Community Lift Irrigation Systems in Gumla District, Jharkhand

RAKESH TIWARY

Examining the irrigation sharing practices among beneficiary groups, their conflicts and conflict resolution mechanisms, the study identifies the scope for formal ans sustainable institutional mechanisms for community managed irrigation systems. This study was carried out for PRADAN, Ranchi and Jharkhand.

INTRODUCTION

In rural India, a large number of families depend on agriculture for food security and livelihood. Irrigation is most important for improving agricultural methods, output and productivity. Assured irrigation can substantially enhance livelihood opportunities, particularly for small and marginal farmers. In the tribal areas of eastern India, assured irrigation is most critical for making the shift from primitive and subsistence agriculture to modern and commercial agriculture. However, access to assured irrigation becomes much more difficult due to physiographic conditions, remoteness, poverty, lack of modern technology, etc. Hence, external assistance is extremely important to bridge the financial, technological, information and institutional gaps in the promotion of irrigation in these areas.

In order to strengthen the existing livelihoods of the rural people in Jharkhand, Professional Assistance for Development Action (PRADAN) has undertaken the task of institutionalizing people-managed irrigation systems in the villages. These include wells in the homesteads, lowland wells, water lifting devices and river-based lift irrigation schemes. All such infrastructure was created through funding from different government programmes, specified for poor rural families. PRADAN provides techno-managerial support to install the systems and creates social organizations to manage the schemes in the long run. These systems are managed by groups of beneficiaries, who share the responsibility of meeting the operating costs, the maintenance and the safe-keep of the systems. The water users share common ownership over the irrigation systems. These systems have been implemented in phases; thus, some schemes are fifteen years old whereas some have started functioning only last year. At this stage, it is important to study various aspects of the existing schemes, with the aim of improving the programmes.

The author was assigned the task of carrying out a preliminary study of the existing schemes, particularly to understand the organization of irrigation and its internal dynamics. The study also attempts to come up with a simple format for agreement among the shareholders of irrigation assets, which will provide necessary reinforcement to the customary systems for sharing common assets.

The economy of the district is primarily dependent on agriculture, forest produce, cattle development, mining activities etc. Agriculture is practised using primitive methods, due to lack of irrigation facilities, scientific inputs, marketing, infrastructure, etc., and is mainly dependent on rain.

OBJECTIVES OF THE STUDY

The study aims to underst-and: (1) the existing irrigation sharing practices among beneficiary groups; (2) how the management system (introduced by PRADAN) has adapted to the local customs, norms, etc., (3) conflicts and conflict resolution mech-anisms; (4) and identify the scope for more formal and sustainable institutional mechanisms for community managed irrigation systems.

METHOD OF STUDY

The study primarily employed the case study approach, in which tools such as field reconnaissance, focused group discussions and interviews were used to understand the social organization of well irrigation.

4. AREA OF STUDY

The study was carried out in Gumla district of Jharkhand state. Eight cases were studied—six homestead well-based systems and two river-based systems. These cases were selected from three blocks, namely, Palkot (3), Ghaghra (2) and Gumla (2).

4.1 PHYSICAL AND SOCIO-ECONOMIC FEATURES

Tribal people predominate in Gumla district. Sixty-eight per cent of the total population is tribal. The district is backward compared to other districts of the state; it, however, has rich natural resources and favourable climatic conditions.

The economy of the district is primarily dependent on agriculture, forest produce, cattle development, mining activities and other commercial activities. Agriculture is practised using primitive methods, due to lack of irrigation facilities, scientific inputs, marketing, infrastructure, etc., and is mainly dependent on rain. The district has an average rainfall of 1,000–1,100 mm but due to lack of rainwater harvesting techniques most of it is not utilized.

4.2 SOCIAL AND ECONOMIC ANTHROPOLOGY OF THE COMMUNITY

The main tribe in this region is Oraon and this community has a strong demographic presence in all the schemes studied. The family is the smallest unit of the Oraon tribe and society, which is nuclear in structure; there are seldom any joint families. The Oraon family is patriarchal and patrilineal

Fig.1: Gumla District and the Blocks Studied

in nature. The father is head of the family and takes all major decisions; however, all family members, including the women, participate in economic activities. Sons in herit property and all movable and immovable property is divided among brothers. Among immovable property, land is equally divided among all the sons. However, the irrigation well (if any) remains a shared property. The well is used for irrigation by all the inheritors of the land as a norm. Families reported that the inheritors carry out irrigation, based on a spirit of cooperation through mutual discussion. They fix periods in a day (referred to as *pali*) for allocation of water to each member. The right, or *haq*, of brothers is recognized at the clan and the village levels. Ideally, brothers take care that all shareholders get water on an equal basis. There are extra provisions for providing water to the needy, to save a crop from wilting, etc.

The Oraons have traditional political organizations such as the village *panchayat*. The secular head of the village community is the *mahato*. All heads of families are members of the village *panchayat*. The *panchayat* sits at an *akhara*. The *panchayat* is an important forum for conflict resolution in the village. Besides matters of marriage, theft and divorce, the *panchayat* adjudicates in cases of property and inheritance. The decision of the *panchayat* is binding on all. The *panchayat* uses various forms of social sanctions and imposes fines to ensure compliance.[1]

4.3 AGRICULTURE

Agriculture is the main economic activity of the Oraon community; the Oraons also work as labour, collect minor forest produce and services. Each Oraon family owns some agricultural land besides the homestead land and the *bari* land. In the *bari* land, they cultivate maize, *marua*, bean, *bodi* vegetables, etc., using the dry cultivation method, in the beginning of the rainy season. Agricultural land is of two types—*don* and *tanr* (upland). In the *tanr*, coarse varieties of paddy, *kodo*, *kurathi*, *surguja*, maize, *marua* and millet, etc., are cultivated, using the dry cultivation method. In the *don*, a fine variety of paddy is cultivated through the wet cultivation method. The Oraons carry out paddy cultivation in the *kharif* season (called *Agahni dhan* because it is harvested in the month of *Aghan*) through flooding methods. The *rabi* crops, traditionally, are cultivated in a few plots situated near the village. These are cultivated after the paddy is harvested. Due to the lack of an assured means of irrigation, *garma* crops are not cultivated. The traditional means of irrigation are percolation wells (masonry or *kutcha*) fitted with levers—the beam-bucket method (locally called *latha-kudi or laith*). The command area of these is small. Nowadays, some well-to-do Oraon families have their own wells and diesel machines for irrigation.

4.4 STUDIED IRRIGATION SCHEMES

A description of the organization of irrigation schemes that were studied follows. The process of formation of groups, the norms of irrigation, the nature of the contract, the

[1]This refers to traditional political structure of the Oraon community. The political structure at the village level has changed since the introduction of local government. The use of the traditional political structure in dispute resolution needs to be further studied.

operation of day-to-day activities, conflicts and other aspects are also discussed.

CASE 1

This study was held in Barandatoli village, Palkot block. The irrigation system was installed in 2005, with 10 members. All the members were from the Kharia community and all were related to each other. The location of the well was in a plot owned by a member, Ratia Kharia. The members said that the location of the well was determined by its physical suitability. There was a discussion with Ratia, who agreed to provide land for the well for common use. The constructed well covered a large part of the plot; the diameter of the well was 32 feet. Interestingly, Ratia himself was not a farmer because there was no work force in his family.

Initially, the staff of PRADAN approached and informed the community about the scheme and its benefits; thereafter a *Samiti* was formed. The members reported that they had prepared a written document with the names of the shareholders and their plot numbers, according to the village revenue map. The shareholders then signed the document. This document also had a map that indicated the plot with the well, the location of the well within the command area and the boundary of the command area of the well. These specifications were marked with different colours on the map. The shareholders did not have a copy of this document. In this village, the *sarpanch* also discussed issues with the shareholders and gathered information about the well. When asked whether they felt the need for a written agreement, particularly about the well location plot, they responded positively. Members admitted, though hesitantly, that a written document, which can safeguard common interests in the future, would be helpful.

Norms of water allocation: Irrigation water was allocated after discussion. The guiding principles are fairness and equity. There are different norms for allocating water: from 'those who ask for it first' to 'those who need it most (for saving the crop)'. Although the guiding principle is 'equity', there is also consideration of the immediate need, or urgency. The members work together with a spirit of cooperation and fairness to parties involved. Schedules are allocated in terms of time, that is, days or hours. Schedules are divided loosely along the periods of the day, or sometimes for a day, depending upon assessed need of irrigation of the given crop and land. Schedules are fixed orally (*zubani*) and are not very rigid. One member can exceed the time allocated to him for irrigation if others consider it justified.

Shareholders reported that they also practised fairness to all when deciding on the direction of the underground channel and the location of successive outlets (*nikasi*) because these alignments may have differential benefits. *More rigorous mapping and assessments are required to verify these claims.* They also reported that whenever there is simultaneous demand by two members, the outputs channels are bifurcated to facilitate irrigation for both. Thus, the members improvise and allocate water in an equitable manner. Different seasons bring differential pressures on irrigation. In the *kharif* season, all grow paddy. The demand for water rises, particularly in two phases of paddy cultivation—during the plantation of saplings (*ropani*) and before harvesting (*katni*). Delay in rainfall during these periods

creates sudden increase in the demand for well irrigation from all members. These two situations (that last for about two weeks each) create competitive demands. The members then create schedules for irrigation and allocate water on a daily basis to different shareholders.

On other days, there is not much pressure for irrigation pressure. During *rabi*, farmers grow vegetables such as potato, tomato and peas. Tomato is specially preferred because it fetches good money and its is sold to nearby towns and even to the capital city of Ranchi.

Conflict and resolution: The shareholders reported that the scheme is functioning without any major conflicts. So far, no issue emerged in which dispute resolution was necessary. This may be for two reasons—first, there is actually no major conflict and, second, the members were reluctant to discuss internal conflicts in the focused group discussions.

The members agree that sometimes, during the peak demand periods, some parties feel aggrieved and complain to other parties about perceived or real harm. However, all cases have been resolved by discussions/conciliation among the shareholders, and there has never been a need for adjudication. There was not much opportunity available to interview farmers individually at this stage of investigation. Although all the members reported conflict-free allocation of water, two out of ten partners were still not getting water even though adequate pipes had been purchased and installed by the *Samiti*. These two partners were members since the inception and they had contributed labour for the installation of the pipes. The *Samiti* had some money left in the corpus fund; however, the members were waiting for external help to purchase pipes. Therefore, of the ten members, only eight shareholders were actually getting irrigation. The two members, however, were not forthcoming about voicing their demand. This may lead to latent conflict. More follow-ups and monitoring may reveal other such anomalies.

CASE II

The second study was conducted in Pura Pakartoli village of Palkot block. The homestead well was being shared by five members. Four out five members belon ged to the Oraon tribe and one member was from the Kharia tribe. A well was installed in 2005. During the installation, PRADAN personnel motivated the village men and facilitated the task. Five members took the initiative in the cooperative irrigation scheme. A written document was prepared; it had two parts—first, the name of the members, the area irrigated by respective households under the command area, the plot and *raqba* numbers, signed by each member. Second, the document had a map marking the command area, the plot on which the well is located, and the location of the well. The members reported that these documents were submitted to PRADAN. The member households did not have a copy of the document.

The location of well was identified, according to the availability of water. The well was located between two plots (though an unequal amount of land had been allocated). Members initially discussed among themselves about the possibility of one partner who owned the plot claiming ownership over the infrastructure in future. They also expressed the desire to have a

written document to ensure compliance and commitment from the plot owners. The member who had allocated a lesser share of his land too was apprehensive about any future claims from the member who had allocated the larger share of land for the well. The agriculture shareholders have almost equal amount of land in the command area.

For paddy cultivation, well irrigation plays an important role because it provides supplementary irrigation when monsoon rains are not adequate. The main benefit is in the *rabi* season agriculture because a variety of vegetables are cultivated; peas, tomato, potato and cabbage are grown in different portions of the plot. These not only bring cash to the households but also supplement the food and nutritional basket. Vegetable cultivation requires multiple irrigation methods and is easily facilitated by lift irrigation.

The members cooperate and use the irrigation facilities. Diesel for operating the pump is provided by the members themselves. They pump the water from the well to irrigate their fields. The members told us that they never faced any difficulty with the arrangement. No serious issue of dispute has ever emerged. One of the member households did not perform agriculture last year because of personal reasons. His right over the irrigation water remained intact. These families are gradually learning to carry out organized irrigation on a cooperative basis. The arrangement is a novel one. Until then, land and water arrangements were unaltered; thus, alternatives with all their complexities were never envisaged or explored. The members discussed future directions and emphasized the need for written documents to protect their collective interest.

CASE III

The third case is in Kura village, also from Palkot block. The group (called *Samiti*), with ten members, was formed in 2006. The group members were mainly from the Oraon community. The group is homogenous, in terms of the amount of individual household land in the command area of the shared irrigation system. Two partners owned 50 decimals of land each, three owned 30 decimals, two owned 25 decimals and three owned 15 decimals. The group started with a written contract, in which the name of the head of each household, plot number and area were mentioned. A map was attached with specifications, as mentioned in the previous cases. According to group members, the document was submitted to the PRADAN office; the members themselves do not have any copy of the agreement. They also reported that the days of shared labour was also registered in the labour ledger.

The well is located on the land of a member called Parmanand. The decision to locate a well in this plot was consensual and the consideration was to find the best possible location for the well. Parmanand was persuaded and he agreed to provide land for well. When Parmanand was asked about why he agreed to have the well in his plot, he said, "For the benefit of myself and others." The irrigation scheme was, thus, started in keeping with the guiding principle of cooperation and benefit.

The shareholders grow vegetables and wheat on their land. The members do not follow any schedule. They use the well and the pump whenever they need to and inform each other. This happens with mutual consensus and the information is shared orally. During the peak demand period, for particular

weeks, the schedules are mutually discussed and agreed upon. The schedules during this period are usually in *palis*, or different periods of a day, and sometimes for a day or more. However, schedules are based on 'those who demand first' but there is always consideration for protecting the interest of a member whose standing crop is in urgent need of water.

There is no extra privilege for Parmanand, the owner of the well-site plot. He is one among equals. The members reported that till then there had never been any conflict among them. Members might have discussed their difficulties with others but the situations never reached serious proportions. Regarding the need for a written document, the members expressed the need to have one that describes the rights and responsibilities of members. Currently, they depend upon the written document prepared at the initial level as well as the register that records their input in the shared labour. Their ideas about the linkages of land and water rights were similar to previous cases and these have been discussed in a later section.

CASE IV

The fourth case study was also on a shared homestead well. The irrigation scheme is located in Tilsiri Amba Toli village of Ghaghra block in Gumla district. The shared irrigation system called *Chameli Sinchai Samiti* was started in 2005 with five member households as partners. PRADAN was the facilitating agency, motivating households to come together for this endeavour. The members, belonging to the Oraon tribe, have different landholdings under the designated command area of the well, as presented in the table.

The earlier case studies included the names of members and the details related to their land, the map of the command area and the well. The document reportedly was submitted to PRADAN. The members did not have a copy of the document.

The members have some internal arrangement for sharing the water for irrigation. They meet on Wednesday to discuss issues related to irrigation. The water is shared according to the principles of mutual benefit and consensus. The schedules, or *palis*, are determined orally. The maintenance costs are shared. A pump is used to draw water from the well. Members pay Rs 20 per day to meet the related expenses. Currently, the *Samiti* has about Rs 1,300 left in command fund, which had been created to meet maintenance costs. A register for collection and payments for maintenance is not maintained, and most of the arrangements are oral in nature.

One member keeps the pump in his house; it is carried to the well to draw water. The land owned by different members is not equal and Martin has no extra privileges as well. A member who owns a relatively larger piece of land in the command area had the same privileges as the others as far as access to irrigation is concerned. He may use the well and the pump more frequently but only after the needs of the others are met.

Members reported that disputes and conflict related to the sharing of the well are rare and none of them take the shape of conflict. All conflict resolution is carried out among themselves. Although members presume that there will never be problems, a few partners would like matters to be recorded on paper, particularly to protect the interests of small farmers. These partners also revealed similar concepts about land and water linkages and their views have been compiled in a separate section.

CASE V

A homestead well was studied at Basugram Toli village in Gumla block of Gumla district. This is a typical Oraon village, where the villagers perform agriculture activity to meet their livelihood needs. Traditionally, they irrigated their agricultural fields with percolation wells and the lever beam method of irrigation called *laith*. In this village too, PRADAN facilitated developmental activities with the help of a dedicated team. In 2007, a shared irrigation system was started among five households of this village. A well was excavated and a pump installed, to improve irrigation facilities. The group is called *Chala Kisan Sinchai Samiti.*

Member households have a small amount of land in the command area of the well. This group started with a written contract, in which the name of the head of the member household, the plot number and the area were mentioned. A map was also attached with specifications, as mentioned in the previous cases. The document had been submitted to PRADAN and the members did not have any copy of the agreement. They also reported that a labour ledger had a record of the days of shared labour for the cause.

The members irrigate their plots in the command area after discussions. There are no fixed schedules or regular meetings to decide upon schedules. Households use their own kerosene oil to use the common pump and well whenever they feel the need. No register is maintained for schedules. They pool in Rs 2 per hour as maintenance fee. The members reported that the money collected for maintenance and expenditure is arranged orally. They said that the group did not have any money in this account because the entire collection had been spent. The partners grow crops of their own choice; the crops grown by each household in 2007 have been presented in the table.

The group seemed reluctant to share about their conflicts, even trivial, with the investigator. They thought that the group was working well and without any issues. A detailed study over a prolonged period will reveal the internal conflicts. However, after a deeper probe into the arrangements of sharing, a few noticeable facts emerged. The pump was kept at one member's house; whenever there was need, other members ask for it for use. The member, who keeps the pump, is also responsible for collecting the maintenance cost (however, no written record is maintained, as discussed earlier). The asymmetrical relations and inequities need to be probed further individually on issues such as gaps in irrigation, demand and availability, and the privileges of members, who manage activities on others' behalf.

The location of the well in the command area was determined differently in this village. The well is located at a site that falls in two different plots, owned by two shareholders. They did this to avoid future conflict. Sukhram and Punai are the owners of the plots, with Sukhram providing the larger area for the well site. The partners reported that Sukhram had volunteered to have the entire well site in his plot but the others were afraid that Sukhram may claim ownership over the well in the future. The members discussed the issue and it was decided that the well should be located at a cross-section of two plots owned by two members. Because this provision involves more than one person, the chances of one person claiming the well to be his/her personal property is less. This conflict

prevention measure by the villagers may be adopted wherever possible.

There is no written document about the shared rights and responsibilities of the shareholders; however, the members did express the need for such a document.

CASE VI

Another study of a homestead well was conducted in Basugram village. Five member households used the shared irrigation system. All five belong to the Oraon community and are agriculturists. The irrigation scheme, under the name *Krishna Sinchai Samiti,* started functioning in 2007 and was facilitated by PRADAN. An agreement was reached in this case before installing the irrigation system. The group has submitted the papers and reported that they did not have a copy of it, however.

The member households have a small amount of land in the command area of the given well. The location of the well in the command area was decided through mutual consensus. The well is located at the meeting point of two plots, owned by Deepak and Gangaram. Two members are involved as far as the well plot is concerned (Annexe II). This is to avoid future possible conflicts, in which a member may ask for complete ownership.

As we can see from table, the landholdings of the members are not equal. The members irrigate their lands through mutual consensus and cooperation. Those who need water use their own kerosene oil to run the pump and draw water from the well. The schedules are usually for one day or these are divided into hours (depending upon the need of the crop). There are no specific meetings about the schedule. A member, Amar, keeps the pump at his house and other members take it from him as per their needs.

Deepak, a member, irrigates two acres of land on which he grows cash crops. Other members reported that Deepak worked hard, to make good use of the irrigation facilities. Although he irrigated more land, the water is shared on an equitable basis and the others, who own less land, too get to draw water as required. A maintenance fee is charged from the users. The rate is Rs 2 per hour. However, no register is maintained about the collection of fee and its utilization. Members reported that the entire fund had been exhausted.

Members reported that sometimes they provide irrigation water to non-members also, especially If there is an urgent request for water to save a crop. However, the person must use his/her own pump and oil to draw water from well.

CASE VII

A study was conducted of the lift irrigation scheme in a river-based community in Kurag village of Ghaghara block, Gumla district. The scheme was started in 1996–97 and has been functional since then. The group is called *Lift Sinchai Samiti Kurag*. Thirty members started this *Samiti*; at present, there are 25 active members. All belong to the Oraon community. The total command area of the irrigation scheme is 50 acres.

The scheme was started with a written contract among the shareholders. The written agreement included the names of the shareholders, their land area and the plot numbers in the designated command area. The members reported that a map with a designated command area and plots was also prepared and submitted to PRADAN. The pump shed and collection pool are not located on private land. A diversion channel and a collection pool have been constructed near a small rivulet. The rivulet is perennial;

some amount of water is always present even in the dry season. The water is enough to irrigate the members' land even in the summer season. A diesel pump is permanently based in a shed. The roof of the shed has collapsed partially and requires immediate attention. Because the water channel and the pump house are located on public land along the rivulet, there is no issue of donation of private land.

There was a coupon system for the irrigation schedule. However, this is not being followed. There is a weekly meeting on Wednesdays, in which the schedule for one week is prepared. This schedule is prepared through mutual consensus and the guiding principle is equity and fairness to all. However, not all members are present in these meetings. Those who need water are present in the meeting and they are allocated schedules. These schedules are followed without any problem. The special consideration is the need of the crop. If a member is in dire need of irrigation, he is given priority. The schedules are oral in nature. Therefore, the coupon system is not being followed.

There is no restriction about growing different crops. Water is provided (by allocating schedules), according to the cultivated crop. Schedules may stretch up to 4–5 days, as per the demand of the crop. For small irrigation needs, schedules may be divided into different periods of the day. An operator facilitates the irrigation. In the original scheme, there was provision for providing Rs 3 for the operator and Rs 4 for maintenance by households, per irrigation session. However, the collection of money for the operator is not being followed. Irrigators contribute money for maintenance, which is being managed on an *ad hoc* basis, that is, if the machine develops some problem when a member is using it, the member arranges for technicians to repair it. In the following Wednesday meeting, the expenditure on the machine is shared by irrigators.

The division of land owned by one of the member households of the irrigation system took place. In three cases, the member households' land (in the command area) was divided among the sons of the family. The sons of the respective households are cultivating their plots in the command area and they are considered equal partners in the irrigation scheme. Each household is allocated water as per rule of equity and fairness. *This is how the irrigation scheme has accommodated the division of property and the sharing of common irrigation facilities.* The members have readily accepted that if further division of land takes place in the command area, the inheritors of the land will be accorded full membership status. This norm was not stipulated initially but has been adopted from the social norms and practices being practised traditionally. These norms can be formally introduced in the rules of the community irrigation scheme.

CASE VIII

Another river-based lift irrigation scheme was studied in a village called Ghutti of Ghaghra block in Gumla district. This community based scheme is called *Samvikas Sinchai Samiti Ghutti.*

The village is located at a foothill and is rich in water resources. However, there was no surface water lift irrigation scheme functioning in the village. The households practising agriculture depended upon groundwater resources utilized through *laith kudi*. In 2007, PRADAN facilitated a community irrigation scheme in this village. Twenty-five members belonging to different households (all from

the Oraon community) came forward to participate in the scheme. The infrastructure (pump installation, pump shed, water collection well, underground pipes etc.) was created by May 2005. The total command area served by the scheme is ten acres.

The group was mobilized by the PRADAN team. The members reported that they knew about benefits of lift irrigation but never had the opportunity to utilize the surface water resource available to them in the form of a rivulet that flows from nearby hills. The rivulet carried water through the year. When the PRADAN team approached the villagers, some households came forward to share the benefits. Focused group discussions revealed that a written document was formulated that included the names of the heads of households along with their signatures, their land area under irrigation and the plot numbers. A map showing the location of the well, the command area and the alignment of pipes was attached to this document.

The organization of the irrigation was carried out according to specified norms. They follow the principal of 'equity' and 'fairness to all'. Water is allocated for irrigation through mutual discussions. The group meets every Wednesday evening. They discuss water allocation to different households. The schedules are allocated on first-come, first-serve basis because there is not much competitive pressure as yet. Schedules are allocated to members and coupons distributed. Every Wednesday, the coupons are distributed for the following week. The group leader reported that because there was not much competitive demand, there is no mention of the duration of each irrigation schedule on the coupons. Because decisions are based on mutual consensus, these are mainly conveyed orally to the operator. When the irrigation demand increases in the future, the coupon system will be more useful.

There is a designated pump operator for the scheme. He maintains a register of schedules. During the weekly meetings, the operator also informs the participants about the schedules utilized in the previous week. Members provide the diesel to run the pump. Besides, they have to pay Rs 10 per day, to cover the expenses on the operator and the maintenance of the system. The operator collects the coupon from the members and looks after issues such as the hours required to irrigate the specified land, whether the member has arranged his own diesel and whether it is adequate to irrigate the land.

The operator also manages the maintenance of the pump and distribution channels. The technical problems that occur are corrected, using the common fund (irrespective of who is using the pump when the defect occurs).

Members reported that currently the demand is not very high; hence, all the members are free to cultivate crops of their choice. In the *kharif* season of 2007, the scheme helped immensely in the supplementary irrigation of paddy. The *rabi* cultivation of wheat and vegetables (2007–08) was entirely carried out through lift irrigation facilities. All member households cultivated wheat and, in the last *rabi* season, 20 households grew vegetables (such as brinjals and tomatoes) partially on their plots. During discussions, members revealed that they are planning their paddy crop for forthcoming *kharif* season, according to the availability of irrigation. They are planning schedule-based irrigation for sowing paddy. Five to seven households can carry out sowing in one day; it will thus take

around one week for all members to plant paddy in their fields in the command area. This will require prior allocation of schedules for irrigation.

Members provided some water to non-members on request because they do not want to utilize this facility in isolation. After witnessing the success of the irrigation scheme, some villagers have expressed their willingness to join the *Samiti*. The scheme has completed one year of successful operation and members reported that so far they have functioned amicably. There has been no conflict or dispute. They rely on mutual discussions to sort out any issues.

The well and pump house are located in the land of a member. The site was selected after careful observation and detailed discussions. The criterion to select the site was the physical suitability of the well. The member agreed to provide land for the well and the pump house. The commitment is oral in nature. However, the group has written records of the discussions carried out on this subject. When asked about the need for a more formal written agreement, they responded positively to the idea (mainly as a safeguard against future disputes).

The group also expressed the opinion about possible land and water transfer scenarios in the command area of the well. Regarding the implications of this on water sharing, they rely on prevalent traditions/norms, which in turn are also reflections of the principles of fairness and justice. The solutions to possible scenarios are similar to the responses gathered in other villages covered under the same study. An abstraction from these responses (across case studies) is presented here.

LAND AND WATER LINKAGES

The shared system of irrigation brings about some common situations over time. The land structures of the households do not remain static over time. Land undergoes division and is transferred to the next generation. Land is also transferred through sale, purchase, gifts, etc. In case of land mortgage, the rights to the use are also transferred temporarily. All these situations also have implications on shared irrigation.

The irrigation schemes started functioning very recently (in most of studied cases); thus many of the future land- and water-related issues have not been confronted.[2] Alternatives or possible detours from the current arrangement have not been envisaged with their complexities. When questioned about possible future scenarios of sharing water, the members based their answers on their norms and notions of justice, fairness and equity. After the internal discussion among themselves in the light of their social norms/practices, they agreed that 1) The sons of members, as inheritors of the land, will be entitled for irrigation from the given shared well. 2) If one partner mortgages his land fully or partially, the concurrent owner will have right over irrigation. 3) If a member sells his/her land under the command area, the new owner will have right of access to irrigation. Members of the irrigation scheme located in a village of Palkot block (Case II) said, "*Naya malik to haq mangega, aur hamein dena chahiye* (The

[2]River-based lift irrigation in Kurag is about a decade old. In this scheme, a few members faced division of land through inheritance. The scheme has adapted to the prevalent norms. Sons, who now own divided land plots in the designated command area, have been accorded equal membership status and they have equal irrigation rights in the scheme.

new owner will ask for his right and we should give it)." This they inferred from social norms as well as principles of justice, equity and fairness.

The members argued that though these situations have not occurred yet, these cannot be ruled out in future. The transfer of irrigation rights is based on the idea that the transfer of land having assured irrigation will inherently entail transfer of irrigation rights. They often referred to the word *haq*, or right. One argument extended is worth mentioning. The head of a member household remarked that they should not share water with a new member because the new member (hypothetical) was not party to the shared labour contributed in the initial stage. However, this household, at a later stage of the discussion, agreed that the principle of equity and fairness calls for equitable sharing of water with the new entrant.

Another possible situation may be the addition of more partners in a given scheme. Members usually agreed that there is enough water to accommodate more partners (with an agreed fee). In some wells, non-member households were provided water—sometimes they came with their own machines or sometimes they paid for the fuel. Members reported that requests for crop saving irrigation (as help) from outside are sympathetically considered and if there is no pressure among members, they are not averse to the idea of giving water to a fellow villager.

CONCLUSION AND SUGGESTIONS

The homestead and river-based lift irrigation systems facilitated by PRADAN are functioning in Gumla district of Jharkhand. A preliminary study reveals that the community has benefited immensely from the irrigation system. The assured irrigation facilities have given them security to try out cash crops such as vegetables. This has contributed to their economic and social well being. Irrigators readily accepted that lift irrigation has helped them to shift to modern agriculture. An impact study will reveal the accrued benefits. The irrigation schemes are new; hence, impact studies are recommended here, using recall methods or based on counterfactuals, as soon as possible. Impact studies can be carried out through meaningful questionnaires and careful selection of beneficiary and non-beneficiary households. A majority of the schemes studied are about two years old. Although the basic tenets of the scheme are reportedly adhered to, the study was conducted informally. Most of the arrangements are oral in nature and are not, therefore, amenable to verification. The norms of regular meetings are not being followed in most of the schemes. Schedules are allocated orally and no registers are being maintained. In some cases, the collection of money is not regular.

Although the principles of equity and fairness were reportedly being followed, in the absence of written documents, these elements are difficult to verify or track.

It seems that some deviations have crept in as far as the operational structure is concerned because irrigators do not have any incentive or disincentive to adhere to the guidelines. Due to the absence of inbuilt monitoring systems in the programme/project design, the deviations are difficult to measure. Compliance to initial guidelines can be assured through adding provisions of disincentives/penalties as well as subjecting the schemes to monitoring. The provision of disincentives is not based on the notion of mistrust. Non-maintenance of written records

and lack of monitoring can lead to deviations from the principles of equity and fairness. Further, any inequity and anomaly will become extremely difficult to identify. In case of the river-based scheme in Kurag, the total active membership has declined. The reasons for the decline in membership need to be further examined.[3]

The provision of clear guidelines, regarding the possible scenario on land water linkages and their transfers, can make the schemes much more durable in the long-term perspective. Some cases show that irrigators have taken elements from the existing social norms; some have devised strategies to avoid future conflicts. In tribal societies, socially and culturally acceptable norms can be very useful to design sustainable programmes; however, careful study is required to make it compatible with formal laws and procedures.

Members have expressed their desire to have more formal written agreements in cases where the well/pump shed is located on a single member's land. This was expressed as a 'felt need' of members across the cases studied. Although the current members, usually, are not apprehensive about the immediate future, they want to safeguard their shared benefits in the long term. A few cases show interesting innovations to avoid future conflict, particularly on this issue. The methods adopted can be seriously considered for incorporation into standard procedures wherever applicable or possible.

In the villages where irrigation schemes have started, government agencies (local government heads, officials) can also be made party to the agreements as safeguard against future disputes. Though respondents generally reported that there is no conflict, detailed and rigorous studies (such as irrigation mapping, difference in irrigation demanded and allocated, inequities emanating from channel structures, asymmetries emerging from power relations within groups, etc.) are required, to understand the conflicts and the inequities involved. These detailed studies can identify anomalies in "what they say they do" and "what they do"; and thus help in incorporating safeguard measures.

The study revealed that there is urgent need for strengthening the organization of irriga-tion among shareholders and institutional design. A motivated team is working to bring positive change in the lives of the tribal population of rural Jharkhand. The target group also appears to be keen to adopt necessary changes. However, they need the help of external agencies for guidelines. Though schemes are envisaged as community managed systems, improvement in operational designs/ structures will make them much more sustainable. To achieve the objective, at this stage, programme/project monitoring or concurrent evaluation study is highly recommended for taking stock, identifying problem areas and bringing necessary changes for the future.

[3]A ten-year-old scheme should be picked up for detailed case study to identify possible deviations/informalism that can enter into new schemes. Learnings from old cases can help in improving the institutional design of implementation in future schemes.