to divert water into their canal during the night from six in the evening to six o'clock in the morning after assessing the condition

of their nurseries. Such informal mutual sharing of water during critical periods were facilitated during such a meeting that operated as a forum for such requests and issues.

Records

The mukhiya does not possess any written records regarding the canal. However, a different shareholder of Taplek possesses the agreement that was signed by both Taplek leaders and Pokhariya leaders during the extension of Taplek canal to Pokhariya, the contents of which have been described above. All attendance record and meeting minutes are kept by the mukhiya of Pokhariya.

Organizational Structure in Chherlung

Chherlung Functionaries

A mukhiya heads the system. He is to see that the system functions properly in terms of water allocation, distribution, maintenance, and also conflict resolution. He keeps the accounts as well as attendance records. Though the mukhiya holds position as long as he does an acceptable job, the position of mukhiya seems to be an inherited one. The present mukhiya's father and brother were mukhiyas before him. All the mukhiyas to date, except one, have been descendants of the original investors or themselves. The mukhiya who was a non-family member and from the Brahmin caste did not last long for he tried to be very strict and enforce rigid sanctions for defaulters. It was during his time that defaulters had their pots and pans confiscated and auctioned when they failed to pay their fines. The majority of

the people felt that he was too dictatorial and thus replaced him with another member from the investors' family because this "ensured" love and protection from the new mukhiya for the canal constructed by his ancestor. He is also to supervise maintenance work and keep all records of the system.

There are seven tharis, each one responsible for a particular day of the week, who assist the mukhiya. Under each thari are a group of irrigators who are responsible to him. The thari functionaries were introduced in early 1950s after having seen Chherlung Thulo Kulo adopt it and that it eased the burden of the mukhiya. The Tallo Kulo farmers too decided to adopt this system because this would relieve the mukhiya from a bulk of his duties, and would facilitate the process of communication as well as collecting fines too. There are two sets of pales (canal patrolmen); two for summer monsoon and the other for winter. They patrol the canal and repair minor damages and see that no leakages occur or have occurred and checks for illegal turnouts and water thefts. In 1987, the monsoon pale was paid Rs.300 for the year, whereas the one for the winter was paid Rs.220. There is more work on the canal during monsoon season both in terms of the crop, i.e., rice which needs reliable supply of water as well as the greater tendency of canal damages and landslides due to rain and increased sub-surface flow. These pales are more experienced in the traditional technology and can judge the amount of labour necessary for the repair work. From July to early November, they have to walk to the intake daily and are to be on duty from morning six o'clock to four in the afternoon.

If it is work that they alone cannot accomplish and there is an urgency for water delivery in the canal, they notify the mukhiya about the nature of the damage and the amount of labour necessary. The mukhiya then informs the thari of that particular day to mobilize and send the necessary men to work on the canal. These men get remuneration for work beyond their obligations at the end of the year when the accounts are settled. The tharis are responsible for collecting the fines and resolving the conflicts for the shareholders under their jurisdiction.

It is the irrigation society (known as Samaj, comprising of the irrigator brothers) that decides the acceptance of the mukhiya's position and tenure, the accounts, the maintenance work etc.

An advisory body known as the kulo-samiti or the canal committee consists of these seven tharis and other esteemed village elders who have been active in politically or as state functionaries are also shareholders of the canal. The purpose of this group of esteemed Mohiyas is to advise the committee, e.g., for implementation, i.e., proper functioning, work for winter irrigation, advise the rate of fines and labourers taking inflation into consideration; and also to witness the transactions of money made. Defaulters are fined, kulo-pales are paid, and those who worked more are also paid.

Meetings

During early June, prior to rice cultivation, a meeting of the Samaj is held to decide upon the selection of mukhiya and the other functionaries. The nature of canal-maintenance work for that season is

discussed. Attendance during canal work is reviewed and rules are revised and amended if needed. Those who absent themselves from work are fined. It is the duty of the mukhiya to call meetings and chair them (routine as well as emergency ones, e.g., during the Chherlung Artunga water dispute).

A second meeting is usually held in mid-October when the accounts are read out to the Samaj assembly. The work procedure for winter irrigation (wheat and maize) is also discussed. Women in lieu of their absent husbands also can attend this meeting (for clarification or notification). Another meeting is held in two-weeks' time. The two week interval allows time for people to raise money for the fines to be paid. The presence of the other shareholders curtails illegal monetary transactions. Decisions are made more on a consensus basis rather than majority voting. Sometimes meetings are long drawn out and those who are dissatisfied with certain rules or decisions are pacified or the logic for the decisions are argued till they agree to comply. At the end of the meeting, a designated scribe for that meeting who is usually a school teacher, writes down the minutes of the meeting and passes around the register for everyone's signatures. Those who were absent are not fined, but they forfeit the right to question the decisions made until the next such meeting.

Artunga shareholders send their delegation to this meeting and are very careful about attending the meeting and seeing that decisions are not taken that could be adverse to Artunga. People from Taplek and Pokhariya do not bother and need not come to the meetings. The burden

of organization and the transaction costs are therefore borne by middle and tail enders.

Records

The Samaj has written rules that have been updated and changed several times. Rules are formulated when all the shareholders meet together. The mukhiya has begun to collect important old documents relating to the history and the different agreements made either with the government or with other canals and groups of people.[16] Attendance records and accounts are kept well. These are ratified by the samiti and any shareholder of the Samaj has access to them and can question them for clarification. These opportunities are usually made available during meetings. A log register (pani purja lagat, similar to the sameli of Phalebas Tallo Kulo which will be discussed after the next chapter) documenting individual shareholder's water share under a certain proportioning weir and the transactions of water made by that individual with another through sale or purchase is kept by the mukhiya. He also files and keeps correspondence that deals with the system.

Organizational Structure in Artunga

Artunga Functionaries

A mukhiya heads the Artunga part of Tallo Kulo. He is chosen on a consensus basis each year by the water rights holders of Artunga prior

[16]My search for historical evidences regarding crucial events in the canal history got the mukhiya collecting them as part of his own family's heritage. He wanted to have proper documentation of the canal history for future generations.

to the general routine meeting in Chherlung. So far, the person with the largest landholding and the greatest water shares has been the mukhiya. This mukhiya is in turn known as a samiti in the wider Brangdhi Tallo Kulo organization. The present mukhiya's father was active in local politics and had been the chief negotiator with outsiders during the Tallo Kulo's extension to Artunga. The mukhiya keeps the records of water shares, labour contributions, and assigns water turns to the different rotation areas in the Artunga command area. There is one irrigation leader in each rotation area and the mukhiya acts as one of them. These leaders coordinate the various shareholders within their region for field channel maintenance work as well as coordinate and assign turns to the different water users. These leaders act as representatives from Artunga in most of its dealings with Chherlung or panchayat matters. The mukhiya's father also acts as an additional representative. The present mukhiya and the leader from one of the regions share the responsibility of maintaining the accounts, attendance records and official correspondence. This other leader has been the chairman of the ward (i.e., Artunga) for several years and has had experience dealing with the panchayat system as well as keeping records. The mukhiya has not had such experience earlier. He acts as the liaison between the main organization (which is controlled by Chherlung irrigators) and Artunga irrigators. He therefore contacts the irrigators in Artunga and briefs them regarding meetings, and decisions made by the Kulo Samiti. He is accountable to the shareholders from the Artunga region only. As a remuneration, he

is exempt Rs. 25 worth of labour contribution and is treated in the same rank of a thari of the Chherlung command area.

Meetings

Prior to water being alloted to Artunga, several emergency meetings were held by the potential irrigators of Artunga to strategize ways of negotiating and threatening for a larger watershare from the canal. These meetings were usually presided by the chairman of the ward who is also currently a leader of one of the irrigation regions of Artunga or the father of the present mukhiya who has the greatest amount of land in Artunga and who is a retired Lieutenant of the British Gurkhas. The mukhiya in consultation with the two other leaders and his father along with some neighbours call for meetings. Meetings are usually held around the time when the canal routine meetings are held. Artunga meetings provide an arena for those who participated in the canal's meeting chaired by Chherlung mukhiya to inform Artunga shareholders of the decisions taken during the meeting; organize shareholders from Artunga for the annual routine maintenance; inform them of the financial status of the canal including the amount of fines that Artunga owed to the canal and the accounts of the Artunga system. It is usually in response to the canal's meeting that Artunga meeting is held so as clear accounts at Artunga's end; elect the new mukhiya if the old one has not performed satisfactory work or desires to retire; lay down rules and regulations for Artunga organization; make plans for clearing and cleaning field channels as well as assign turns for the whole canal maintenance where Artunga is obligated to

provide sixteen labourers. This has been going on since 1983 after winter irrigation took place in Artunga.

Records

Due to its association with the different levels of the panchayat structure as well as the irrigation organization of Chherlung during the whole process of negotiating for water allocation from the extended and rehabilitated canal, the Artunga irrigators have developed a sense of the importance of keeping records of the minutes of meetings, accounts, attendance, and official correspondence. The individual leaders of the different rotation areas keep records of water turns and individual water rights of the shareholders in their region.

SUMMARY

In this chapter, I presented the history of the process of amalgamation and extension in Brangdhi Tallo Kulo. The key negotiations regarding property rights in water among the different command areas were also presented. The organizational structures of the different sub-commands were examined through the associated roles, meetings held routinely, and records kept. The history of Brangdhi Tallo Kulo also highlighted the role of the state in adjudicating litigations over rights-of-way.

The following chapter will examine the different crucial irrigation tasks necessary for the reproduction of property rights in Brangdhi Tallo Kulo. That chapter will conclude with the relationships between state intervention and property rights in the system.

CHAPTER V

PROPERTY AND STATE IN BRANGDHI TALLO KULO
PART II

The previous chapter dealt with the history of Brangdhi Tallo Kulo in Palpa examining the role of state intervention and the creation of property relations in Brangdhi Tallo Kulo. The evolution of this canal portrayed an irrigation system with each subsidiary part having a history and autonomy of its own. This autonomy is further examined in this chapter. This chapter will examine the irrigation management activities in each of the command areas and conclude with the findings on state intervention and property rights in Brangdhi Tallo Kulo.

Prior to the discussion of the specific irrigation management activities in the sub-commands, it would be useful to see the water-land ratio in each of the sub-commands. Table 5.1 presents the distribution of land areas and water allocation within each of the sub-commands. This table shows the relative scarcity or availability of water for the different sub-commands. The type of water distribution practiced in the sub-commands in highly influenced by this ratio. This ratio is a result of historical negotiations over water allocations among the sub-commands and the land or water constraints in the sub-commands. For example, in Chherlung, land has been brought under irrigation year after year. This process has been facilitated greatly by the fact that water is not tied to land and that watershares can be transacted through sale and purchase.

Table 5.1. Division of Command Area and Water Allocation in Brangdhi Tallo Kulo.

	Land		Water		Water-Land Ratio	
Sub-commands	Hectares	%	Actual units	%	Water units per hectare	Index
Taplek	2.00	6.57	8.00	20.0	4.00	100.00
Pokhariya	6.00	19.70	12.00	30.0	2.00	50.00
Chherlung	19.15	62.89	18.64*	46.6	0.97	24.25
Artunga	3.30	10.84	1.36*	3.4	0.41	10.25
Total	30.45	100	40	100		

* In practice, the 20 units remaining for Chherlung and Artunga are first converted into 59 shares, 55 going to Chherlung and 4 to Artunga.

IRRIGATION MANAGEMENT ACTIVITIES OF TAPLEK-POKHARIYA

Water Acquisition

Taplek command area has been irrigated from its very inception by water diverted from Brangdhi Khola utilizing the spring on the stream bed nested amongst huge boulders thereby acting like a natural intake. This natural intake has withstood several major floods which had resulted in washing away several other intakes of the canals tapping water from Brangdhi Khola. The spring that feeds into the canal has proven to be a permanent one unlike the spring that was tapped for the Chherlung Tallo Kulo. Taplek and Pokhariya have been fortunate to have a stable and sturdy natural intake. It has saved a lot of labour that would have otherwise been used in repairing or constructing the intake in a hilly environment with great fluctuations in stream flows. In

most of the hill irrigation systems in Nepal, water acquisition poses the single most important task requiring much coordination and labour (Yoder, 1986; Martin, 1986).

Water Allocation

Water Allocation in Taplek

Water at the individual level in Taplek is allocated according to the original land entitlements. At command area level, the irrigators of Taplek are entitled to 20 percent of system's water. The following is the historical background to watersharing by Taplek with other command areas through negotiations. In the earlier chapter, we noted the stipulations of obligations for junior rights holders.

When Pratap Singh Saru of Chherlung had requested Lohabir Rana and Purna Singh Rana of Taplek for permission to extend the Taplek Kulo to Chherlung, Nar Bahadur Nisan of Pokhariya objected to the proposal and demanded that Taplek Kulo should be extended to Pokhariya first if at all it were to be extended. Pokhariya farmers demanded that Chherlung could not receive water if Pokhariya did not. The Taplek shareholders gave permission to Pokhariya farmers to extend Taplek Kulo to Pokhariya in 1932. After the extension, the elders of both Taplek and Pokhariya got together and verbally agreed to sharing the water equally. A proportioning weir (locally known as sancho) was installed for the first time at Taplek to divide the water equally between Taplek and Pokhariya. The farmer's learnt to use the sancho from seeing these structures being used in Argeli which is nearby around two and a half hours walk away.

Originally, the total command area of Taplek was 40 mato muri (0.5 hectare) and water was shared according to one's land area but in mato muri terms. However, as land transactions and reclamation took place, shareholders in Taplek now have unequal water shares in comparison to their land holdings. Several groups of brothers share a certain amount of water but own different sizes of land. There are nine shareholders in the Taplek system for a total of 40 mato muri of water for Taplek. The command area at Taplek is nearly 2 hectares.

Taplek used to share half its water with Pokhariya, but now has access to only 40 % of the water shared between Pokhariya and Taplek. There are no wooden weirs or sanchos within the Taplek command area. Water is allocated and distributed through field channels and approximations. Taplek shareholders use continuous flow of water while irrigating rice and irrigate only during the day since they reside on the top of a hill approximately 45 minutes away from the irrigated fields. The shareholders feel that they have adequate water given their small command area.

There are plots of land below the command area of Taplek owned by non-Gumha people who are Brahmins and Newars that reside at Hatti Dhunga near Ranighat. These people do not have water rights to irrigate their land from the canal since they are not shareholders of the irrigation system at any point in time. Instead they irrigate from the Taplek stream which is nearby.

Water Allocation in Pokhariya

In Pokhariya, water is allocated on the basis of one's watershares and not land holdings. The initial water rights were on the basis of

individual investments made for the extension of the Taplek canal to Pokhariya. Later on, a major improvement was made and the total amount of water shares was increased. In order to be entitled to more water, one had to contribute to the improvement. Some purchasing of water from Taplek also occurred but the shareholders in Pokhariya or Taplek were uncertain about the exact amount or the price.

At the initial stage of extending the Taplek canal to Pokhariya, some had land that was above the canal and therefore remained unirrigated. Two related irrigators, an uncle and nephew who were both active in extending the canal to Pokhariya, had conflicts regarding water allocations. During the land inheritance settlement at the time when water was to be brought to Pokhariya, the uncle's inherited land was above the canal while the nephew's remained below and therefore could be irrigated. The uncle demanded that both share land above as well as below the canal, but the nephew did not agree. The uncle reclaimed some of his forest land that lay below the canal as khet.

There are thirteen wooden sanchos in the command area of 6 hectares to operationalize individual water allocation. Pokhariya used to share an equal amount of water with Taplek in the initial stage. But after purchase of water and continuing reclamation of land in Pokhariya as well as the amalgamation with Chherlung, it is currently entitled to 30 % of Brangdhi Tallo Kulo's water.

Water Distribution

Water Distribution in Taplek

Since Taplek is the head-end command area, it does not wait for others to start or finish nursery preparation or even rice

transplantation. The irrigators of Taplek need not worry about the timing of their use of water from the main canal because of their express senior rights as stipulated in the various agreements made by them with the other command areas. A crucial factor that enters into the consideration of how to irrigate is the topography and the physical layout of the Taplek command area. The fields are terraced, scattered and interspersed with large boulders. The presence of large boulders prohibit the making of larger plots. It would be too costly for the farmers to remove them. There are very few field channels because of these boulders. Water is distributed from one upper terrace to either the adjoining ones or the ones below. As mentioned earlier, there are no proportioning weirs because water is plentiful and is distributed from one upper terrace to the other which might belong to someone else.

During nursery preparation, the shareholders of Taplek descend to their fields from their village Gumha on top of the hill and divert the water from their notch of 8 inches in the main canal sancho onto their own. If the water from the 8 inch notch of the main canal sancho is insufficient during nursery preparation or after nursery preparation, Taplek shareholders use all of the canal's water.

Taplek shareholders decide amongst themselves the date of land preparation for their rice transplanting. The transplanting occurs from the lowest fields working themselves up towards the top. This system has been adopted taking into consideration the rather steep gradient of the command area and the lack of tracks for bullocks to move around without having to cross the actual fields. If land preparation is done from the lowest field upwards then those fields

above provide thoroughfares for the lower ones without destroying the fields. The shareholders who have to use the bullocks for land preparation decide amongst themselves the number of bullocks they are going to operate in a single time. This is contingent upon the supply of the water in the canal. If for some reasons there is no water in their canal then they have a mutual understanding with Chherlung Thulo Kulo to use their water. However, due to their stable intake, it was reported that they have not as yet had to seek recourse to the water from the other canal. Since there are no separate field channels to control the flow of water from one field to another, water is made to flow from the upper terraces to the lower ones continuously after rice transplantation. In effect, the total water supplied by their 8 inches notch is allocated to the total rice area. The water is applied continuously until a few weeks before rice harvest.

As noted earlier, the amalgamation of this canal to the Tallo Kulo of Chherlung raised the "new" canal's alignment higher such that three original shareholders of Taplek canal could reclaim their unirrigated bari as khet. Water was supplied to them as to others of Taplek without any extra obligations. However the fields belonging to some Brahmins and a Newar just below the Taplek system's farmer do not have rights to the water. The owners of the fields were not part of the original family that had bought the land from the Bhattarai of Chherlung.

As mentioned above, there are no field channels leading to individual plots. Therefore, if someone wants to irrigate then nearly all the plots lying above the particular terrace had to be irrigated.

Most of the shareholders did not practice presowing irrigation. Rice itself was irrigated just prior to harvest such that there is enough moisture content in the soil during wheat sowing period. Because of this moisture conservation, wheat is irrigated late after sowing. During both wheat and maize irrigation, the total water supply from the canal is diverted into Taplek area and turned back into the canal after the required irrigation. Because of the topographical structure and the physical layout of Taplek command area and the distant residential location, nearly all agricultural activities have to be done or coordinated with all shareholders of the system. This is possible because there are only nine shareholders cultivating and they are related to one another very closely. The mukhiya is not consulted for the different activities. His sole purpose seems to be as a liaison for the Taplek system with other groups. A consensus is usually reached amongst the different irrigators as to who and when they need to irrigate. It was reported that the need for irrigation was determined by the moisture condition and the stage of plant growth. In a span from four to five days the whole area gets irrigation during a turn. The shareholders are watchful for excessive water flow lest there may be minor landslides and damages to their terraces. Therefore, irrigation is applied only during the day time and this provides opportunity for the command areas lower down the system to irrigate during the nights.

Water Distribution in Pokhariya

In the very beginning prior to having the extended canal from Taplek, Pokhariya was irrigated from Taplek stream. Due to the short

supply of water from this stream as well as Chherlung's petition to Taplek shareholders for the extension of their canal to Chherlung, Pokhariya found it urgent to demand the extension of the canal to its command area lest Taplek did permit Chherlung to have the extension. People in Pokhariya felt that this was a good opportunity for acquiring access to irrigation water. The present command area of Pokhariya is comprised of Magars and one Newar. The lower fields in this command area have access to sub-surface water.

There are twenty nine irrigators using water from the canal but only seventeen are registered with the Pokhariya mukhiya as water right holders. When water is entitled to a certain registered person, he is obligated to share the entitlement with his or her coparcener. Though the water right may be in one brother's name, in actuality it is the entitlement of all of his male siblings who are cultivating their own inherited land.[1] They decide among themselves how much each one gets. This roughly approximates each individual's land inheritance size. A common water sharing system devised amongst such coparceners is through shared rotation. During actual water application, the one

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[1]Unlike in land transaction where the landholding has to be registered in the Revenue Office and therefore one's taxes readjusted, there is no such provision in the Nepalese revenue administration for such changes to be registered in the case of water rights. This is done customarily by the villagers themselves or where irrigation organizations exist, it is recorded by the organization. This recording can be very informal and can be mere recognition of such water sharing by the community involved or it can be very formal and legalistic as in Chherlung Tallo Kulo where such changes are documented and records kept with proper signatures to validate such transactions. These water rights records are collectively known as pani purja lagat as mentioned in the previous chapter.

whose turn it is applies water first to his field and then to his coparcener. Likewise the next one does so in his turn.

Pokhariya is divided into three sections served by three secondary canals. These secondary canals are referred to as ahat by the farmers and those who are supplied water by a particular ahat are considered to be ahat bhai or ahat brothers. If for some reason water was unavailable to the whole command area of Pokhariya for more than three to four days then rotation is practiced within each such ahat. Water supply from the whole notch of 12 inches in the main sancho is not used for rotation within a single ahat area because this volume of water might damage the channels and create landslides or gullies. When all fields have been irrigated through rotation within the ahat then continuous irrigation is practiced using the individual sanchos or proportioning weirs leading to one's own plots. In the past if someone was to reclaim his land into khet, all shareholders would provide him with water from their water shares initially. This is because newly reclaimed land requires a large amount of water to be ready for rice cultivation.

There is a mutual understanding among the Pokhariya shareholders that during rice nursery preparation they will use their individual sancho if there is adequate water delivered from it. If however, water scarcity occurs then dolo, or the whole water from each ahat, is used to irrigate the plots in rotation. Water from all three ahats is never combined for purposes of irrigation for fear of damage to the channels and the fields. If someone is not using water then his water is diverted into someone else's individual sancho and the nursery

prepared. Several sanchos are at times combined to supply water for preparing an individual's nursery. Much of this is done through negotiations and mutual understandings. After preparing the nurseries, water is applied through one's own individual sancho.

If there is abundant water in the main canal then the water from each individual sancho is adequate for land preparation. However if there is a low discharge of water in the canal then the total water flowing into a particular ahat is used by a single farmer at a time during land preparation. The volume of water in the ahat determines how many farmers can prepare their land for rice transplantation simultaneously. The shareholders negotiate among themselves as to the order of preparing their lands since this involves the mobilization of bullocks as well as transplanters. During the day, water is allocated to those who are preparing their land for transplantation while during the night those who have already transplanted utilize the water. The Pokhariya mukhiya is not involved in routine water allocation or distribution. These activities occur through negotiation among the different shareholders. Conflicts do occur and the mukhiya along with the other ahat bhai try to resolve it. After rice transplantation has occurred in the whole command area of Pokhariya, each irrigator applies water according to his share. This is actualized by the delivery of water through their respective sancho. Water is applied continuously through the individual sancho, day and night, for a few days until the transplanted rice seedlings are well established. After this, water is applied only during the day in spite of the fact that they have the water rights to apply water continuously. This again is taking the

fragile ecology into consideration. Thus for the night when irrigation cannot be checked, water is not applied. This is achieved by closing the Pokhariya sancho on the main canal. The water is utilized by the downcanal command areas.

Approximately fifteen days before rice harvest, irrigation of rice is stopped. Continued irrigation would result in excessive moisture both for rice harvesting and wheat sowing. Most farmers see the last rice irrigation to be the wheat presowing irrigation. It was reported that this irrigation provides adequate moisture for wheat germination.

During both the wheat and maize seasons, the individual proportioning weirs are not used. The required amount of water is diverted from the main canal into the ahat by the farmer irrigating. Once again, the kulo mukhiya is not involved in water distribution during wheat season. A farmer who wants to irrigate on a certain date will let his fellow ahat bhais know a few days in advance and find out if it is alright with others to do so. If there are others also who want to irrigate on that date, they negotiate and settle it amongst themselves. Usually, they assign turns for the day so that conflicts do not occur. Because the total volume of the main canal is not diverted to a single ahat, several persons in different areas within the command area can irrigate at the same time. Therefore the competition for water is not acute.

After wheat harvest, the land to be cultivated with maize is irrigated four to five days before maize sowing. This presowing irrigation softens the soil for land preparation done by several

bullock ploughings, and provides adequate moisture for maize germination.

After maize is planted in the first two weeks of May, farmers wait for the rain instead of irrigating. Irrigation is applied only if it fails to rain for an interval of twenty days. If irrigation is to be applied, the farmer who intends to do so diverts water from the main canal to his particular ahat and irrigates his land. He has to remain there as long as he irrigates for fear of landslides or damages to the terraces that might be caused by the flow of the water. If there is already someone else irrigating then he will have to wait until that person is done. Since many farmers wait for the rain, there is little competition for irrigation water. Monkeys prove to be a menacing problem during cob formation. Shareholders descend to Pokhariya with their watch dogs and guns to scare away the monkeys. Maize is harvested during the end of July and early August in time for rice cultivation.

Resource Mobilization

Resources are mobilized on the basis of one labourer per Rs 100 water share from shareholders of Pokhariya. In Taplek, all those entitled to watershares contribute equal resources regardless of their entitlements. Often, one among a group of co-owners of a share contributes resources for that particular event. Women also are allowed to participate in the canal maintenance work unlike in Chherlung. Two types of canal maintenance work are undertaken: routine

and emergency. Every member has to participate during the emergency work regardless of the amount of water shares owned.

Since the amalgamation of this canal, the canal maintenance contribution from both Taplek and Pokhariya has reduced drastically. In fact, even during the emergency maintenance work organized by Chherlung, they fail to turn up.

During the irrigation period, a pale (watchman) from Gumha village (on the hill) is sent to the canal and the command area to inspect for any damages and to repair the canal if needed. If it is not possible for him to repair the canal, he informs the mukhiya who in turn informs the rest of the shareholders about the needed canal maintenance work. This practice of assigning pales for inspection has continued even after the extension of the Taplek canal to Pokhariya.

In Pokhariya, pales are recruited from shareholders themselves, one per day, on a rotation basis. It is the duty of the current day's pale to recruit someone else for the next day. Even women are allowed to work on the canal. However, since the amalgamation with Chherlung Kulo there has been less canal work to be done and irrigation duties now are usually carried out by men. Attendance and accounts are maintained by the mukhiya.

Conflict Resolution

The shareholders of the Taplek and Pokhariya command areas have been in conflict with shareholders from other command areas as well as their own. The disputes are resolved locally or through state actions.

As mentioned in the earlier section dealing with the inception of Thulo Kulo, Taplek shareholders threw away the tools of the agris and stopped the Thulo canal work because rights-of-way through their land had not been negotiated. It was only when the state granted permission to the Thulo Kulo builders to continue the work and provisions were made for a certain right-of-way that Taplek yielded.

Family feuds regarding rearranging inheritance lands such that water could be allocated more fairly amongst those who invested was left to be resolved by the parties involved and the organization did not intervene.

In their dealings with Chherlung and Artunga, Taplek and Pokhariya adhered to their existing property privileges and the provisions of the mutual agreements and contracts they had arranged. During the water allocation dispute between Artunga and Chherlung, Taplek and Pokhariya stood by the previous agreements and stayed clear of the dispute. As long as their rights and privileges were not jeopardized, they remained uninvolved in the disputes of the other groups.

IRRIGATION MANAGEMENT ACTIVITIES OF CHHERLUNG

Water Acquisition

Due to the presence of a natural intake formed of large boulders, very little work has to be done at the intake except for directing the stream flow into the crevices of the boulders. After the meeting in early June when the procedures for routine canal maintenance for that year are decided, all the shareholders set out to work on the main canal contributing resources in proportion to the shares they own.

Water Allocation

The principle of water-allocation is based on purchased shares. The initial cost of constructing the irrigation works in 1932 was Rs. 5,500. To recover this cost, the total water volume was divided into 55 units and each unit-share sold for Rs. 100. The unit was measured by the breadth of one's finger. Now measuring scales, usually rulers, are used. Proportioning weirs (sancho) divide the water from the main canal into secondary canals. There are six weirs (sanchos) for the Chherlung area at (i) Khil Danda (ii) Dhara (iii) Thado Sancho (iv) Birkha (v) Ampko Rukh (vi) Artunga Jane Bato.[2]

These 55 units of water are divided among the Chherlung irrigators according to the number of shares each owns. If one share gets 2 hours of water supply then a one-half share gets one hour of water supply. For rice, water is allocated by timed rotation on an hourly basis according to ones shares. If a person does not have enough water and another one has more than enough, then they may informally adjust the timings (especially if they are friends). One who has inadequate water may buy watershares or portions of a watershare from any willing to sell to him. In 1938 when water was delivered by Tallo Kulo, one share cost Rs. 100. In 1978, one share cost Rs. 6000. Now, one share cost Rs. 10,000.

Previously the time was noted using a "pani ghadi" literally meaning a "water-clock". A metal bowl with a hole in the bottom was

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[2]At the end of 1983, there were only four such weirs. Two more have been added after the water allocation negotiations with Artunga.

placed over a dish of water. The weight of the bowl causes water to enter the bowl and when the bowl sinks to the bottom, the time taken is noted as one unit or one "pani" (water) hour. Nowadays, it is done with a watch. The length of time associated with a turn, however, does change according to the supply and demand for water.

Water Distribution

Water distribution in Pokhariya occurs following distinct rules and roles. These rules take into account the crop being grown, the stage of the crop, day and night differences as well as the senior and junior water rights of different sub-commands.

1) Water distribution for rice

One month before rice transplanting, wet nurseries are prepared. Those who want to prepare their nurseries approach the mukhiya for his permission. The mukhiya then allows him to divert some canal water into his nursery. Whether he can use the whole main canal's discharge or will have to rotate with his field neighbours depends on the discharge of water and the demand on that water by the various irrigators preparing their nurseries.

During both land preparation and transplanting, the command areas upcanal of Chherlung divert water when they please. Chherlung shareholders wait to irrigate only after the shareholders of Taplek and Pokhariya have irrigated because an erratic water supply from the canal poses difficulties for arranging bullocks and labour for the day.

During rice transplanting, the number of bullocks operated depends on the amount of water flowing through individual sanchos. The members of the sancho arrange to share the water amongst themselves. Each member lets his other sancho member know when he is going to transplant and how many bullocks he will have. When others agree then he can set finding the necessary bullocks and transplanters (usually women and girls). A considerable division of labour occurs and females and Brahmins are not allowed to operate ploughs. If problems or conflicts arise, then the thari tries to intervene and allot the water shares. If the matter really gets out of hand, then the mukhiya assigns the turns at the sancho level and the water shares. His decisions are final and all obey.

During the night, when bullocks do not operate, those who have transplanted share the sancho water amongst themselves. As more and more fields have transplanted rice, the time for night irrigation per plot diminishes. Then, when all have transplanted, a strict rotation according to ones share operates day and night since Chherlung does not have adequate water for continuous supply. Women seldom go out during the night to irrigate.

2) Water distribution for wheat

Irrigating rice is usually discontinued after October. The canal water then is allowed to flow to Artunga where it is used first for rice irrigation, and then for wheat. Those in Chherlung who have bari irrigate the bari (unlevelled land not for rice) for presowing wheat. At about this time rice harvesting takes place. Some irrigate their

khet for presowing wheat irrigation with the rice still standing and others only after the rice has been harvested.

When the land is irrigated for presowing wheat on standing rice, it is done one week before harvest. With a standing crop, the fields do not dry as quickly and there is adequate moisture for wheat germination. The irrigator need not ask the mukhiya's permission for this type of irrigation. However, if the farmer wants to irrigate his khet after having harvested his rice, he has to ask the mukhiya for his turn which is on a first come first served basis. The mukhiya then assigns the turns for irrigating. At times when several shareholders from different parts of the command area come and ask, he assigns turns according to areas so that time and water are not lost conveying the water up and down the canal.

It was observed during the end of October and early November that the mukhiya grouped irrigators for a particular day according to sancho and irrigation took place from one sancho to another. This was not necessarily head to tail within Chherlung, but in terms of which sancho shareholders asked first. The mukhiya sometimes orders a whole sancho group to irrigate simultaneously even when some shareholders within that sancho had not asked to do so. People agree because it is convenient for most. Occasionally a group of shareholders would irrigate without asking the mukhiya.

Even if the shareholders do get prior permission from the mukhiya some do exchange turns. One such shareholder requested another for exchanging turns because he was invited to a religious feast during his

turn. Such informal negotiations and exchanges occur and lend flexibility to rigid rules and orders.

Though the agricultural cycle for each command area of the irrigation system is not exactly the same, certain irrigation requirement periods do overlap. When Chherlung shareholders are irrigating wheat, someone from Artunga may come to the Chherlung mukhiya and ask if Artunga can take water. Such prior agreement on the part of the Chherlung mukhiya becomes necessary for the Artunga shareholders because Chherlung shareholders might just divert the water and upset Artunga plans. In this happens, Artunga usually negotiates for the night shift.

During several meetings, the Artunga mukhiya first requested, and then demanded, a clear cut prior commitment to the time when Artunga could irrigate because there was uncertainty and many disruptions. The Chherlung people claimed that they were helpless because Taplek and Pokhariya does the same to Chherlung. Since people from Taplek and Pokhariya do not attend the meetings the matter has remained unresolved.

Postsowing wheat irrigation is undertaken once a month if it does not rain. Normally, wheat is irrigated about four times. The mukhiya is to be consulted and asked for one's turn. The mukhiya assigns turns as people come and ask him. The mukhiya prepares a list (mental or written) for the day. Shareholders irrigate their whole plot served by a certain channel, or even their total cultivated landholdings on the same channel. The entire water supply in the main canal (dolo pani) can be applied to a single holding. They even use some of the water

and the time given to irrigate their kitchen gardens. The mukhiya also can allocate a period for a particular section of the command only. This facilitates the smooth conveying of water from one place to another in the command area. In addition, individual negotiations and exchanges of turns occur.

When Chherlung's irrigation schedule was disrupted because Taplek and Pokhariya diverted water during the day, Chherlung resorted to following their schedule during the night.

3) Water distribution for maize

Prior to the introduction of irrigation, maize was grown under rainfed conditions on unirrigated bari. Unirrigated bari still can be seen nearby and across the Kali Gandaki River. Irrigation has enabled triple cropping on the khet lands. Irrigated maize is planted before the usual date sown in unirrigated bari to fit with the rice and wheat crops. When it is sown earlier, irrigation is required for seed germination and to control white grub. However, rainfall is unreliable at this time and the irrigation supply at the source is minimal. Thus, irrigation scheduling is essential.

The first irrigation for presowing maize is carried out either withstanding wheat, a few days before harvest, or immediately after wheat harvest. The mukhiya is contacted to request one's turn. The mukhiya will assess the intensity of the demand of water, the supply of water in the canal, whether it has rained or not, and whether Taplek and Pokhariya people are also irrigating. He then prepares an

irrigation schedule outlining the turns of all those who have requested irrigation water.

The turns are on a first come first served basis. If Chherlung does not have water to use then the schedule is shifted to the next day or the night. Each farmer can irrigate his entire field during his turn. Due to the scarcity and unreliability of water supply to Chherlung for maize pre-sowing, night irrigation scheduling takes place too. Usually, lands under Khildanda Sancho and Dhara Sancho are given the first turn to irrigate because of their smaller areas. And by doing so, the mukhiya need not bother about them later on.

After maize germination, most farmers delay irrigation waiting for the rains. They delay irrigating because they feel that in their type of soil water logging will occur and adversely affect the maize. Only, when hope for rainfall has been turned to despair do they use irrigation. Postsowing irrigation of maize may not occur at all. This irrigation turn also has to be requested from the mukhiya. By this time, annual maintenance work in preparation for rice is about to begin.

Some shareholders under the Khildanda sancho have access to another spring nearby and they grow pre-monsoon rice when everyone else grows maize. As a rule, no one is allowed to grow winter rice. So initially the Khildanda group gets minimal water as for maize. However, after the presowing irrigation for maize, since hardly any one is using water they also apply the water from the Brangdhi canal to their rice. For monsoon rice nursery preparation however, they cannot freely use the water from the canal. They have to wait for the

irrigation cycle of the main canal in tandem with the rest of the shareholders in Chherlung.

Resource Mobilization

Routine maintenance on the main canal is done in the end of May and early June. A new main proportioning weir (sancho) is made and installed if the old one has worn out. The mukhiya supervises and organizes the work and keeps the attendance records. Labour is mobilized according to shares. The amount one has to work is proportional to the shares owned with one share of water requiring one worker each day. Thus, resource contribution is property weighted. During the routine work, failure to provide the required worker entails a fine of Rs 10 during summer and Rs 8 for the winter. During emergency work (locally known as Maha jhara), a fine of Rs. 12 is levied.

During emergency maintenance work all shareholders regardless of the shares owned have to report for work. An example, emergency work is used to repair landslides.

Women are not permitted to work on the canal (reportedly due to the physical work and the misbehavior of men during work), nor do they directly participate in rituals at the place of worship in the kulo.

Cash, if required, is also raised in proportion to shares owned. The accounts (of shareholders' payments and labour contributions) are maintained by the mukhiya.

Conflict Resolution

If the shareholders cannot settle disputes themselves mutually and amicably, the grievances are taken to a member of the kulo Committee.

If he is unable to resolve it then the problem goes to the whole kulo Committee headed by the mukhiya. A major problem is tackled by the whole samaj (the general assembly). Water stealing is a problem and people caught stealing are fined ten rupees for the first time, twenty rupees the next, and even fifty rupees if caught after the second time. Watchmen not doing their duty are fined five rupees. People found dirtying the canal (because it is used for drinking) are also fined around five rupees for the first time, but twenty rupees for the second time. Those who refuse to pay the fines may have their utensils taken by force, or pawned, and returned only after the dues are cleared. Money from fines are used to pay the Kulo Pales and also pay those who worked extra during maintenance activities.

Since water stealing is quite prevalent, shareholders have to be vigilant during their turns. Stealing is apparently done by making illegal turnouts from the secondary or main canal. However, during the research period no one was fined although water "stealing" did occur and it was attributed to canal leakages.

In mid-December of 1986 during wheat irrigation, a few shareholders were reprimanded by the mukhiya because they irrigated without asking him and thereby upset the legitimate turn of a woman farmer who had prior permission. She did not complain to the men who were irrigating but reported to the mukhiya. Such situations are resolved by the mukhiya reprimanding the defaulters. The one wronged gets a priority turn before the others and those who defaulted are embarrassed.

A typical case of conflict occurred between neighbouring field farmers served by a small field channel. If a farmer wants to irrigate after all his neighbours have already done so, this may make the adjacent fields wetter and affect their wheat crop. The mukhiya therefore would like to see areas served by a single field channel irrigate together. Otherwise, the farmer who wants water would have to stand guard and divert minimal water so as to safeguard his neighbours.

The Chherlung group has been in conflict with other groups in the system prior, during and after consecutive amalgamation. In such instances, even though there are grudges among the shareholders within a single command area, they team up against the outsiders and portray a remarkable sense of collectiveness. The Chherlung group also was in conflict with the local government when the state bureaucracy was involved in the water allocation adjudication.

IRRIGATION MANAGEMENT ACTIVITIES IN ARTUNGA

Water Acquisition

Water from Bhulke spring is diverted down to a pond and collected together with water from the Brangdhi canal. Several shareholders clear the old canal, named Keradi Kulo, that delivers water from Bhulke spring. The distance from Bhulke is very short and diverting the water is no great task.

Artunga irrigators also participate in the annual cleaning and maintenance of the Brangdhi Tallo Kulo with the irrigators from Chherlung prior to rice planting. As mentioned earlier, the natural intake of Brangdhi Tallo Kulo requires little labour on the part of the

irrigators. The tail end of Artunga is nearly eight kilometers from this intake.

Water Allocation

Prior to the use of water from Brangdhi Tallo Kulo, there were no water allocation rules for use of water from Bhulke. The stipulation for the extension and the rehabilitation of Brangdhi Tallo Kulo was that both Artunga and Chherlung were to contribute equal labour from the panchayat border (i.e., the demarcation between Chherlung and Artunga) to the intake. The allocation of the Brangdhi Tallo Kulo water reflects the investments made in extending the canal to Artunga.

On a per person basis, shareholders from Artunga contributed nearly twice as much labour because their total shareholders numbered only half of that of Chherlung. In addition, the Artunga shareholders had to construct the extension from the panchayat border to their command area with their own labour.

The Artunga irrigators decided to contribute labour based on the size of their landholding that could potentially be irrigated by the extended canal. Fines were collected if the obligations were not met and the cash was used to hire labour to fulfil Artunga's commitment in the resource contribution. Water allocation in Artunga now reflects these original labour contributions which in turn were based on irrigable land size.

The series of negotiations to resolve the water allocation conflict between Artunga and Chherlung culminated in a begrudging compromise whereby Artunga was to receive 4 inches of the 59 inches of

water that entered the Chherlung command area. In other words, Artunga received less than 7 per cent of the Brangdhi water that was alloted for Chherlung and Artunga even though it has 15% of the combined command of these two units. Because of a smaller share of water for Artunga, its command is also smaller.

One "inch" of water was considered to be Rs. 100 of water on the basis of the traditional 55 inches representing 5500 rupees of investment. Thus, Artunga was to receive Rs 400 worth of water. However, for each "inch" of water, Artunga was obligated to contribute four labourers instead of only one. The total number of labourers to be provided by Artunga was to be sixteen. This was justified as the cost to be borne by the irrigators of Artunga for the prior investments made by the irrigators of Chherlung. This stipulation is similar to the increased obligations and junior water rights that Chherlung had to accept in negotiations with Taplek and Pokhariya. The latecomers clearly are expected to pay more.

Since Artunga had to provide sixteen labourers, they decided to make the total amount of water alloted to Artunga equivalent to Rs. 1600. Water was then allocated according to one's investment in the project (which was a reflection of one's expected potential irrigable land size). The water shares in Artunga therefore range between Rs.8.30 and Rs.181.53.

Water allocation according to sub-command's entitlement within Brangdhi Tallo Kulo takes effect primarily during the rice season. In the other seasons the total supply of the water is rotated among the different sub-commands normally following a head to tail pattern.

Artunga usually has to irrigate during the night and must arrange its water distribution following the irrigation pattern and timing of the other three sub-commands.

Water Distribution

Different irrigation practices are undertaken depending on the nature of the crop and the availability of water from the two sources; Bhulke spring and Brangdhi. Rules and norms regarding the timings of turns and priority of turns are laid down through the mutual understanding of the irrigators.

1) Water distribution for rice

Rice is a new crop grown in Artunga only after the extension of the canal from Chherlung. Its production requires coordination among the various water right holders who invested in the Brangdhi extensions. For rice irrigation, water is distributed according to one's share. Water is applied in turns among the irrigators belonging to the three sections of the Artunga sub-command: Mathillo Gaon, Pande Tol, and Magar Tol. The total time allocated to each section is proportional to the combined number of shares its shareholders possess. Within that total time, the individual shareholders are assigned time in proportion to their individual shares. This is coordinated and supervised by the section leader (sakha naike) in consultation with his shareholders. Due to water scarcity, the total water that is alloted to Artunga is diverted to only one of these three section at a time.

A sancho is used on the main canal just prior to entering the Artunga command area. Here it is used not as a device for allocating different proportions of water but as a gate to divert water to one of the three sections or another. During the rice season after rice transplanting, in a 24-hour period, Mathillo Gaon is entitled to five hours and forty minutes, Pande Tol is allotted eight hours and twenty minutes, and Magar Tol ten hours.

i) Water distribution during nursery preparation

Prior to acquiring water from the Brangdhi Tallo Kulo, few rice nurseries were prepared by the farmers in Artunga. Some did have small nurseries using water from the Bhulke spring. Other Artunga farmers planted their nurseries in Malunge which is situated lower than Artunga towards the river Kali Gandaki, about a half-hour's walk from Artunga. It has a perennial spring and rice is grown twice a year there.

The current mukhiya of Artunga has land there that he and his father rent to irrigators from Artunga to plant their rice nurseries. Another family from Chherlung also has land in Malunge and they too rent land for nurseries. The rent paid is rice seed equivalent to the amount sown in the nursery. The renter is responsible for the care of the nursery.

After the extension of the Brangdhi canal the Artunga farmers were supposed to receive water preparing their rice nurseries. However, there are several problems that make this difficult. First, many of the lands have a standing maize crop at this time. Second, the supply of water to Artunga at this time tends to be both small and

unpredictable. Even when Artunga was entitled to water from the Kulo, it was delivered only after Taplek, Pokhariya, and Chherlung had completed their nurseries preparation. This is too late for Artunga farmers to plant their nurseries.

In 1984, as part of the negotiations with Chherlung, Artunga asked for the whole canal supply to be diverted to Artunga to allow nursery planting. However, the actual supply was erratic and unreliable and the supply insufficient because the Chherlung users were preparing their nurseries.

Since 1985 the Artunga shareholders have reverted back to renting land in Malunge for nursery preparation. This situation is likely to remain unless a better supply can be obtained from the Brangdhi Tallo Kulo.

ii) Water distribution during and after transplanting

Prior to assigning turns for water during rice transplanting, all the irrigators are gathered together with the respective section leaders. The length of time for water application for each section is agreed to and the whole water, i.e., the 4 "inches" that is delivered to the Artunga command is rotated among the three sections.

Within each section, the shareholder of that area get together and assign turns amongst themselves. Priority is given to those who have their corn cobs ready for harvest and those who have less rice to transplant or have already made arrangement with borrowed or rented bullocks.

During the day, water is assigned to those who are transplanting rice and the total amount of water from the pond (which is a combination of both Brangdhi and Bhulke water) is used on one particular plot. A large volume of water is necessary for levelling and puddling the field such that it is ready for rice transplanting. The time is ascertained by the number of bullocks he is employing. At a single time several irrigators may divide the water amongst themselves for rice transplanting.

During the night, water is rotated from one section to another among those who have transplanted rice on a time basis in proportion to one's water shares. The less the number of irrigators who have transplanted their rice, the more the time for water application during the night. Those who are able to transplant earlier benefit to some extent this way. When all have transplanted, water is rotated among the three sections over a 24-hour period (see above). Water is allocated to each user according to one's shares.

To date, those who do not transplant rice and therefore do not use their water are not permitted to sell their water. The Artunga community feels that any excess water is to be used for the benefit of all. This reflects their feeling that they lost in the bargaining with Chherlung for the water to be allocated to them. The water unused by a particular farmer is mixed, so to speak, with the rest of the water and used by all. Each therefore receives a slightly greater amount of water. The shareholder who do not use their water during the rice season do not have to go for emergency maintenance work but do contribute to the routine maintenance. A fixed list is prepared for

each section that lays down the order and length of turn of each irrigator and this is adhered to. To alternate night and day turns, the order is reversed (which is referred to as "dubbling") every four days. This list is prepared after all the irrigators have transplanted rice.

The person who has just completed his turn informs the one next on the list. The list is passed on to the new user so that he can keep track of his time limit as well as inform the next in turn and pass on the list. This mode of communication works well and virtually all the irrigators comply. In Artunga, women were seen applying water in their fields, at times even during the night. These are women whose husbands have gone for work in India.

Since there are only 4 "inches" of water flowing in the main canal from Chherlung, there is little damage while transporting water. Seldom has a landslide occurred such that irrigation had to stop. Those who did not receive water while the canal is damaged and repairs undertaken have the first priority on the water. If during this time there is a good rainfall, some of those who missed their turn might opt not to irrigate. Having made these adjustments, the list is followed for continuing irrigation in the section.

Irrigation in the rice fields continues until a few days before harvest. This prevents crack formation in the soil and provides pre-sowing irrigation for wheat cultivation.

2) Water distribution for wheat

There has been a substantial increase in wheat production since water was delivered to Artunga from the extended Brangdhi Tallo Kulo.

Since completion of the rehabilitation and extension project, Chherlung has allowed excess, or unused, water to flow to Artunga. This water is used for wheat irrigation. Chherlung did not let water for rice irrigation flow to Artunga as long as the water allocation dispute was unsettled. Likewise, Chherlung did not allow, or require, Artunga irrigators to provide maintenance labour for the water provided during wheat irrigation. Chherlung irrigators felt that allowing Artunga to contribute labour and other resources for canal work would justify Artunga claiming water rights in the system. Since the water allocation dispute was settled Artunga has been contributing resources for canal maintenance and operation throughout the whole year as discussed in detail below.

Wheat has been planted in all the reclaimed khet and bari land in the command area after the extension of the Brangdhi Tallo Kulo. Artunga irrigators adjust their presowing and postsowing wheat irrigation in accordance to the cropping situation and the use of the water from the canal by the other sub-command areas. Within Artunga itself, the area is divided into three sections and irrigated as during the rice season.

From the first week of November the total volume of water from the irrigation canal flows to Artunga because the other command areas are not using the water. Therefore irrigation in Artunga can be carried out day and night. During this time, there is sufficient soil moisture in the other command areas.

After this time plots that have standing rice are irrigated because the canal water does not contain salts and helps in diluting

and leaching out the salts deposited in the soil by previous irrigation from the Bhulke spring water. After having irrigated the rice plots, fallow bari or khet lands are then irrigated during the second week of November. Maize had just been harvested from these fallow lands. A week later, plots that had harvested a mixed crop of maize and Jhilinge legume were irrigated.

During the last week of November or, the first week of December, millet (which is grown interspersed with maize) becomes ready for harvest. By this time, maize has already been harvested and irrigation is provided on these plots as millet is being harvested. Now, Chherlung is ready for presowing wheat irrigation and uses the water during the day time while Artunga irrigates during the night. Irrigation water is assigned to the former rice fields first since these were the first to be irrigated in November.

As during the rice irrigation season, the area in Artunga is divided into three sections. Mathillo Gaon receives two-eights of the water and Pande Tol and Magar Tol each receives three-eights. In actual irrigation distribution, this is translated as a certain number of night turns for each section based on their respective land areas. Thus, in a eight-night rotation, Mathillo Gaon is allotted two nights of irrigation water while Pande and Magar Tol are each alloted three nights.

Within each of these sections, the individuals contact the mukhiya for their turns for water. However, in Mathillo Gaon, the irrigators themselves assign turns and manage the water distribution without the assistance of the kulo mukhiya. This is usually on a first

come first served basis. However, priority is given to the farmer who needs it most or who has not yet irrigated. An irrigator is usually allowed a turn of twelve hours. If he completes irrigating earlier another irrigator can use the water.

At times when water is being used by Chherlung during the night, the whole water rotation schedule is shifted accordingly. During each person's turn, the irrigator usually goes to Chherlung to clean the canal, plug any leakages, and try to acquire as much water as possible for his turn.

For postsowing irrigation, the turns are assigned by either the mukhiya as in the case of Magar and Pande Tols or by the cultivators as in Mathillo Gaon. The person whose turn it is has to patrol the canal all the way up to Chherlung so as to bring more water in the canal. When a conflict does arise over irrigation turns, the mukhiya determines who is to get the turn by weighing factors such as the water requirement of the plant, the moisture condition of the soil, and the unavailability of water during one's actual turn. The latter factor can be influenced by canal damage or Chherlung irrigators deciding to use the water during that particular night.

Postsowing wheat irrigation in Artunga is determined to a large extent by the activities in the other sub-command areas. It is very hard for Artunga to follow a predetermined schedule because of the uncertainty as to when the upper areas might use the water, even during the night. Each sub-command area seems to operate on its own. Since there are no arrangements for coordination of irrigation distribution among the four sub-commands, it has been very difficult for Artunga to

plan ahead. Much to the credit of Artunga, it has managed its irrigation activities in reaction to external activities. To some extent, Chherlung also experiences this fate from the hands of Taplek and Pokhariya.

During a person's turn, he irrigates as much of his lands as he can, both the khet as well as the bari. The farmer is careful while irrigating his sloping bari, especially at night, because an excess amount of water can cause soil erosion and damage to neighbouring plots. Even during times of rainfall, irrigation is practiced.

Some improved, or management-responsive, wheat varieties were planted by the farmers in Artunga. These are of long duration and need more water. The mukhiya assigned priority turns for these varieties. Everyone's wheat received irrigation during the crown root initiation period and during the flowering stage. It was especially important to have received water at the crown root initiation period because the shareholders had used fertilizer during this stage.

Usually Artunga irrigates after Chherlung does. But at times, Artunga irrigators go all the way to the head of the system at Taplek during the night and bring water to Artunga if Chherlung has not planned night irrigation. The erratic availability of water for Artunga has undermined the Artunga mukhiya's credibility to represent and negotiate with the Chherlung irrigators or during the kulo meetings on behalf of Artunga.

3) Water distribution for maize

During wheat harvesting, an annual winter main canal maintenance work is undertaken. This canal work is known as sithe jhara. The

mukhiya from Chherlung summons the shareholders from Chherlung and Artunga for this jhara. Water rights holders from Artunga are obligated to participate in this maintenance work. The main tasks during this jhara work are to clean the canal, remove weeds, desilt and scrape away gravel, plug all leakages and make repairs that could not be done during the monsoon season. This jhara helps in bringing more water for the critical maize cultivation.

If there is no rainfall in Artunga during the maize sowing period, the situation is very critical on the khet lands. Late maize sowing in khet land causes difficulties for the cropping cycle on that of land. It is only in khet land that wet-rice is cultivated. If maize ripens late, due to late sowing, it can negatively effect the rice crop. This problem does not occur in the bari because there is not the urgency of rice transplanting. Therefore, irrigation priority during maize cultivation is given to khet lands and the bari lands usually are left waiting for rain. There is a scarcity of water in the stream itself during this time and it is very seldom that the bari fields receive irrigation water.

For the two years prior to the research, there was no rainfall and little water in the Brangdhi canal during maize sowing period. The Artunga people requested water from Chherlung Thulo Kulo and shared its water during the night. During the year of the study, there was rainfall during maize sowing period and Artunga did not depend on the Thulo canal. Use of the Thulo canal requires considerable canal maintenance to bring a worthwhile volume of water to Artunga.

During the maize season, Artunga is divided into the same three sections as for rice and wheat cultivation. Each subdivision is allocated two nights of irrigation. The mukhiya assigns individual turns for two of the sections which are near his residence. The section leader for Mathillo Gaon who also happens to be the ward chairman for Artunga assigns individual turns in his section, the area of his residence.

During water distribution for maize, khet lands are clearly given the first priority. Therefore, within each section, turns are first assigned to khet, followed by the bari lands of people who have water rights but had opted not to plant rice or who had no khet land. Only after these turns could other bari lands be irrigated.

Due to water scarcity and the need to set priorities, the key role of water distribution during maize cultivation is invested in the mukhiya and the ward chairman so that water conflicts and tensions can be minimized.

Resource Mobilization

Each Artunga shareholder is obligated to contribute labour at the rate of one labourer, locally known as khetara, for every Rs 100 worth of water or .25 "inches" of water. In this manner, a total of sixteen labourers can be mobilized on any particular day when routine maintenance on the canal takes place. For such maintenance work, overall supervision is provided by the Chherlung kulo mukhiya. He usually assigns a certain portion for supervision by the mukhiya from Artunga or the ward chairman of Artunga. The Artunga mukhiya keeps his own

record of the irrigators who worked. This is a check against the records kept by the Chherlung mukhiya for Artunga labour contributors. It also enables him to fine the defaulters from Artunga.

During their field channel cleaning, the leaders of the three Artunga sections supervise their sections as well as the common canal that extends from Chherlung to Artunga. This portion of the canal is not maintained by the irrigators of Chherlung. No heavy landslide requiring substantial labour or capital has occurred in this stretch so far. Seasonal maintenance is done during the wheat and maize seasons but this takes only a few days.

At times of emergency maintenance work called by the Chherlung mukhiya, all irrigators are obligated to participate. Several times Artunga was not notified and was fined for not supplying labour. To avoid this problem, Artunga has hired a person from Chherlung to inform them whenever they are summoned for emergency canal maintenance work. This messenger is paid Rs 10 each time he informs them.

When Artunga is using water for irrigation, a few irrigators check for leakages and damages along the main canal so that there is minimum loss of water. It is usually the one who is to irrigate that day or night who makes such checks. This is in addition to the activities of the pale whose duty is to check and repair such leakages. The extended portion of the main canal needs to patrolled because the Artunga irrigators have not been able to enforce strong supervision over the pale to inspect this extension. This portion of the main canal has been left virtually as the sole responsibility of those from Artunga.

Defaulters are fined the rate prescribed by the kulo samiti since it is that rate for which the mukhiya from Artunga will be liable if his irrigators do not show up.

Though women did work in clearing and cleaning field channels and applying water during the day (and occasionally at night), the kulo samiti and samaj prohibited them from working on the main canal.

Conflict Resolution

Irrigation conflicts had occurred prior to using water from Brangdhi stream. Conflicts were resolved by fellow neighbours. Some of the residents of Artunga left because they did not see agricultural occupation being viable there, and access to water from Bhulke spring for rice irrigation was unreliable, uncertain and conflict ridden.

As mentioned above, Artunga was involved in water allocation disputes with Chherlung ever since the project was considered to be complete. Artunga still is in conflict over the timing of water deliveries -- directly with Chherlung and indirectly with the other two sub-commands. This conflict occurs periodically during the maize and wheat seasons and is resolved in several ways. Artunga attempts to determine from the Taplek and Pokhariya people when they will complete their irrigating and then strikes a compromise with the Chherlung irrigators to use the water. Or, they carefully watch the Chherlung shareholders to see when they are finished irrigating. Often, Artunga ends up irrigating during the night. Sometimes, Artunga collects the water into a small pond at night and then irrigates from the pond during the day. During the monsoon period, the water from Bhulke

spring is also added to the pond. In extreme cases, they also beg water from the Thulo Kulo.

During the year of this study, several irrigators from Artunga were challengers in the election for the post of mukhiya. They alleged that the current mukhiya was not representing Artunga's interests and did not bargain well during the canal meetings. However, the mukhiya's father rallied support, including that of the ward chairman and reinstated his son as the mukhiya.

As mentioned above, there was conflict over Artunga's attendance during jhara, especially emergency ones. In 1984, the Chherlung mukhiya along with the tharis of Chherlung fined Artunga Rs 4100 for the amount of labour not contributed when several jharas were summoned. Artunga argued that they were not informed about the jharas and therefore did not attend. Chherlung argued that by the time they were informed and arrived much of the work was already done. Artunga petitioned the district panchayat to intervene on their behalf. The mukhiya from Chherlung along with other shareholders of the kulo samiti and representatives from Artunga were summoned to the district panchayat office by the Chief District Officer to settle the conflict. A compromise was reached at a fine of Rs 2500 instead of Rs 4100. The negotiators then decided that only in extreme cases would maha jhara, or emergency maintenance, be organized. Also, Artunga had to arrange for a messenger to inform them of a jhara when one is announced by the Chherlung mukhiya.

PROPERTY AND STATE IN BRANGDHI TALLO KULO

What does the case study of Brangdhi Tallo Kulo illustrate regarding state, locality, and irrigation property? This section of the chapter deals with this more generalized interpretation of the case.

PROPERTY CREATION

The case study shows that both state and locality have been active creators of irrigation property. The original property rights were created through the combination of local actions and state support. Recently, state actions were crucial to the creation of irrigation property rights for Artunga. But even in this case, local actions by Chherlung did much to shape the actual rights of the Artunga group. Throughout the history of Brangdhi Tallo Kulo, there were incentives for various actors to create this property.

The nature of acquisition of property rights once state or public funds have been utilized is a bone of contention for irrigation engineers and bureaucrats. They feel that such public investments should not entail the privatization of water rights that can be sold and benefits from public investment acquired by private water right holders.[3]

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[3]This view was expressed by irrigation engineers and bureaucrats of the Rasuwa Nuwakot Integrated Rural Development Project in Central Nepal when they visited Chherlung. Chherlung had wanted Artunga to buy water from them. In response to this viewpoint, the Chherlung villagers asked the engineers and bureaucrats if they would sell their land and houses at a higher price if the government built a road alongside their property. This silenced the state champions.

Many property rights and relations were created by the localities themselves through pioneer investments in construction, or through negotiations with payments to those who had prior rights. Subsequent generations, or latecomers, have acquired property rights through inheritance, purchase, and additional investments. Initially, raikar and kipat land tenure in Chherlung and Pokhariya facilitated individual or group initiatives in extending or constructing canals since the investors were in a position to benefit directly.

As mentioned in the earlier chapter, the decree from the centre that permitted Chherlung to continue constructing the canal with a three yards wide rights-of-way along the alignment was a case of the state granting property rights including continuing access.

Objects of Property

The hydraulic artifacts of Brangdhi Tallo Kulo are the common property of all who have a right to water from them. Examples of these hydraulic structures are the intake, main canal, aqueducts, field canals, proportioning weirs, and the pond in Artunga. Some structures are common to the entire group while other structures belong only to sub-groups within the kulo. For example, the pond is the exclusive irrigation property object of the Artunga irrigators only. Likewise, the field channels are the exclusive artifacts of those who are served by them.

Some of the objects are devices to actualize water rights, i.e., the sancho. Changes in water rights necessitate changes in the sancho by adjusting the different notches of the proportioning weir.

Actions must be taken to sustain and repair these property objects. Hence, we observe, as described earlier, the elaborate resource mobilization rules and procedures.

Property Rights

Each sub-command acquired water rights by virtue of having invested in the system through labour, cash payments, and/or agreeing to future and continuing re-investments. These sub-commands are physically linked to one another through the fact that they draw water from the same intake and make use of a single canal. However, that physical linkage must be seen as the outcome not the cause of the property structure that underlies it. These property rights have been negotiated over time among the different groups thus creating and maintaining a common group of users organized in a hierarchy of senior and junior rights holders.

In Brangdhi Tallo Kulo water rights are a commodity that can be sold or rented within limits. They are also an item that can be given or inherited. In Chherlung, the price is fixed by the samaj which behaves like a monopoly in this regard.

In the canal water is common property whose control and use is governed at the community of users' level. It becomes individual property when it enters a user's field.

Possessing water rights does not give full liberty to do as one pleases with the water. There are constraints and liabilities. Pre-monsoon rice cannot be grown. One has to be vigilant for possible gully formation and land erosion while applying water. The transfer of

water to other command areas is prohibited. This group coercion guarantees security in water rights for the command area. The powers derived from possession of water rights is thus not forfeited to other command areas through water transfer. Such exclusionary policy enhances security derived from water rights to a specific command area. Where water can be alienable on an individual basis, it is not alienable from the "command area" entitlement.

The pani purja lagat is significant in that it serves as a public record of water rights. It indicates the name of the weir from which the watershare is utilized. This compilation is property based and serves a useful purpose for verifying the entitlements held under a weir, by an individual or household, and the transactions undertaken.

The role of the mukhiya is primarily geared towards operationalizing water rights during the different cropping seasons. We saw how the mukhiya assigns turns and priorities for rotations among the different shareholders. He adjudicates water disputes and represents his sub-command while negotiating water from other sub-commands.

The complex water distribution rules reflect both rights and agronomic realities. As mentioned earlier, the different water-land ratio influences the way water is distributed. Due to water shortage, elaborate rotations of water turns are carried out in response not only to the sub-commands cropping pattern but also in response to water availability from main canal while other sub-commands irrigate.

Property Relations

The relationships among sub-commands and among individual irrigators within these areas largely centers on irrigation property

rights rather than other forms of social relations, e.g., kinship, patron-client relationship, or caste.

One's irrigation property status, represented through ownership of water shares, establishes a diverse set of derivative relationships. These shares entitle an individual to be a member of an irrigation group to cooperate and compete with other groups using the water of Brangdhi and to request, resist, utilize, or modify various state actions.

Property relations between canal groups are created and represented in the placement of intakes. These relations, or rights, are sanctioned both by the state and by customary rulings. Prior appropriation is socially endorsed. Negative sanctions apply if the rights of a share holder with respect to water is violated. Water thieves are fined by the committee.

PROPERTY RIGHTS AND IRRIGATION DUTIES AND TASKS

1) At the Level of Sub-commands

Within each sub-command, system tasks have been devised to reproduce property rights and provide benefit from them. The basic social processes of Brangdhi Tallo Kulo --maintenance procedures, water allocation and distribution, and conflict resolution --bear property images.

These water rights, property relationships and associated obligations and duties govern Brangdhi Kulo's maintenance procedures. Control is in the hands of the Chherlung shareholders, the group with the largest block of water shares. This occurred through the various

negotiations and arrangements among the different irrigation groups that comprise Brangdhi Tallo Kulo. Though Chherlung had to provide an inordinate level of resources on behalf of both Taplek and Pokhariya, it gained by translating responsibility into control. Chherlung irrigators have considerable power over the canal once the senior rights of Taplek and Pokhariya are satisfied. Taplek has the senior-most rights in the Brangdhi Tallo kulo by having invested in water acquisition and canal construction before any other group in the Brangdhi Tallo Kulo. Taplek had also shared its water with Pokhariya and Chherlung with stipulations regarding a greater resource contribution from the newcomers. Operation and maintenance costs and responsibilities were to be borne by additional newcomers, in this case, the group of irrigators from the new command. In carrying out its responsibilities, it acquired power to influence and determine the day to day affairs of the canal. Its overwhelming shareholders compared to other sub-commands provides a greater solidarity and capability for canal management.

Differential resource contribution towards the maintenance of the hydraulic property is governed by the historically negotiated water rights and related state actions. Conflicts between sub-commands revolve around water rights. The associated obligations for a particular water share differ from one command to another. The different functionaries created for the purposes of resource mobilization and water distribution serve the purpose of reproducing property and translating one's rights into actual use.

2) At the Level of Individual Shareholder

The continued fulfillment of obligations associated with one's right guarantees the reproduction of that right. During canal maintenance, each shareholder is obligated to provide labour or cash either on the basis of shares owned or just on the basis of possessing watershares as in the case of emergency canal work.

Individual shareholders have to maintain their own weirs and field channels. Unlike in the main channel, the distributory and field channels are the sole responsibilities of the direct users.

STATE INTERVENTION

The recent history of Brangdhi Tallo Kulo shows that the state intervened without regard to the existing property structure. This led to conflicts between the people of Brangdhi Tallo Kulo and the newcomers of Artunga. In its plans and actions, the state gave no explicit recognition to the prior investments of local people or the property structure which shaped their existing irrigation system.

As noted in Chapter Four, those who were not shareholders in the canal group or even potential water right holders were made members of the construction committee. In fact, the chairman of the committee was a non-shareholder. In short, the project was implemented without taking into account the existing property structure. The main actors in the project were chosen because of their political roles in the state apparatus not because of their roles as property owners in Brangdhi Tallo Kulo.

Efficacy of State Involvement

State intervention is not always tolerated or successful. Local groups do question the legitimacy and efficacy of state involvement especially when the existing property structure is seen by the current beneficiaries to be de-structured to their disadvantage. Those expecting to receive new rights and benefits are also disillusioned by state actions when results belie anticipations, as was the case for Artunga.

Initially, when Chherlung Tallo Kulo's intake was in disrepair and when that canal's shareholders wanted to have Taplek-Pokhariya kulo's intake also serve Chherlung kulo by joining the alignments, the district administration intervened in the negotiations on behalf of Chherlung Tallo Kulo. This intervention in the negotiations was resisted by the Taplek and Pokhariya canal shareholders. The locus of negotiations was retained among the contending parties both formally and informally. However, the shareholders of Taplek and Pokhariya also felt that it was not wise to alienate the district administration for fear of being penalized by denying future funds for "development" activities in the canal or in the village panchayat. Thus, the irrigators from Taplek and Pokhariya agreed to share water with Chherlung but under the arrangements mentioned earlier.

Later, during the Chherlung-Artunga water dispute, the district administration was involved in the negotiations for water allocation to Artunga also with very little success. Ultimately, the district and village panchayat officials were asked to leave the contending parties, Chherlung and Artunga, to settle the matter themselves. The state

agreed to this even though it had invested in the canal extension, perhaps because its interests were in demonstrating visible development activities (i.e., the extended canal) and not in the details of system operation. With the state removed from the process, the Chherlung and Artunga groups were able to reach an agreement utilizing local processes and precedents. These agreements while perhaps appearing unfair to the Artunga group, clearly reflect the existing property structure of Brangdhi Tallo Kulo and repeat the earlier used principles for incorporating newcomers.

Nature of Implementing Agency

The state agency responsible for sanctioning and funding the rehabilitation and extension of Brangdhi Tallo Kulo to Artunga, as mentioned in Chapter Four, was the Ministry of Panchayat and Local Development. An implicit function of this ministry is to enhance the legitimacy of the partyless panchayat system by making it the vehicle of local level grassroot development. Needless to say, the crucial actors in the development projects undertaken by this agency are the panchayat system's local leaders and representatives. Funding of local level projects through the panchayat enhances the local leaders prestige and the potentiality of being elected again. It also "strengthens" the political system in a number of ways: i) granting patronage to its adherents, ii) stalling local resistance to the political system, iii) establishing local power alliances, and iv) making the system indispensable for local level "development" works and consequently eroding self-reliant group efforts. In this case, the

panchayat was interested in "building" the visible canal but not interested in settling the Chherlung - Artunga dispute. This is clearly a no-win situation for the local groups.

State as Benefactor and Adjudicator

While, as mentioned above, the state is sometimes asked not to be a participant in settling disputes, it is sought for redress of grievances when conflicts (often property related) cannot be resolved by the contending parties at the local level. This can set the process for the state to be invited into resolving local affairs. Over the years, contending parties have sought different wings of the state apparatus for adjudication.

The state acted as a crucial arbiter or adjudicator during the initial conflict between the Tansen municipality and Chherlung farmers in the 1930s. The state's endorsement of the property rights over the canal and land that lay along its alignment was very crucial for the legitimacy of those rights and for the future revenues or benefits accruing from such rights. The terms for enjoying these rights were however laid down by the state apparatus by way of responsibilities, obligations, and liabilities.

SUMMARY

Each sub-command in this system is socially unique while also sharing some common features with the others. Each had a distinct history prior to merging with what is now called Brangdhi Tallo Kulo. Through this history, each has developed its own rules and regulations

for fines for resource mobilization, water allocation and distribution, and conflict resolution. In short, each area has its own property history and property dynamics.

Some common principles shared among the sub-commands are: i) property rights are related to investment and ii) there is a need for re-investments in order to maintain the rights. Differences among the sub-commands occur because these various groups apply the common principles in different times and circumstances.

A historical examination of Brangdhi Tallo Kulo showed the acquisition of water rights through initial investment, inheritance, purchase, or state action (in the case of Artunga). Irrigators of certain sub-commands negotiated for water rights at a cost which translated into labour and monetary costs as well as management costs of operating and maintaining the system. Newcomers always received rights junior to those of the prior shareholders.

State intervention can have positive and negative impacts on different groups of irrigators within a single irrigation system. Early state intervention in granting rights-of-way to the irrigators had a positive impact because without such state support the initial creation of the system might not have taken place. Later however, the financial investment in the extension project to Artunga threatened to undermine the strength of the existing property relations. This state action did lead to a restructuring of property rights and relations.

A negative result of the state financing was local conflict between potential losers and gainers. State action was obviously

welcomed by Artunga which stood to win by the state's actions, but was not welcomed by Chherlung irrigators.

This interplay between state actions and local property structure resulted in a new set of property arrangements with Artunga irrigators as the most junior rights holders who stand in a certain relationship vis-a-vis others in the system. This position is reflected in their water rights and maintenance obligations. The organizational make up, roles, and system activities have changed in the case of Brangdhi Tallo Kulo to take into account this new configuration of property relations and rights.

We now turn to examining the case of Phalebas Tallo Kulo in Parbat district.

CHAPTER VI

PROPERTY AND STATE IN PHALEBAS TALLO KULO

The previous two chapters dealt with the evolution of Brangdhi Tallo Kulo where each sub-command area had a history and autonomy of its own. The negotiations for water rights, the organizational elements and the functioning of each of the autonomous units were also examined. Finally, the role of state intervention and property rights in Brangdhi Tallo Kulo was discussed.

Similarly, this chapter will deal with the evolution of Phalebas Tallo Kulo and the role of the state within it. Its current organizational elements, its functioning, and the development of water rights will be explored. The evolution of the irrigation system here is different from the earlier case study in that, instead of consolidation of preexisting autonomous systems, it is basically a system that has decentralized or disaggregated to the extent that each rotational area is relatively autonomous and the overall system more loosely connected. This chapter will conclude with the examination of the role of state intervention on property rights in Phalebas Tallo Kulo.

There are several farmer-built and managed irrigation systems in Phalebas village of Parbat district. Phalebas is a river terrace (tar) and lies on the bank of Kali Gandaki river. The topography of Phalebas consists of two flat areas (sub-terraces) like steps in a stairwell. They are referred to as upper and lower Phalebas. Many of these irrigation systems were built several decades ago. Most of them function only during the monsoon season for irrigating rice since the

sources of these systems are dry during winter. One system that does have irrigation during summer as well as winter is the Tallo Kulo. Before exploring the recent state intervention for rehabilitation and extension of Tallo Kulo, the nature of this farmer managed system and its relation to another system, Peepale Kulo which was built prior to Tallo Kulo will be discussed.

HISTORICAL INTRODUCTION[1]

Phalebas tar had no irrigation during the early 1900s. Small irrigation commands occurred near monsoon streams in the lowlands by the river. The topography of this tar, as with others, set high above major rivers or streams, meant that if canals were to be built for the area, a distant water source had to be sought with the proper gradient for gravity flow. Many of the local elites in Phalebas had land in the lowlands and cultivated rice. People living in lower Phalebas were far below the monsoon streams. The people from Peepale (situated in upper Phalebas) and lower Phalebas jointly constructed a canal (called Peepale Kulo) on a seasonal (monsoon) stream for rice cultivation. This was completed in 1927. The canal passed through Peepale tar first and then to lower Phalebas. At Khaula, there is a strategic point from

[1]The information for this section was compiled from local historical documents, court cases, petitions, and oral reports. There are many versions to the various details of litigations and the evolution of the canal's organization. Needless to say, the version depended mainly on which faction the reporter belonged to or supported. As far as possible this oral information was cross checked with the written documents. The historical information is from attested copies that are currently in the possession of some of the local functionaries. The history of the canal is replete with conflicts and litigations. There are a few people still alive who are very cognizant of the intrigues and complexities.

which to divert water to many different places on the upper and lower tar. After the success of the seasonal Peepale Kulo, some people of lower Phalebas thought of constructing a canal drawing water for lower Phalebas from a perennial stream.

Around 1928 during the Rana autocracy, the then Rana Commander-in-chief visited Syangja headquarters, the district of which Phalebas was a part. During such visits, the Rana chief would hold court or audience and the commoners would come to petition him for whatever reason. Petitions ranged from court decisions to basic necessities of their village life. In such meetings it was usually the local functionaries and elites who were granted audience. Present day local villagers report that a certain legal expert of a prominent Upadhyaya brahmin family in Phalebas proposed to the Rana commander that if he were given Rs. 9000 he would make drinking water available to the people of Phalebas. At the same time, another local functionary, Jimmawal Bisaya Panta Chettry made a counter offer to the Rana Commander. He indicated that if he were given that much money he would provide irrigation water to Phalebas and that the state coffers would increase due to increased land revenues. The Rana accepted the latter proposal and ordered him to construct a canal and for the local people to provide the necessary labour. The Jimmawal was exempted from paying taxes on trees that had to be cleared en-route. He was to build the canal at his own cost and was to report to the commander after the completion so as to receive his reimbursement. The local functionary was in fact given a contract by the state to construct the canal at his own risk but with the labour of the people. His incentive was that

more irrigated land would be under his jurisdiction as a local tax-collector and he would thus profit directly.[2] The incentive for the state was that it did not have to provide the initial money and bear the risk. Also it would collect more taxes once the lands were irrigated. Thus, the state was able to induce irrigation development without having to risk its own money.

The Jimmawal did not possess all the money necessary to undertake such a venture. So, he called upon his fellow villagers to help him in this enterprise. As mentioned above, several years previously, the Peepale Kulo had been constructed and people were encouraged at the prospect that lower Phalebas could also be irrigated by an additional canal. The Jimmawal along with other villagers willing to participate in the construction of the Phalebas canal prepared a list (called sameli) of all those willing to participate in becoming a coshareholder of the canal. The sameli was drawn up in 1929 and had eighty five participants. Each participant was to contribute however much he or she could afford and upon the completion of the project and receipt of the reimbursement, each was to be reimbursed according to the investment made. Investment in the form of grains, spices, tools and cash, were made for the expenses of the work team. Expert agris were hired to undertake the construction project.

The construction was completed in 1930 despite conflict with the people of Armana, an upcanal village which would not give them the

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[2]Our discussion on the role of the state in irrigation expansion in Chapter III showed the benefits of the financial incentives to being granted a contract. These terms were negotiable in the process of undertaking the irrigation project.

right-of-way for their canal through that village. The physical fights with the Armana people deterred the agris from their work and they threatened to leave. The matter was resolved when the Armana people were given land near the Kali Gandaki river by the people from Phalebas in compensation for rights of way.[3]

After completion of the canal, approximately three years after its start, the Jimmawal reported to Syangja headquarters and an inspection team was sent by the district administration to verify and survey the reclaimable land. During the inspection, there were two factions in the locality. The faction led by a local legal expert was cynical about the possibility of water being conveyed from the streams to Phalebas and said it was impossible for water to be delivered there. The other faction was led by the Jimmawal along with several hundred people from Mudukuwa, near lower Phalebas. The Mudukuwa people were not involved in the construction but swore that they saw fish being carried from the stream to Khaula. Apparently it was their hope that this exaggeration would help in endorsing the canal as being complete and that the reimbursement would occur. They also hoped that because of their having taken sides with the original investors in the canal, they too would be allowed to join in utilizing the irrigation supply.

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[3]However, this deal was never carried out because the Armana people thought that they should not "starve" the people of Phalebas. They ignored the arrangement to gain "religiosity", so they say. Others at Phalebas believe that since the people in Phalebas outnumbered those in Armana, the people from Armana were intimidated and did not pursue the conflict. Moreover, Phalebas had the standing blessing from the Rana commander for the smooth construction of this canal such that even forest or tree tax for trees cleared along the alignment had been waived.

The inspection team accepted Jimmawal's stand and surveyed the whole area of lower Phalebas as khet land. It was registered with the land revenue office even though water was inadequate to serve all of the registered 12,571 mato muris (157 ha) of "khet" land.[4] This was to the advantage of Jimmawal because he could collect the higher taxes on these lands, if given permission by the state. This set him in conflict with some of the villagers who were now legally obliged to pay the tax increase even though there was no guarantee of water delivery to their land. What ensued was a series of litigations among the different factions.[5] In spite of the common goal of harnessing water from the streams and applying it to their respective fields, conflicts of interests occurred portraying the heterogeneity of the community of coshareholders. Due to these conflicts, irrigation from this canal was hardly carried out. The farmers feared tax increases without adequate supply of water. This situation went on for over a decade. The canal was not maintained and was in disrepair.

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[4]After it was confirmed that the canal was in fact constructed, Lt. Dal Bahadur of Kusma cantonment was instructed by Kathmandu to deliver Rs. 7000 instead of Rs 9000 as reimbursement from the state. Rs. 7000 was the cost borne by the shareholders in the construction of the canal. This money was used for strengthening aqueduct structures in the canal by the community of shareholders.

When land was registered as khet, the tenants or occupancy rights holders were obligated to pay a higher land tax or could face eviction for defaulting.

[5]The chronology and the details of the litigation and the final verdict by the Rana Commander in Chief reported in this section is documented in the decree issued by the Commander in Chief to Syangja headquarters. A few of the present local functionaries in Phalebas have attested copies of this document bearing the Khadga Nisana, the official seal of the Ranas.

There were cases filed in 1931 against the first inspection team leader, Lt. Dal Bahadur by villagers who rightly did not want to pay taxes on land that they were not sure would receive water. At that time, those who alleged to been wronged by government officials had the right to file cases against the officials to make them accountable not only to the state but also to the one wronged. More than sixty villagers complained against the inspecting lieutenant stating that he, along with the Jimmawal, intimidated the villagers and reported that there was sufficient water when in fact there was little.[6]

The faction led by the local legal expert filed a case against the Jimmawal in 1944 stating that there had not been proper maintenance and repair of the canal since its completion in 1930. He stated that there was hardly any water flowing in the canal and thus the Jimmawal has brought about a loss of nearly eight to nine thousand rupees for the state. An inspection team was again sent in 1944 headed by the same lieutenant of the first inspection. The team noted that there were no caretakers for the canal and that there were many leakages along the alignment. Many of the villagers, along with the Jimmawal, promised to pay the taxes on their land if in fact more water was supplied. The case had been referred to the Hill Administrative Branch and to the

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[6]The villagers use the terminology of "ghatta pani" for volume of water with the capacity of operating one traditional grindstone watermill (roughly 28 liters per second). The lieutenant had reported that at the source of the canal there were six ghatta pani and in Khaula where it is divided there were three ghatta pani. The villagers said that this was not true and that there was hardly one ghatta pani at Khaula. If it could be reported that there was adequate water in the canal then the Jimmawal would obviously stand to win and profit. More land that he could collect the taxes at the irrigated land level would be under his jurisdiction.

Krishi Parishad, which was the forerunner of the present Ministry of Agriculture.[7] The Krishi Parishad noted with dismay that the Land Revenue Office at Syangja had not followed the matter closely and had not checked the land during the rice season to determine which lands were irrigated and which were not. In support of the details supplied by Syangja headquarters regarding the poor condition of the canal, the Parishad recommended to the Rana Prime Minister that two caretakers (chitaidars) be employed at sixty rupees each per annum. This cost was to be borne by the state itself. Such actions on the part of the state did not form a sufficient basis for creating local roles. Also, the Land Revenue Office of Syangja was to be fined one rupee for its negligence and irresponsibility.

The chitaidars were recruited. However, the Jimmawal notified the Revenue office that in spite of the repair and maintenance hardly any water could be conveyed along the canal during the winter. Jimmawal knew that both the people as well as the state were displeased.

Nearly sixty other farmers filed a case against the lieutenant in 1944 after the second inspection stating that he continued to uphold the previous land survey registration of 12,571 mato muris (157 ha) of land and that he was irresponsible in maintaining the canal even though the money was sanctioned by the state for the chitaidars to carry out rehabilitation. He was accused of not paying the labourers, not doing

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[7]The Hill Administrative Branch came under Sadar Dafdarkhana, a central office in Kathmandu directly under the Rana commander. This office took care of matters relating to land revenue. Krishi Parishad had just been formed and matters relating to agriculture were sent for their advice. This office would then recommend to the Rana commander any necessary steps. It functioned as an agricultural advisory board.

a good job of rehabilitating the canal, and falsely reporting adequate water at Khaula. In short, to get the state's attention, they alleged that he had brought about tax losses due to the poor repair of the canal.

The faction led by the local legal expert filed yet another case in 1944 against the Jimmawal stating that he had encroached on public land and that he did not repair the canal adequately. Such encroachment on public, or common, property posed a serious threat to the community at large and especially the wealthy in the village who grazed their cattle on these lands.

A delegation of farmers from Phalebas went to Kathmandu in 1945 to plead with the Rana Prime Minister to revoke the land registration. After reviewing all these cases, the concerned offices of Syangja district headquarters and the people of Phalebas were notified by the office of the Commander in Chief, towards the end of 1945, that lands were to be inspected during the rice season. Only those with water were to be registered as khet along with any lands where people already had pledged to pay khet taxes. The canal was to be maintained by two caretakers and if there were repairs to be made, the additional money was to come from the district headquarters.

The decree from the Commander in Chief's office also stated that the legal expert from Phalebas was known to cause trouble for the villagers. Thus, if in the future he did so for more than twelve times he was to be punished according to the penal code. This was unexpected because the legal expert was a powerful local leader and it was not in the interest of the state to alienate him. Thus, we witness

considerable state involvement in shaping the fate of the irrigation system in Phalebas.

The villagers though joyful of the decisions were very distrustful of one another. Jimmawal was frustrated with the whole thing and had spent considerable money just on the court cases and now had many enemies. Unfortunately about this same time, his son passed away. Within the same year of his son's death in 1946, he left for Assam (India) in grief and the canal was rendered virtually inoperative without anyone to take the lead.[8]

Bisaya Pant, the former Jimmawal, returned in 1953 having earned some money. He found the canal in disrepair and wanted to rehabilitate it and renew his claims and status. By 1954, he had spent all the money he had earned on canal rehabilitation which the other original shareholders had not helped him to finance. The agris employed by Bisaya Pant threatened to leave after repairing the intake at Bungdhi stream.

At this point, some of the previous shareholders collected money and retained the agris. They took the leadership away from the old

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[8]During his absence, another local elite took over as the new Jimmawal. Not much occurred by way of continued maintenance of the canal. People informed me that this was a time of political upheaval and transition and the decrees of the Rana Commander in Chief were not upheld continuously. In 1951 the autocratic regime of the Ranas was overthrown. The employment of the chitaidars was discontinued and the canal barely delivered water. Some of the influential people of the faction led by the local legal expert controlled the water of Peepale Kulo at Peepale tar and hardly any water from this canal was used by lower Phalebas. After Phalebas Tallo Kulo was rehabilitated by the people in 1955 (to be mentioned later), an agreement was reached between the irrigators of the two canals. It was precisely because of some powerful people controlling the water since they happen to be at the head-end (or source-end as they call it in Nepal) and the ensuing conflicts that an agreement for proper water sharing had to be drawn.

Jimmawal (Bisaya Pant) and began taking an active part in the supervision of the reconstruction of the canal. This renewed action was orchestrated to a great extent by the new Jimmawal so that additional reclaimed land could be under his jurisdiction.

This new group took several measures to establish their previous rights. Their claims to their earlier investments were accepted by the community at large as the granting of rights to those who have invested was customary. The original sameli, and its signatures, acted as a legal document which had validity and recognition in the courts of Nepal, if contested. More importantly, the sameli had social recognition within the community of Phalebas. They were sure that additional resource mobilization would bring irrigation water to Phalebas Tallo Kulo. The new group felt that the canal could operate effectively under their leadership.

In 1954, the original sameli was taken from the previous Jimmawal, Bisaya Pant, and a new sameli was prepared on the basis of the 1929 one. However, all the original water right holders, had to contribute half of what they had previously invested. Anyone else who wanted to become a member would have to contribute more, equivalent to the investments made by the original shareholder. If a person had invested Rs. 50 during 1929 then he was obligated to contribute Rs. 25 in 1955 or else he would forfeit his water entitlement. If he found someone else willing to contribute the required money on his behalf, the person's original right was upheld. It was up to the two to settle how much water each was to get or if the payment was merely a loan.

However, whatever arrangement these people entered into had to be reported to the core group who had taken control of the kulo.

The resource needed at this time was primarily cash. This resource mobilization process increased the pool of resource contributors and concomitantly the number of shareholders. In the history of Phalebas Tallo Kulo, this was the second time when access to property rights in water was facilitated by the necessity of amassing resources for the operation of the nearly defunct canal.

This new control group set a date by when all those who had contributed resources during the initial construction had to submit their receipts as evidence. Those who failed to show their receipts forfeited their entitlements. There were several who actually forfeited their entitlements because they had either lost their receipts or else had been away to India during the time when the receipts were due. The decision regarding entitlements were made final based on one's ability to present the receipts in front of this new caucus.

This group also forced the previous Jimmawal to surrender his authority to supervise and control the canal to one of the influential men of this new group. This was done in writing.

Those not with the new group realized their precarious position. A certain retired captain who had fought for the British during World War II had this new group call a meeting of the general body of the canal members to discuss the canal operations now that resources had been collected and the canal had been rehabilitated. He asked to see the new <u>sameli</u>. He then refused to give it back saying that it needed

to be crosschecked with the original sameli. Most of the shareholders, who were apprehensive of the new group's actions, concurred. The captain refused to give the sameli back until clear cut rules and regulations were developed for the canal operation. He forced the new group to make him the chairman of the canal committee. They conceded knowing that most of the shareholders supported the captain. The new Jimmawal also did not want to be seen as having gone against the wishes of the majority of the shareholders.

After crosschecking the samelis of 1929 and 1954, a new sameli was formed with new rules. In addition, a new committee was formed. This occasion also was used to check if the rules laid down in the previous samelis were followed or not. Special attention was given to the rule stating that if anyone wanted to sell his or her water shares, the seller had to do so with the consent of the other water right holders. Through this rule, the existing water right holders controlled water transactions. Also, members got preference over non-members for the purchase of the water. And, control over the locations where irrigation could be used was maintained. This was important since new members at a distant place would impose greater transaction costs to the organization as well as greater conveyance losses.

The recent canal history, with its intrigues, had made everyone cautious in maintaining the power and control among themselves. Thus, the sameli of 1955 was written with new rules outlining: i) fines for those who do not provide maintenance labour when summoned; ii) fines for those who dirty the canal water; iii) rules for water allocation measures during winter and summer; and iv) rules regarding transaction

of water by sale and purchase that required the consent of all present shareholders.

Thus, the Phalebas Tallo Kulo was constructed in 1930 with its alignment lower than the Peepale Kulo and serving areas below the Peepale tar. The agreed relationship between the two Kulos is documented in a signed agreement of 1957 between the water right holders of the two canals.[9]

Many of the water right holders who entered into this contract (to be explained below) had shares in both canals by virtue of having invested in the construction of both. A majority of the share holders had attested to the agreement by their signatures. Out of the total of 105 who did sign, 47 were shareholders in Tallo kulo only, 2 in Peepale only, 54 had rights in both canals, and 2 could not be identified. Thus, a substantial share of the water from Peepale Kulo belonged to shareholders who also had land in lower Phalebas and had invested in the construction of Phalebas Tallo Kulo.

The agreement identifies the multiple intakes of the two canals and the investment made in each during construction. As specified in the document, Peepale Kulo taps water from Khahare, Dhuwan, and Tiwoore streams while Phalebas Tallo Kulo taps water from five streams, namely Khahare, Dhuwan, Bungdhi, Lamaya, and Khalte. At the time of the study, Peepale continued to use all three intakes while Phalebas Tallo Kulo usually tapped water from four intakes but not from Khahare

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[9]The local irrigation functionaries of both the canals have copies of this document. These local functionaries were contacted to verify the signatories as to whether they had water rights only in one canal or possessed rights in both the canals.

because the other streams provided adequate water for monsoon irrigation.

Peepale Kulo was constructed at a cost of Rs. 4000. Phalebas Tallo Kulo was constructed at a cost of Rs. 11,300.[10] According to the 1957 agreement, a water share equivalent to Rs. 750 (a little less than 20% of the Rs. 4000 total) was to be allotted for Peepale Tar (the upper portion) and the remainder was to be mixed with the water of Phalebas Tallo Kulo, at Khaula, for distribution to the various regions of lower Phalebas. This proposition of combining the water was agreed upon as a way to avoid using land for two canals in an area of limited space. A further reason cited for this decision was that Peepale Kulo is only seasonal whereas Phalebas Tallo Kulo is perennial. The total water supply equivalent to Rs. 14,550 was to be distributed amongst the lower Phalebas people according to their shares.[11]

The specific stipulations that the signatories agreed to abide by are: 1) to observe and obey the rules and regulations of both the canals; 2) to contribute resources according to one's shares; 3) to be concerned if someone steals water upcanal even though it is not the turn of the one who finds out about the stealing and in such a situation to convene with the rest of the members to adjudicate the

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[10]It is very unclear as to what actually was the initial investment for this canal because the local documents bear different sums and even the local people are not singular about it. There is a great debate amongst the locals as to whether it is a government invested canal or whether it really is farmer invested and constructed canal. This distinction becomes very crucial later on for the government's claim of legitimacy in intervening with an ADB-financed project.

[11]This amount was the total investment that the people of lower Phalebas had provided for the construction of the two canals.

case; 4) to see that if and when the gahak (proportioning weir) is affixed and operative anyone caught stealing water forfeits seven water turns if the culprit is a member of the canal, and if not then to agree to convene with the rest of the members to adjudicate the case; 5) not to discriminate between the two canals; 6) to allow new members to join in or to allow new lands to be irrigated with the canal's water only after a majority consent of the community of members first and not by one individual's decision alone; and 7) to be willing to forfeit membership in both canals if found to have not abided by the rules and regulations of both the canals unless one is abroad or seriously ill.

Thus, an agreement reinforcing obligations to provide mutual help in maintaining both systems was attained. Many of the stipulations indicate concern that the Phalebas shareholders (greater in number than the Peepale shareholders) would not continue to support the Peepale Kulo. This was something that the Peepale people wanted to avoid since they were completely dependent on this canal. New rights to the excess water of the canal was to be obtained only with the majority's consent. A social boundary was established for the use of water to irrigate new lands or allow others to become members. Great stress was laid on the obligation of all members of both the canals to provide resources for its upkeep.

After the rehabilitation of Phalebas Tallo Kulo, there were many conflicts regarding water distribution. The irrigators at Peepale tar would steal lower Phalebas's watershare in the Peepale Kulo and since Peepale was at the head end, it was difficult to monitor or catch the

defaulters. An effective organization to manage and control water use had not developed. New rules and roles had to be tried.

A few years after the rehabilitation of Phalebas Tallo Kulo, the shareholders of both canals resolved the situation as in the agreement document. The implementation of this agreement of 1957 was very short lived. More organizational and labour efforts were directed towards Phalebas Tallo kulo because of its perennial nature. This gradually increased its water supply. The lower Phalebas people began to abandon the Peepale Kulo and forfeit their rights there. During the time of the study, several of the local irrigation functionaries in lower Phalebas felt that they should regain their rights in the Peepale canal and contribute towards canal cleaning and repair just prior to the rice season. This was prompted by the unreliability of their water supply in Phalebas Tallo Kulo due to the government irrigation project (this is discussed in more detail below).

There was a big drive for resource mobilization for canal maintenance during 1962. This was carried out during winter when the demand for labour for agriculture is not as great or crucial as during rice irrigation period. Also, the soil conditions are better due to lack of monsoon rain and the probability of landslides is lower. Water need not be flowing in the canal all the time and this expedites canal repair without any harm to the agricultural cycle or the crops planted. By 1962, the number of shareholders had increased for several reasons; inheritance and parceling of both water and land rights, sale and purchase of water shares, and access to shareholder membership granted by the committee during major resource mobilization

drives for rehabilitation like in 1929, 1955, and 1962 to anyone willing to invest a higher sum to reflect prior individual investments.

Unfortunately, during this work five people were trapped in a landslide and killed. The new sameli incorporating the new members and the investments made during the 1962 resource mobilization drive was never completed. The incomplete sameli however had registered 186 members (at the time of the tragedy) as compared to 127 in 1955 and 85 in 1929.

In the years that followed, people transacted water sales without seeking the permission of everyone. Often, only the rotational area leaders were notified. These area leaders known as gahak sadasya (gahak representatives) acted very autonomously. Thus, water was distributed in a decentralized manner. It was only when some complained to the chairman that a totalling of all the water shares were made and Rs. 400 was found to be in excess of the total watershares of Phalebas Tallo Kulo.

Upon crosschecking the totals of the different gahak it was found that a person who had sold his water to someone in a different gahak had notified the leader of the gahak where his water was to be transferred but did not mention it to his own gahak representative, therefore continuing to enjoy his previous share. This also resulted in double-counting the watershares for Rupees 400 in the system. The punishment of cancelling his membership as stated in the previous samelis was not done since everyone started blaming someone else. Everyone was required to bring their receipts and proofs of having

bought and sold water. After verifying these transactions, a new sameli was prepared.

It was at this time (1977-1978) that the villagers learned that the government might intervene in their system since large hill areas like Phalebas were being examined by the government for irrigation projects. The samelis prepared in the past had only recorded occasional resource mobilizations, the large actions, and did not reflect the labour and minor monetary contributions made during other years. Thus, the contributions for different years needed to be readjusted. This was done by preparing a new sameli in 1978. This readjustment was intended to impress upon the government that substantial resources had been provided by the members themselves in managing their own system. Furthermore, according to the leaders who prepared this new sameli, this data regarding the farmers' own contributions over the years would justify the continued control of their own system and give them legitimacy for negotiating with the government.

The sameli of 1978 is still being followed for the functioning of the canal. The post-1978 sameli era can be described as a period when government intervention has created chaos and tension (not a new phenomenon in this canal) not only among members of the canal, but also amongst the members and non-members, and between the state and the locality. This interaction between state and locality will be dealt later on in this chapter. The current organizational structure and functioning of this canal will be explored first.

ORGANIZATIONAL STRUCTURE OF PHALEBAS TALLO KULO

Phalebas Functionaries

The organization of irrigation in Phalebas Tallo Kulo has several levels of administration and authority; the general body of all members who are shareholders, the committee, and the individual gahaks. The gahaks operate differently from each other, and there is substantial autonomy among them in water distribution and application, resource mobilization, and in conflict management.

The Phalebas Tallo Kulo irrigation committee consists of a chairman, vice-chairman, secretary, treasurer, and the eight gahak member-representatives (one from each gahak). None of these functionaries receives any remuneration for their work. The chairman is the head of committee. During the time of the study, the chairman was working in the terai. Thus, the vice-chairman had assumed these duties. The chairman is the group's chief spokesperson. Since the present incumbent is a strong representative of the group and can speak well during conflicts with the government, the shareholders have chosen to keep him even though he is not present at the irrigation site. If a situation arises where he is desperately needed to represent the irrigation system, then he returns to Phalebas.

The daily activities of the Kulo are monitored by the vice-chairman (acting as chairman). The chairman's responsibilities are multiple. He is to adjudicate between gahaks if they cannot agree on water allocations on their own. He authorizes new gahak construction or new field channels to newly reclaimed khet. He is to call and

convene the meetings of the committee as well as the whole assembly of shareholders. He is to supervise the other committee members. And, he is to present accounts to the assembly on behalf of the committee.

The secretary calls meetings at the request of the chairman. He keeps the official correspondence and the minutes of the meetings along with the signatures of those present. He maintains the receipts and accounts of previous years for record.

The treasurer controls the group's money. He is permitted to spend on behalf of the irrigation group's work. He informs the secretary of such expenditures and hands over the receipts to him. Both of them keep detailed accounts of the organization. The treasurer is responsible for preparing the accounts of the year for the committee to present to the assembly.

The gahak-sadasyas are responsible for proper water distribution within their gahak. Each gahak-sadasya is free to distribute water differently from another gahak. The gahak-sadasya is responsible for setting the turns according to a certain priority which is acceptable to the majority of the irrigators within his gahak. During the rice season, he allocates the number of bullocks that can be operated simultaneously. He has to delegate labourers (khetaras) from his gahak to clean and desilt the main canal when gahaks are joined to bring more water during water-scare periods. He takes attendance when his gahak is on duty for jhara (labour contribution) on the main canal. He collects the fines from his gahak defaulters too. If there is a conflict within his gahak, then the gahak members try to settle it amongst themselves. If they can not do so, the conflict is referred to

the committee for adjudication. Thus, under the general rules outlined in the sameli, each gahak has autonomy in undertaking water allocation, distribution, and resource contribution and mobilization for activities within that gahak. Each gahak-sadasya has a copy of the sameli of 1978 that lists shareholders according to individual gahaks, the investments made by the individual shareholders during different years, and the individual shares held.

Two jagires (patrolmen), who are paid by the organization, repair minor leakages in the main canal caused by crabs and small landslides. If there is a landslide that has blocked the canal then they drain the canal upcanal. Likewise, they repair intakes if they have been damaged. If for any of this maintenance and repair work they need a sizable labour force, they inform one of the committee members to sanction more khetaras. They also patrol the canal watching for those who steal or dirty the water.

The irrigation group uses the same Katuwal (village messenger or crier) as the village panchayat office and he is given some grain during harvest by each household of the panchayat and others who are not in the panchayat but are shareholders in the canal. As a village crier, he informs people of canal activities such as meetings, jharas, or ritual events. He mounts a small hillock, sounds his bugle and cries out the message. He also acts as the mail delivery person for the Kulo. He is sent to bring defaulters before the committee for adjudication.

Meetings

During the end of June or early July, a general meeting is called by the committee when all the shareholders elect the members of the committee, if needed. The work schedule, rules regarding fines, wages, etc., are discussed.

In addition to the assembly meetings, there are several committee (samiti) meetings. There have been several occasional and informal meetings to discuss relevant actions to take against the government irrigation office. Also, there have been several government-initiated assembly meetings to resolve conflicts that resulted from the government activities. The committee has been summoned by the district administration, as well as by the regional director's irrigation office, to be reprimanded for their belligerent attitudes, or simply to negotiate on the irrigation group's demands.

Records

The historical portion of this chapter testifies to the fact that several canal shareholders possess important documents and records pertaining to the irrigation canal. Such records are usually the following: sameli and water rights in each gahak; rules and regulations, meetings, and minutes along with the signatures of those present; petitions; decrees from central administration and verdicts from the Land Revenue Office or courts; receipts; attendance of members in each gahak; expenditure and income accounts; copies of court cases and litigation papers; official correspondence with the district administration or the government irrigation office; lists of people to

whom canal money has been loaned; rotation lists for water turns in each gahak; and pledge notes known as kayal nama written by defaulters like those who steal the canal water promising that they will not steal again and asking forgiveness. Some of these records are for the system as a whole while others are for the individual gahaks. Some records are with individual elders even though they may pertain to the system, e.g., decrees and verdicts from the administration or courts.

During the years of government intervention, much effort was spent in negotiating with the government (more on this below). Records were not properly kept and the accounts have not been submitted to the general assembly. During the year of the study, the majority of the members threatened the committee that they would not work during the jhara unless at least the attendance and fines were squared away. This was done but the fines have yet to be collected.

IRRIGATION MANAGEMENT ACTIVITIES IN PHALEBAS

Water Acquisition

Water acquisition requires placing multiple intakes in various streams during different times in the agricultural cycle of the system. Since certain streams have water only during the monsoon/summer season, these are tapped first and then as water becomes scarce and more critical, intakes are placed at perennial streams further away. Currently this system, under customary rights and by virtue of prior appropriation, as well as the force of a large number of shareholders, has four intakes for water acquisition. Dhuwan Khola and Bungdhi Khola are nearby monsoon streams and these are tapped first during rice

planting time. During September, an intake is placed on Lamaya Khola so as to bring in more water. In 1985, repair work at the Lamaya intake had to be done at least five times.

As water becomes scarce, and the time for winter crops is nearing, the members place yet another intake on Khalte Khola and build a flume to join the Khalte conveyance with Lamaya's conveyance. This is done during the end of November and early December. At this time, there is little water in Dhuwan Khola and Bungdhi Khola. All four intakes help to bring about winter irrigation. With existing technology, hardly any water can be diverted after the end April so the members do not maintain the canal to bring water then. Only at the end of June or early July, do they again tap water as mentioned above. The layout of the farmer's system is very flexible and temporary, receptive to the available water supply at the various streams.

Water Allocation

Water allocation, distribution, and application differs from season to season. Presently, the primary canal delivers water to the main proportioning weir known as gahak, and then water is conveyed through its four notches along secondary canals.[12] The canals from the first two notches do not have additional proportioning weirs, but the others do. In total, water is subsequently divided into eight geographical regions (also called gahak), each receiving a volume of water from a notch whose size is proportional to the share-entitlement that its users have. The measurements of the notches in the main gahak

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[12]This period refers to as of July 1987.

total 76.1 inches. An inch is equivalent to a Rs. 200 share. In total, the system thus has shares worth rupees 15,220/- divided amongst 340 shareholders. As noted previously, the shareholders are allowed to sell and purchase water-shares with the consent of the majority of the gahak members.

Water Distribution

Water is distributed continuously to the eight gahaks, and rotation is practiced amongst the shareholders of the gahak. As water becomes scarcer, gahaks join together, and are allocated time proportionately between the gahaks. Again rotation is practiced by the shareholders within each gahak. This usually happens during winter, especially for maize when water supply is very limited. Rotation is on a time basis proportionate to one's shares in the canal. The gahak entitlement of water is proportional to the shares of the gahak, but the amount of water each share is entitled to differs from one gahak to another. The amount of time allotted per unit investment, as well as the number of turns one gets during a season differs from one gahak to another and one year to another. This depends on the number of members, the quantity of water the notch delivers, and the quality of the soil in the gahak area. But, the ultimate determinate is the total supply of water available in the kulo: no absolute amounts of water are guaranteed, only a proportion of the variable total supply of water available.

1) Water distribution for rice

During the rice planting period, water is delivered continuously through the gahaks. The amount of water delivered determines the number of bullocks that operate simultaneously. The gahak member-representative allots turns to the different shareholders of that gahak, on a certain priority-basis. Those whose land had remained barren during the previous season for some reason, are given the first priority. Those whose maize has ripened and is about to be harvested are nest. Then, the rest get their turns.

During the day, those preparing their lands get the total quantity of water. From evening until five or six o'clock in the morning, those individuals who have already planted use the water.

Thus, as the days pass but before everyone has finished ploughing and planting rice, the time allotted at night per shareholder decreases. At times some get only five or ten minutes of the total quantity of water from the gahak. Water application becomes extremely complex, and households have to be ready for their turns. Even women are seen applying water during the night with their watches synchronized to the Radio Nepal time. All adhere to the turns outlined in the list prepared by the member-representative. The list passes on from one individual to another after their turns, and is eventually handed over to the member-representative.

When everyone has planted rice a detailed list of turns and their respective time is prepared by the member-representative and water for the rice fields is available twenty-four hours a day. To prepare the list of turns, the total amount of rupees in a gahak is divided into

three, or five, parts. Each individual gets his turn every third or fifth (occasionally even every seventh) twelve-hour or twenty-four hour interval. Changes in the rotation are made by altering the number of intervals, or the duration of an interval. These changes are made taking into account the availability of the water. In some gahaks, a single list of the sequence of turns is maintained. Only the changes in the starting-time for the turns are made, such that those who irrigated during the night, also have turns irrigating during the day.

2) Water distribution for wheat

The land is irrigated just prior to rice harvest to store water for wheat germination. High-yielding varieties of wheat are planted and chemical fertilizer is applied during the crown root initiation stage which also requires irrigation. This is a critical moment for wheat irrigation.

Usually, the members follow turns of an hour each, or apply water until the individual's planted area is wet. Some of the gahaks join together so that there is a greater volume of water. They then allot time proportionately to each gahak and during a gahak's time it receives the combined volume of the gahaks. Those gahaks applying water send five to eight people to patrol the canal to check any leakages or malpractices such as using polythene pipes to irrigate upcanal. The irrigators prefer shifting the total volume of the canal from one gahak to the other as this minimizes water theft by other gahaks that are using water at the same time.

3) Water distribution for maize

The time for irrigating maize shifts depending on how much land has been cultivated with wheat. A considerable amount of land is left fallow during the wheat season due to the scarcity of water, large landholdings and unavailability of labour, or presence of absentee owners who do not worry about wheat crops.

Because of the low volume of water available in this season, dolo pani (water of the entire system) is used on a single field for land wetting just before maize sowing. The rotation is fixed in advance and the dolo pani follows that schedule if there is water for a second turn. By then, the streams have nearly dried and it is difficult to acquire water without a massive labour force. However, there are frequent rain showers and this mitigates the problem.

Resource Mobilization

To guarantee water delivery along the canal, down to the individual shareholders' land, the irrigation tasks of water acquisition and system maintenance have to be performed. And, these tasks have to be coordinated with the irrigator's current agricultural practices.

In late June or early July, dry seed-beds of rice are prepared due to water scarcity. During this time, maintenance and repair work on the main canal is performed by all the shareholders in the system for a few days. Field-channels are also cleaned and de-silted in the respective gahaks. During ploughing and planting time, two paid patrol-men (jagire) inform the Chairman, who then informs, through a

messenger (Katuwal), a certain number of gahaks to report for repair work. In a year, there are approximately thirty days of maintenance/repair work on the main canal and the number of people attending work ranges from fifty to as many as three hundred and seventy-five in a single day.

Resource mobilization for maintenance/repair work takes place chiefly in two forms; labour, and cash. Labour is not mobilized proportionate to shares. Rather one labourer is required per shareholder. Those with greater shares benefit from this arrangement.[13] Those who, for one reason or another, cannot, or do not want to provide labour, can contribute cash based on their rice yields. This system provides options and choices, and thus flexibility. People contribute differently depending upon their off-farm employment situation since many are in the civil, teaching, or military services in Nepal or abroad. Women too are allowed to work on the canal unlike some other systems in Nepal.

During winter maintenance work, however, labour has to be contributed and if someone defaults, the person is fined Rs. 20/-the same as during summer.[14] This does not reflect the present opportunity cost of labour and the committee has been thinking of raising it to Rs. 25. Cash that is collected is invested in the system or used to pay

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[13]In Phalebas, 70% of the shareholders fall within the Rs. 50 share category accounting for 38% of the total shares in the canal. 22% of the shareholders fall within the 50 to 100 rupees share category accounting for 32% of the total shares. Less than 10% of the shareholders have more than Rs. 100 as their watershares and this group accounts for approximately 30% of the total watershares.

[14]Major rehabilitation of irrigation is taken up during winter and a large pool of labour is necessary.

the Jagires. It also is loaned out to shareholders in the irrigation system at a high interest rate of 24% per annum. The water share is used as collateral. The irrigation organization functions as a bank never letting its assets remain idle. However it is usually the more powerful and rich shareholders that are loaned money. The accounts are cleared every year.

Conflict Resolution

The system has been effective in guarding the property rights of the shareholders. Shareholders who are defaulters are fined and punished. Non-water right holders along the alignment before the main gahak are punished either by fine or by destroying the crops they have irrigated with stolen water. A definite geographical area is delimited within which water transactions and irrigation can take place. And, only upon the consent of other gahak members, can one engage in water transactions. That situation is discussed in the next section.

The historical introduction to this chapter has outlined some of the conflicts that had to be resolved during the canal's early evolution. Currently, there is conflict between the government irrigation office and the canal organization regarding water allocation and distribution to new comers.

THE PROPOSED IRRIGATION PROJECT

Nepal's Fifth Five-Year Development Plan (1975/76-1979/80) accorded high priority for irrigation development in the hill regions of Nepal. Nepal's western hill region is characterized by chronic

food-deficiency and inaccessibility. It has been noted that agricultural productivity in this region is very low. Since farm incomes are marginal, there is large scale migration to the plains, as well as movement to off-farm employment within Nepal and abroad. In 1970, the Asian Development Bank (ADB) was requested by His Majesty's Government of Nepal (HMG/N) to consider providing technical assistance for preparation of the Vijaypur Irrigation Project in the Western Development Region. In 1979, HMG/N proposed to include additional hill irrigation projects under this package. Phalebas was included as an additional project since the people of Phalebas who were without irrigation had petitioned His Majesty.

A Bank-fact-finding Mission inspected a project area with an irrigable area estimated at approximately 4,500 ha spread over five locations. One location was Phalebas with an estimated area of 300 ha. It was concluded, after discussing with the Nepali Government officials, that technical assistance would be required for project preparation before any activity could be considered for financing. So, in early 1980, several international consulting agencies were invited to bid for conducting the detailed feasibility study. The German firm, GITEC, in association with Lahmeyer International, was selected by the Bank. The study team visited Nepal from March to June 1980 and submitted its Feasibility Study Report covering technical, agricultural, economic, socio-economic and institutional aspects.

The Project then was examined by the Asian Development Bank in September 1980 and considered well-suited for Bank financing. According to ADB, the Hill Irrigation Project was to provide irrigation

facilities and other supporting services essential to agricultural and rural development (ADB, 1980).

The study team recommended that in Phalebas the existing canal should be rehabilitated and extended. The study team acknowledged that where irrigation facilities exist, there was likely to be some irrigation organization to deal with water allocation as well as maintenance of the canal. However, they did not mention how the existing irrigation facilities and institutional arrangements were to be incorporated and integrated with the proposed irrigation project.

The GITEC study (1980) characterized the Phalebas Tallo Kulo as follows:

> "The present feeder canal leaks badly throughout its length (80% of the intake being lost before the canal's emergence onto the upper terrace); another difficulty is the temporary nature of the intake on the Khalte Khola and the aqueduct over the Lamaya Khola. Both structures require rebuilding after the monsoon season, and the canal needs substantial maintenance each year."

To correct these problems in Phalebas, the plan proposed:

i) An intake on the Khalte Khola, replacing the temporary structure at same location
ii) a Tyrolian weir and intake on the Lamaya Khola replacing the temporary structure at the same location
iii) a connecting channel, feeder canal and distribution system for the extension area of approximately 187 ha[15]
iv) a 80 KW capacity mini-hydropower (the existing canal would provide enough height for the drop); and
iv) a sub-area headquarters for the irrigation staff.

It also was envisaged that upon completion of the construction, the operation and maintenance of the canal and related facilities were to be the responsibility of the Western Regional Irrigation

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[15]As reported by Phalebas project officials in Phalebas.

Directorate, Department of Irrigation, Hydrology and Meteorology (DIHM) at Pokhara. Water user's associations were to be established with assistance of DIHM at least one year before completion of the project. These associations were to participate in activities such as proper operation and maintenance of the project facilities at the farm level. No attention was given to the existing arrangements for operating and maintaining the Kulo. Likewise, the plans for extension did not consider the matter of existing water rights and shareholders.

Project Implementation and Farmers' Responses

DIHM was to be the implementing agency for the project. GITEC's report was based on a water requirement of 0.62 liters/second/hectare for the planned cropping pattern. This water requirement, according to the experiences of other hill irrigation projects, was very low.[16] A more realistic figure according to DIHM was 4.5 lit/sec/ha (more than seven times larger).[17] Thus, a second survey had to be done by DIHM for the layout and design of structures, as well as to estimate the new cost and benefits.

Because of the GITEC feasibility study, the farmers became aware that an irrigation project might be sanctioned for the area. Most of the farmers, including the leaders, feared government takeover of their system. Thus, when a second survey was begun, initially the farmers

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[16]As reported by Phalebas project officials. Nepali counterparts from the irrigation department were not involved in the feasibility studies undertaken by GITEC.

[17]As reported by irrigation officials who surveyed the Phalebas Tallo Kulo the second time.

did not allow it to take place. They expressed concern that they were not informed about the purpose of the survey and were offended because the surveyors from the irrigation department did not ask permission to survey their canal.

After these encounters, the farmers petitioned His majesty the King to ask that the project not be implemented and that their system not be nationalized. In their petition, they indicated that Phalebas Tallo Kulo is a private canal where people have invested labour and cash individually. They reported that by 1978, approximately three lakhs of rupees, in cash, had been invested and every year nearly one and half lakh rupees worth of labour was contributed. They also complained that during the construction period of the project they would be denied the source of their livelihood, and the benefits from their private property, since compensation would not be made. They expressed concern that during the implementation period there would be corruption and encroachment upon their personal rights and benefits. In short, the farmers petitioned the King to protect their irrigation property.

The farmers gave an example of a nearby irrigation project undertaken by the government in Baglung district. There the existing canal was to be rehabilitated and extended. Now the existing canal is defunct and the new canal does not operate. The irrigators of Phalebas feared this same fate.

The idea of extending the old canal to serve additional cultivators was abandoned by the government because of the objections of the shareholders of the existing canal. However, since the project

had already been sanctioned and foreign capital was indeed coming, DIHM needed an alternative. They thus decided to construct a new canal above the existing canal. Building a lower canal would mean less command area and less height for the hydro-power plant which might render it infeasible.

Due to these changes the tender documents for the contractor had to be revised in 1982. The components of the new project were:

1) a trench type head works on two rivers (Khalte & Lamaya)
2) a river crossing at Lamaya
3) construction of a new 7.2 km main canal
4) construction of a new 4.0 km branch canal and 3.5 km of new distribution canals
5) construction of 80 KW capacity mini-hydropower
6) Project area headquarters for the irrigation staff

The major change in the revised proposal was the construction of a 7.2 km new main canal above the existing one.

During 1982 and 1983, the office buildings and sections of the new main canal were constructed. The new main canal taps water from two streams. The Lamaya stream intake is above the Phalebas Tallo Kulo's temporary intake while that on Khalte stream is lower. The government's Khalte intake may receive inadequate water in winter when the stream flow is low. The farmers' intake is likely to tap nearly all available water. The Lamaya intake of the government canal (located above the Phalebas's existing intake) is likely to have adequate water for summer. However, its flood gates open directly to the intake of the existing Kulo. The farmers say that their intake is only a temporary structure. If the government's structure diverts more water than what the Phalebas Tallo Kulo farmers need they will relocate their temporary intake above the government's structure and thus secure the

water they require. If conflict ensues they will take the government to court for having built its intake above the existing Kulo.

The shareholders also petitioned the Prime Minister after the government's decision about the new canal. They made three demands: (i) during the monsoon season, the project's canal was to tap water only from the far away Khalte stream since the nearby streams were necessary for the command area of the Phalebas Tallo Kulo (ii) from September onwards, the project's canal was to stop tapping water from Khalte because this water would be necessary for the command area of Phalebas Tallo Kulo (the other nearby streams would have dried up by then) and (iii) since the system is located in a hilly region, and the project canal will be built near the existing Kulo, any damage done to the Kulo during the construction period is to be repaired by the government.

The Prime Minister ordered the DIHM to accept these demands and a Deputy Director General of DIHM was sent to the site to investigate. He had a general meeting with the shareholders and the community to discuss whether they wanted the project. The majority, including the non-irrigators, decided that the project should carry on. However, due to the opposition and pressure of the shareholders, a set of conditions was stipulated: (i) Phalebas Tallo Kulo is to receive its usual amount of water, during and after the project, (ii) it is to receive first priority for water after the project is completed and (iii) during the project period, any damage done to the Kulo due to construction is to be repaired by the project.

During this meeting, some of the people who did not have water rights in the Phalebas canal presented to the DIHM delegation a document dated some fifty years back. It recorded the government's assistance of seven thousand rupees to this canal during the Rana period (i.e., referring to the events described earlier in this chapter). These people wanted to show that the Phalebas canal was not a locally funded canal but that it was, in fact, a state funded canal. The non-shareholder wanted to establish that since the Kulo was state funded, the government had the right to intervene as it wished. They argued that the government had a claim to the ownership of the system based on this record of earlier assistance. However, the shareholders say that though the government investment was made, it was made in a system that never operated (a point not inconsistent with the discussion presented earlier). It required a substantial investment by the farmers years later to create the present system. This is a case of two factions: one that wanted to protect original rights and feared that government involvement would de-structure this existing property arrangements, the other that wanted government intervention to acquire water rights from the system. As can be seen from the prior discussion, the "facts" are very complex. The state had been heavily involved in the Kulo earlier, even supplying workers for its maintenance. But this state aid was always complemented by significant, and leading, involvement by shareholders in the Kulo. In short, the Kulo clearly was neither solely private or state.

The outcome of the meeting was that the government canal was to be built above the existing canal and that during construction period, the

existing canal was not to be disrupted. If any damage occurred to the existing canal by the construction, then it was to be repaired with state funds. The Deputy Director wrote to the Director General informing him of this decision and the line of action.

Subsequently, the contractor was required to sign a contract stipulating that the construction would not disturb the existing canal system which runs approximately 5.6 meters below the proposed canal alignment. As of July 1987, nearly eight lakhs of rupees has been spent on repairing damage to Phalebas Tallo Kulo resulting from construction of the new canal. The shareholders had gone to the project office 80 times to request, force, and threaten the office to repair their canal.[18] The construction period has created much disruption and frustration in the smooth operation of the existing canal.

PROPERTY AND STATE IN PHALEBAS TALLO KULO

What does the Phalebas Tallo Kulo case illustrate regarding state, locality, and irrigation property? As seen from the case study, the evolutionary history of Phalebas Tallo Kulo has been shaped by a mix of state and local actions.

IRRIGATION PROPERTY

In Phalebas, the original irrigation property was created by local actions with state support. There were incentives for various

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[18]This figure was given by the project office and more or less confirmed by the contractor, and the shareholders.

actors to create this property. As we recall from this case study, the proposal for local investments in constructing an irrigation canal was backed by the state's promise of re-payment. There were incentives for both the state as well as the local elites to create this irrigation property. The state stood to benefit from increase in irrigated land revenues while the local elites would continue as tax-collectors for larger areas.

Property rights, mainly in the form of watershares, crucial for irrigation, were based on the individual investments made in the construction of the canal. This institutional arrangement provided incentives for the local people to invest in the irrigation systems.

Property Objects and Rights

In Phalebas Tallo Kulo, water rights were one of the more fundamental property rights. One's share was determined by the amount of investments made not only during initial construction of the canal, but also by investments made during successive resource mobilization drives for system rehabilitations and through participation in routine maintenance. Clear cut obligations and duties associated with individual rights were established.

Water rights in Phalebas Tallo Kulo were commodities that could be inherited and sold or purchased with some limitations. Sanctions against the misuse of water rights were laid down.

Other important objects of property were the multiple intakes and the main canal of the system. We recall from the petitions to the King as well as to the Prime Minister during the early 1980s that the

shareholders of Phalebas Tallo Kulo wanted to protect these objects of property and safeguard their rights.

The primary social relations among the irrigators of Phalebas Tallo Kulo were property relations. The call for investments and acquisitions of watershares were not on the basis of kinship, patron-client relations, and so on. Water rights defined an important set of the relationships among people from lower Phalebas, Peepale, and Mudukuwa. Some had water rights while others did not: these were relations of exclusion or inclusion.

Once these objects of property and property rights were created, they needed to be maintained so as to enjoy the benefits from such property rights and objects. The resource mobilization activities of the Phalebas irrigation organization reflects this. The state also undertakes activities to protect the property rights it has helped to create.

The state's continued interest in the activities of irrigation systems like Phalebas Tallo Kulo is explained, in part, by the fact that when the state provides recurrent costs for the functioning of the canal, the state has a justifiable "claim" to the canal's fate. As in the case of Phalebas Tallo Kulo, not only was the reimbursement for the initial canal construction provided by the state, but money was also made available for some duration of time for two caretakers to maintain and repair the canal. The state believed that the farmers alone were not responsible, perhaps not capable, of maintaining the canal. To ensure continued revenue generation from initial investment, for a

short time the state provided recurrent costs to maintain property that had been previously created.

Property Rights and Conflicts

The property-creating activities resulted in considerable conflict among the people in Phalebas. In these property-creating processes, some benefitted while others did not. The recent state intervention through the ADB-funded project has created conflicts among shareholders within the existing system, between these shareholders and the state, and between present shareholders and future shareholders who had not invested in the existing system. The owners of land to be newly irrigated would stand to gain while the existing shareholders might suffer if they lost control of the Kulo and could not influence decisions over their property rights.

During the thirty year period (1927 - 1957), various local conflicts continued with some involving the state. The 1957 agreement between the two kulos revolve around sharing and protecting property rights in water. Many of the conflicts were locally resolved, while some conflicts "brought" the state into the locality.

Property-based Documents

Most of the local documents are property based. The series of samelis, verdicts from the administration and courts are examples of such documents. The petitions and minutes of meetings held in Phalebas are replete with property issues. They stipulate the objects of property, rights, sanctions and obligations.

STRUCTURE AND FUNCTIONING OF THE SYSTEM

The basic structure and functioning of Phalebas Tallo Kulo -- maintenance procedures, water acquisition, allocation and distribution and conflict resolution are all property related. Irrigation tasks were carried out to "create" and maintain property rights and property objects. Roles and rules were created to preserve and protect the property rights. Resource mobilization was a vital task for property protection.

Resource mobilization was on the basis of water rights. Sometimes all shareholders were treated equally, while at other times there was recognition of their unequal shareholdings. Defaulters were fined and non-shareholders were severely punished if they stole water.

Conflicts occurred among local people or with the state over property matters, e.g., watersharing, ownership of the canal, water rights, etc. The conflict with the government had adverse impact on the performance of the system. Disturbances and damages to the canal, small shareholders siding with the government project, constant protests against and bargaining with irrigation officials, all undermined the functioning and the solidarity of Phalebas Tallo Kulo.

STATE ACTION AND DE-STRUCTURING OF EXISTING PROPERTY

The ADB-financed project resulted in de-structuring the existing property rights. It promised water rights to people of new areas who were not current shareholders and tried to with little compensation to the prior investors. The current shareholders feared that their

ownership of the hydraulic property would shift to the state and they therefore would lose control of their property rights.

The current shareholders of the Kulo were using water from the same source that was to deliver water to the new irrigators. But they were not consulted. Existing legislation regarding water resource development by the government allowed the government to act in this way. But, quite predictably, such one-sided action caused strong local reactions.[19]

Conventional irrigation implementation procedures were used in the ADB-funded project. The typical lending procedures were followed.[20] International consulting agencies were invited to bid on conducting the feasibility study. As noted earlier in this chapter, the feasibility report ignored the importance of the local social organization of the irrigation system and its property basis and did not offer any

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[19]The state of Nepal has upheld and endorsed certain local customary practices regarding irrigation. In fact, the Muluki Ain outlines these very emphatically. However, if these practices contravene government actions, government's will and actions shall prevail. It is with this legislative backing that the government can undertake projects even when there is strong resistance. The state always tries to have the final say under the eminent domain. In fact, the Irrigation, Electricity, and Related Water Resources Act of 1967 lays down the following stipulation as mentioned in Chapter Three:

> ".....For drawing water for irrigation purposes from gullies, aqueducts or streams, ponds, wells, lakes, canals or dams through labour and resources of the local people themselves either individually or collectively, in such a manner that no adverse effect is created on any hydroelectric or irrigation project of His Majesty's Government constructed before or after commencement of this Act, or those proposed to be constructed in the future."

[20]For a detailed discussion on project lending procedures and mechanism, see Payer (1982).

mechanisms for the incorporation or integration of the existing irrigation facilities and institutional arrangements.

Government had to resurvey and redesign the project because the consultant's design was based on an unrealistic water requirement. The physical structure of the irrigation project was capital intensive and the materials had to be procured externally.

The final design had to be approved by the ADB. They would sanction only what they deemed durable and stable. And this required capital intensive materials thus justifying their funds. The local hydrologic conditions and the monsoon streams had damaged the very structures endorsed jointly by ADB and DIHM for the Phalebas project.[21] Even on the technical side, vulnerability of certain structures to local geological and hydrological conditions were not taken into account.

The approach to the project was the typical technocratic one with which DIHM was familiar. The underlying assumption was that "enhanced" physical structures meant better irrigation.[22] There was no assessment of existing property relations and rights, nor was the existing local organization involved in project implementation.

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[21]These damages were observed by the researcher during Phalebas project implementation and were similarly reported by the irrigation staff.

[22]In contrast, see Yoder (1984) for a good description of "time-tested" local technology of hill irrigation systems in Nepal.

FARMERS' REACTIONS AS PROPERTY PROTECTING ACTIVITIES

Local reactions against government involvement in Phalebas can be interpreted as property protecting activities. Channels of interaction between the center and the locality for voicing grievances and protecting property rights against ongoing or proposed state actions have been multitude. Petitions, delegations, silent resistance, filing charges at the executive or the judiciary wings of the state apparatus, or merely getting one section of the state to contravene or check another section's actions have all occurred.

During the Rana regime, the nature and scope of state intervention at the local level depended very much on the ability of the local elites' or representative of the local people to articulate their needs and grievances. It also depended on their ability to bargain with the various incumbents of the state apparatus. This remains true. In the case of Phalebas Tallo Kulo, the current shareholders have chosen a chairman who can articulate the needs of the group and bargain with the state authorities and other contending parties. He has been selected despite the fact that he does not reside in Phalebas. A strategist and a hard bargainer is usually sought to be such an irrigation leader.[23]

As noted earlier, in Phalebas Tallo Kulo, the shareholders have resisted the state's action in many ways. They have petitioned higher authorities of the political system, sent delegations to Kathmandu,

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[23]In the Brangdhi case, a lawyer who has water shares in the system have been influential in drafting the agreements between the contending parties. In the terai system studied by Pradhan, Giri, and Tiwari (1987) an ex-minister who was an active politician was chosen as their patron even when he did not have any watershares in the system.

threatened workers on the canal and undertaken gherao activities against the irrigation bureaucrats.[24] The resistance on the part of existing canal shareholders forced the government to abandon the proposal of rehabilitating the existing canal and extending it to serve a new group of irrigators. More importantly, they felt that government intervention meant the unfair sharing of their water and changes in the social relations between them and non-shareholders regarding water control. They also felt the state was siding with the non-irrigators.[25]

The stipulations listed their petitions and the decisions arrived at in meetings are innately property-based. These stipulations, e.g., use of certain water sources by the government canal, duration of water use, compensation for damages during canal construction, etc., are intended to protect existing property rights.

SUMMARY

This chapter examined the process of direct state intervention in Phalebas Tallo Kulo that has upset prior property arrangements there. The full impact of this intervention is not clear as yet. During the time of the study, water sale among shareholders had not occurred because farmers expected the government to provide the water. Accounts

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[24] Gherao is a terminology used in Northern India and Nepal where agitators circle someone and not let him go home or do anything till their demands are met or till they're dispersed by the police. This has been a common agitation practice in the universities.

[25] Past government irrigation rehabilitation involvement around the vicinity had not been favourable and the Phalebas irrigators feared this fate. See Pradhan (1987a).

were not settled and records were irregularly kept. Shareholders' reactions to state actions were seen as property protecting activities.

The next chapter will be the concluding chapter of this study. It will compare and contrasts the two cases in terms of state intervention and property rights and assess these materials in view of the existing literature on property in irrigation.

CHAPTER VII

CONCLUSIONS

This study set out to: i) examine the concept of irrigation property, ii) to examine historically the role of state intervention in irrigation particularly since Nepal unification, and iii) to examine the connections between state intervention and existing property rights and the resultant consequences for the structure and functioning of irrigation systems.

The concept of irrigation property was examined in Chapter II and the salient features of irrigation property were explored in the subsequent chapters. A review of Nepali economic history pertaining to irrigation as discussed in Chapter III and the operations of the current irrigation bureaucracy demonstrate the dominant and persistent role of the state in irrigation development in Nepal.

Chapters IV, V, VI analyzed the two case studies of hill irrigation systems in Western Nepal. The irrigation system in Palpa (Brangdhi Tallo Kulo) was one where the state through indirect investment extended an existing canal, and after completion of the project, the new "beneficiaries" and the old members became locked in water allocation disputes. The case in Parbat (Phalebas Tallo Kulo) involved direct state intervention and investment where the plan by the government to extend an existing canal with international financing backfired; a new canal built above the existing one touched off continuing conflict regarding water acquisition, construction of facilities, and later on, water allocation.

The case studies in turn affirmed the proposition that "irrigation development is the result of activities by both the state and the locality" (Coward, 1986). The literature on Nepali economic history and the field research supported Coward's observation (1986:491):

> .... that much of the history of irrigation development has been an interplay of state and locality initiatives and actions. In some areas and in some places, local groups (and sometimes individuals) have seized opportunities to develop hydraulic facilities, sometimes in response to incentives (or at least in the absence of disincentives) created through state policies.
> .... At the present time, there is a preponderance of state involvement in irrigation development: no modern nation-state in Asia is without an irrigation agency, for example.

The preceding three chapters have shown the nature and scope of the different irrigation-related property rights and relations that had existed, and in some cases still exist, in the research sites. These chapters also documented the various state involvements in the research sites. The interplay between the actions of the local groups and state policies and programs for irrigation shaped the irrigation property system and the nature and functioning of the irrigation systems. The final sections of the previous two chapters presented the findings pertaining to state, locality, and irrigation property in the case studies.

This concluding chapter first discusses the finding of a distinctive hierarchical structure of property rights in Brangdhi Tallo Kulo. Other findings from this study are then related to generalizations drawn from previous literature on property in irrigation development and on hill irrigation in Nepal. Finally, several policy implications are drawn from the interrelationships among state, locality, and irrigation property.

HIERARCHICAL PROPERTY STRUCTURE

Brangdhi Tallo Kulo exhibited a hierarchical property structure by which I mean the differential, junior and senior rights and obligations distributed among the sub-commands. Crucial questions stemming from a hierarchical property structure are the following. How is social solidarity maintained in Brangdhi Tallo Kulo given the stratified water rights that exist there? Does this type of hierarchical property structure mean a certain degree of structural fragility in Brangdhi Tallo Kulo? If so, how is this manifested? What are the significant consequences of this hierarchy for actions and procedures regarding irrigation management in Brangdhi Tallo Kulo?

Senior water rights in Brangdhi Tallo Kulo are based on a combination of joined factors: time of investment and geographical location. The newcomers have always been "downstream" of the old-timers. The newcomers are relegated junior rights while the previous users maintain senior rights. Location acts to reinforce the power relations established through time. The existence of these differential rights confirms the notion that co-shareholders of the hydraulic property might not all be equal shareholders. Coward had suggested this possibility earlier: "the relationships among the newly served water users and between them and the original users can all be seen as new property relations -- i.e., social relations based on their joint (though not necessarily equal) rights to the canal and its water supply" (1986:492).

Coward's recent field research in the Western Himalayas of India also explored this notion of differential rights within a single

system, a hierarchical property structure as termed here. He states (1987:16):

> The irrigation rights of these five village clusters [served by the Bharul canal] differ greatly. The first three clusters, Bharmat, Banuri and Band Bihar, all have rights to use water from Bharul kuhl [canal] for the complete kharif [summer] and Rabi [winter] seasons. Deogram has kharif rights only in the first part of the season, for sowing, and for the entire rabi crop. For the latter part of the kharif season the Deogram cultivators must depend upon irrigation from seasonal creeks located in their immediate area. The outlier cluster has rights to water from Bharul kuhl only for twelve days during the kharif sowing period....

Chapter V discussed the differential rights in the sub-commands of Brangdhi Tallo Kulo. The origin of the hierarchical property structure in this system seems to derive from historically grounded power relations, location, and an accepted ideological view that those who invested first have a higher claim. The fact that the property structure is characterized by a hierarchical pattern leads to derivative rules, procedures, obligations, and organizational arrangements in the canal. The discussion of the organizational structure and irrigation management activities of Brangdhi Tallo Kulo showed how each sub-command had specific rules and regulations, obligations, and organizational structure. The responsibility of managing and maintaining the canal rests with the Chherlung committee.

The hierarchy of property rights is associated with differential obligations. The organizational structure in Chherlung is more elaborate than the other sub-commands due to the greater number of shareholders as well as its key responsibility for managing the canal. When tharis (assistants to the canal leader who supervise a group of shareholders on particular days of the week) were instituted in

Chherlung during the 1950s, a new set of complicated relations were created for Chherlung. Taplek and Pokhariya became less complex organizationally with Chherlung's increased responsibility.

The Brangdhi case provides an opportunity to examine tradeoffs between junior and senior water rights and the associated obligations and responsibilities. Regardless of Chherlung's position in the junior-senior spectrum of water rights, the Chherlung group's control of day-to-day activities is paramount. Because this group has responsibility for and control of daily activities of the system, it also has the power to decide the "reproduction" of the groups rights. The Chherlung leaders have been capable of providing leadership in operating and maintaining the system as well as bargaining and negotiating with the government in times of conflict. Chherlung irrigators now have the organizational capacity to potentially change rules on the various irrigators of the system. However, at the present moment, Chherlung is in a position to interpret and implement everyday activities in the framework of the existing property structure --- but not to actually change that structure. For example, they are not able to modify either the allocation or distribution of water to Taplek and Pokhariya users.

A tentative generalization that can be made from this case is that if management decisions and responsibilities are taken (or given) away, then the basis for the development of leadership in managing the system is lost. Such was the case with Taplek and Pokhariya. The added obligation and responsibility led to the control of daily activities and the management of the system by Chherlung.

The hierarchy of rights and associated obligations have implications for social solidarity among the co-shareholders. Our examination of the history of the negotiations over water allocation showed considerable social solidarity within the sub-commands. Each sub-command acted as an interest group. In the negotiations with the district panchayat regarding water allocation for Artunga, Taplek and Pokhariya declined to be contending parties to the dispute. Artunga shareholders voice grievances against the Chherlung group. This hierarchy of property structure has resulted in a low level of social solidarity among the Brangdhi shareholders.

Coward explored the conditions of solidarity in an irrigation network with unequal water rights in the study noted earlier:

> ...This lack of symmetry in the conditions and needs of the upper and lower groups of the network may help to explain the disjointed organization of Bharul kuhl and its low level of social solidarity. Since the work required to maintain the diversion structure and the upper portions of the main canal systems are relatively light, the upper zones could do without the input of the lower zones, if necessary. They do not really need the participation of the lower groups though they clearly benefit from having it. But the lower groups can not afford to disengage themselves completely from the network. While their seasonal creeks generally are effective after the sowing period these creeks are not able to supply the water required at sowing time. Consequently, the lower zone people reproduce their rights in the Bharul network even though the costs to them are considerably higher than those incurred by the upper groups. Their greater needs induce them to supply unequal amounts of resources(1987:24).

This case is very similar to Brangdhi Tallo Kulo and especially the position of Artunga within the system. The structural fragility of Brangdhi Tallo Kulo is manifest by a lack of coordination among the sub-commands for water distribution and the presence of ill-feeling toward upcanal commands by the lower ones. For example, during the

rice-planting season, Artunga has to wait until the upcanal sub-commands are done irrigating. Utter necessity requires that the Artunga group accept this arrangement because they are constrained by lack of hydraulic alternatives to irrigate their sub-command.

Those, like the Artunga group, who feel disadvantaged in this hierarchy have, at times, attempted to use the state as an ally in relocating positions in that hierarchy. Sometimes these disadvantaged even advocated that the state assume control and responsibilities of the irrigation system so that the hierarchical arrangement is collapsed into a more egalitarian one. On the other hand, as we saw in Brangdhi Tallo Kulo, those in position of power in the property hierarchy also were able to influence and re-arrange the state's action so as to buttress the existing property structure, not alter it.

The differentiated rights and consequent bargaining power of the sub-commands creates a necessary but delicate alliance that provides benefits that are valued by all the participants. This coalition functions and endures through practical procedures for achieving accountability, including fines, coercion and at times denial of access to water.

In short, Brangdhi Tallo Kulo is not a simple amalgamation of co-shareholders but is an alliance of co-shareholders differentiated on two dimensions: i) the senior and junior rights issues and ii) the number of shares owned axis. These differences are important because they account for the basis of social action for the maintenance and reproduction of the system. The amount of resources to be contributed depends on the water rights. Therefore associated rules, procedures,

and organizational structures are all derivatives of this hierarchy of property structure and act to re-create this hierarchical structure.

In the case of Phalebas, the differentiation is on one axis only, i.e., the number of shares owned by an individual. There is no system of senior and junior rights. The resource mobilization in Phalebas is not differentiated to reflect this difference in shares owned. Thus, those disadvantaged in this property structure (i.e., shareholders with a small number of shares) welcomed state involvement. They believed that the government would more likely distribute water according to land as it does elsewhere. However, the committee members were powerful local elites and they coerced social solidarity among themselves. To the outsider, it would seem to be a cohesive social solidarity, but in fact there were several cleavages among the different shareholders. It was only the apparent solidarity that was perceived. The threat of losing existing water rights to newcomers outweighed the hope that government intervention would actually result in a functioning system guaranteeing water allocation according to land size.

The management and transaction costs associated with the enforcement of a property structure to control and maintain the existing social relations can be seen as elements to the modification of Yoder's generalization (1986:312) that " the degree of organization was largely a result of the necessity to mobilize vast amounts of resources to acquire and deliver water to the command area." Both management and transaction costs in maintaining a certain pattern of social relations as well as the necessity to mobilize vast amounts of resources to

acquire and deliver water to the command area result in a certain degree of organization.

RESEARCH FINDINGS IN RELATION TO PREVIOUS WORK ON IRRIGATION PROPERTY AND HILL IRRIGATION IN NEPAL

Ownership and Maintenance

Coward (1986:492) has asserted that in local irrigation systems in Asia, ownership of and responsibility for irrigation works inevitably coincide. In Brangdhi Tallo Kulo, neither Taplek and Pokhariya any longer have the responsibility of maintaining the canal. These groups negotiated their senior rights so as to eliminate their maintenance obligations, except in times of emergency even though these groups have been derelict. Chherlung cannot contest this because of possible forfeiture of the acquired property rights from Taplek and Pokhariya. Martin (1986) points out that a contractor was hired by the irrigation group in West Nepal to be responsible for the maintenance of the system. Thus, the link between ownership and maintenance responsibility does not always have to be direct -- it can be actualized through a variety of arrangements.

Property Rights as a Policy Tool

The various conflicts observed resulting from state intervention that did not take into account existing or proposed property rights prior to project implementation. Coward (1986:492) has proposed that property rights be viewed as a policy variable to be used in designing irrigation development. He suggests three lines of action the state

could follow to foster property-based irrigation development: i) rights recognition -- a property analysis should be a component of the project planning process, ii) indirect investment approaches whereby resources are provided to local irrigation groups for improving those locally owned and managed systems, and iii) the creation of share-based water rights as a form of social contract involving rights and duties.

Regarding the first line of action, Coward suggests the recognition of rights also would have to take into account needed changes if the existing property rights were judged to be "unfair" (1988:340). To do this, the historical development of the existing property rights would need to be assessed before proposing a line of action regarding changes to be made. If external resources are to be provided by the government, it may require the original right holders to bargain away some of their benefits. Questions of compensation to original shareholders have to be negotiated in advance and subsequently honored.

Regarding the second line of action, indirect investment, conflicts over property rights still can occur as the Chherlung-Artunga water dispute testifies. Implementation of irrigation projects through an existing local irrigation group usually will, as was the case in Brangdhi Tallo Kulo, empower those who already have water rights. What is needed, along with indirect investment, is a clear cut understanding between the old-timers and newcomers prior to implementation. The role of the state becomes important in mediating the incorporation of newcomers. On their own, these newcomers might not be able to negotiate with those who already have the water shares. External resources can be used for bargaining power in this context.

Regarding the third line of action, the creation of share systems can be conducive to irrigation development. When water can be sold, it allows water to be acquired by irrigators needing additional water or cultivators with land that has not been irrigated. This process was seen in both my research sites as well as by Martin (1986) and Yoder (1986) in Western Nepal. Martin (1986) concluded from his study of hill irrigation systems that the presence of share arrangement gives more flexibility to systems than does the absence of shares. Similar findings were reported by Siy (1982) regarding the atar systems in Northern Philippines. This also seems consistent with Coward's (1987) analysis of the kuhls in Western Himalayas of India. These kuhls were organized with regard to property rights but not as shares that could be bought and sold since it is very complicated to reallocate water rights. This also was the situation in a Nepali system (called Argeli Raj Kulo) studied by Martin (1986) and Yoder (1986). There water rights were tied to land and could not be bought and sold. Little irrigation expansion has occurred there.

It can be inferred from the water distribution and irrigation expansion pattern in the two cases reported here that personal incentives to utilize water rights optimally and sell excess water rights (because they entail costs in the form of resource contribution) have brought about the efficient use of water. There is an incentive for the organization (Martin,1986) to sell the water because the lumpsum money can be used to improve the system, thereby augmenting the water supply as well as ensuring a greater potential for resource mobilization from the recent share buyers.

Problem with share-based water rights can arise if there are competing users, e.g., for electricity, factories, mills, municipalities, etc. that can buy the shares. Water may thus be diverted from agriculture entirely as shares are bought for non-agricultural use.

In general, the cases reported herein support Coward's (1986:501) suggested lines of action. Understanding the existing property situation and the historical reasons for these rights and relations, and negotiating future modifications and compensation are prerequisites for state actions.

POLICY IMPLICATIONS

Several important policy suggestions for enhanced irrigation development arise from this study of state intervention and property rights in hill irrigation systems in Nepal.

1) A procedure that incorporates institutional arrangements and agreements between those who currently are the property right owners and users with those who are to be the future beneficiaries is necessary. Our cases show that farmers themselves have entered into such institutional arrangements as when a potential group of beneficiaries wanted to share water that was currently being used by others. Sometimes, strict recognition and observance of senior and junior rights along with the associated obligations and liabilities had been outlined and upheld customarily. Recognition of prior investments made by the previous group was worked into the obligations for the enjoyment of certain property rights.

State involvement in any such changes of property relations will have to take these arrangements into consideration. The conflict ridden cases lend support to what might happen if such prior arrangements are not agreed to and upheld in advance by the different parties involved, including the state agency.

While exclusion of local participation may grant the government full powers, including ownership rights over the hydraulic artifacts, it poses operation and maintenance problems later when government funding is not available or timely, and
when the irrigators expect the government to continue maintaining the system.

2) Extensions and rehabilitations of existing canals usually create new shareholders. Prior to project implementation, existing property rights and relations have to be assessed. Compensation to the original shareholders has to be worked into the rights and obligations of both the old and new shareholders.

The original shareholders usually do not want to grant equal rights to newcomers who have not invested in the system earlier. Some compensation to the old-timers would be expected. However, the newcomers, may be at a disadvantage for a long time if unequal rights and obligations are fixed once and for all. An alternative, in the form of some lumpsum payment or greater resource mobilization for only a certain period of time by the latecomers may be negotiated with the original shareholders. The cases reported herein highlight the importance of compensation, both the amount and duration, for negotiating property rights.

3) Irrigation systems cannot be expected to be maintained and operated if such resource contributions are not backed by secure rights. Those who are to maintain and operate the systems have to be guaranteed secure rights. Only when rights are secure, can resource contribution be expected.

SUMMARY

This study set out to: i) examine the concept of irrigation property, ii) to examine historically the role of state intervention in irrigation since Nepal unification and iii) to examine the connections between state intervention and existing property rights and the resultant consequences for the structure and functioning of the irrigation systems.

The study showed the importance of the institutional arrangements by way of property rights for the "reproduction" of the system.

The historical specificity regarding the development of these systems lend support to the utility of undertaking studies from a historical perspective. Such a study enables us to understand the dynamics of the institutional arrangements within the system and the basis or justification of these arrangements, which if only seen synchronically might be misinterpreted.

The study showed the utility of a historical approach using documentary evidence and archival work at both national and local level to understand the dynamics of the social organization of irrigation. Present property rights, relations, and negotiations were historically rooted. It was not enough to understand contemporary

practices in an irrigation system to understand the creation of present property rights and relations. Answers had to be sought in the actions and social relations of the past between local groups and the state.

The study showed that not only was there increasing state penetration generated from the centre or the metropolis; but also that the impetus for such intervention has been provided by the local groups themselves. State actions and interventions in the form of changes in property rights or resource mobilization was mediated by the community of irrigators (present or future) and this intermediating structure shapes the outcome of the state actions. Conversely, local actions are again mediated through this group back to intervene in the state actions.

Within the planned mode of development, the recent basic needs policy demands increasing acreage to be brought under irrigation. However, Nepal simultaneously faces internal fiscal crisis, dependence on foreign aid, and an expansion of state apparatus. It is but evident that the role of the state in irrigation in Nepal is increasing. This study shows the necessity of understanding the linkages between state and locality before undertaking any state actions in irrigation. When the realities of development efforts become dismal due to a lack of understanding of linkages, approaches, and structural constraints and logic then the stated objectives or policies of development efforts become mere rhetoric.

APPENDIX A

CALENDAR CONVERSIONS

The Nepali calendar, Bickram Sambat (B.S.), is 57 years ahead of the Gregorian (A.D.) calendar. The following are the Gregorian conversions for the Nepali months.

Months:

1. Baisakh	-	April/May
2. Jestha	-	May/June
3. Asadh	-	June/July
4. Shrawan	-	July/August
5. Bhadra	-	August/September
6. Aswin	-	September/October
7. Kartik	-	October/November
8. Mangsir	-	November/December
9. Poush	-	December/January
10. Magh	-	January/February
11. Phalgun	-	February/March
12. Chaitra	-	March/April

APPENDIX B

IRRIGATION IN THE TERAI REGION

I) Revenue regulations promulgated for the districts of the Tarai region on Baisakh 13, 1992 (April 25, 1935) made the Mal Adda (Revenue Office) of each district responsible for the construction and maintenance of irrigation facilities. The chief of that office was required to prepare a detailed plan for the development of such facilities in the district in consultation with the local jimidars and other landowners.

The regulations added:

"In case irrigation channels are damaged, or fields are damaged by floods or washouts, the local cultivators or tenants shall undertake necessary repairs themselves or through collective efforts... In case a new irrigation channel must be constructed in any mouja, or a damaged one must be repaired, a levy shall be collected from each jimidar, birta-owner, or other landowner whose lands will be irrigated through such channel, and labour too shall be impressed for that purpose. In case any landowner is unwilling to provide such labour, their obligation shall be commuted to a cash payment at current wage-rates.

"In case local jimidars and landowners are unable to construct irrigation channels through collective efforts as mentioned above, an amount sufficient to meet the estimated cost of the construction or repair project shall be raised through a levy on jirayat, birta, and other lands, and placed under the custody of the local jimidar or other responsible person. The project shall then be executed through wage labour under the supervision of the jimidar, as well as the gumasta and the jethraiti of that mouja. The surplus amount, if any, shall be kept in reserve with the jimidar to finance necessary repairs from time to time.

"No new irrigation dam shall be constructed within a radius of 100 chain-lengths from an existing dam on a perennial stream, or in such a way that supply of water through the existing dam is affected. A dam may be constructed on the upper reaches of a stream if the existing dam, built on the lower reaches, cannot supply sufficient water.

"If the chief of the Revenue Office finds that the jimidar and landowners of any mouja are not capable of collecting funds in advance and mobilizing labour in the manner mentioned above, and that both the government and the

people will suffer if no dam is constructed there, he shall report the matter to the District (Goswara) Office. Arrangements may then be made to supply interest free loans for the construction of the dam under the liability of the local jimidars. Such loans shall be recovered after crops are harvested.

"Plans for the construction and repair of dams and irrigation channels must be finalized before the last day of the month of Magh (February 11) and implemented before the last day of the month of Jestha (June 14) each year.

"Local jimidars shall be ordered to repair immediately any damage to dams and irrigation channels resulting from floods and submit reports accordingly ... As soon as the month of Aswin (September 17) commences, officials of the District Office and the Revenue Office shall be deputed to each mouja to arrange for the repair of damaged dams and irrigation channels.

"The Revenue Office shall exercise supervision to ensure that jimidars use available irrigation facilities properly. Priority in such use shall be given to those landowners who have contributed money and labor for construction of such facilities. Those landowners who have made no such contributions shall be allowed to use the irrigation facilities thereafter on payment of a proportionate share of the cost, and an additional fee of one rupee for each bigha.

"Since dams will be more durable if reinforced with beams, permits may be obtained from the local Kathmahal office for the necessary quantity of non-commercial timber, which shall be cut and transported through the labor of the local people.

"In case the Revenue Office needs additional staff to discharge the functions mentioned above, it shall procure such staff from the local District Office.

"Crops cannot be cultivated without water, and dams and irrigation channels cannot be constructed in all moujas. At some places, water cannot be brought from streams and rivers, so that it is necessary to use run-off water for irrigation. Accordingly, in districts where there are no canals and permanent dams, it is necessary to construct dams and irrigation channels during the appropriate season for utilizing such run-off water. Otherwise irrigation facilities will not be available when needed. South of the Chure range, the tarai region slopes toward the south. North-south irrigation channels must, therefore, be constructed on both sides, east and west, of each mouja, from the northernmost

point (Siraha) to the southernmost (Bhatha), so that all lands under the jurisdiction of the Revenue Office are irrigated."

II) The following regulation was enforced on Magh 2, 1998 (January 15, 1942) :

"In case dams and irrigation channels cannot be constructed through the efforts and contributions of jimidars and landowners alone, so that governmental assistance is essential, the local Bada Hakim is empowered to provide interest-free loans subject to the limits mentioned below. Such loans shall be recovered after the new crop is harvested. The District Office shall be held liable for arrears, if any.

District	Amount
1. Jhapa	Rs. 5000
2. Biratnagar	Rs. 7500
.....	
.....	
22. Surkhet	Rs. 500

"The Chief of the Revenue Office shall check personally or through a trusted employee, whether or not dams and irrigation channels are in proper condition, and whether or not dams and irrigation channels have been made available to landowners according to the regulations. In case any damage is detected, he shall make immediate arrangements for repairs. In case any landowner submits a complaint, the Chief of the Revenue Office shall make water available to him according to the regulations. In case he neglects these duties, and the landowner submits a complaint accordingly, he shall be held to have failed to make necessary arrangements regarding irrigation facilities, and be punished accordingly."

Source: Government of Nepal, Madhesh Malko Sawal (Revenue regulations for the Tarai region), Kathmandu: Gorkha patra Press, n.d., secs. 94-105, and 107, pp. 42-48.) reproduced in Regmi Research Series (RRS), Year 14, 1982. pg. 181-184.

APPENDIX C

ADMINISTRATIVE ARRANGEMENTS FOR THE TERAI REGION (1849 A.D.)

The following regulations were promulgated in the name of General Krishna Bahadur Kunwar Rana, who was appointed as the Chief administrator of several districts in the terai:

1) Do not create any disturbances on the borders from your side, nor shall any government official or ryot be allowed to do so. Anyone who creates such disturbances shall be arrested and a statement shall be recorded from him confessing his guilt. The case shall then be reported to us, and action shall be taken as ordered.

2) Disputes between our ryots and those of the territories of the (East India) Company's government on monetary dealings or other matters shall be settled as usual through correspondence between Subba and Naib Subbas from our side and Thanadars and Magistrates from the Company's side. If before the matter is settled through such correspondence the Magistrate writes to you directly, study the matter thoroughly, consult appropriate persons, arrive at an impartial conclusion, and send a reply accordingly in such a manner that no difficulty arises subsequently. Report the matter to us. If the matter is so serious that you cannot take a decision on your own responsibility, report it to us with full particulars and take action as decided from here.

3) Issue orders to checkposts and military units to remain vigilant toward foreign spies, or agents who may bring in secret correspondence, as well as toward people who leave the country without a passport or take away secret correspondence. Arrest persons guilty or such offenses, report the matter to us, and take action as ordered.

7) Construct dams and irrigation channels in different districts through wage-labour and arrange for the reclamation of uncultivated lands after stipulating tax-exemption for a specified period in the beginning. Exempt the newly-settled villages from the obligation to supply food and fodder to state-owned elephants on a compulsory basis. Send particulars of newly-settled moujas on virgin (kalabanjar) lands. Arrange for the supply of irrigation facilities according to customary shares to Mal, jagir, birta, guthi, sadavarta, bekh, marwat, and other lands in the different pargannas . Let no complaint come from anyone in this regard.

Source: Adapted from Regmi Research Series, 1979. pg. 181-186.

APPENDIX D

IRRIGATION, ELECTRICITY, AND RELATED WATER RESOURCES ACT (1967)

The following specific clauses of the Irrigation, Electricity, and Related Water Resources Act of 1967 relate to property rights and relations of local groups to the state:

Clause 3) Use of Water Resources

(1) No person shall be permitted to utilize a water resource without obtaining licence under this Act. But no licence need be obtained for utilizing any water resource for any of the purposes mentioned below:
(a) For meeting daily personal needs,

(b) For operating windmills for cottage industry purposes,

(c) For operating water mills or irrigation channels

(d) For irrigating lands through underground water by means of tube-wells,

(e) For drawing water for irrigation purposes from gullies, aqueducts or streams, ponds, wells, lakes, canals or dams through labour and resources of the local people themselves either individually or collectively, in such a manner that no adverse effect is created on any hydroelectric or irrigation project of His Majesty's Government constructed before or after commencement of this Act, or those proposed to be constructed in the future.

Clause 6. Acquisition and Requisition by His Majesty's Government

(1) His Majesty's Government may acquire any electric and irrigation installation and related equipment against compensation, if it so becomes necessary for the purposes of making large-scale and comprehensive arrangements regarding electricity and irrigation.

(3) Canal, dams, electric installations, any other construction project and related lands and equipment acquired under this section may be operated by His Majesty's Government itself or be handed over to any other person for operation with or without selling the same to him.

APPENDIX E

GLOSSARY OF FREQUENTLY-USED NEPALI TERMS[1]

abal	Land of the best quality which is irrigated, graded as such for purposes of tax-assessment.
agri	a miner
ahat	field channel
ahate bhai	literally means field channel brother; member of the field channel
Asadh	one of the months in the Nepali calendar
Bada Hakim	The chief administrative officer of a district.
Baisakh	one of the months in the Nepali calendar
bari	see pakho; wet rice is not grown in this type of land but it may be irrigated
begar	forced and unpaid labour
Bhadra	one of the months in the Nepali calendar
Bhattarai	family name of the Brahmin caste
bichari	government employee who is well versed with the legal code of Nepal and helps in the adjudication of litigations
bigha	a land measurement unit in the terai region comprising 0.67 hectares.
birta	land grant made by the state to individuals, usually on a taxfree and inheritable basis.
chahar	fourth grade of land for purposes of tax assessment.
Chaitra	one of the months in the Nepali calendar

[1]The meanings have been adapted to its use in the context of this dissertation and therefore these are not standard dictionary meanings. Some of the meanings are very site specific that may have a totally different meaning in the Pan-Nepali language.

chaudhari	a tax-collection functionary appointed in each Parganna of the Tarai region before the introduction of the jimidari system.
Chettri	caste second in rank after the Brahmins
chitaidar	a caretaker of temples, gardens, forests, etc.
dhalwa/dhalpa	caretaker of irrigation channel in Kathmandu valley.
doudhaha	an official tour of inspection and supervision.
doyam	second grade of land for purposes of tax assessment.
gahak	proportioning weir
Gaire	family name of the Brahmin caste
gaon	a village; a hamlet
ghatta	water turbine or mill
Gurkhas	Nepali soldiers serving in the British and Indian military under diplomatic treaties.
guthi	land alienated by the State or by individuals to finance the performance of religious or charitable functions.
jagera	lands other than jagir, which were retained by the state for direct appropriation of taxes.
jagir	land assigned to government employees as emoluments; abolished in 1951.
jagirdar	a government employee; the owner of a jagir holding.
Jagire	one who is employed
Jestha	one of the months in the Nepali calendar
jhara	1) forced labour; 2) a tax levied on the homestead as the commuted value of such labour in some hill districts; 3) summoning of labour work for canal repair or maintainance, or such labour work
jhilinge	a type of legumes

jimidar	non-official tax collection functionary in the Tarai region.
jimmawal	a non-official functionary who collected taxes on khet lands in the hill region.
Kartik	one of the months in the Nepali calendar
Katuwal	messenger or the village crier
Khadga Nisan	official seal of the Rana Prime minister
khet	1) a measure of land in the hill region equal to twenty five ropanis or 100 muris; 2) irrigated land in the hill region on which paddy and wheat can be grown.
khetara	labourer
khola	stream
kipat	a form of communal land tenure prevalent among certain communities.
Krishi	agriculture
kulo	hill canal
Kumal	potters' community
lakh	100,000 (a hundred thousand)
Magar	ethnic group in Nepal
Magh	one of the months in the Nepali calendar
maha	big
Majhi	fisherpeople community
mal	a revenue collection office.
Mangsir	one of the months in the Nepali calendar
mathillo	upper
mato muri	unit of land measurement in hill Nepal; four mato muri make a ropani
mohi	also mohiya, a tenant

mouja	1) a village as the primary unit of land tax administration in the Tarai; 2) a revenue subdivision, consisting of a group of villages, in some hill districts and Kathmandu Valley.
mukhiya	1) a homestead tax collection functionary in the hill region; 2) chief of an irrigation system
Muluki Ain	legal code of Nepal
muri	1) a volumetric measure for grains, equivalent to 2.40 bushels; 2) a measure of land equal to 1369 square feet (since 1907) in the hill districts and Kathmandu Valley.
naike	leader of a work team.
Newar	an ethnic community predominant in Kathmandu Valley with its own caste system
Nisan	family name of the Magar community
pajani	appointment, dismissal, confirmation, etc. of government employees, tenants, etc.
pakho	unirrigated land in the hill districts and Kathmandu Valley on which only maize, millet, ghaiya, and other dry crops can be grown.
pale	a guard; watchman; or a patroller
panchayat	a local elected council; smallest politico-administrative geographical unit under the present partyless panchayat system
Pande	family name of the Chettri or Brahmin caste
pani	water
parganna	a unit of revenue administration consisting of a group of villages in the eastern tarai region.
Parishad	council
Phalgun	one of the months in the Nepali calendar
Poush	one of the months in the Nepali calendar
raikar	lands on which taxes are collected from individual landowners, traditionally regarded as state-owned

raiti	landholder
rakam	an obligation imposed on peasants to provide porterage or other services.
Rana	family name of the Magar community or Chettri caste
rupees	Nepali currency
sadasya	member or representative
samaj	society; the assembly of all members
sameli	list of signatures of people who have pledged to undertake a commitment
samiti	committee
sancho	proportioning weir
Saru	family name of the Magar community
Shrawan	one of the months in the Nepali calendar
sim	third grade of land for purposes of tax assessment.
sithe	a type of jhara in the irrigation context
sunar	craftsmen that work with metals
tallo	lower
Taluk	landlord; rent-collector and adjudicator of land issues and conflicts at village level
talukdars	such landlords or rent-collectors
terai	plains between Nepal and India
thari	a nonofficial tax collection functionary in the hill districts; assistant to mukhiya in irrigation systems.
thulo	big
tol	a small area, usually a residential area
upadhyaya	family name of the upadhyaya sub-caste of Brahmins

BIBLIOGRAPHY

Abrams, Philip
1982 Historical Sociology. Ithaca: Cornell University Press.

Agrawal, Hem Narayan
1976 The Administrative System of Nepal: From Tradition to modernity. New Delhi: Vikas Publishing House Pvt. Ltd.

Alford, Robert R. and Roger Friedland
1985 Powers of Theory: Capitalism, the State, and Democracy. Cambridge: Cambridge University Press.

Anderson, E. N.
1987 "A Malaysian Tragedy of the Commons." In: The Question of the Commons: The Culture and Ecology of Communal Resources. Bonnie M. McCay and James M. Acheson, eds. Tucson: The University of Arizona Press. 1987.

Annonymous
1988 "Baideshik Reen Laganiko Paripekshyama Mahakali Seenchayee Pariyojana: Ek Adhyayan." (Mahakali Irrigation Project in the Context of Foreign Loan: A Study) In: Jhilko. No. 10, Vol 9. October/ November 1988.

Asian Development Bank (ADB)
1980 Appraisal of the Hill Irrigation Project (Western Region) in Nepal. Manila, The Philippines.

Baer, Werner, Richard Newfarmer, and Thomas Trebat
1976 "On State Capitalism in Brazil: Some New Issues and Questions." Latin American Economic Affairs 30 (Winter): 63-93.

Barnes, H. E.
1942 Social Institutions. N.Y.: Prentice Hall

Banskota, Mahesh
1983 "Foreign Aid and the Poor." In: Foreign Aid and Development in Nepal. Integrated Development Systems (IDS). Kathmandu: IDS.

Blaikie, P., J. Cameron, and D. Seddon
1980 Nepal in Crises: Growth and Stagnation in the Periphery. Oxford: Oxford University Press.

Bloch, M. (ed.)
1975 Marxist Analyses and Social Anthropology. London: Malaby Press.

Bohannan, P.
1963 "Land, tenure, and land tenure." In: African Agrarian Systems. D. Biebuyck, ed. England: Oxford University Press.

Bromley, Daniel W.
1986 "Closing Comments at the Conference on Common Property Resource Management." In: Proceedings of the Conference on Common Property Resource Management. National Research Council. Washington, D.C.:National Academy Press.

Campbell, A.
1837 "Notes on the Agriculture and Rural Economy of the Valley of Nipal." British Residence in Kathmandu.

Canak, William L.
1984 "The Peripheral State Debate: State Capitalistic and Bureaucratic-Authoritarian Regimes in Latin America." Latin American Research Review 19, No.1:3-36.

Ciriacy-Wantrup, S.V. and Richard C. Bishop
1975 " 'Common Property' as a concept in Natural Resources Policy." Natural Resources Journal 15 (October): 715-727.

Coward, E. Walter, Jr.

1988 "Property, Persistence, and Participation: The State and Traditional Irrigation Systems." In Production and Autonomy: Anthropological Studies and Critiques of Development. John W. Bennett and John R. Bowen, eds. Lanham: University Press of America.

1987 "Property rights and Network Order: The Case of Irrigation Works in the Western Himalayas." Unpublished paper.

1986 "State and Locality in Asian Irrigation Development: The Property Factor." In: Irrigation Management in Developing Countries: Current Issues and Approaches. K. C. Nobe and R. K. Sampath, eds. Boulder and London: Westview Press.

1986a "Direct or Indirect Alternatives for Irrigation Investment and the Creation of Property." In K. Easter, ed. Boulder and London: Westview Press.

1980 Irrigation and Agricultural Development in Asia: Perspectives from the Social Sciences. ed. Ithaca: Cornell University Press.

1978 "Research methodology in the Study of Irrigation Organization: A Review of Approaches and Applications." Agricultural Development Council, Inc. Seminar Report, Nov. 18, December 1978.

de Janvry, Alain
1981 The Agrarian Question and Reformism in Latin America. Baltimore: John Hopkins University Press.

Demsetz, H.
1967 " Towards a Theory of Property Rights." AER Papers and Proceedings 57:347-352.

Dharamdasani, M.
1984 Political Economy of Foreign Aid in the Third World: A Case Study of Nepal. Varanasi, India: Konark Publishing House.

Dobb, Maurice (ed.)
1970 A Contribution to the Critique of Political Economy: Karl Marx. New York: International Publishers.

Eggink, J. and Jan Ubels
1984 "Irrigation, Peasants and Development." Msc. Thesis. Agricultural University of Wageningen.

El-Kholy, Heba
1985 "Property Relations and Irrigation organization: A Case Study of Water-lifting Devices in an Egyptian Village in the Delta." Unpublished M.S. Thesis. Ithaca: Cornell University.

Ely, Richard
1914 Property and Contract in Their Relations to The Distribution of Wealth. London: Macmillan.

Furubotn, E., and S. Pejovich
1972 "Property Rights and Economic Theory: A Survey of Recent Literature." Journal of Economic Literature 10:1137-1162.

Gaige, F.
1975 Regionalism and National Unity in Nepal. Berkeley: University of California Press.

Geisler, Charles C.
1988 Book Review on McCay, Bonnie J., and James M. Acheson (eds.), The Question of the Commons (Tuscon: Univ. of Arizona Press, 1987). Journal of Agricultural Ethics, Volume 1: 233-235.

GITEC CONSULT GMBH
1980 Feasibility Study Report: Hill Irrigation Project (Western Region), Nepal. Dusseldorf, West Germany.

Goody, Jack
1962 Death, Property and the Ancesors. California: Stanford University Press.

Government of Nepal
1870 "Jagga Birhaunyako." (On Land Reclamation). In: Ain (Legal Codes). Kathmandu: Government of Nepal.

Grindle, Merilee
1986 State and Countryside. Baltimore and London: The John Hopkins University Press.

Hallowell, A.
1955 Culture and Experience. Philadelphia: University of Pennsylvania Press.

Harriss, John
1978 "The Use of Documentary and historical Evidence in Irrigation Studies and the Problem of Developing Nomothetic Statements." Paper presented at the Seminar on Research Methodology in the Study of Irrigation Organization at Colorado State University, U.S.A.

Hirschon, Renee (ed.)
1984 Women and Property: Women as Property. New York: St. Martin's Press.

His Majesty's Government of Nepal
1982 The Decentralization Act.

1967 The Irrigation, Electricity and Related Water Resources Act.

Hollowell, Peter (ed.)
1982 Property and Social Relations. London: Heinemann.

Husain, Asad
1970 British India's Relations with the Kingdom of Nepal, 1857-1947. London: George Allen and Unwin.

International Bank for Reconstruction and Development (IBRD)
1988 Nepal: Policies for Improving Growth and Alleviating Poverty. Report No. 7418-NEP. IBRD: Washington, D.C.

1981 Nepal: Policies and Prospects for Accelerated Growth. Report No. 3577-NEP. IBRD: Washington, D.C.

Kelly, William W.
1983 "Concepts in the Anthropological Study of Irrigation." American Anthropologist. Vol. 85, 1983. Pp. 880 - 886.

1978 "The Ethnographic Study of irrigation in a Japanese River Basin." Paper presented at the Seminar on Research Methodology in the Study of Irrigation Organization at Colorado State University, U.S.A.

Kendrick, Anita
1988 " 'Hanap Buhay': Survival Strategies of Coastal Households in Masbate, The Philippines." Unpublished M.S. Thesis. Ithaca: Cornell University.

Kumar, Satish
1967 Rana Polity in Nepal: Origin and Growth. New Delhi: Asia Publishing House.

Land Reform Commission
1953 "Reports of the Land Reforms Commission." Mimeographs. Kathmandu: Land Reforms Commission.

Landon, Percevial
1978 Nepal. (reprint of 1928 edition). Kathmandu: Ratna Pustak Bhandar.

Leach, E.
1961 Pul Eliya: A Village in Ceylon. Cambridge University Press.

Lincoln, Yvonna S.
1985 "The Substance of the Emergent Paradigm: Implications for researchers." In: Organizational Theory and Inquiry: The Paradigm Revolution. Yvonna S. Lincoln, ed. Beverly Hills: Sage Publications.

Lincoln, Y. S. and Egon S. Guba
1985 Naturalistic Inquiry. Beverly Hills: Sage Publications.

Macpherson, Stewart
1982 Social Policy in the Thirld World: The Social Dilemmas of Underdevelopment. Allanheld, Osmun and Co.

Macpherson, C.B. (ed.)
1978 Property: Mainstream and Critical Position. Oxford: Blackwell.

Martin, Edward, and Robert Yoder
1983 "Water Allocation and Resource Mobilization for Irrigation: a Comparison of Two Systems in Nepal." Paper presented at the Twelfth Annual Conference on South Asia, University of Wisconsin, Madison.

Martin, Edward D.
1986 "Resource Mobilization, Water Allocation, and Farmer Organization in Hill Irrigation Systems in Nepal." Unpublished Ph.D. Dissertation, Cornell University.

Meinzen-Dick, Ruth S.
1983 "Local Management of Tank Irrigation in South India: Organizations and Operation." Unpublished M.S. Thesis. Ithaca: Cornell University.

Mojumdar, Kanchanmoy
1973 Anglo-Nepalese Relations in the Nineteenth Century. Calcutta: Firma K. L. Mukhopadhyay.

National Research Council (NRC)
1986 Proceedings of the Conference on Common Property Resource Management. Washington, D.C.:National Academy Press.

National Archives of India
1909 Nepal Collection. New Delhi: National Archives of India.

1877 Political A. November 1877, Nos. 169-179. new Delhi: National Archives of India.

Nepal, National Planning Commission (NPC)
1985 "The Seventh Plan (1985-1990)." Kathmandu: HMG Press.

Oakerson, Ronald J.
1986 "A Model for the Analysis of Common Property Problems." In NRC, Proceedings of the Conference on Common Property Resource Management. Washington, D.C.:National Academy Press.

Oldfield, Henry A.
1974 Sketches from Nipal. (reprint of 1880 edition). New Delhi: Cosmo Publications.

Pant, Thakur Nath
1983 "Foreign Aid and Agricultural Development in Nepal." In: Foreign Aid and Development in Nepal. Integrated Development Systems. Kathmandu: IDS.

Parel, A. and Thomas Flanagan (eds.)
1979 Theories of Property. Calgary: Wilfred Laurier University Press.

Payer, Cheryl
1982 The World Bank: A Critical Analysis. New York: Monthly Review Press.

Poudel, S.
1986 Irrigation Development in Nepal. Kathmandu.

Poudel, Bholanath
1965 "Bhaktapurko Rajkulo." (The State Irrigation Channel of Bhaktapur). Purnima, No. 4. January 1965. Pp.44-49.

Pradhan, Prachanda
1986 "Patterns of Irrigation Organization in Nepal: A Case Study of Twenty-one Farmer-Managed Irrigation Systems." Kathmandu: International Irrigation Management Institute (IIMI).

1985 "Irrigation Service Fee Study: Nepal." Lalitpur: Development Research Group Pvt. Ltd.

1970 "Bureaucracy and Development in Nepal." Unpublished Ph.D. Dissertation. Claremont: Claremont Graduate School.

Pradhan, P., K. Giri, and D.N. Tiwari
1987 "Resource Mobilization and Organizational Support in Irrigation System Management: Experiences from Kulariya, Jamara, and Rani Kulos of Kailali District." In: Irrigation Management in Nepal: Research Papers from a National Seminar. International Irrigation Management Institute (IIMI). Kathmandu: IIMI.

Pradhan, Ujjwal
1987 "Property Perspective in the Evolution of a HIll Irrigation System: A Case from Western Nepal." In: Irrigation Management in Nepal: Research Papers from a National Seminar. International Irrigation Management Institute (IIMI). Kathmandu: IIMI.

1987a "Alienation or Development: Dilemmas over Property Rights and Irrigation Expansion." In: Irrigation Design for Management Asian Regional Symposium. Overseas Development Unit, Hydraulics Research Limited. Wallingford: Hydraulics Research.

1984 "Water as Property: Its Ramifications." Paper present at the 13th Annual Conference on South Asia, University of Wisconsin, Madison.

1982 "Irrigation Development: Whose Panacea?" Unpublished paper, Kathmandu, Nepal.

Reeve, Andrew
1986 Property. London: Macmillan Education Ltd.

Regmi, D. R.
1975 Modern Nepal. Calcutta: Firma K.L. Mukhopadhyay.

1958 A Century of Family Autocracy in Nepal. Kathmandu: Nepali National Congress.

Regmi, Mahesh C.
1988 An Economic History of Nepal, 1846-1901. Varanasi: Nath Publishing House.

1984 The State and Economic Surplus: Production, Trade Resource Mobilization in Early 19th Century Nepal. Varanasi, India: Nath Publishing House.

1984a Regmi Research Series Year 16 No. 7. Kathmandu: Regmi Research (Private) Ltd.

1981 Regmi Research Series. 1981. Kathmandu: Regmi Research (Private) Ltd.

1978 Thatched Huts and Stucco Palaces: Peasants and Landlords in 19th Century Nepal. New Delhi: Vikas Publishing House Pvt. Ltd.

1978a Land Tenure and Taxation in Nepal. Kathmandu: Ratna Pustak Bhandar.

1976 Landownership in Nepal. Berkeley: University of California Press.

1971 A Study in Nepali Economic History, 1768-1846. New Delhi: Manjusri Publishing House.

Rosdolsky, Roman
1968 The Making of Marx's 'Capital'. London: Pluto.

Runge, C. Ford
1986 "Common Property and Collective Action in Economic Development." In NRC, Proceedings of the Conference on Common Property Resource Management. Washington, D.C.:National Academy Press.

Schroeder, Larry, and James Wozny
1987 "Financing Rural Local Panchayats in Nepal." Occasional Paper No. 109, Local Revenue Administration Project, Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University.

Seddon, David
1987 Nepal: A State of Poverty. New Delhi: Vikas Publishing House Pvt. Ltd.

Seddon, D., P. Blaikie, and J. Cameron (eds.)
1979 Peasants and Workers in Nepal. New Delhi: Vikas Publishing House Pvt. Ltd.

Shrestha, Nanda R.
1981 "The Process of Rural-to-Rural Migration in the Agrarian Economy of Nepal." Unpublished Ph.D. Dissertation. Indiana University.

1985 "The political economy of economic underdevelopment and externalmigration in Nepal." Political Geography Quarterly, Vol. 4. No. 4. October 1985, 289-306.

Siy, Robert Y. Jr.
1982 Community Resource management: Lessons from the Zanjera. Quezon City: University of the Philippines Press.

Skocpol, Theda
1979 States and Social Revolutions. Cambridge: Cambridge University Press.

Small, L., Marietta S. Adriano and Edward D. martin
1986 "Regional Study on Irrigation Service Fees: Final Report." Sri Lanka: International Irrigation Management Institute.

Stepan, Alfred
1978 The State and Society: Peru in Comparative Perspective. Princeton: Princeton University Press.

Stinchcombe, Arthur
1983 Economic Sociology. N.Y: Academic Press.

Stone, Linda
1989 "Cultural Crossroads of Community Participation in Development: A Case from Nepal." Human Organization, Vol. 48, No. 3, 1989. Pp. 206 - 213.

Suvorova, Maria and Boris Romanov
1986 What is Property? Moscow: Progress Publishers.

Tamaki, Akira
1977 "The Development Theory of Irrigation Agriculture." Institute of Developing Economics, Special Paper # 7. Tokyo: Institute of Developing Economics.