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Utilisation and Development of Common Property Resources - A Field Study in Punjab

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The Common Property Resources (CPRs) can be broadly defined as those resources in which a group of people have joint rights over their use. Resources falling in this category include community forests, pasture and waste lands, watershed drainage, village ponds/tanks, rivers, *choe* (perennial stream) banks and *choe* beds, etc. (Jodha, 1990; Nadkarni, 1990; Arnold and Stewart, 1991; Pasha, 1992). Even when the legal ownership of some of these resources may rest with another agency (e.g., forests owned by the Forest Department of the State Government), in *de facto* sense they belong to the village communities. Since the historical past these resources have been contributing a lot to the village economies. Besides maintaining the ecological balance by way of checking soil erosion, deforestation and siltation, the CPRs benefit the rural masses in terms of availability of fodder, fuelwood, small timber and employment in local products deriving raw material from CPRs or in harvesting of these materials for use by others, collection of fruits and medicinal herbs. Since these resources are being used commonly and freely, a situation of no caretaker prevails which leads to over-exploitation culminating in a state of degraded condition and thereby places a further stress on the rural economy particularly the economy of the rural poor.

The 'Kandi tract' in Punjab State has a total area of 5 lakh hectares which has undulating topography that is prone to soil erosion problems through excessive run-off due to lack of vegetative cover, the amount of water available for irrigation is extremely limited and the soil fertility is inherently low. The natural vegetation in the region consists of grasses, bushes and very few trees. About a century ago there were very few perennial streams locally known as *choes* and the area affected by these *choes* was very small (Sur and Parihar, 1978). The misuse of land and allied resources in this region has resulted in its degradation and destruction. For example, according to an ICAR (Indian Council of Agricultural Research) estimate, the soil loss in the Kandi area of Punjab State occurs to the extent of 16.35 tonnes per hectare whereas the acceptable soil loss range is 7.5 to 12.5 tonnes per hectare (Khanna, 1995). Most of the 2.85 lakh hectares classified as forest land in the state is in the Kandi area. A major proportion of these forest lands have common ownership and thus are an important CPR (Bhumbla, 1995). The CPRs being in large area in this region are the major contributors to the people's sustenance. Keeping in view the importance of these resources in the development of this under-developed tract with degraded soils, this study was undertaken purposively in this belt of the state. The primary objectives of the study were to examine (i) the managementwise productivity (income) and encroachments (shrinkage) of the CPRs, (ii) the pattern of utilisation of the CPRs; (iii) the extent of dependence/contribution of the CPRs; and (iv) evaluation of the strategy adopted for their development.

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DATA BASE AND METHODOLOGY

The evidence presented in this paper is based on the data collected for the baseline and concurrent evaluation reports of the World Bank aided Integrated Watershed Development Project (IWDP), Punjab, during 1990-91 and 1992-93 by the Evaluation Cell set up under the aegis of the earlier World Bank aided Kandi Watershed and Area Development Project (KWADP) in the Department of Economics and Sociology, Punjab Agricultural University, Ludhiana. These projects [KWADP was implemented in Punjab only from 1979-80 to 1988-89 which has been extended to the four states of Punjab, Haryana, Himachal Pradesh and Jammu and Kashmir, known as IWDP (Hills) and in operation since 1990-91] have been put into operation in the Kandi area with the objective to slow down and reverse the degradation of natural environment through the use of appropriate soil and moisture conservation technology. The improvement of vegetative cover on the common as well as private non-arable lands (a significant proportion of the total area in this tract) through afforestation, plantation of grasses and undertaking appropriate soil conservation treatments, is an important mandate of the project.

The IWDP (Hills) is being implemented by the Government of Punjab since April 1990 in four watersheds, namely, Dasuya-Langerpur, Arniala and Nara-Dada-Manjhi in Hoshiarpur district and Jainti Devi-Ke-Rao in Ropar district. To assess the impact of developmental works being executed under the project, two-phase sampling was followed, i.e., information from the benchmark (1990-91) sample households was again collected during July-November 1993 for the agricultural year 1992-93. Out of the total 34 villages in Dasuya-Langerpur watershed, eight villages were selected randomly. A random sample of 52 landless and 147 cultivating households was selected for the estimation of various parameters. Since one of the objectives of the project is the sustainable development of the CPRs in the area, detailed information about the existing availability and use of these resources among various household categories, viz., marginal, small and large cultivating households and landless households was collected from the sample households. The detailed information about the works carried out for the development of the CPRs in the sample villages was also obtained from the office of the Co-ordinator of IWDP (Hills), Punjab.

RESULTS AND DISCUSSION

The basic statistics of the sample villages presented in Table 1 show that about 1,634 hectares (33.4 per cent of the total geographical area of the eight sample villages) of land was arable. Most of this area (94 per cent of the arable land) was unirrigated. The non-arable lands being about two-thirds of the total area consist of area under *kharkana* (factory establishments), *choes*, hills, etc., classified as forest area. The occupational pattern of the rural households in the sample villages indicated that 47 per cent of them were cultivators and the remaining 53 per cent were non-cultivators. The average farm size of the cultivators was 1.6 hectares. The family size averaged 6.3 and 5.5 persons for the cultivator and non-cultivator households respectively. On an average, ownership of 5.7 and 3.2 cattle heads by cultivating and non-cultivating households respectively indicated the extent of animal pressure on these arable and non-arable lands.

TABLE 1. BASIC STATISTICS OF THE SAMPLE VILLAGES, DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB), 1992-93

Particulars (1)	Value (2)	Per cent (3)
1. Land (hectares)		
(a) Arable land		
Irrigated	101.4	2.1
Unirrigated	1,532.5	31.3
Total	1,633.9	33.4
(b) Non-arable land	3,259.0	66.6
(c) Total geographical area	4,892.9	100.0
2. Irrigated area as percentage of arable land	6.2	
3. Occupational pattern		
Cultivating households (number)	684.0	47.0
Non-cultivating households (number)	771.0	53.0
4. Average farm size (ha)	1.6	
5. Average family size (number per household)		
Cultivators	6.3	
Non-cultivators	5.5	
Overall	6.1	
6. Ruminant livestock (number per household)		
Cultivators	5.7	
Non-cultivators	3.2	
Overall	5.1	

Encroachment of CPRs

The total land of the sample villages was classified into private and common on the basis of ownership rights. The land-based CPR in this tract is as much as 34 per cent of the total land. Of the total land area of 4,893 hectares in the sample villages, 1,686 hectares was commonly owned. The arable common land was 132.4 hectares, which was owned by the village panchayat. Out of this, 8.1 hectares were irrigated and 124.3 hectares were unirrigated (Table 2). The income data from these lands revealed that all the 8.1 hectares of the common irrigated and 24.3 hectares of unirrigated (19.5 per cent) land were illegally occupied by the individual villagers. About 48 per cent of the total non-arable land was common. It comprised 81 hectares of government land and 1,473 hectares of panchayat land. The annual auction of the common lands yielded very low incomes compared to the corresponding rental value of private lands. For example, the average rental value of privately owned unirrigated arable land was Rs. 750 per hectare whereas the corresponding rent received from a hectare of common unirrigated arable land was merely Rs. 125 which was one-sixth of the former. Even if manipulation by influentials is expected to corner half the rent unduly, the differential in the rental values of the land, the major CPR, indicated that the CPRs have a productivity level of one-third to one-sixth of the privately owned lands. Thus the income analysis shows that the common lands are mismanaged lot having low productivity and encroachment by the influentials.

The available common water resources in the sample villages were used for irrigation on a very limited area through the *kuhl*¹ system as the main source of irrigation water covering the four villages followed in order by water harvesting tanks covering two villages, and *Dholbaha*² dam covering one village. The water requirements for other purposes (drinking, washing clothes, etc.) were supplemented from 11 village ponds in the sample villages.

TABLE 2. OWNERSHIP, INCOME AND ENCROACHMENTS OF COMMON PROPERTY RESOURCES (CPRs), SAMPLE VILLAGES, DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB), 1992-93

Particulars	Ownership			Total
	Private	Common		
		Government	Panchayat	
(1)	(2)	(3)	(4)	(5)
A. Land resources				
Total area (ha)	3,206.5	81.0	1,605.4	4,892.9
1. Arable land				
Total (ha)	1,501.5	-	132.4	1,633.9
(i) Irrigated				
Area (ha)	93.3 (92.0)	-	8.1 (8.0)	101.4 (100.0)
Income (Rs./ha)	1,750.0*	-	Nil	-
Encroachment				
Area	-	-	8.1	8.1
Per cent of total common land	-	-	100.0	100.0
(ii) Unirrigated				
Area (ha)	1,408.2 (91.9)	-	124.3 (8.1)	1,532.5 (100.0)
Income (Rs./ha)	750.0*	-	124.7	-
Encroachment				
Area	-	-	24.3	24.3
Per cent of total common land	-	-	19.5	19.5
2. Non-arable land				
Area (ha)	1,705.0 (52.3)	81.0 (2.5)	1,473.0 (45.2)	3,259.0 (100.0)
Income (Rs./ha)	375.0*	-	86	-
B. Water resources				
Ponds (number)	-	-	11	-
Water harvesting tanks	-	2	-	-
Kuhl	-	-	4	-
Dam (Dholbaha)	-	1	-	-

Figures in parentheses are percentages.

* Average rental value of privately owned lands.

Utilisation Pattern of CPRs

The use of CPRs presented in Table 3 shows that a significant proportion of sample households used common non-arable lands for meeting their biomass requirements. About 11 per cent of the cultivator households operated the common arable land. The proportion of households bringing fodder grasses was 61.5 per cent for the landless and 88.4 per cent for the cultivating households. There is a wide gap between the requirement and supply of fodder from all sources in the sample villages. The requirement of fodder for the livestock, assuming 10 kilograms of dry matter per animal per day, was 11,555 quintals per annum against which the supply of fodder was 2,556 quintals per annum (Government of Punjab, 1993). The deficit to some extent (or else the animals would remain underfed) is met by excessive grazing of animals in the non-arable areas even though grazing of animals is not allowed in such areas. It was found that about 60 per cent of the landless as well as the cultivator households grazed their animals in these areas. Among the cultivators, there was a positive association between the proportion of cultivators grazing animals and the farm

size. The forest fuelwood was the primary source meeting the fuel requirements. About 98 per cent of the landless and 88 per cent of the cultivator households used to bring fuelwood from the forests to meet their fuel requirements. As the farm size increased, the proportion of cultivators depending on fuelwood from forests declined. However, this does not reflect the extent of exploitation of the CPRs in relation to the farm size. About 42 per cent of the landless and 76 per cent of the cultivating households used village ponds for drinking water to the livestock. In addition to this, about 29 per cent of the sample cultivating households used this resource (water) for irrigation on a very limited area.

TABLE 3. DISTRIBUTION OF SAMPLE HOUSEHOLDS ACCORDING TO PATTERN OF UTILISATION OF COMMON PROPERTY RESOURCES (CPRs), DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB), 1990-91
(per cent)

Resource/type of use (1)	Landless households (52) (2)	Cultivating households				Overall (199) (7)
		Marginal (46) (3)	Small (51) (4)	Large (50) (5)	Overall (147) (6)	
1. Arable land						
Cultivation	-	6.5 (3)	7.9 (4)	18.0 (9)	10.9 (16)	8.0 (16)
2. Non-arable land						
Fodder grasses	65.1	82.6	94.1	88.0	88.4	81.4
Tree leaves	51.9	47.8	70.6	46.0	55.1	54.3
Grazing	59.6	50.0	52.9	65.0	60.5	60.3
Fuelwood	98.1	100.0	88.2	76.0	87.8	90.4
3. Water resources						
Drinking water for animals						
Village ponds	42.3	91.3	68.6	68.0	75.5	66.8
Irrigation						
Water harvesting tanks	-	8.7	13.7	8.0	10.2	7.5
Dam	-	6.5	7.8	12.0	8.8	6.5
Kuhl	-	8.7	7.8	14.0	10.2	7.5

Source: Baseline Survey Report, Dasuya-Langerpur Watershed, March, 1993.
Figures in parentheses indicate number of sample households.

The CPRs, being a supplementary resource supplementing the incomes of the local population particularly in the under-developed areas, need to be rationally distributed and should benefit most the poorest (landless) among the poor class of the rural population. For their sustainable development, the misuse/degradation of these lands and allied resources needs to be checked.

The utilisation of the CPRs is directly related to the ownership of the PPRs (private property resources, namely, private land and livestock owned by the rural households) due to two factors. One, the case where the owning of an asset enables the use of the CPR; for instance, one has to own an animal in order to take it for grazing on a CPR, thereby the more are the animals one owns, the more one can exploit the CPR. Two, the ownership of the PPRs gives economic power to individuals through which they are able to wield undue influence to exploit the CPRs. Although it is difficult to document this phenomenon, it is true that the unauthorisedly cut woods from the common forests were also found to be sold in the nearby markets.

Since the cultivators control and own a large proportion of PPRs, the greater is the exploitation of the CPRs by them. In absolute terms, the per household use of biomass from

the CPRs by the cultivators was about 191 quintals (40 quintals fuelwood and 151 quintals of fodder), which was much higher than about 125 quintals (37 quintals of fuelwood and 88 quintals of fodder) used by the landless households (Table 4). Thus although the cultivators had the ownership of resources to meet some of their own requirements of fodder for their animals, yet they were exploiting the CPRs relatively much more (151 quintals) than the landless (88 quintals). Amongst the cultivator households, the marginal farmers who had relatively poorer resource ownership depended for fodder requirements from the CPRs to the extent of 159 quintals per annum. The small farmers who had better ownership to avail of the complementary use of the CPRs, used these to get as high as 179 quintals per annum. The large farmers used these resources to produce 128 quintals of fodder per annum which was less than the small and marginal farmers, but was much higher than that by the landless.

TABLE 4. FODDER AND FUELWOOD CONSUMPTION FROM COMMON LANDS ON DIFFERENT FARM SIZE CATEGORIES, SAMPLE HOUSEHOLDS, DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB), 1990-91
(*qtl/household/annum*)

Particulars of biomass (1)	Landless (2)	Cultivating households			Overall (6)	Overall (7)
		Marginal (3)	Small (4)	Large (5)		
A. Fodder						
Total consumption	152.6	289.0	335.2	407.3	324.7	299.5
From CPRs						
Quantity	87.8	159.0	178.7	128.1	151.1	138.7
Per cent of total consumption	57.5	55.0	53.3	31.4	46.5	46.3
B. Fuelwood						
Total consumption	39.5	42.1	46.7	59.7	49.3	46.7
From CPRs						
Quantity	37.3	27.9	44.4	44.3	39.7	39.3
Per cent of total consumption	94.4	66.3	95.0	74.2	80.5	84.1
C. Total biomass						
Total consumption	192.1	331.1	381.9	467.0	374.0	346.2
From CPRs						
Quantity	125.1	186.9	223.1	172.4	190.8	178.0
Per cent of total consumption	65.1	56.4	58.4	36.9	51.0	51.4
Fodder percentage	70.2	85.1	80.0	74.3	79.2	77.9

Income from CPRs

In spite of the shrinkage and degradation of the CPRs, their contribution to the rural economy continues to be significant particularly in dry regions. Jodha (1986) had found in his study that the per household income per year derived from the CPRs ranged between Rs. 530 and Rs. 830 in different areas of India and that this was higher than the income generated by a number of anti-poverty programmes. In some areas, the rural poor derived as much as 25 per cent of their sustenance from the CPRs. If the latter degrade and disappear, the prospective crop technology will have to produce 25 per cent extra for maintaining the existing levels of living of such groups (Jodha, 1995).

In the Kandi area of Punjab, the locale of this study, the CPRs contributed 27.3 per cent of the total gross income of the landless and 22 per cent of the income of the cultivating

households (Table 5). In fact, if one were to consider only those cultivating households who also depend on the CPRs, the relative income would work out to be much higher. The per household income from the CPRs was estimated at Rs. 3,669 per annum for the landless and Rs. 5,169 per annum for the cultivator households. Most of this income (about 80 per cent) was from the imputed value of biomass brought free from the CPRs. On an average, the sample landless households earned Rs. 794 per annum from *ban-making*³ using bhabbar grass from the CPRs. In addition to drinking requirement, water was used for irrigation by the cultivator households. This resource contributed Rs. 415 (8 per cent) to the total gross income by increasing the land productivity. The income (gross margin) from common arable lands was estimated at Rs. 462 per annum which was about 9 per cent of the total gross income from the CPRs.

TABLE 5. EXTENT OF DEPENDENCE ON CPRs, SAMPLE HOUSEHOLDS, DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB), 1990-91
(Rs./household/annum)

Particulars (1)	Landless, (2)	Cultivators			Overall (6)	Overall (7)
		Marginal (3)	Small (4)	Large (5)		
A. Total gross income	13,431	15,957	27,409	26,432	23,467	20,871
B. Income from CPRs						
Arable land	-	291 (6.4)	152 (2.8)	660 (12.1)	462 (8.9)	342 (7.0)
Fodder*	1,756 (47.9)	3,180 (69.9)	3,574 (65.9)	2,565 (47.2)	3,022 (58.5)	2,774 (56.9)
Fuelwood*	1,119 (30.5)	837 (18.5)	1,332 (24.6)	1,329 (24.4)	1,191 (23.0)	1,179 (24.2)
<i>Ban-making</i>	794 (21.6)	111 (2.4)	110 (2.0)	20 (0.4)	79 (1.5)	271 (5.6)
Irrigation water**	-	128 (2.8)	255 (4.7)	862 (15.9)	415 (8.1)	307 (6.3)
Total	3,669 (100.0)	4,547 (100.0)	5,423 (100.0)	5,436 (100.0)	5,169 (100.0)	4,873 (100.0)
C. CPRs' share						
(i) Per cent of total gross income	27.3	28.5	19.8	20.5	22.0	23.3
(ii) Per cent increase over landless	-	23.9	47.8	48.1	40.9	-

Figures in parentheses are percentages.

* Imputed value of fodder and fuelwood brought free from the common land.

** Difference in productivity of irrigated land (Rs. 7,338/ha) and unirrigated land (Rs. 4,146/ha).

The hypothesis that the better-off is the person, the more the exploitation of the CPR is validated much more clearly from the total income derived from the CPRs by different categories of households. The income from the CPRs earned by the cultivators (Rs. 5,169) was about 41 per cent more than that earned by the landless (Rs. 3,669). Further, the income from the CPRs earned by the marginal, small and large farmers was Rs. 4,547, Rs. 5,423 and Rs. 5,436, which was 23.9, 47.8 and 48.1 per cent higher than the income earned by the landless households respectively.

Development of CPRs

The low productivity of arable and non-arable common lands as compared to the respective privately owned lands observed in the preceding section reveals the poor man-

agement/degradation of the CPRs which are also being depleted more by the landowner - relatively better-off population, as compared to the landless - the poorest section of the Kandi population. Keeping in view the present non-sustainable exploitation of the CPRs by impoverished inhabitants due to their overriding subsistence requirements, an integrated development of these resources through afforestation/silvipastoral, soil conservation and water management works has been taken up under the IWDP (Hills), Punjab.

To reverse the ecological degradation and to regenerate biomass production, the forestry component of the project initiated the process of improving vegetative cover by treating 1,779 hectares of badly denuded non-arable area, of which 60 per cent (1,064 hectares) was common non-arable lands during 1990-92 (Table 6). Most of these lands were brought under afforestation (86 per cent) and silvipastoral works (11.7 per cent) by planting species like khair, rajain, siris, kikkar and subabul along with baggar, nepier and khas grasses. According to the monitoring reports of the Project Directorate, the survival rate of these plantations was 67 and 84 per cent for siris and khair respectively. However, earlier studies have shown that the real survival rates when the plants are well established, are far lower than the ones shown by the first monitoring surveys (Singh *et al.*, 1993 a, b). Therefore, repeated monitoring surveys when plantations get more firmly established would show the final survival rates.

TABLE 6. STRATEGY ADOPTED FOR THE DEVELOPMENT OF CPRs UNDER IWDP (HILLS) IN SAMPLE VILLAGE, DASUYA-LANGERPUR WATERSHED, HOSHIARPUR DISTRICT (PUNJAB)

Type of development works (1)	Ownership		
	Common (2)	Private (3)	Total (4)
1. Forestry works			
Afforestation	85.9	57.8	74.6
Silvipastoral	11.7	25.5	12.3
Production component	2.4	16.7	8.1
Total	100.0	100.0	100.0
(Total area treated in ha)	(1,064)	(715)	(1,779)
2. Soil conservation works (metres length planted)			
Vegetative field boundary	480	16,202	16,682
Contour vegetative barriers	27	37,601	37,628
Vegetative spurs	33.8	-	33.8
Total	540.8	53,803	5,40,948
3. Water management*			
Ponds rehabilitated			
Number	2	-	2
Percentage of total	25.0	-	25.0
Makkowal type of tanks constructed	2	-	2

Source: Sorted out from the beneficiarywise works accomplished as per list supplied by Project Director, IWDP (Hills).

* Renovation of two ponds and construction of two Makkowal type tanks is in progress.

The independent mid-term evaluation studies have shown that there are indications towards improvements in the productivity of these lands. The impact of encouraging the on-farm fodder production programme by supplying free inputs of fodder seeds and fertilisers to land owning households resulted in increased fodder availability and in the practice of stall feeding. The proportion of these households bringing fodders from the CPRs declined

from 88 per cent to 75 per cent and the contribution of the CPRs in the total green fodder consumption declined from 58.8 per cent to 56.3 per cent from 1990-91 to 1992-93 respectively (Singh *et al.*, 1994). Similarly to reduce their fuelwood dependence on CPRs, incentives in the form of subsidised inputs and easy finance may be given to encourage the landowners to become tree farmers by diverting their marginal lands to afforestation/silvipastoral plantations. Also, to enable them to meet their biomass requirements from the PPRs, the restrictions on cutting and sale of trees from the non-hilly (i.e., relatively less prone to erosion in addition to being better protected by individuals themselves) cultivated lands should be relaxed. This would require (a) withdrawal of the section 4 of the Land Preservation Act for non-hilly area; and (b) ensuring remunerative prices for the wood (Bhumbla, 1995).

In the case of landless households, the proportion of households bringing fodder from the CPRs and its magnitude in the total fodder consumption increased from 61 to 75 per cent and from 68.5 to 88.1 per cent respectively during 1990-91 to 1992-93. Furthermore, an increase in the practice of grazing by these households was also observed which is not a healthy sign and needs to be checked. The immediate impact of the development works executed under the project was the generation of more employment as the income from hiring out family labour (for farm and non-farm works) increased from Rs. 5,675 to Rs. 8,792 (an increase of about 55 per cent) for the landless households whereas the corresponding income in the case of cultivator households increased from Rs. 2,989 to Rs. 3,843 (an increase of 20.6 per cent) during 1990-91 to 1992-93.

Keeping in view the geo-conditions of the study area, soil erosion is one of the chronic environmental hazards and is a constant cause of concern. A few hours of torrential rain can wash away the major chunk of top soil from each hectare of land. With a view to curbing this menace, soil conservation component of the project has taken up a new venture of injecting green lines (vegetative field boundaries/barriers) of little known tropical grass vetivar. For soil and moisture conservation, vegetative barriers of about 54 thousand metres in length were raised mainly on the private lands. Soil conservation structures such as masonry and cement structures, crate-wire structures and vegetative spurs, etc., were also constructed at suitable places. However, the evaluation study conducted by the Evaluation Cell observed that the survival rate of vegetative barriers was almost negligible (less than 5 per cent) because the contour vegetative barriers were raised mostly on marginal lands (having lower productivity) which were not even properly looked after/protected from the unattended grazing animals leading to most of the barriers drying up.

In view of the general water scarcity in the area, works were initiated to develop additional common property (water) resources through water management by soil conservation component. To meet the water requirements of the villages, two village ponds were rehabilitated and two Makkowal type tanks were constructed. Makkowal is a village in the Kandi area where a tank already existed since long time; the water into this tank flows continuously through a pipe from a long distance upstream by gravity; this tank has also been renovated and improvised under the project and the development of other similar tanks have been planned which are known as Makkowal type tanks. Renovation of two more ponds and construction of two more tanks are in progress.

Peoples' Participation

The previous experiences of the Government in Kandi tract of Punjab have shown that purely technical afforestation and soil conservation measures cannot be expected to bring the desired results unless the peoples' participation is effective. Therefore, under this project, attempts are being made to effect a drastic shift in the pattern of forest management from a unitary departmental approach (Forest Department) to involve the local community in the planning and protection of forests as well as sharing of forest products. In order to ensure effective participation of people in the implementation of the project, village level committees consisting of project officials, elected village leaders, social workers, school teachers, representatives of women's organisations (Mahila mandals) were to be formed, which will be meeting regularly to discuss the project proposal before implementing them throughout the project period. The views of women participants regarding fuelwood and fodder are to be given due consideration. However, only 19 per cent of the landless and 26 per cent of the cultivator households were aware of the formation of such committees (Singh *et al.*, 1994). The members of these societies pointed out that very few meetings were held with very poor attendance (13 to 50 per cent). Thus the study revealed that the strategy adopted for the development of the CPRs by involving local people along with project officials was still not being implemented effectively. There were suggestions that the revenue from the CPRs may be supplemented by charging nominal prices for the production used from the CPRs which may be used for their scientific management. This will help in making the peoples' participation attractive, economical and scientific.

CONCLUSION

The CPRs are an important source of income of the people, particularly the poor ones, in many areas contributing more than 25 per cent of their total income. The productivity of the CPRs is very low and is hardly one-third to one-sixth of the privately owned resources. The encroachment of the CPRs by the influential persons is not uncommon. The CPRs are being over-exploited. More than 60 per cent of the households graze their animals and more than 90 per cent of them bring fuelwood from commonly owned forest lands. The use and exploitation of the CPRs are directly proportional to the ownership of private resources, hence the relatively better-off derive relatively more from the CPRs. There is a need to reduce their dependence on the CPRs by providing incentives in the form of subsidised inputs, easy finance and permission for cutting/sale of trees raised on the privately owned non-hilly marginal lands to minimise the inequality in benefit-sharing among the rich and the poor landless households. The development efforts under the World Bank aided 'Integrated Watershed Development Project' have shown, based on independent evaluation studies, that the productivity of these lands is improving. However, the peoples' participation, which is very crucial for the effectiveness of these types of development works, is still to be made properly effective. The revenue from the CPRs may be supplemented by charging nominal prices for the production used from the CPRs which may be used for improving the scientific management of the CPRs.

NOTES

1. *Kuhl* is a narrow outlet or small canal along the hill slope through which water flows with gravity and is conducted to the cultivated surface of land.

2. *Dholbaha* is the name of the village/site where an earthen dam (irrigation-cum-attenuation) has been constructed. Five such dams at Dholbaha, Maili, Janauri, Chohal and Perch have already been constructed during the KWADP phase. For the cost-benefit analysis of watershed with one such dam, see Singh *et al.* (1991).

3. *Ban*-making is a tiny-scale cottage industry wherein the dry vegetative shreds of bhabbar grass are woven to produce coarse twine used mostly for stringing cots.

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