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The politics of ecological knowledge: the case of British colonial codification of "customary" irrigation practices in Kangra, India

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Presented at the American Society of Environmental History Conference
"Environmental History Across Boundaries"
April 1999, Tucson, AZ

One of the hallmarks of British rule in India was the attempt to base colonial administrative rule on Indian customary laws. The requisite colonial knowledge for this was sought through the codification of Indian social customs, practices, and law. From the tenure of Warren Hastings, the first Governor General of India, through to the last colonial census of India in the twentieth century, British rule in India was characterized by exhaustive efforts at cataloguing, classifying, and codifying what some Indians said about who they were and what they did. As many scholars have ably demonstrated, the project of gathering colonialist knowledge about "authentic" Indian traditions was fraught with insurmountable challenges, not the least of which included the plurality and changing nature of Indian customs, the inherent relations of domination and subordination which characterized colonial interactions with Indians, the strategic or pragmatic decisions Indians made about how to represent themselves to colonial rulers, and the British tendency to reify ideas rooted in European social philosophy as Indian tradition (Cohn 1987, Dirks 1985, Guha 1981, Raheja 1998).

One central focus of British rule was the land settlement, the process through which the nature of property rights was determined, rights holders identified, and most importantly, revenue rates and payment schedules established. Although ostensibly an exercise in elucidating and recording a region's customs and laws relating to land rights, cultivation, and the distribution of agricultural surpluses, land settlements were heavily influenced by prevailing European social theories concerning private property, investment, and productivity, as well as the successes and failures of prior settlements in other regions of India, all cloaked in the guise of debates over what constituted "local custom" (Baden-Powell 1892, Guha 1981).

In areas where irrigation augmented natural rainfall, the settlement report for a village would also include a description of the manner of irrigation, the area irrigated, irrigation rights, and sometimes notes on the social organization of irrigation management. However, the village-by-village approach to recording irrigation information was unworkable in what is now District Kangra in the mountainous state of Himachal Pradesh. There, farmer-managed gravity flow irrigation systems, known as kuhls, used to irrigate rice and wheat fields, were and still are, exceedingly complex, constituting a dense web of interlocking irrigation systems and channels etched into the landscape. Often one village would use water from several different kuhls to irrigate fields at different elevations, or concomitantly one kuhl might irrigate fields in as many

as 30 or 40 different villages. The management of multi-village kuhls required inter-village coordination for channel repair and maintenance, and water distribution. Thus a record of rights at the village level would reveal only a partial picture of irrigation organization and management. The limitations and inadequacies of village-level information lead to the preparation of a record of irrigation rights at a watershed scale for all the kuhl irrigation systems which irrigated multiple villages as part of the first revised settlement of the district completed in 1874. In the two tehsils (subdistricts) of District Kangra with the greatest density of irrigation networks, Palampur and Kangra, the origins, methods of construction, inter-village rights and responsibilities, and maps of more than 715 kuhls were codified, catalogued, and recorded on a watershed-by-watershed basis. This constituted the first edition of the Riwaj-i-Abpashi. The Riwaj-i-Abpashi also includes a glossary of specialized irrigation terminology and a section on the customary rules governing the construction of new kuhls. The corresponding information regarding the more than 1500 smaller kuhls which irrigate one village or less was compiled as part of each individual village's settlement papers. The Riwaj-i-Abpashi was revised in 1915. The revised volumes are stored in the sub-district revenue department offices and are still used as the basis for adjudicating water disputes between and within villages.

The Riwaj-i-Abpashi is a unique text because it represents an unusual, almost encyclopedic, compendium of detailed information circa late nineteenth century about what had hitherto been orally transmitted knowledge regarding local irrigation practices and customs. Within the context of small-scale farmer-managed gravity-flow irrigation systems worldwide, and certainly within the south Asian context, such a document is comparatively rare. In this paper I examine the Riwaj-i-Abpashi from three perspectives. First, based on a somewhat literal reading of the text, I pose the question, "does the Riwaj-i-Abpashi provide us with information about the kuhl irrigation systems specifically, and farmer managed irrigation systems more generally, which we did not already know?". Secondly, I examine the text as it relates to and itself is a product of, colonial agrarian policies, ideas about property, and the slippery terrain of attempts to codify custom. Thirdly, I explore the text as part of the broader project of creating colonialist knowledge about India. Despite the text's self-presentation as an ostensibly transparent, apolitical and impartial document, it is actually a form of colonial intervention, inherently bound to relations of domination, subordination, and representation. I attempt to

uncover some of the transactional pragmatics (Raheja 1998) that governed the collection of the information it contains and to discuss the social consequences that resulted from the codification of this local knowledge system.

New Insights Concerning Farmer-Managed Gravity Flow Irrigation Systems

For each of the approximately 715 multi-village kuhls in Kangra and Palampur Tehsils the Riwaj-i-Abpashi provides a short paragraph describing the history of the kuhl, what villages it irrigates, the location of the diversion structure which diverts water from the stream into the kuhl's channel, and the origin of the name of the kuhl. Two primary insights which emerge from this information are the role of supra-local authority in some aspects of kuhl construction and management, and the ways in which natural perturbations, primarily floods and earthquakes, have affected kuhl structures and management.

Pre-colonial and colonial governments played multiple and diverse roles in kuhl management. The variety of roles supra-local authority played in kuhl management belies the conventional wisdom that "traditional" or "community managed" irrigation systems operated independently of higher levels of authority and governance. Instead we learn from the Riwaj-i-Abpashi that pre-colonial mountain rulers sponsored the construction of kuhls, were involved with kuhl management, and occasionally adjudicated conflicts between upstream and downstream kuhls during periods of water scarcity. Pre-colonial rulers sponsored the construction of 18 kuhls in Palampur and Kangra Tehsils, primarily in the eighteenth and nineteenth centuries. While relatively few in number, they constituted the longest kuhls in the region with the largest command areas. Their main stem length often ranges from 20 to 40 kilometers, conveying irrigation water to several thousand hectares scattered across as many as 50 or 60 different hamlets.

Pre-colonial rulers sponsored the construction of kuhls to increase their revenues and to strengthen their political legitimacy. Because the state received twice as much revenue from irrigated land as it did from unirrigated fields (half of the gross production, compared to as little as one quarter on unirrigated plots) increasing the area irrigated significantly increased state revenues.

State sponsorship of kuhls also bolstered the ruling lineage's political legitimacy because not only cultivators, but artisans, traders, and shopkeepers benefited from the water a new kuhl brought and in return were more likely to support the local ruler. Kuhl water satisfied all domestic water needs such as cooking, washing (utensils, persons and clothes), and watering livestock and the small kitchen garden invariably found near the domestic compound. Kuhl water was also used by members of the basket making caste, and kuhl hydropower was used to turn potter's wheels and to husk and grind grain. Through the act of sponsoring the construction of a kuhl the raja or rani strengthened the legitimacy of the raja's rule amongst the kuhl beneficiaries. Furthermore, by naming the kuhl after themselves they ensured that their name would endure long after their death.

Pre-colonial rulers were also involved with the management of some kuhls. In the southern part of Kangra District bordering the Punjab plains, the ruler or his agent appointed individuals, known as kohlis or watermasters, to be in charge of water distribution and kuhl maintenance and repair. During the colonial period this practice was discontinued and the farmers themselves began to choose their own watermasters. By the 1930s it was observed that conflict over water distribution had increased as a result of the withdrawal of state involvement in kuhl management, and that officers of the Revenue Department had been enlisted to help resolve the ensuing disputes .

The Riwaj-i-Abpashi also refers to occasions when pre-colonial rulers exercised their authority to resolve upstream downstream disputes between different kuhls. This occurred when the monsoon rains failed or were late and water shortages became critical. The text states that the ruler would appoint an agent charged with apportioning water between upstream and downstream kuhls to ensure that the irrigators of upstream kuhls did not divert all of the scarce water from the feeder streams.

These examples of state sponsorship of kuhl construction and state involvement in kuhl management and conflict resolution suggest that while most of the kuhls in Kangra were managed most of the time without any state involvement, for some kuhls and at some times the pre-colonial state did play important roles. The temporal and substantive diversity of precolonial state involvement in irrigation management in Kangra suggests that prevailing views which tend to dichotomize state and locally managed irrigation systems as discrete entities do not accurately

represent the nature of state-local relations for irrigation management. The plurality of state roles in "local" irrigation management in Kangra described in the Riwaj-i-Abpashi suggests that effective state intervention will take different forms in different places and that current boilerplate templates for joint irrigation management and other models for devolving authority to local irrigator groups for irrigation system management will not be effective unless they incorporate the range of possible state-local relations illustrated in the Riwaj-i-Abpashi.

The second insight regarding kuhls which the Riwaj-i-Abpashi yields concerns the manner in which coordination between kuhl irrigation systems reduces the destructive impacts of sudden shocks such as floods and earthquakes. Each year during the monsoon season the mountain streams from which kuhls divert water become raging and turbulent torrents which often destroy the kuhl's diversion dam and upstream channel portion. Occasionally landslides in the narrow headwater canyons create temporary dams which, when they burst, send a destructive wall of mud, water, boulders and trees downstream. Less frequent, but also quite destructive, are earthquakes which rumble through the seismically active Himalaya mountain range. The Riwaj-i-Abpashi notes the influence of these environmental shocks on kuhls in several ways. For 22 kuhls it describes how the position of the kuhl's diversion structure shifts upstream or downstream due to changes in the course of the river due to the annual floods, thus emphasizing the ephemeral nature of kuhls as cuts across the landscape that are drawn again and again, in contrast to many common perceptions of traditional irrigation systems as unchanging.

The Riwaj-i-Abpashi describes several instances in which coordination between individual kuhl systems helped to mitigate the destructive effects of these environmental shocks. For example, it mentions several cases of kuhls which used to be managed independently are now managed jointly with a shared diversion structure. Such inter-kuhl coordination between kuhls, kohlis, and irrigators takes the form of participating in each other's kuhl-related rituals, sharing the same diversion structure and occasionally sharing the upper sections of the kuhl's main stem. The fact that coordination between adjacent kuhls promotes their persistence often escapes current attempts to theorize the conditions under which such resource systems will maintain their integrity because they often focus exclusively on the individual resource system, often to the exclusion of possible beneficial exchange relations (or competition and conflict) between adjacent resource systems.

The Riwai-i-Abpashi and British Theories of Property

While the Riwaj-i-Abpashi provides insights into community managed irrigation systems, it also exemplifies colonial notions of property and the importance the colonial administration attached to clearly defined property rights as the precursor to revenue collection and agricultural development. Indeed the primary motivation for the compilation of the first edition of the Riwaj-i-Abpashi in 1879 was to facilitate and control the expansion of irrigation in the region. This was linked with a set of wider agrarian policies aimed at agricultural expansion, monetization of the economy, and the production of agricultural surpluses. The cornerstone of these policies was the recording and protection of rights in land; a necessary step prior to the assessment of tax rates. The assumption underlying the clarification of property rights was that clear property rights and moderate assessments would inevitably lead to greater investments in agricultural productivity. This was the basis of the early British criticism of the manner of revenue collection prevailing in Kaiigra when they wrested control of the region from Sikh rulers from the Punjab in the mid-nineteenth century. Known as the Sikh farming system, it entailed the promise by a wealthy individual to pay the government a fixed amount of revenue annually for a set number of villages. This person in turn attempted to maximize his profit by taxing the villages at often unsustainably high rates and retaining the difference between what was collected and what he had contracted to pay the government. This short term profit maximization approach, the British believed, mitigated against long term investments for increasing agricultural productivity and instead provided perverse incentives for short term profit at the expense of long term ecological health and productivity.

Following the assumption of British control of Kangra in 1846 the first settlement officer initiated a series of administrative policies designed to create the conditions necessary for agricultural development consistent with prevailing utilitarian behavioral theories. The settlement officer, G.C. Barnes, fixed the revenue for twenty years in order to encourage investment in agriculture, he commuted revenue payments in kind to cash, and he initiated an exhaustive inquiry into the nature of property rights in Kangra (Barnes 1855). Although authorized only to record pre-existing customary land rights as the basis for British taxation, Barnes actually transformed the nature of rights in land in Kangra. Uncultivated areas previously

controlled by ruling lineages who had given usufruct rights to local residents were declared village common property and then divided among landowners (in effect, privatized), farmers were given proprietary rights to the land they cultivated, and for the first time they could buy and sell land as a commodity. As James B. Lyall, the settlement officer in charge of the first revised settlement in 1879 stated, Barnes had actually "effected a revolution in the old state of property", even though as a settlement officer, he was not authorized to do so (Lyall 1874).

It was part of the effort to record rights in land that irrigation rights were first recorded and published in 1879. By this time the effects of a fixed revenue, in combination with rising grain prices and improved transportation, had resulted in agricultural expansion and the construction of new kuhls. In order to exercise control over the construction of new kuhls as well as to resolve conflicts over irrigation rights, existing kuhls were mapped and attested records of irrigation rights were compiled. This constituted the first edition of the Riwaj-i-Abpashi. However, as the next section demonstrates, recording customary irrigation rights provided almost as many opportunities for transforming irrigation rights as had the recording of customary land rights twenty-five years earlier. The next section explores the politics of recording irrigation rights as an example of the colonialist construction of knowledge about India.

The Politics of Recording Irrigation Rights

The Riwaj-i-Abpashi was also part of the broader project of creating colonialist knowledge about India by recording and classifying customs - an endeavor which the British pursued with (in)famous vigor and tenacity. As with other efforts to classify custom, colonial administrators portrayed their classificatory attempts as transparent, noninterventionist, and apolitical. This facade of neutrality conceals the politics of recording custom and the transactional pragmatics (Raheja 1998) that invariably accompanied the self-representation of tradition to colonial rulers. For the creation of colonial knowledge was actually a form of intervention, inherently bound to relations of domination, subordination, resistance, and representation.

The ways irrigation rights were recorded conjures up classic images of how colonial knowledge was generated. Settlement officers attempted to ascertain the irrigation customs and practices relating to a specific kuhl by calling a public meeting in one of the villages irrigated by

the kuhl in question and asking those who came to describe their irrigation customs and practices. After writing them down they were read aloud, suggested changes incorporated, and then local elites and village leaders attested to the veracity of the statement with their thumbprint or signature. The resulting document constituted a legally binding record of rights. The difficulty of such an endeavor was acknowledged by Lyall himself in an unusually candid passage. He notes that "probably these statements are sometimes incorrect....the custom is often vague and difficult to define" (1874, p.243). While irrigation customs may have appeared vague to a settlement officer who may not have known the local mountain dialect, one wonders if they appeared equally vague to the farmers whose harvest depended on reliable water supplies?

The process of recording of irrigation rights created new arenas for negotiating water rights between different water users and between water user's and the government. Groups that were in conflict over water allocation no doubt saw the creation of the Riwaj-i-Abpashi as an opportunity to attempt to solidify their contested water claims, or at the very least to express their discontent with the existing manner of water distribution. In one case, that of Kanduhl Kuhl, the Riwaj-i-Abpashi describes the distribution of water between twelve different villages in terms of the numbers of days and nights each village can claim the kuhl's water and in what order. In also mentions that a measured portion of the kuhl's flow is to be reserved always for the village, Kandwari, whose local elite in the late eighteenth century mobilized labor to repair the previously defunct kuhl and then named it after their village. The text notes that the residents of Kandwari contested some of the rights the other villages claimed and argued that these villages were claiming new rights which had not existed in the past. It also states that farmers from three villages alleged that the residents of a cluster of four villages were claiming water rights earlier in the season than they actually had the right to claim. The text for this kuhl concludes by stating that the claims of the cluster of four villages were rejected, and that all present except the residents of Kandwari agreed to the final statement of rights. A reference to an 1889 civil court case concerning Kandwari's rights to the kuhl's flow suggests that the conflict between Kandwari and neighboring villages had been ongoing.

This brief vignette suggests that the process of recording irrigation rights provided some groups with an arena for advancing new water claims (which may or may not be recognized as legitimate) and a new arena for debating old water conflicts. The negotiations that occurred

during the preparation of the record of rights were important, as no doubt the participants recognized, because the record became the template against which future disputes over water were to be resolved. In many cases it served to reinforce dominant power relations which existed at the time of its preparation, thus strengthening the position of local elites and weakening the basis for future counterclaims. One example of this is a kuhl known as Sappruhl Kuhl after the clan of a relatively low agricultural caste known as Girth which constructed the kuhl in the late eighteenth or early nineteenth century. Unfortunately, before bringing water to the Girth village, the constraints of elevation and gravity dictated that it flow through an upstream high caste Rana village. The Riwaj notes that the Ranas forcibly appropriated all the kuhl's water and that the Girths were eventually forced to leave the area. While higher caste Rajputs now live in the area the Girths left and use water from this kuhl, conflicts with the upstream Ranas continue to this day and require the downstream Rajput farmers to carefully organize water guarding round the clock by patrols of six to eight pairs of male water guards armed with staves.

The recording of irrigation rights was not only imbricated in local processes of negotiating water rights, it also contributed to the decline of the local watermaster's authority. The position of watermaster, known locally as kohli, was a hereditary post whose responsibilities included the mobilization of labor for annual kuhl maintenance and repair, the performance of ritual aimed at ensuring adequate water and warding off destructive floods, the supervision of water distribution within the kuhl and resolution of related conflicts, and occasionally coordination with other up- and downstream watermasters. Through the codification of custom, the Riwaj-i-Abpashi created an alternative repository of knowledge regarding water rights that constituted legitimate evidence in an alternative dispute resolution arena - the district courts. As alternative sources of expertise and ways to resolve conflict, they tended to undermine the specialized knowledge of the kohli and his ability to resolve conflicts in local conflict resolution arenas. The creation of a competing source of expertise and a competing arena in which that expertise circulated weakened the monopoly kohlis previously held concerning the prerogative to resolve disputes. Thus the long term decline of the kohli's authority, more recently exacerbated by recent regional economic changes, especially the increasing importance of nonfarm employment and remittance income, at least extends back to the codification of irrigation rights.

The emergence of the district court as an alternative to local dispute resolution arenas had several implications. First it suggests that the codification of irrigation custom did not necessarily ossify fluid social relations, as has sometimes been argued regarding the effects of colonialist knowledge, but rather that it helped to create a new arena within which to negotiate contested social claims to water. This new arena operated according to a different legal logic and jurisprudence tradition than had existed previously in this region. To operative effectively within this arena required a different set of skills and forms of expertise. Kuhl committees are an organizational form which emerged in the mid-twentieth century partially in response to the exigencies of interacting within these new bureaucratic arenas. Kuhl committees are similarly structured formal organizations with elected officers and extensive written records, whose purposes include the effective representation of the interests of the kuhl's irrigators in court and lobbying the district administration for grants for kuhl repair. Committees also serve as a vehicle for the defending a kuhl's water rights in court. For example in the late 1980s farmers whose kuhl water was threatened by a government-sponsored expansion of an upstream kuhl formed a kuhl committee for the express purpose of representing their interests in court. They successfully sued the state of Himachal Pradesh, using the Riwaj-i-Abpashi as the legal basis of the case which described the nature of their water rights and customary rules prohibiting the construction or expansion of a kuhl if it negatively affected the water supply of downstream kuhls. In this case local farmers used the codification of their water rights and a "modern" dispute resolution forum - the courts - to successfully defend their water rights against the state government. This illustrates how farmers can become adept at using the court system for their own ends, even to the point of fashioning local organizations for the express purpose of more successfully negotiating within those arenas.

Conclusion

The Riwaj-i-Abpashi arose out of the desire by British colonial administrators to control and regulate the expansion of irrigated agriculture in order to generate greater revenue. This required the codification of irrigation customs, both for purposes of taxation and to be able to resolve future water conflicts. The extraction and classification of local irrigation knowledge and rights influenced relations between local groups competing for water and between local groups

and the colonial and independent governments of India. However, rather than a unilateral extraction of information and revenue from taxes, the codification of custom created new arenas for expressing and negotiating local claims to water. The extent to which local groups are able to successfully stake and maintain their claims to resources, knowledge systems, and the benefits derived from both, differs from context to context. This analysis of the Riwaj-i-Abpashi suggests that it would vary with the type of political system within which local groups operate, the extent to which they are able to mobilize resources to pursue and represent their cause, and the past history of relations both within local groups and between them and other competing groups and political entities.

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