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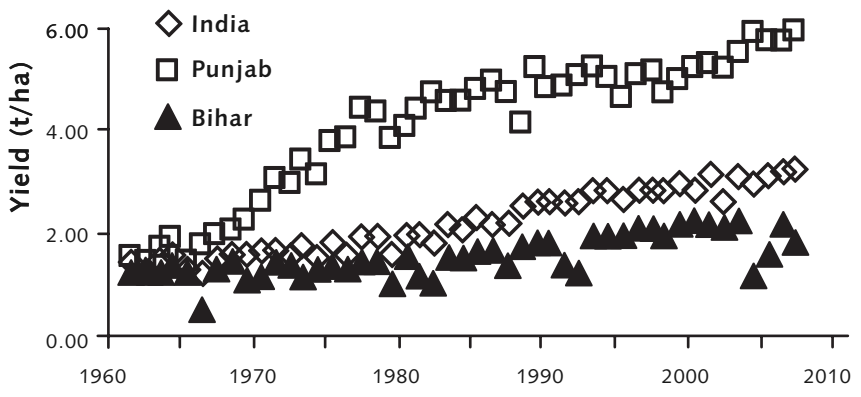
Can Agriculture Provide Food Security and Decent Livelihoods in East India?

PETER CORNISH

Efficient use of water and land, including the storing of excess run-off and the cultivation of alternative crops to lowland rice such as vegetables and pulses, are some of the ways to ensure food security and decent livelihoods for the subsistence farmers in the East India Plateau.

The Green Revolution brought food security to India mainly by increased productivity through irrigated agriculture. In Punjab, the average rice yields have increased three-fold since the 1960s (Figure 1). Sadly, productivity has improved little in parts of India where agriculture is mostly rain-fed. In Bihar, for example, rice yields for predominantly subsistence farmers have barely improved in 50 years (Figure 1). Therefore, despite the national food security, East India suffers from a severe food deficit and is the most densely populated, least developed and poorest region of India, with around 70 per cent of the people not enjoying food security at all. For subsistence farmers, who use no irrigation methods and who depend on rainfall, drought is also an ever-present risk. This is despite having an average rainfall that is so high it is the envy of farmers elsewhere in India. Does it need to stay this way?

Figure 1: Rice (Paddy) Production for All India, Punjab and Bihar, 1970–2008



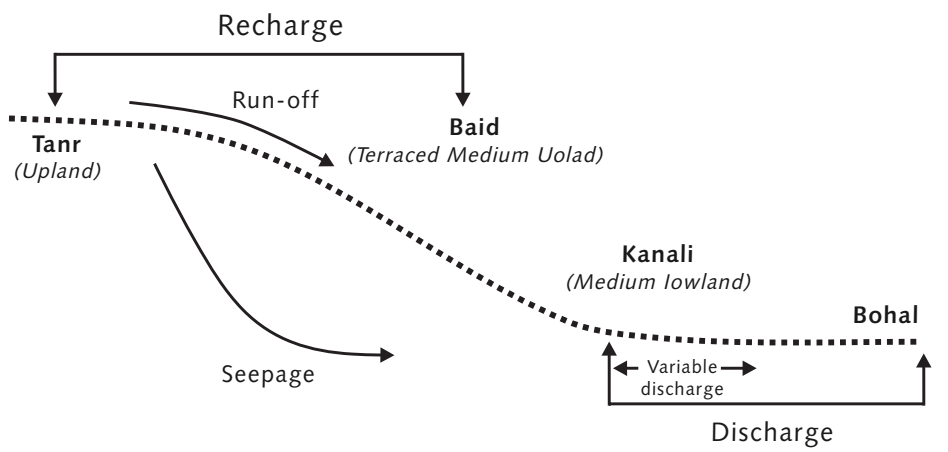
If poor farmers are to achieve improved livelihoods, based on agriculture, they must make more efficient use of water and, of course, the land. Understanding water is one of the keys that will unlock the path to development for poor farmers.

Participatory research with farmers by PRADAN, in partnership with Australian scientists and the Indian Council for Agricultural Research (ICAR), has shed light on why productivity remains low, and why farmers are so at risk of drought on the East India Plateau (EIP). It also points to ways by which such situations can be improved. The project is funded by the Australian Centre for International Agricultural Research. The project aims at developing water harvesting principles, based on PRADAN's long-standing work, and at developing new cropping systems that make best use of the water resources for improved livelihoods. This article focuses on the risks and opportunities relating to rainfall.

The work centres on Pogro and Amagara sub-catchments in Purulia district in West Bengal on the eastern edge of the EIP. The area enjoys high rainfall (1,100–1,600 mm) although 80 per cent falls within the monsoon between June and September. Because there is little irrigation, there is negligible cropping outside the monsoon and the region is largely mono-cropped with rain-fed rice. So, with the low rice yields, few other crops and the rising population, food security is a critical issue. The landscape is mostly undulating (Figure 2), with drainage lines and land near streams comprising lowlands (*bohal*) that rise to the local uplands (*tanr*), with relief typically <30 m.

There is much more rainfall in the monsoon than plants can use; so all the 'excess' either runs off or seeps into the local shallow groundwater (Figure 2). The uplands are 'recharge' areas whereas the lowlands are the local 'discharge' areas for seasonally recharged groundwater. The narrow band of medium lowlands (*kanali*) between them is a discharge area in the wetter years only. *Bohal* has been cropped with rice for centuries;

Figure 2: Schematic Landscape Showing Land Classes and the Movement of Water



Modelling is a way of estimating soil water without having to dig holes. It can give an estimation of soil water content continuously even when there are no measurements at all.

however, with the pressure of the increasing population, the up-slopes have been terraced and bunded progressively to create medium uplands (*baid*). Medium uplands are now the most extensive areas for rice. Farmers readily identify *bohal* as their best land if they have any because lowland rice grows well there. Farmers also understand the patterns of run-off and drainage in their landscape and adapt to this by growing shorter duration rice varieties in the medium uplands.

RAINFALL AND WATER: RISKS AND OPPORTUNITIES

When asked about their greatest needs, poor farmers invariably say, "Give us water and we can do anything." From a scientific viewpoint too, the availability of water creates opportunities as well as sets boundaries on what farmers can achieve. If poor farmers are to achieve improved livelihoods, based on agriculture, they must make more efficient use of water and, of course, the land. Understanding water is one of the keys that will unlock the path to development for poor farmers.

A farmer's water resources, or at least potential water resources, lie not only in the current rainfall but also in the run-off that may be captured in ponds. Moreover, seepage water makes the *bohal* the safest for lowland rice and provides a potential source of irrigation water. 'Water harvesting' aims to capture the run-off and seepage water that is usually lost. A less obvious resource is the water stored in the soil. All crops, both rain-fed and irrigated, depend on water held in soil. Even rice depends on water stored in the soil after the fields have been drained and before maturity, or in the dry periods. Rain-fed crops depend on soil water whenever it is not raining, often for long periods of time.

Equally important as it is to know about the rainfall is to know how much water is in the soil. Astute farmers manage the irrigation by maintaining soil water within acceptable limits. In order to cultivate 'lowland' rice varieties, it is important to know how long the water remains 'ponded', and whether short periods of drying occur. Knowing this may help to explain why rice crops fail so often. We will see later that knowledge of soil water can also *identify opportunities* for farmers to safely grow productive crops when it is too dry for rice.

KNOWING SOIL WATER: MEASUREMENT AND 'MODELLING'

Not all of the water held in the soil can be used by plants; scientists talk about a lower limit, that is, how far plants can dry out the soil if they need to (sometimes called the 'permanent wilting point'). There is also an upper limit to the amount of water a soil can hold (saturation, for rice paddy; 'field capacity' for other crops). Between the upper and lower limits is the 'available' soil water. This is referred to in the same way as rainfall, that is, in millimetres (mm). The maximum amount of available soil water depends on the type of soil as well as the type of plant, because plants with deeper roots explore a greater volume of soil. Many people are surprised by how much available water can be held in soils. For agricultural plants, it can be as much as around 250 mm. Rain-fed crops can grow for weeks or even months, using water held in the soil, without rainfall

at all. The amount of water held in the soil is highest after heavy rains and lowest after long dry periods during which plants absorb the water through their roots, which often extend to over one metre deep in the soil. When cultivating rice, the water is meant to 'pond' above the soil surface for much of the crop growing period.

The research team used a combination of soil water measurement and modelling to understand better the risks involved and opportunities provided by the rainfall in East India. The direct measurement of soil water involves boring hundreds of small holes in dozens of farmers' fields to the depth that crop roots can grow, say up to one metre. This soil is returned to the laboratory and dried out to determine how much water it holds. We have measured soil water after rice and some *rabi* crops over several years in different land classes to determine the 'lower limit' for these crops in soils typical of the EIP. This is very time consuming, and impractical on any scale. Modelling is a way of estimating soil water without having to dig the holes. It can give an estimation of soil water content continuously even when there are no measurements at all. Actual measurements are used just to check that the model is giving sensible results.

DAILY WATER BALANCE MODELS

Models simply use a sequence of mathematical calculations that mimic what is actually happening in the soil. Models treat the soil like a bank account. Each day, water received from rainfall is added to the soil water carried forward from the previous day, and the water used by the crop that day is withdrawn (meteorological data are used to estimate evaporation and, from this, crop water-use is estimated). The balance is the amount of water available to a plant on that day. This balance is carried over to the next day, when rainfall is added and crop water used is subtracted and so on, to give a running daily water balance.

The 'water balance' model can account for run-off, for drainage below the roots of crops, for ponding above the soil surface and any other factor that affects the amount of available water. The water balance is calculated from data obtained from standard weather stations. Models need to be based on real data and the predictions need to be verified.

THE RISKS OF GROWING RICE

The research team wanted to know how risky it was to grow rice in the medium uplands, on which most poor families depend. To find out, the team estimated the soil water balance for rain-fed monoculture rice (rice-weedy fallow) for the period of our work in Purulia (2006–09). Farmers assessed the rice in medium uplands for these years as follows.

2005: (Before the project commenced) Was a bad year for rice in medium uplands.
2006: Poor despite a wet start.
2007: Very good.
2008: Poor with a dry finish.
2009: Disastrous, with delayed transplanting and an early end to the monsoon.
2010: Looks like another disaster.
Thus, the farmers say that five of the last six years have been bad.

The farmers' assessment of these years is borne out by the measurements and modelling in Figure 3, which gives us some confidence in the model. The continuous line in Figure 3 is the estimated available water

on every day for four years. You see it rise with the onset of the monsoon when rainfall exceeds evaporation and fall away at the end of the monsoon.

Note: Evaporation and rainfall are monthly data, and only for 2006, to simplify the graph. The data show excess of rainfall (squares) over evaporation (triangles). The number under the line is the days between the first ponding and the final draining, ignoring any temporary drying of fields.

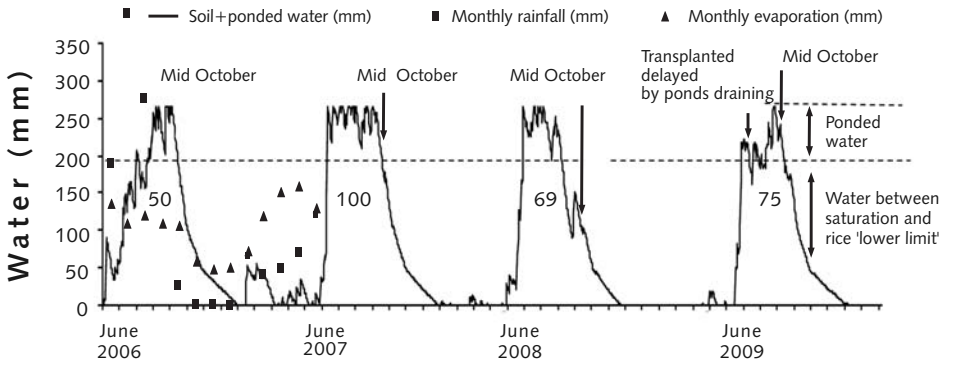
With a thinly spread extension service, low levels of literacy, high levels of risk aversion and poor self perception, most farmers grow mainly rice with which they are familiar and which, by repute, needs little fertilizer and for which it is relatively easy to manage weeds.

Because we are modelling rice fields, we have allowed water to stand during the rice crop, if there is enough rainfall. The top line of dashes indicates the maximum total water storage (soil + standing water) of 265 mm. Below the two lines of dashes is the amount of available water when the soil is saturated. The average depth of ponded water is 75 mm. For most of its growth, rice needs standing water; therefore, the continuous line needs to be above the bottom line of dashes.

What does Figure 3 tell us? Only in 2007 did water remain ponded continuously, for 100 days, which is enough for a rice variety with medium duration. In 2006, the good rainfall in June would have allowed rice nurseries to be planted; however, transplanting in July and August was followed by draining of the fields. The year 2008 had a promising start but the rains faltered in August; the fields dried and there was temporary respite in late September. In 2009, transplanting was delayed because of the faltering monsoon rains.

The model results not only confirm what the farmers say but also give insight into the nature of the problem, whether it is a late onset of the monsoon, an early finish, or periods during the monsoon when the fields drain. Each of these problems requires a different solution. For example, the period between the start of ponding and final draining of fields (the number under the line) was much less than 100 days in three years, even if short dry periods are ignored. This means that even very short duration rice will suffer from either late transplanting or early cessation of monsoon rains—early maturity will not solve the problem, even though

Figure 3: Soil Water and Monthly Rainfall and Evaporation, Pogro Catchment, 2006–2009



farmers have sensibly moved to shorter duration varieties. Above all, any temporary draining of fields at critical times such as flowering worsens the disaster.

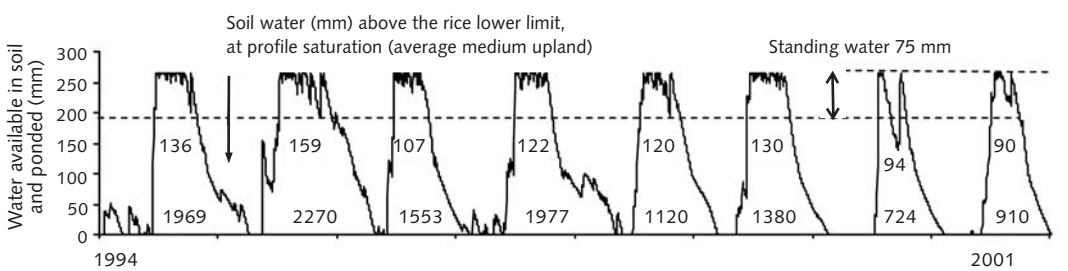
Next, we wanted to know what happens over a greater period of time. For this, we used weather data for 1994–2004 from the nearby Shahrajore dam. The duration of inundation varied from 94–159 days, again disregarding periods of drying during the monsoon that would make the situation worse than simply being a short season. Although there were more 'good' years for rice in the period 1994–2004 than since 2005, in three of the eight years, the rice fields are predicted to have dried of free water, again showing the risk in cultivating rice on the medium uplands. Much of the *baid* land holds less water than the 190 mm assumed here and is, therefore, even riskier.

What does this mean? Does this simply mean that East India is drought-prone and farmers need to face this fact? No, it does not. The region is blessed with high rainfall, and even the 'bad' years such as 2000 (724 mm) have enough rainfall to grow the right kind of crop. Tribal farmers near Hyderabad, who heard about the collaborating farmers in Purulia district, said they must be poor farmers to suffer so badly when they receive so much rain. This is not the problem. What it means is that lowland rice is not a safe crop to grow on the medium uplands of East India. Failed rice crops are unavoidable in most years, even with shorter-duration varieties. Short duration is no protection against within-season stress although it would have been useful in some years with the short duration of flooded conditions. With a thinly spread extension service, low levels of literacy, high levels of risk aversion and poor self perception, most farmers grow mainly rice with which they are familiar and which, by repute, needs little fertilizer and for which it is relatively easy to manage weeds.

Is there an alternative to lowland rice? The results in both figures illustrate the potential for upland rice varieties (these are locally available) or rain-fed alternatives to rice in the *kharif*. Collaborating farmers in Amagara and Pogro have successfully grown alternatives to rice in uplands and medium uplands—so it can be done.

The implication is that serious effort needs to go into developing crop options for the *kharif* and proving that these are viable to the farmers. This is a challenge as much for researchers as it is for a development NGO such as PRADAN. The arrows in Figure 3 point to mid-October, which is after the finish of the monsoon. Notice how the soil holds a lot of 'available' water, even after a 'bad'

Figure 4: Water Balance to 90 cm Depth for 1994–2001 in the Best Medium Upland (Baid) Rice.



monsoon. This means that a *rabi* crop can be sown with just a little irrigation because most of the water it needs is already in the soil. For this to work, early planting and a short maturity for rice are needed, so that the *rabi* crop can use 'residual' water before it drains away, evaporates or is used by weeds. This requires good management, which is something farmers develop for themselves—it cannot be 'taught' in a workshop or two. Direct seeding of short-duration rice has proven successful in Amagara during the project, most notably in the bad year 2009.

Short duration varieties are central to improved cropping systems in medium uplands. There are high-yielding rice varieties available that mature before mid-October, especially if direct-seeded early when rice nurseries are being prepared.

First, monsoon rainfall greatly exceeds evaporation in all years, generating substantial run-off, except in 2006; therefore, 'water harvesting' certainly has potential, as promoted by PRADAN. It aims to convert some run-off to transpiration by (1) using structures to slow/detain run-off and retain more water in the landscape in the monsoon and (2) using it in *situ* for plantation crops; or (3) captured in surface storages for 'rescue irrigation' if needed in the monsoon; or (4) to recharge shallow groundwater for extraction down-slope in structures located in seepage lines and used to irrigate *rabi* crops. It is important to increase recharge in order to 'harvest' seepage water in a sustainable way.

Second, showers often precede the monsoon and are commonly used to prepare land for rice. This water could be used to grow alternative early monsoon crops. Water at this time is uncertain (Figures 3 and 4) but may be secured by controlling 'fallow' weeds to conserve water left at the end of the monsoon (arrows in Figure 3) in small areas designated for later pre-monsoon cropping (on flat fields with no erosion risk). Water may also be made more reliable by storing any run-off from the pre-monsoon rains in small ponds for 'rescue irrigation' of early sown crops.

Third, soil water remaining after rice may be used by *rabi* crops, as noted already. But because of a perception that *rabi* crops need full irrigation, none are grown at present. Timely planting is crucial. Figures 3 and 4 show soil is mostly near saturation in early October, even in 'poor' years for rice. In most years, soil in medium uplands holds 150–200 mm water, which is available for *rabi* crops. Strategies to use this water depend on planting shorter-duration rice varieties that create the opportunity for a second crop and reduce the risk of crop failure in a short monsoon. Short duration varieties are central to improved cropping systems in medium uplands. There are high-yielding rice varieties available that mature before mid-October, especially if direct-seeded early when rice nurseries are being prepared.

Seepage water that is 'harvested' could be used to fully irrigate *rabi* crops; but a better strategy would be to supplementarily irrigate crops to force them to use the residual water left by rice. In practice, collaborating farmers have had difficulty establishing crops quickly enough after rice to not need irrigation for establishment. In any case, yields have generally been poor without at least some irrigation that makes P-fertilizers available.

SOIL FERTILITY

The project team undertook extensive soil surveys to see how soil fertility constrains productivity as well as many fertilizer experiments with farmers. The results paint a clear picture of low organic matter, P deficiency (even in paddy rice) and likely K deficiency, but not in all fields. Simple prescriptions for all fields are inappropriate. P deficiency is so severe in *rabi* crops that many farmers have observed 'with no phosphate there is no crop'. P-fertilizer use is low on the EIP; this may help explain why farmers who have tried *rabi* crops believe these will not grow, blaming lack of irrigation.

CONCLUSION

Despite high rainfall, lowland rice is risky on the medium uplands on which most families depend. Alternatives to it include upland rice, vegetables and pulses. Uplands are a hitherto untapped resource in which, with increased confidence, knowledge and skills, farmers have adopted the cultivation of various vegetables, timed to gain high market prices. Short-duration rice reduces the risk of failure and creates opportunities for *rabi* crops that yield well with only supplemental irrigation, by using water left by rice. Significant challenges include the severely degraded structure of rice soils, which sometimes limits irrigation rates, and limits root growth and access to residual moisture. More professionals are needed to initiate ongoing farmer-learning: a challenge to India at large to recognize 'development' as a worthy *profession*, and for universities to develop relevant courses.

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.

Approach to Development: My Experience in Pradan

BHARAT CHANDRA MOHANTY

An apprentice's reminiscences about his early days in PRADAN leads to a frank examination of the processes of intervention, the pitfalls, the initial failure, the mourning about the lack of depth in engagement with individuals because of the pressure of achieving targets and numbers, and the learning from early setbacks.

I resigned from PRADAN on 25 October 2008, to join AXIS Bank as an Agri Operation Officer. My responsibility is to look after the agri portfolio of four branches attached to the cluster so that these remain in a financially profitable position without any further accretion to the category of Non Performing Assets (NPAs). The job requires me to visit clients, who are irregular with repayment, and pose a threat to their status, thereby undermining the business of lending to earn profit. This was an entirely new experience for me; I was required to exert pressure on delinquent clients so that they fall in line and start repaying the debt they owe the bank. As I moved about in the villages, in an attempt to ensure proper recovery and to source potential clients, I was reminded of the days that I had spent in Hatgamharia, a sub-location of West Singhbhum team, Jharkhand. I remember the day I joined PRADAN vividly; it marked the onset of my professional career. When reflecting on my acts of commission and omission during the stint I spent in PRADAN, I find, though not surprisingly, several situations in which I could have acted/reacted differently and probably more creatively, thus triggering a more vibrant response from other significant stakeholders, including the community, that could probably have culminated on a different note. This is an attempt to spell out some of these situations in which I was in a dilemma and unable to chart an effective course of action towards the desired destination.

I grew up in a village. I had to walk more than 2 km, from class VI onwards, to go to a school. The school got electricity only in 1998; by then, I had completed the intermediate level in science. The road to the village was barely approachable by car or any vehicle in the rainy season. Barring four families, the remaining one hundred and twenty depended entirely on agriculture for survival. I went to different villages during the first phase of apprenticeship, accompanied by a senior PRADANite, to get a feel of rural life, and to observe the different developmental initiatives undertaken by PRADAN and the kind of rigour to which a PRADANite is

subjected. The main difference from the village I grew up in, in terms of the physical infrastructure, was the lack of a source of irrigation. My limited interaction with the villagers also gave me the impression that the major hurdle to their economic prosperity was the non-availability of any irrigation infrastructure. However, the villages I visited were endowed with rich forest resources that offered an additional source of livelihood. I thought that any project with a focus on the creation of irrigation infrastructure would usher in a brighter tomorrow. The villagers would also come forward to grab any such opportunity that allowed them to realize their dream of a better future. The team had also just then started implementing a watershed project—Jharkhand Tribal Development Programme— in two blocks, Tonto and Sonua, where the poverty was glaring. With a focus on land- and water-related interventions through floating various community organizations such as women's self help groups (SHGs) and programme execution committees (PECs), with the nodal agency being the *gram sabha*, the project gained such immense popularity that when a PRADANite stepped into the villages s/he was greeted almost by all, children, adults and the aged alike. It boosted my confidence to see a project that addressed the long-felt needs of the community being implemented successfully and without much difficulty. The physical stress did not worry me at all because I was used to it. I was looking to be given a task to put into operation on the ground, to prove my mettle. Finally, the opportunity came. I was excited.

The team decided that it would start by promoting vermi-composting with those farmers for whom agricultural intervention was being targeted. The first phase would begin with 25 families. After observing the result and responses, it would be replicated in rest of the villages. Two villages, namely, Ramsai and Sosopi, were selected for this purpose. The rationale behind the selection of these two villages was that they were among the JTDP programme villages and community mobilization here was better as compared to others. Moreover, with the inordinate delay in the release of funds for the construction of water harvesting structures, it was necessary to start something new in that area, to sustain the momentum generated among the villagers to move towards prosperity. When the team leader asked me whether I would take up the responsibility, I immediately accepted the proposal. This was an opportunity for me to prove my worth and I thought the task would not be a difficult one, considering the target number of beneficiaries and the degree of community mobilization that I had witnessed there.

During my field visit, I had found that there were some persons in every village, who came forward to act as an interface between PRADANites and rest of the villagers; they were actually performing the role of development agents on behalf of various agencies. I chalked out a strategy to approach them, discuss with them about pros and cons of organic farming, the advantages of vermi-compost in ensuring greater productivity without any deterioration of the health of soil and, above all, about how they could act as catalysts in making their village an epicentre of organic farming, which would then show the others the path. Accordingly, I approached four persons—Deben Hansda and Harish Hansda of Ramsai, and Arjun Gope and Armiya Hansda of Sosopi. They were very active in their locality. Deben and Arjun were president of their *gram sabhas* whereas Harish and Armiya were animators for the JTDP project. In the initial discussion, I found all of them to be very enthusiastic.

They assured me that the 25 families would be easily identified and I need not be worried. They accompanied me when I visited some families and discussed details about vermi-composting. I was still very new to the villages. I was not aware about the resources the families possessed so that vermi-composting could aid in their better utilization. I had focused primarily on ensuring a 'Yes' from them. Somehow, we suffered a setback and it was not a cakewalk at all as I had thought.

The setback in implementation of plan to introduce vermi-composting was bitter to digest. I realized that I was basically seeding the concept among some selected persons, who are already identified by the community/PRADAN for doing activities on their behalf, and this may not have worked well. Being new to the area, the community and these selected persons, perhaps I was not able to inspire them to try vermi-composting as a profitable proposition. I had adopted the approach of not interacting with individual beneficiaries mainly because of two reasons. First, I was not familiar with the community, so was somewhat reluctant, rather apprehensive, in dealing with them directly. Second, I thought a target of 25 vermi-beds with 25 families was not a huge one that would require me to interact at the individual level. So, I relied solely on these selected persons for whom the task of identifying 25 families would be quite easy.

My first attempt to prove my worth as a development worker and trigger long-term change in agricultural practice of the locality in long run met with a setback. I myself had not visualized vermi-composting as a potent tool that could bring about discernible change in the life of the community. I had also resorted to these short-cuts half-heartedly. I attempted to seed the concept through the persons already identified rather than involving myself with the task fully. This not only prevented me from getting to core of the process but also pushed me to introduce the new concept with some families, which did not have enough resources to set up a viable unit. In the process, I persuaded Dadimo didi of SHG of Sosopi. In fact, she was the first one to buy the idea in her village. Later, I came to know that she belonged to a landless family, with no livestock; her major source of income was from a shop she was running in her village. The first bed she prepared was from dung collected from roads and fields. Obviously, this was not a proper way to get my feet into developmental activities.

I realized the danger of over-reliance on some select few people. Whom should I target for this? Groups or individuals? I thought the primacy of a group prevails over its constituent individuals. So, I chose to actively interact with women's SHGs, the key community organization that PRADAN floats. I attended group and cluster meetings more frequently, interacted with group members and tried to first build a relationship with the group that would enable me to enter their frame of reference. Gradually, I found myself better equipped to relate to the groups; in turn, the groups responded to my ideas with enhanced reciprocation. This increased my confidence, in the sense that I was better placed to understand the needs of the group and, therefore, plan interventions accordingly. I decided to intervene in *kharif* agriculture with all the SHGs (there were 18 SHGs at that time), with a target of increasing the household income by Rs 5,000 on an average. Agricultural intervention had been started in the location in the previous year with 85 farmers in 6 SHGs of Nurda cluster. I

chalked out a plan, fixing the deadline for each step, so that I could reach 250 farmers. This number was very important for me because I believed that for an intervention to be effective it must have a certain scale of reach. Although, as far as numbers go, 250 farmers would not be very influential, it would certainly lay a sound foundation for a larger scale for the coming year. The first round of meetings, regarding concept seeding of kharif agriculture, was completed with all members of the 18 SHGs, the men in their families and whoever else were interested. Mamta Koda, an SHG member of Asha ki Kiran Mahila Mandal of Edalsai, was associated with me in all the meetings. From the response we got from the groups, we were confident that we would achieve our self-imposed target and even thought of exceeding it! We were also ahead of two other locations of the team in completing the first round of meetings. Our morale at the location was high. Everything was running as expected. However, when the deadline came, I was surprised to find that only about 50 members had turned up with their list. We had received positive responses from all the meetings. Therefore, we were in a fix.

Unable to understand the reasons for the lack of response, I decided to organize a second round of meetings, this time only with group members. Some members, who had said an emphatic, "Yes" at the initial meeting, were reluctant and somewhat apprehensive about the seed-varieties that had been promoted, some about the broad spectrum insecticide, Phorate, and some with the process of dry bed raising nursery and transplanting. In the initial meeting, no such apprehensions had been expressed; rather all of them had shown a kind of proactive acceptance. Therefore, when such apprehensions came to the surface, I became irritated. When answering their queries, my attitude was that of 'I know more and so I understand better than you tribals'. This did not help at all. One evening, I met Mamta *didi*. We discussed the issues raised by the members. I realized then that I had ignored these apprehensions that had been raised by a few members in the first round of meetings itself. It would have been better if I had paid heed at that time. I also felt that the decision-making process of a group and that of family differs. There is every likelihood of a member saying, "Yes" in a group and finally saying, "No".

Although I was not absolutely clear about why the members changed their minds, I accepted it as a fact. Maybe in a group an individual did not get enough space to express his/her opinion, which was different from the opinion of the group. Therefore, from the group's context, a problem may not have had much relevance, but the same may have enough significance from the point of view of the individual. In the end, it is the individual, who takes the decision on behalf of his/her family, not the group.

I had found a striking example of this in Sarasoya, a hamlet of Balijodi village. There were around 40 households in the hamlet with two SHGs—Asora Marshal Mahila Mandal and Unnati Hora Mandal. The latter had been formed one year after the former. Both the groups sit together and the accountant of Asora Marshal Mahila Mandal also maintains the accounts of Unnati Hora Mahila Mandal, without demanding anything in return. The initial meeting of concept seeding had been held jointly with both the groups. Although the members were asked to invite the male members of their family, no one had turned up for the meeting. Mamta didi and I were present to at the meeting. Mamta didi was from the adjacent hamlet of

the same village. We discussed the problems they faced with their age-old agricultural practices and the low productivity of traditional varieties. We also discussed how things could be different with high-yielding varieties. The members present readily agreed to the idea of adopting new practices, maybe on a smaller piece of land. I was satisfied with the way the discussion had progressed. We expected at least 30 farmers to sign up. Instead, only nine members from both the groups finally agreed to try the new methods.

When I discussed this separately with the groups, I found that a majority of the members of Unnati Hora Mahila Mandal were either landless, or had marginal land holding. Agricultural intervention for them had little or no importance. However, they did not say so in the initial meeting because they had hardly any scope to do so. I realized the mistake of not doing resource analysis of individual households prior to venturing into land-related interventions. I had hardly any time to listen to the issues of each and every individual of a group. I had to reach the numbers I had committed to. I decided to prevail upon the group as a whole and tried to persuade as many members as possible to adopt PoPs of improved paddy at least on an area of 25 decimals of medium upland or lowland. The idea was that if a family got a good yield from a small patch of land, it would be easy to convince the family the following year to adopt modern practices on a larger area. Finally, we generated a list of 185 farmers from the 18 SHGs in two clusters.

The following year, we were able to diversify the intervention in agriculture with more than 750 families from about 70 SHGs. Although no statistical analysis has been conducted on the impact of this agriculture intervention, there is hardly any doubt that it has augmented the family income, introduced high yielding varieties of paddy such as Swarna, Lalat, Jaya and Pankaj successfully, ensured acceptance of nursery raising and transplantation of around two-week-old paddy seedlings in the community, and resulted in a rise in consumption of potash fertilizer, to list a few. We had achieved our target and were buoyant over the fact that the number of families under agriculture intervention had increased from 85 to more than 750 in just two years.

However, there was a grey side to it, which I had grossly overlooked in the process of reaching these numbers. I had not done anything for the landless families and those with marginal land holdings in the SHGs. It was not that I was not concerned about them, but actually I had not any idea about what to do and how to do on a large scale. Despite the attempt to bring families with homogeneity under the ambit of an SHG, there were differences among them in terms of resources, socio-economic conditions, etc. The magnitude of these differences was greater in the context of a cluster. But, we had intervened with all the groups across clusters with more or less the same approach, that is, an approach that lacked flexibility and with a focus on some pre-selected crops and varieties. This had naturally excluded the landless and marginal landholding families. Our frequency and intensity of interaction had increased with those who were under our intervention. This had further accentuated the degree of exclusion and gradual isolation of these landless and marginal landholding families. This did not pertain to agricultural intervention alone.

The same deficiency was present in our key intervention activity, that is, the promotion of

SHGs. The location boasts of more than 90 SHGs. As the number of SHGs grew, the intensity of interaction with individual groups and individuals within the group decreased.

My usual proclivity was to interact more with those members of the group with whom I was comfortable, and I found some kind of resonance. One of the basic reasons was that they were always the first to come forward to accept an idea and implement it. They were placed better financially as compared to their peers in the groups. So the risk of experimenting with a new idea was less for them. I realized this as I introspected over the agricultural intervention in the location.

More than 60 per cent of the members, who had adopted new scientific PoPs, had more than 2 ha of land. So, the risk of trying new PoPs on an area of 25 to 50 decimals of land was negligible. Had it failed, the resultant impact on their overall grain production would not have been very severe. For the marginal farmers, on the other hand, it was a higher risk. They were, thus, either excluded from the process or, if at all they tried the new PoP, it was on less productive area of their landholding. As a result, both production and productivity of the comparatively better-placed families got a bigger fillip than that of the marginal farmers. The net impact may not have accentuated differences between these two sections but it had certainly started the process. This was true for a number of activities we had undertaken with the groups at the location. This is my interpretation of the experience; others may differ with me.

When increasing the scale of intervention, it is practically impossible to be in constant touch with all the groups and its constituent individuals. Can we find some suitable alternatives? The last few weeks in PRADAN was quite enriching in this regard; I was involved in micro-planning of the district under the Backward Region Grant Fund (BRGF) scheme of the central government. The task was to impart training to the district machinery at various levels so that all the departments sit together to work as a coherent unit to prepare a holistic plan for development of their respective villages, blocks, wards, etc. No organization can work in isolation now. It is also not possible for a single organization to address the entire gamut of issues of development of an area. An important task, therefore, is to ensure effective coordination among all the stakeholders, so that the synergistic effect of the sum total of efforts is more than the sum of their individuals.

When I recollect my days in PRADAN, I find that I had a lot of pride being associated with an organization with an impeccable record of integrity. This had gradually made me feel superior to others working in some local NGOs. I did not, therefore, develop the kind of rapport with officers of other line departments simply for the same reason because I doubted (of course, sometimes not without base) their integrity. This obviously harmed the implementation of the projects undertaken with grants from these departments. Was criticizing the only way out to protest? Could we work alone? My brief experience in BRGF planning changed my way of looking at the line departments. The potential of working in close collaboration with different line departments of the government is huge and beset with a lot of possibilities although the way to harness this potential without compromising one's integrity even slightly is challenging.

The Green Revolution brought food security to India mainly by increased productivity through irrigated agriculture. In Punjab, the average rice yields have increased three-fold since the 1960s. Sadly, productivity has improved little in parts of India where agriculture is mostly rain-fed. In Bihar, for example, rice yields for predominantly subsistence farmers have barely improved in 50 years.

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Pradan is a voluntary organization registered in Delhi under the Societies Registration Act. Pradan works through small teams of professionals in selected villages across eight states. The focus of Pradan's work is to promote and strengthen livelihoods for the rural poor. It involves organizing the poor, enhancing their capabilities, introducing ways to improve their income and linking them to banks, markets and other economic services. The professionals work directly with the poor, using their knowledge and skills to help remove poverty. News*R*each, Pradan's monthly journal is a forum for sharing the thoughts and experiences of these professionals working in remote and far-flung areas in the field. News*R*each helps them to reach out and connect with each other, the development fraternity and the outside world.

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