Farmers' Water Rights and Their Relation to Data Collection and Management

Introduction

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This paper explores the nature and complexities of farmer water rights within the generic term, property, in the context of irrigation systems in rural Nepal. The paper will initially deal briefly with the nature of property rights taking into account water rights as an example of property rights. It will then present the legal and policy framework prevalent in Nepal that governs water rights. The paper will further elaborate on the dynamics and complexities of water rights in selected irrigation systems in the hills of Nepal, to substantiate the importance of water rights. The final section of the paper will discuss data collection and management of water rights information as practiced by the farmers themselves; it will also address the need for further research and action regarding water rights.

In Nepal, as elsewhere in Asia, the state as well as the private sector is increasing its involvement in matters relating to natural resources. In the appropriation, extraction, management, control, and use of natural resources, property rights and relations become vital. Property is pivotal to many current debates regarding economic and social growth, the rights of individuals, corporations, the state, and eminent domain.

The history of irrigation development in Nepal shows that it is only in the last several decades that a direct role of the state in irrigation through "planned mode of development" has occurred. Throughout Nepal's history, however, state control and direction in irrigation development had existed from time to time. The topographical nature, varying policies of the individual petty kingdoms before Nepal's unification, the remoteness of several areas, and a dominant local initiative and organization, all have contributed to a tradition of strong local irrigation management in Nepal. At present there exists a spectrum of management styles with local management of irrigation at one end, and government or state control of irrigation schemes in both the hills and the terai at the other end. In many agency controlled irrigation systems, one finds informal management or ad hoc farmer behaviors and responses regarding irrigation tasks. Water users' involvement is being encouraged in several large "jointly managed" (i.e., managed by the agency and the farmers at distinct levels) irrigation systems. Several systems that were previously agency administered are

being "prepared" for management turnover to the farmers themselves.

Local management was, to a great extent, possible with the concerned society at large endorsing and abiding by their customary laws or rules regarding water use, sharing, and further water resource development. These customary rights existed side by side with the evolving formal rights codified in government laws and statutes. In fact customary water rights are also evolving. The interrelationship between these two domains needs to be researched. Some customary rulings find endorsement in the national code (*Muluki Ain*).

TOWARDS AN UNDERSTANDING OF PROPERTY RIGHTS

Concepts of property vary over space and time. Scholars of property point out that property is both an institution and a concept, and that over time each has influenced the other. It is essential to note that they also vary across cultural boundaries.

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. Therefore the distinctions between objects of property and property relations are pivotal. Objects of property are the things or objects over which property rights are extended. For example, the valued objects in an irrigation system would be the irrigated fields whose owners have access to the irrigation water, the hydraulic structures, and the water itself. Land, labor, capital, water, implements, and physical structures (such as the intake, canal alignment, aqueducts, siphons, weirs, and dams) can be objects of property in an irrigation system. In order to transport water from the stream to a distant command area, water rights at the intake point and rights-of-way have to be obtained for the construction of the hydraulic structures to convey the water. The objects of property in an irrigation system may fall under various jurisdictions and control (e.g., the national government, local government, other communities, temple endowments, or individuals). The land that the alignment has to cross belongs to many different owners, both single or joint.

Not only is it important to focus on property objects, but also on the relationships between people with regard to a certain object (Coward, 1986). Property often includes more than a single, absolute right. For example, one who has water rights may use that water irrigating rice but not vegetables. In other words, if the person does not use the water, he may not waste it. The usufructuary rights may belong to someone, while ownership is vested in another. There are multiple claims, enforceable and at times mutually agreed upon, with regards to the same object of property. Such co-existing claims and possible transfers relegate the object of property to have only use-value or also exchange-value. 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.

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: 1) common property, 2) private property, and 3) state property. Each type of property has a different set of rights, obligations, enforceable claims, and alienation from the original possessor. Recent studies on common property resources mention a fourth type of resource whose access is open; no secure claims, therefore, on resource services exist. However, in each of these cases the state or at times the society itself becomes the final arbiter.

The jurisdictions 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 ever-occurring. 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. Similarly, the stream can be tapped at various places by various groups securing water acquisition rights all along the watershed. 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 ownership from the community to the state. Now the government is considering "turning over" these systems to the users themselves. The negotiations and agreements between irrigator communities lay down the terms for the transfer or use of certain objects of property from one group to another.

In rural Nepal, customary laws and rules regarding the use, control, and management of natural resources are also prevalent. Many of these are culturally and historically derived. Customary law often has rich historical, cultural, religious and social roots (Mifsud, 1967). Customary law can be defined as rules, either written or unwritten, whose usage is by common consent. Some customary laws have long established practices and have taken on the force of law. At times, certain state legislated acts legitimized customary rights of the people. For example, within this subcontinent in India, the Easement Act, 1882, legitimizes customary rights of the people and provides two rules of recognition: 1) by long use or prescription (Section 15) and 2) by local customs (Section 18). Thus, a right may exist by custom in which some people are entitled to take water from another's land (Singh, 1991).

Many customary laws have been practiced for a long period of time (sometimes from time immemorial) and have been handed down from generation to generation, as opposed to parliamentary enactments and judicial precedents (which are laid down by courts of law and hold legal sanctions until reversed by a superior court). Most of the customary laws have their basis in moral values and ethics. Some customary laws originated during the Vedic period, others are of more recent origin. Customary laws must have implied the extensive concurrence of the community to whom it is applicable. Customary laws may vary from community to community in the same nation-state. Each community is governed by its own customary law which may starkly contrast with those of another community. Conspicuous examples of this would include those relating to marriage rituals among Hindus, divorce procedures among the different schools of Islam, succession to ancestral property, and resource mobilization pattern followed by the Tharu community in Southern Nepal.

To an extent, the tension between customary and modern systems arises from their different notions of the private and public domains and their different ideas of ownership and attributes (Clark, 1989). Clark further notes that notions of communal title, inalienability, trusteeship, the unity of human kind and nature, of communal not individual or state authority, and of a balance between personal desires and community obligations, underlie many customary systems. Thus, more developed formal legal systems and economic theorists are often uncomfortable with such notions.

Customary or indigenous laws in the context of water rights, differ in important ways from the more formal water rights laid down by the state. Since most of the water rights are usually unwritten, the intricate evolving rules remain invisible to outsiders accustomed to working with formal legal frameworks. Customary water rights are usually negotiated locally, and parties to the negotiation abide by customary process for the negotiation. The process is equally important as the resolution. Customary water law is dynamic, forcing it to be adaptive to chang-

ing conditions. Thus, given the innate, "invisible" or "fugitive" characteristics of customary rights or laws, it is important to see the nature and dynamism in a historical perspective with a combination of methodological techniques.

While in the process of nation-building, formal laws, legal acts, and adjudicatory powers of administrative branches have been formulated and have set the parameters for property rights and relations. As a result, in Nepal, a variety of property jurisdictions exist. The different types of property can be simultaneously intermingling, coexisting, changing and functioning.

Crucial among the various rights within agrarian Nepal are water and land rights. As the country changes with agricultural expansion and intensification, incorporation of newer technology, newer demands and competition for the scarce resources, property issues and their governance become more and more vital. The system of property rights and relations determine who gets what and how much: it is an instrument of acquisition, distribution, and alienation. In the case of water and land rights, the access to these resources, the tenure and nature of such access determine the status level of the particular individual as well as the person's security for continued present and future returns or income. Any change in property rights and relations, therefore, changes the configuration of who loses and who gains.

In short, property rights and relations over scarce natural resources are complex, and their management processes reflect such property arrangements. A proper understanding of existing property situation is necessary before any intervention or "development" activity can be undertaken regarding the use, control, and management of the natural resources. Experiences in Nepal in development efforts by line agencies, as well as communities in the realm of irrigation development, hydropower, drinking water, mills, etc., show disputes and conflicts relating to rights, control, use, and management of these scarce resources. These property issues and tensions are further compounded when the projects are multi-purpose in nature.

THE LEGAL AND POLICY FRAMEWORK FOR WATER RIGHTS

To a great extent, water rights and rules in farmer managed irrigation systems in rural areas have been operative under customary or traditional law. The present Law on Reclamation of Wastelands (effective with amendments ever since 1853) outlined in the Legal Code of Nepal, the *Muluki Ain* (Regmi, 1978:244) portrays some of the resource mobilization obligations and property rights to be honored at the local level. Under this provision, 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.[2] The law also makes provisions for sharing water, rights-of-way, and forfeiture thereof, 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 for allocation, and has incorporated stipulations for water allocation and use with the intent of curtailing potential water conflicts over priorities with the very irrigation sector.

Measures for 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 for the repair is described. The onus lay on the peasants. The state lay 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.

Though these stipulations of the law do indicate mechanisms for upholding some customary norms and indirect governance of irrigation systems, agrarian institutions in the form of land tenurial relations have changed and private property of land has been enhanced since the early nineteenth century, the time legal provisions were being made.

The Irrigation, Electricity, and Related Water Resources Act of 1967 presented 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. This act was the first attempt of the state to introduce specific legislation in water resources. Though the act recognized the right of the individuals and groups to construct irrigation systems, the realm of eminent domain was manifest in this act. The paramount power of the state over existing irrigation systems if they "hindered" government actions was evident by the above act. The act incorporated the concept of licensing, payment of irrigation service fees, etc. It also stipulated the authority to control irrigation facilities once state investment had been made.

In sum, local rights or customary rights had meaning as long as they were legitimized by the state. However, with the flurry of development activities, the opportunity of alternative and competing uses of water, and different technologies available for extraction of water, warranted changes to this act.

The recent irrigation policy, effective from 1992, makes reference to: legal recognition of water users as autonomous entities, rights and duties of the water users and the agency, user managed systems to be under collective ownership of the users, the full ownership of turnover systems and the related structures to be with the water users association registered by the government. But nowhere specifically is the issue of water rights and the water right holder or owner spelled out.

A new Water Resources Act was passed by parliament last year replacing the 1967 act. A separate Electricity Act was also passed. This Act addresses issues of prioritization or hierarchy of water uses, privatization, incentives, licensing, etc.

A fundamental characteristic of the new Act is that the ownership of all water resources within the kingdom of Nepal is vested in the state. As the state deems fit, it allows corporations, communities, or individuals to use the resources. People obtain water use rights either through licenses, or are "granted" free access to water for certain uses. In the case of facilities regulated by public agencies or private developers, individual rights become subservient to the terms and conditions imposed by the state through the concerned agencies. Since "ownership" right is treated as the "mother of rights" and other such as usufructuary rights, transfer rights, etc, as derivatives or secondary to "ownership" rights, the difference between "peoples' rights" and "state rights" become apparent. Paramount power vested in "ownership rights" is to a great extent a very western concept. However, in formulating legislation with such borrowed concepts (that may not reflect the social reality of the complexities of property rights), such concepts start out as "myths" which later on take the force of "reality" when property disputes are settled with "myth" concepts. The state is not seen as a public trustee of the natural resources but as the paramount owner of it, despite the very first statement in the Preamble of the Constitution of Nepal:

WHEREAS, We are convinced that the source of sovereign authority of the independent and sovereign Nepal is inherent in the people, and, therefore, We have, from time to time, made known our desire to conduct the government of the country in consonance with the popular will; AND WHEREAS, in keeping with the desire of the Nepalese people expressed through the recent people's movement to bring about constitutional changes, We are further inspired by the objective

of securing to the Nepalese people social, political and economic justice long into the future.." (HMG, 1992)

The Act also has provisions for the principle of beneficial water use, through the establishment of priority over various uses presumably based on a hierarchy of needs.[3] The Act authorizes the government to utilize or develop water resources on its own. Nothing mentioned in the Act shall be deemed to have prevented His Majesty's Government from utilizing or developing water resources on its own. This includes extensive public uses, acquiring and developing water resources, land, buildings, equipment, and structures relating thereto, utilized by any person under this Act.[4]

The Act does provide mechanisms for conflict or dispute resolution through the arbitration of a prescribed committee. However, who should prescribe the committee is not delineated in the Act.

The rights of the state as stipulated in the Act may not alter daily activities within irrigation systems due to lack of funds to carry out "development" projects or the intent to control each individual irrigation system on the part of the government. However, the balance of power has definitely shifted in favor of the state due to this Act and if for any reason a case were to be brought to court it is very likely that the state hails supreme. With each successive legislation, the reconciling of customary laws and norms with modern principles of water management or modern legal systems continues with subsequent erosion of customs.

However for the stipulations in the Act to be translated into real action, the regulations for the Act will have to be formulated. It is hoped that during the drafting of the new regulations, different interest groups and water resource stake holders will have a say in the proposed regulations as well as assist in the regulation-making. It would be important to be farsighted enough to see the real implications of the regulations on the current social practices involving water resource. The regulations should be framed in such a way that participation of the stakeholders in drafting the regulations is ensured, future decisions regarding water use planning and conflict resolutions are undertaken democratically, and that the very framework guarantees and accommodates existing water rights (especially customary water rights of the more vulnerable groups). It should also ensure future water resource use development without the water resource being the monopoly of either the state, corporation, a group of current users, or a powerful interest group. Thus the process of making legislation (including acts, regulations, and policies) with public hearings, is as important as the contents of the legislation in a society moving towards democracy.

Stipulations within statutes may exist only in paper. It is therefore important to understand the actual situations in the field regarding water rights. It is towards that task that I now turn to drawing information from several case studies in the hills of Nepal.

THE DYNAMICS OF FARMER WATER RIGHTS IN A HILL IRRIGATION SYSTEM

The information in this section is primarily based on one of two irrigation systems I studied between 1986 and 1987. The case study I explore here concerns the Brangdhi Tallo Kulo located in Palpa. This irrigation system was one where the state, through indirect investment, extended an existing farmer managed canal, and after completion of the project, the new "beneficiaries" and the old members became locked in water allocation disputes.

In Brangdhi Tallo Kulo, the original property rights in water, rights-of-way, land, hydraulic artifacts 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, the extended area of the canal. But even in this case, local actions

by Chherlung, the original investors, 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 property rights acquisition, especially water rights, once state or public funds had been utilized, was a bone of contention for irrigation engineers and bureaucrats. They felt that such public investments should not entail the privatization of water rights that can be sold, with benefits from public investment acquired by private water right holders.[5]

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, had acquired water rights through inheritance, purchase, and additional investments. A decree from the center, permitting Chherlung to continue canal construction with a three yards wide rights-of-way along the alignment, was a case of the state granting property rights including continuing access. Some of the objects of property of this canal were devices to actualize water rights, i.e., the *sancho* (proportioning weir). Changes in water rights necessitated 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, elaborate resource mobilization rules and procedures were observed for the reproduction of these rights.

Each sub-command acquired water rights by virtue of having invested in the system through labor, cash payments, and/or agreeing to future and continuing re-investments. These sub-commands were physically linked to one another because they drew water from the same intake and made 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, especially water rights, had 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 were a commodity that could be sold or rented within limits. They were also an item that can be given or inherited. In Chherlung, the price was fixed by the *samaj* (the irrigation organization) with the consent of the general assembly, which behaved like a monopoly in this regard. In the canal, water was common property whose control and use was governed at the community of users' level. It became individual property when it entered a user's field.

Possessing water rights did not give full liberty to do as one pleased with the water. There were constraints and liabilities. Pre-monsoon rice could not be grown. One had to be vigilant for possible gully formation and land erosion while applying water. The transfer of water to other command areas was prohibited. This group coercion guaranteed security in water rights for the command area. The powers derived from possession of water rights were thus not forfeited to other command areas through water transfer. Such an exclusionary policy enhanced security derived from water rights to a specific command area. Where water could be alienable on an individual basis, it was not alienable from the "command area" entitlement.

The *pani purja lagat*, water rights record, which the irrigation organization maintained, was significant because it served as a public record of water rights. It indicated the name of the weir from which the watershare was utilized. This compilation was property-based, and served 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*, the chief of the canal or sub-command, was to operationalize water rights during the different cropping seasons. The

mukhiya assigned turns and priorities for rotations among the different shareholders. He adjudicated water disputes and represented his sub-command while negotiating water from other sub-commands.

The complex water distribution rules reflected both rights and agronomic realities. The different water-land ratio as presented in Table 1 influenced the way water was distributed. Due to water shortage, elaborate rotations of water turns were carried out in response not only to the sub-command's cropping pattern, but also in response to water availability from the main canal while other sub-commands irrigate.

TABLE 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 were first converted into 59 shares, 55 going to Chherlung and 4 to Artunga.

The relationships among sub-commands and among individual irrigators within these areas largely center on irrigation property rights rather than on other forms of social relations (e.g., kinship, patron-client relationship, or caste).

One's irrigation property status, represented through ownership of water shares, established a diverse set of derivative relationships. These shares entitled 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 were created and represented in the placement of intakes. These relations, or rights, were sanctioned both by the state and by customary rulings. Prior appropriation was socially endorsed. Negative sanctions applied if the rights of a share holder with respect to water was violated. Water thieves were fined by the committee.

In conclusion, some common principles shared among the sub-commands are: 1) property rights are related to investment and 2) 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 at different times and under different 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 labor 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.

THE CONTEXT AND PURPOSE OF DATA COLLECTION AND MANAGEMENT

Farmers in well managed irrigation systems like the one discussed above have been recording their collective and individual water rights. This information was seen to be necessary for the management and reproduction of the irrigation system. The water rights ascertained the basis for future entitlements and duties and governed the current benefit stream as well as obligations. An updated, publicly verified water rights record was essential for financing future development in the irrigation system by the users, assessing resources to be contributed to meeting recurrent costs, water sharing among different users, sub-commands, or between systems, and water distribution within areas.

An understanding of the dynamics of property and water rights and relations will provide insights to irrigation development processes and appropriate irrigation planning and rehabilitation activities. It will also help formulate and modify Nepal's water laws, taking into account the implications of existing customary rights. Since irrigation is a property-creating or altering process, involving benefits, losses, access, rights, obligations, and changes in relations, a significant sociological contribution to the improvement of irrigation development strategies will emerge from the study of the property factor in irrigation (Coward, 1986; 1986a).

A water rights profile or inventory along a watershed, river basin, or between and within systems would be very useful for future development of the water resources without displacing or curtailing current users. Often, a lack of information and understanding of the interrelationship between various uses and users of water resources can lead to poor planning, uncoordinated implementation, prolonged litigations and disputes between users, the state, communities, villages, and within or between sectors.

There are several techniques that we can use to better understand the present the more "invisible and vague customary water rights" concepts.[6] First, field inventories and spatial representation of indigenous irrigation systems are necessary to record the existence of the irrigation systems themselves. The spatial representation could include techniques such as the Geographic Information System (GIS). Often, indigenous irrigation systems are overlooked in official statistics, and ignored when agencies or the state plan changes. Thus, the first step to acknowledging and securing indigenous systems' water rights is to record their *existence* and place them on the map.

Many process-oriented water rights at the micro-level are ideally suited to the use of Participatory Rural Appraisal (PRA) and direct observation techniques. People's knowledge of water rights itself is not uniform and PRA techniques not only help the outsider to understand the dynamics of the rules operating but also help create enhanced knowledge among the villagers themselves. Direct observation is useful to record the manifestations of the customary water law in action, in the way water is actually being distributed, shared, prioritized, and resources mobilized. For direct observation techniques, the various perspectives of legal anthropology may provide particularly appropriate insights into the process of the different and sometimes competing legal frameworks relating to irrigation systems. Getting the lawyers, who draft national laws, to understand the nature and dynamics of customary water law through field visits, is equally important (Ambler, 1993).

GIS-produced maps could graphically show changes in water rights boundaries over time and depict the seasonal and stress-related boundary changes that occur within shorter time horizons (Ambler, 1993). By recording water rights systems and their negotiating texts, we can build a data base that can be correlated with performance. This information can be valuable for crafting farmer-to-farmer training programs where farmers from lower performing systems can be taken to higher performing systems with simi-

lar conditions. Usually the farmer-to-farmer training programs have been for institutional development and improvement in water management techniques. A good deal of this cross-learning can also be seen in terms of the articulation of customary water law and its field application (Ambler, 1993).

CONCLUSIONS

This paper explored farmers' water rights within the general concept of property and also discussed the legal and policy framework for those rights. Extracting from a case study, the paper attempted to show the dynamics of farmer water rights in a hill irrigation system. It then linked this understanding in relation to the need for information on water rights. The paper concludes with some policy implications for irrigation development arising out of a property perspective as outlined below and the need for further studies on water rights dynamics in Nepal within the present context.

Several tentative policy implications arising out of the property perspective research can be suggested: 1) a procedure that incorporates institutional arrangements and agreements between those who currently are the property rights owners and users with those who are to be the future beneficiaries is necessary, 2) extension and rehabilitation of existing canals usually create new shareholders. As a result, prior to project implementation, existing property rights and relations have to be assessed such that compensation to the original shareholders is worked into the rights and obligations of both the old and new shareholders, and 3) irrigation systems cannot be expected to be maintained and operated if such resource contributions are not backed by secure rights.

An understanding and recording of water rights and concomitant duties is appropriate because the present water scenario faced by Nepal is one that is both dynamic and competitive; formal legal provisions are being provided for water use, customary rulings are still in existence and at times in co-existence with formal laws, competition over water for various different sector uses exists, and water is rapidly changing into a commodity with express exchange value rather than use value alone. Even within a single sector, there are competitive demands made by proponents of different technologies. In the case of irrigation, surface, groundwater, and conjunctive uses would place competing demands on water. Likewise, for a specific water resource, demands on it may be placed by different users and sectors (e.g., drinking water, biodiversity conservation, fishing, municipality use, irrigation, energy, etc).

Several studies on water use in Nepal portray a range of water use related conflicts (IMC/APROSC, 1990; APROSC, 1985; Pradhan, 1990). These conflicts were between different sectors, users, and uses. They reveal different levels of governance (i.e., the state, local administration, or the grouped users, etc.), different sources of endorsement or legitimacy (i.e., customary or formal legal provisions), and different demands placed on the same water source (e.g., drinking, fishing, irrigation, energy, etc.). Thus, there are conflicts and competitive demands over water use and sharing in both the irrigation and non-irrigation sectors.

Additional research with a variety of research methodologies is necessary for analyzing the current situation of the various water uses, the relationship between customary and formal water rights (i.e., the existing legal framework taking into account the customary and community rights), the nature and scope of the evolving conflicts over water use, the relationship between eminent domain and existing water rights, and the potential for a mechanism for collaboration between sectors, users, the state and locality to ascertain the value of water and the priorities. In sum, such research on water rights would lead to an understanding of means for accommodating or guaranteeing existing water rights. At the same time, it would facilitate new equitable and productive developments of water resources.

Notes

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

[3] The priority order is as follows: a) drinking water and domestic use, b) irrigation, c) agricultural uses such as animal husbandry and fisheries, d) hydroelectricity, e) cottage industry, industrial enterprises and mining uses, f) navigation, g) recreational uses, and h) other uses.

[4] In this case, the Act explains that "Extensive Public Use" means the use which does not cause substantial adverse effect on the existing use, and benefits a larger population than the existing one. The government will compensate such a practice. What remains crucial is the fair, just, and transparent evaluation of the "extensive pubic use". In a similar vein, Singh (1989), formerly of the Indian Law Institute, states in the context of water rights in India, but generally applicable elsewhere, "...primarily the rights cannot be thought as absolute rights against which no prescription can be obtained...the duties of the state in the use of water--specially where people's natural right is violated, needs to be very clearly specified, in the statute itself...the duties of the state including all its agencies would have to be congruent with the kind of rights acquired by the state. "

Again, Singh states, "...it is not sufficient to merely translate "common good" as "public purpose". It needs to be clearly defined who the benefitting public is, and how the original users are to be included in the "public", and how their rights are to be respected if they are not going to be a part of the "public". The purpose too needs to be legally justifiable. The planners cannot arbitrarily plan projects whose worth the public has no way of evaluating. Unless such radical rethinking is done on the issue of water-rights, it is unlikely that the lawlessness of the state in planning water schemes can be checked. It is equally unlikely that the poorer sections of the society will be empowered to claim their rights to water when the state plans to change the users or water use."

See Pradhan (1990) for organizational and conflict details of the irrigation system being discussed as well as for another comparative case.

[5] 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.

[6] The author acknowledges the comments and suggestions of John Ambler regarding customary water rights and techniques to study them.

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