PROPERTY PERSPECTIVE IN THE EVOLUTION OF A HILL IRRIGATION SYSTEM: A CASE FROM WESTERN NEPAL'

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THE FOCUS OF INQUIRY

National governments and agencies involved in irrigation development in Asia, as elsewhere, frequently have experienced unexpected problems and outcomes from their intervention in 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 farmer-managed irrigation systems.

(Inward (1985; 1985a) suggests that another cause of problems is the alterations in property rights that often occur during project implementation. To examine this proposition, field research was carried out on several hill irrigation systems in Nepal which investigated the dynamics of property rights and obligations.

The discussion in this paper is limited to the preliminary findings on the negotiation processes for arriving at agreements which affect water allocation and sharing arrangements. The arrangements have resulted in alterations in property rights and relations. A section on the research methodology is included.

CONCEPTUALIZATION

In irrigation systems, different kinds of property rights and relations exist over different objects (i.e., land, labor, water, and hydraulic structures). These relations change over time and space.

Irrigated agriculture creates and is created by social :*elations based on the use and control over not only land, but also hydraulic structures and water. An understanding of such property relations would facilitate a more comprehensive understanding of irrigated agriculture.

Property is a complex system of recognized rights and duties with reference to the control of 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. Hallowell (1955:246) notes that property rights are institutionalized means of defining who may control various classes of valuable objects for a variety of present and future purposes. Property rights also outline the conditions under which this power of control may be exercised.

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Property could also be considered as a conglomerate of rights especially when different people exercise different rights over a particular object of property. Though a person may have ownership rights, the usufructuary rights may be with somebody else. And at times, thr owner of a certain object cannot alienate this object to whomsoever he or she pleases. Certain sanctions and constraints might be laid down. The nuances and deviations from one such conglomerate to another would depend very much on the nature of the broad macro social formation as well as the micro individual, communel, or customary adjustments made. Often, this macro to micro interaction determines the nature of a certain set of rights.

Since property rights direct benefits to certain individuals or groups, they are not only mechanisms of acquisition or access, but also mechanisms of distribution. Where a change in property rights alters this distribution of wealth, income, or benefits, the result will create new gainers and new losers. Naturally, people do not always prefer the existing framework of property rights, or the proposed changes in their structure. Such changes define certain adjustments in the social relationships among people.

Coward notes that the development of irrigated agriculture is a property creating process in which both the local communities as well as the state at large have played interactive and dynamic roles (Coward 1983:4). In community irrigation systems, Coward observes 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 had been created. Often the basic relationships among the members and leaders of a system are property based, i.e., their relationships reflect the rights and privileges that the respective parties have to the common property of the irrigation works (Coward 1983). The need for high investment to sustain the system perpetuates the property rights in irrigated agriculture. Such investment needs call for concomitant obligations with respect to the rights held.

The role of the state in establishing and enforcing property riahts and relations has been very significant. State intervention in existing irrigation systems has produced responses within the organizational processes of these systems sometimes resulting in modifications in property rights and relations (Pradhan 1987). Likewise, the state's enactment of formal laws reqarding irrigation water, as well as its adjudication of disputes have contributed to reinforcing existing or changing different property relations.

THE CONTEXT FOR NEPAL

The Basic Principles of the Seventh Plan (1985-1990) in Nepal accords overall priority to the agricultural sector. Irrigation is a key component of its agricultural development strategy and irrigation programs of all sizes are to be launched on a wide scale in both the hills and the plains. It is envisioned that legal provisions will be made for the use of both surface and ground water resources. Currently, legislation of this kind is either non-existent or clearly inadequate (National Planning Commission 1984).

Existing irrigation is noted **for** its scale and management diversity, a consequence **of** numerous and distinct geographic regions, many ethnic groups, traditions, and the variety of possible agricultural crops. Many systems are farmer-managed in a variety of environmental settings. Traditionally, property

rights have been well defined by custom, or by the community at large, rather than by statute.

The Irrigation and Related Water Resources Act, of 1967 recognizes the right of individuals and groups to construct irrigation systems to divert water from rivers and streams and to estract underground water so long as such activities do not adversely obstruct or affect a government irrigation project or hydro-electric plant. No amount of compensation for taking the resource is mentioned.

The Law on the Reclamation of Wasteland' in the <u>Muluki Ain</u> (Legal Code of Nepal) outlines principles of property rights in water for irrigation. Investment in the form of construction gives entitlement to water which is usually according to the doctrine of prior appropriation. Rules for sharing water, provisions for rights-of-way, loss of water rights, and obligations associated to justify the possessions of the rights are also outlined. Previous field studies of Nepali irrigation systems have, to some extent, revealed the dynamics of property rights and their implications for irrigation (Martin 1986; Pradhan 1982, 1984; Yoder 1986).

An understanding of the dynamics of property rights and relations will provide insights to irrigation development processes and appropriate rehabilitation activities. It will also help in the formulation and modification of Nepal's water laws, taking into account the implications for existing, customary rights. Since irrigation development 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.

RESEARCH OBJECTIVE AND METHODOLOGY

The specific objective of the research reported here is to ascertain the impact of significant changes in resource mobilization processes on property rights and relations, and in turn, the subsequent effects of the property changes on continuing resource mobilization processes. Resource mobilization in an irrigation system is a process of accumulation of resources--labor, cash, capital. and other materials--for the construction, operation, and the maintenance of the system. The mobilization of resources can be undertaken by the state, or the community of irrigators, or by **a** combination of both.

A fundamental research assumption is that a relationship exists between resource mobilization and the property structure. For example, often resources are mobilized on the basis of water rights--those with greater rights are expected to provide more labor, larger amounts of cash and so on, than those with lesser rights. Sometimes, resources are mobilized just on the basis of membership and not on the amount of rights. This research also assumes that any change in either the resource mobilization process or the property structure will result in a change in the other. One source of change in resource mobilization is state intervention in the form of finance, new technology, or technical assistance. This state intervention may result in changes in the property structure, and these changes in turn may affect subsequent resource mobilization by either the state or the local group. Following state

³The English translation is included in the appendix of Regmi (1963).

intervention, new water rights holders may be created, or the existing ones reduced or displaced. Farmers now may view the system as the state's, and expect the state to continue maintaining it. Thus, state mobilization of resources may serve to demnbilize local resources and unbalance the existing property structure.

In farmer-managed irrigation systems, members of the system have pooled their resources to carry out irrigation activities and to perpetuate the system. They have also mobilized resources from outside the system with increasing frequency in recent years. The sources for such outside resource mobilization have primarily been the state, private voluntary organizations, non-government organizations, and donor agencies. The nature and form of resource mobilization from each of these categories is varied. Sometimes, as changes in resource mobilization occur, conflicts over property rights and relations ensue (Pradhan 1982). A process of adjustments, negotiations, rules, and compromises among the various actors involved may result in the formation of a different configuration of property rights and relations that have an impact on resource The interplay between changes in resource mobilization and mobilization. changes in property rights and relations has been an ongoing process. It is this process of mutual alterations that this research addresses.

Thermation was gathered through field studies. Processes of resource mobilization and property relationships were studied in the settings where rhey occurred--farmer-managed irrigation systems that have received state assistance. Besides documenting contemporary processes, the field studies include historical reconstruction of prior social arrangements and negotiation processes, and any prior involvements with state assistance.

The units for analysis are community- or farmer-managed irrigation systems that have or are esperiencing changes in resource mobilization through some form of state intervention. Two systems that have experienced external resource mobilization and concomitant conflict over property rights were selected for detailed field study. One case is referred to in this paper to illustrate the process of negotiations undertaken during the conflict. Conflict has thus been used as a prism to understand the dynamics of property.

Data collection was done through participant observation, interviews, and survey questionnaires. The questionnaires were administered to key informants for information on the organization of the system and to a sample of farmers selected--on the basis of water rights, the criterion for membership in the system--for detailed study on agricultural, irrigation, and property practices. Rapid appraisals of nearby systems were conducted to compare differences in property rights with those systems selected for detailed study.

THE CASE OF CHHERLUNG

The irrigation system studied **is** known as the Brangdhi Tallo Kulo (lower canal). Currently, it encompasses four distinct command areas at various places along its alignment. The four areas are Taplek, Pokhariya, Chherlung, and Artunga. They 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 Thulo Kulo (large canal) which is parallel and slightly above the Tallo Kulo (See Figure 1 for the relative position of the canals). The canals are situated in Bougha Gumha panchayat on the south bank of the Kali Figure 1. Chherlung land use and irrigation systems (Source: Yoder 1986).

Gandaki river in Palpa district of Lumbini Zone. Access is by walking on a trail that takes three hours from Tansen via Ranighat.

From an historical perspective, the first canal tapping water from Rrangdhi stream served only the Taplek area. Taplek presently has a command area of nearly two hectares. It is said that this canal was built, during the Sen period, but the exact date is unknown.

Building of the Thulo Kulo irrigation system to Chherlung was financed by some 27 villagers under the initiative of two village leaders in 1928. The cost of the construction was Rs 5,000 and water was divided into fifty sharps, 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 more shares, i.e., the water delivered by their shares was more than they needed--were able to sell part of their shares to others and thus divide the shares into smaller parts. Consequently the number of members in the system has increased.

The original investors had their land and settlement in the lower part of the village. As partial compensation for right-of-way along the upper part of the village, those investing in the construction of the system agreed to sell some water to the upper part. However, they would not sell nearly as much as the upper village wanted. It was not possible for this single canal to irrigate both the upper and the lower villages. Therefore, under the leadership of two Magar (an ethnic group in Nepal) leaders, one of them the father of the present <u>mukhiya</u> (head of the irrigation system), a second canal was financed and constructed during 1932. Through mobilization of their personal funds and loans from businessmen in Tansen, they raised **Rs** 5,500 for 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 a 100 meters (m) away. The distance between intakes placed downstream did not matter. The distance between the Thulo Kulo (placed upstream) and Taplek Kulo intakes is 280 m, while that between Taplek and Tallo Kulos (placed downstream) was only 42 m. 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.'

Construction began for this Tallo Kulo in 1932 and water was finally delivered in 1938. Traditional tunnel diggers known as <u>agris</u> from Damukh Khani near Seti Beni were employed. The contract was undertaken by the construction team leaders (<u>naikes</u>), Bal Bir Sunar, and Man Bir Sunar, both blacksmiths.

It is documented 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

⁴However 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.

two Magar leaders, got permission from the Public Works Department for the Hills from the Rana commander-in-chief. This gave them clearance for a three-meter-wide right-of-way. The construction party was to regulate traffic while the construction was going on.⁵

The Rana administration considered having the Thulo Kulo broadened when the conflict with the municipality occurred but the water supply from this canal could not possibly irrigate both the villages. Furthermore, the villagers had already spent Rs 3,600 in constructing the canal, now two-thirds completr. Taplek farmers had thrown away the tools of the agris and stopped the work because right-of-way through their land had not been negotiated. Added reclamation of land meant more revenue for the national treasury. So the administration decided that the farmers using the canal would be responsible for maintaining and repairing the road if damaged by the canal, and would also have to compensate reclaimed land that falls along the alignment. 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. The state played an active role even then, in deciding the canal's fate.

Initially, the two Magar leaders had requested that Taplek extend their 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 ever it was to be extended. So in the same year as construction for the Tallo Kulo began, an extension was made from Taplek to Pokhariya. By then the people from the upper part of Chherlung begun constructing the Tallo Kulo.

The mutual agreement between Taplek and Pokhariya regarding the sharing and acquiring of new water rights were that Pokhariya would not damage or waste the water that Taplek had been using and that Pokhariya would broaden the canal and take the increased discharge the improvements allowed to be delivered. 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. Pokhariya farmers spent nearly Rs 1,400 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.

In 1970 a flood caused havoc along the Brangdhi Khola, washing away all the intakes. In the same year, a landslide occurred near the intake of the Tallo Kulo. It was not possible for the farmers to overcome the damage caused by the landslide and for nearly two years winter irrigation was almost impossible in the area served by the Tallo Kulo. Due to the flood, a spring just below the Taplek intake which was their main winter water source had shifted downstream. For some time water was brought by means of an aqueduct hut that two was carried away in a landslide. At times the Tallo Kulo shared water from the Thulo Kulo but mainly they stole water from the Taplek-Pokhariya and Thulo Kulos to carry on irrigation.

Initial attempts to negotiate with the people using the Taplek-Pokhariya Kulo did not bring results. At one point, the village panchayat intervened but the water users felt that it was an internal matter for them to settle by

⁵The present mukhiya has this document.

themselves. External intervention or pressure was not tolerated. Seeing no other way out, the Chherlung Tallo Kulo people went humbly and gave a feast to the Taplek-Pokhariya people and an understanding about sharing water was reached.

Taplek-Pokhariya people feared that in the future the government administration night take sides with Chherlung people and help thrm construct a canal above theirs. They realized that this would either lead to more conflicts or reduce Taplek's and Pokhariya's water supply. An agreement was signed in 1977 whereby the Tallo Kulo members 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 nnd 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 he exempt from all canal maintenance work, except during emergencies when all the members of the canal would be summoned for work. 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 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.

It was also agreed that if there was a water shortage during wheat sowing, maize planting, or during seed-bed preparation for rice the different sub-command areas would rotate the total amount of irrigation water by turns. However, the first priority is to go to Taplek, then to Pokhariya, and finally to Chherlung. After this agreement, approximately Rs 18,000 was invested in making improvements in the canal. Rupees 7,250 were raised as cash an.' the rest as labor contributions. Water is tightly controlled by the Chherlung organization so that no one, even in Taplek and Pokhariya, is allowed to use the canal water for early (premonsoon) rice due to water shortage.

An extension project for the 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 Argali Village Panchayat) could he irrigated too. This was a project within the realm of Panchayat and Local Development.

A meeting of the canal members of Chherlung, future beneficiaries in Artunga, the two panchayats' officials, district panchayat officials, and the engineer who had carried out the survey, was held. The decisions of this meeting were the only agreement made between Chherlung and Artunga. It was decided that a "Chherlung-Artunga Irrigation Reconstruction Canal Committee" be constituted for the work. Surprisingly, there were members in this committee who were not irrigating or even expected to be future beneficiaries of the irrigation system. The chairman of the committee himself was not a water user of the canal. It was decided that after the reconstruction, land areas in Taplek, Pokhariya, Chherlung, and Artunga could be irrigated "better," so the district panchayat was asked to determine a just allocation of water taking into consideration the land areas of the respective places. Both Artunga and Chherlung were to contribute equal labor and inputs from the panchayat boundary to the intake. Work began and a total expenditure of nearly Rs 150,000 was made. Rupees 95,000 was actual cash given by the district panchayat and the rest was mobilized as labor contributions from Chherlung and Artunga. The work was completed in 1981. With the work complete, it was time to decide on the water allocation to Artunga. Several meetings were held over the nest two years for this purpose but 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 haw 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 for Chherlung was fulfilled. Chherlung's interpretation of 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 felt 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 and Pokhariya insisted that they were to get the half of the water for their land and Chherlung should take the remaining half and reach a settlement with Artunga.

In the case of this canal the feeling of ownership of the system entails many consequences for effective resource mobilization and management. Chherlung felt, that because, for nearly half a century they had taken risks and invested labor and money into the system, it was a private canal, not a state-owned or state-constructed one. It was thus quite irreconcilable for Chherlung to give half of their 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 safeguard what they owned.

The role of the district panchayat must be seen in light of this dispute. The ambiguity of the previous agreement for water allocation and its inability to arbitrate aver this case clearly shows its lack of farsightedness and knowledge of the social dynamics of development activities. 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, they were 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.

Finally, in 1983 an agreement was reached. Until then, Artunga received water only **for** winter irrigation and was not allowed to contribute labor during maintenance work days because that would have entitled them to the canal and water rights. The agreement stipulated that it would have no effect or make any changes on the previous agreement made between Taplek, Pokhariya, and Chherlunp during their amalgamation process. Due to the grant by the district panchayat and mutual labor contribution from both Chherlung and Artunga,

Artunga irrigators were entitled from that day onwards to be shareholders in the canal.

According to the agreement with Taplek and Pokhariya, half of the water in the canal is 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 increased 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 laborers during maintenance work while Chherlung provides only one laborer per inch of water. Artunga farmers are 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 registration forms for individual water rights. The proportioning weir that was to deliver the four inches of water for Artunga would be installed at Chaptol in Chherlung. 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 he 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 contrart, both parties will abide by the rules and regulations of the canal.

An effective organization, mainly controlled and operated by the Chherlung command area members, exists to take care of the various tasks and institutional elements of the system.⁶

CONCLUSIONS

This paper started out with a brief theoretical exposition of property, then related it to the author's research focus and objective. The latter part of the paper outlined the historical perspective of the processes of the amalgamation, espansion, and extension that brought about negotiations regarding acquisition and sharing of property rights as well as thr concomitant changes in property rights and relations. Some were internally induced, while others were necessitated from the outside. Internally, farmrrs' resource mobilization itself brought about changes in property rights and relations through a series of negotiations.

The negotiating process and resulting agreements have laid down rules and norms for the stated or <u>de-jure</u> property rights and relations. In the analysis of documents on negotiations, one notes **a** hierarchy of property rights, reflecting previous input or investment in the system for acquiring membership status. Senior and junior water rights exist. By analyzing water rights from an historical perspective, one sees the reasons for them being SC. The nature of both the property rights and resource mobilization obligations have been altered after the interventions by the farmers or the government. The control of the system, in this case, lies in the hands of the Chherlung members. Artunga is definitely in a position of having most junior water rights.

⁶A general description of the functioning of this organization is made in Pradhan 1982.

When property rights in water can be negotiated and separated from property rights in land, not only at the individual level, but also at the command area level, one notes enhanced area reclamation and irrigation expansion. Water allocation through purchased shares fosters this. If the water allocation principle has implications for irrigation expansion or area reclamation, then more thought rhould be given to determining the type of water allocation principles so that further development and expansion is ensured.

This case study has shown the dynamic and ever-growing nature of an irrigation system. Thus designs for new systems and modification to existing systems should have built-in flexibility so that the system can be dynamic. The nature of the physical structures must interact with the water allocation principle.

Each right, entails a certain obligation towards the upkeep of the system and to the organization. When one is guaranteed a certain type of right, forfeited only when one does not fulfill the obligation, then he can fully participate in the decision-making process that governs the fate of the system. Fulfillment of certain tasks bring about leadership qualities in the memoers.

Farmers are willing to invest in the hydraulic system only when rights in determining use of the property are guaranteed. In some of the irrigation systems, effective organizations exist for the preservation of these rights. Implementing agencies would do well to recognize this and come out with a planning and implementing approach such that the rights are not jeopardized or negated. Prior communication and dialogue is necessary for a negotiating process that sustains the existing members' co-operation and incorporation, if needs be.

Since existing irrigation systems have some form of organization capable of innovations in institutional arrangements over time, an analysis of the existing institutional arrangements that take into account the property aspects should be completed. A checklist might include topics like water rights within the system and among systems at the source; seasonal rights and who the members are; the nature of existing property rights and the transaction of rights: how potential beneficiaries can gain water rights; right-of-way for construction; and duties, obligations, and sanctions for the preservation of rights. This type of analysis geared towards the specific locale should be undertaken before any intervention.

When external resource input and adjudication means external control, shifting management and maintenance activities away from the beneficiaries, then the system will perpetually need external resources. Such depletion of a system's self-reliance takes away leadership roles and the resiliency of the organization to adapt to changing circumstances. The system will no longer be dynamic.

Nepal is faced by a fiscal crisis and has accumulated loans from investment in irrigation infrastructure that need to be paid back. To improve irrigation performance there have been attempts to establish water users associations and to implement decentralization norms. This must be accompanied by finding ways to enlist active participation of the beneficiaries in maintaining their systems. But unless and until beneficiaries feel that their rights are secure, guaranteed, and reliable, they cannot be expected to invest in maintaining their system.

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