Ind. Jn. of Agri. Econ.
Vol. 52, No. 4, Oct.-Dec. 1997

Second Generation Problems of Involuntary Migration: Evidences from Sardar Sarovar Project

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I

THE ISSUE

Agriculture is still a way of life in the tribal society where land is not only a production input but also has a cultural affinity. Despite this and a number of legislative enactments as well as a quantum jump in financial allocation to tribal development, heavy influx of outsiders for commercial interest and development interventions have eroded the resource base and socio-cultural heritage of the tribal population (Government of India, 1992). Despite growing concerns,[1] the disruption of economic environment and lifestyle of this group remains uncompensated owing to unimaginative and insensitive relocation package (Government of India, 1990).

It has been argued (Sah, 1995 b) that alienation and deprivation are inherent in the strategy of Indian economic development. Large dams in independent India have become the new icon of development and are considered as one of the main sources of irrigation on which synergistic effect of all other agricultural inputs depends. The Sardar Sarovar Project also has similar claims.[2] Even these claims have not remained unquestioned,[3] especially relating to the rehabilitation of displaced persons. However, it can be argued (Wood, 1993) that within the given constraints of the development paradigm, the compensation package to project affected peoples (PAPs) of Sardar Sarovar Project is far better than any other irrigation project. Although, land has been provided to all the PAPs, its optimum use may have been constrained due to inadequate support.

Relocation of project affected people brings a spate of changes along with it. Sardar Sarovar Project is no exception to this. When relocation is accompanied with changed economic environment, where traditional mutual exchange economy is replaced all of a sudden by markets, the oustees may need support to (a) visualise and get adjusted to competitive markets, and (b) have resources and information to become active participants in technologically dynamic agriculture. This may become all the more necessary because agriculture in the submerging villages are unable to generate surplus, and by and large, the oustees at the time of relocation had little entrepreneurial abilities to experiment and adapt to new ideas. The oustees in the new environment may make efforts to adopt new ways in agriculture and may start developing input and output linkages with markets. But they may be unable to break the investment constraints and thus may be unable to reap the full potential of their productive resources. There may be variations in technology adoption between host

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The author is grateful to Ghanshyam Shah for introducing him to this topic. Thanks are due to Biswaroop Das, S.P Punalekar, Chikabhai. Sangeeta Gujarati, Amita Shah and Ghanshyam Shah for their comments on an earlier draft. The author is grateful to an anonymous referee for his comments. Usual disclaimers apply.

and new sites, the farm income may be higher on the farms of experienced host villagers. Linkages with credit market were extremely weak in the submerging villages. Thus it shall be worth understanding whether low demand for production credit is responsible for low technology adoption in dry relocation zones. The available agricultural technology itself may be risky in the dry relocation sites. In this situation, it may be desirable to provide long-term support for reducing yield variations across farms through direct investment in agriculture.

The process of integration with mainstream agriculture without extension, irrigation, and credit support, may have been left to market forces. PAPs may be active participants in the existing markets or may avoid them because of the perceptions that the markets may become exploitative. But markets, nonetheless, play facilitating role in rural transformation. At the macro level markets help industrialisation by resource outflows from agriculture in the form of labour and economic surplus; and create demand for non-farm consumer goods and agricultural inputs. At the micro level markets facilitate land allocation and transfer of agricultural technology. But such commercialisation in agriculture may vary depending on the stages of agricultural development.

Traditionally, sectoral transformation is driven by surplus in the primary sector where irrigation works as prime mover of such commercialisation. In the case of oustees, their acceptance, participation and integration with mainstream agriculture and its market institutions have been forced by relocation. Their socio-economic milieu may be responsible for the process of market penetration or exploitative development of interlocked markets. When commercialisation is forced by involuntary migration, the oustee farmers' response to markets may be guarded: It may confine to product market and may be guided by village trade. In order to avoid interlocked output and input or output and credit markets, oustees may avoid participation in some of the markets. Therefore, PAPs' responses to forced commercialisation would vary across locations, farms and crops. The important question is how the PAPs, being unfamiliar with many of the intricacies of markets, have responded to commercialisation in agriculture.

The resettlement and rehabilitation (R&R) policy of Sardar Sarovar project emanated over a period of time and after a long struggle by activists in Gujarat for a better deal for the displaced population (Sah, 1995 b). Apparently, the R&R policy frame for PAPs of Sardar Sarovar project seems significantly superior in comparison to similar packages available to PAPs in the past. Over 4,500 PAP families who have been displaced from 19 submerging villages have been provided with land. However, this R&R package heavily rested on the productive resource 'land' for maintaining the living standard of PAPs.[4] An attempt is made in this paper to compare productivity, farm production, input use, and the extent of commercialisation of agriculture of PAPs before and after relocation. It could be argued that such a comparison may not be correct when the soil type, topography and access to irrigation vary between the two situations. Despite these variations, the comparison would still provide insights on as to how the PAPs' living conditions and access to food have changed. Within the frame developed above, this paper seeks to understand the adjustment behaviour of relocated Sardar Sarovar Project oustees towards technology adoption and commercialisation, and the effect of these processes on their standard of living during normal as well as abnormal years.[5] The paper is divided in six sections, including the introduction.

The second section presents the findings on allocation of agricultural land to PAPs, productivity of allotted land, consumption intake and variations in it caused by variations in farm production due to fluctuating yields. The next three sections present analysis respectively on the coping mechanism of PAPs during scarcity, the constraints in technology transfer, and commercialisation. The last section presents the concluding observations.

II

LAND PRODUCTIVITY AND CONSUMPTION

Productivity Gains of PAPs after Relocation

Relocation has not only increased the land assets of PAPs but has also changed the way land is owned and operated by PAPs. From joint land operations in submerging villages which were prevalent among about 43 per cent of the households, cultivation has moved towards individually owned enterprise (Table 1). About 93 per cent of the holdings are operated by the individuals in the new sites. On the other hand, for every acre owned in the submerging villages, more than one acre was encroached forest land. In this process, though only 4.2 acres of land was owned by cultivating households in submerging villages, PAPs operated 9.2 acres of land. As high as 32 per cent of the households in submerging villages did not own land legally, though they were cultivators who had encroached forest land. In contrast to this, in new sites all the land is owned; about 5.7 acres of land is owned on an average by PAP household. By September 1996, about 96 per cent of the total 4,557 PAPs have been allotted agricultural land. Only 4 per cent of the total relocated PAPs are landless. Bulk of these landless households have been identified as PAPs and are in search of agricultural land in various new sites.

TABLE 1. LAND OWNED BY PAPS IN SUBMERGING VILLAGES AND NEW SITES

Particulars (1)	Submerging villages (2)	New Sites 1993-94 (3)
Total households	2,310*	2,981**
	Percentage	
Landless	32	6
Individual holdings	53	93
Size of holding		
Small	48	75
Medium	14	15
Large	6	4
	Acre per PAP	
Size of holding	4.2	5.7
Operated area	9.2	5.9

Source: Sah, 1993; 1996 a.

* In 14 out of 19 submerging villages; PAPs from remaining 5 villages had already relocated at the time of the study.

** In 120 relocated new sites by July 1994.

Table 2 gives the proportion of cropped area allocated to different crops and crop yield of PAP households in submerging villages and in their new sites. After relocation, easy access to markets and increased irrigation have been responsible in replacing traditional low value food crops by high value crops like cotton, paddy and wheat. In the new sites, about 60 per cent of the gross cropped area (GCA) is allocated to cereals, 23 per cent to pulses and the remaining 17 per cent to commercial crops, i.e., cotton, oilseeds, fodder and vegetables. In comparison to new sites, the PAPs in their submerging villages had over 96 per cent of the area under cereals and pulses, and only about 2 per cent under commercial crops.

TABLE 2. CROPPING PATTERN AND YIELD CHANGES AFTER RELOCATION

Crops	Area allocation		Yield	
	Submerging villages	New sites* 1993-94	Submerging villages	New sites* 1993-94
(1)	(2)	(3)	(4)	(5)
	Percentage of GCA		Kg per acre	
Paddy	2	14		379
Maize	30	22		220
Jowar	42	22	95	212
Wheat	0	2		611
Bajri	2	@		63
Minor cereals	5	-		-
Tur	11	21	95	179
Other pulses	6	2	87	161
Cotton	@	12	87	187
Oilseeds	1	1	-	182
Fodder	-	4	-	NA

Source: Sah (1994 a; 1995 a; 1996 a,b).
* Based on 610 households in submerging villages and 536 households in new sites for 1993-94.

About 10 per cent of GCA in the new sites is under irrigation. In irrigated new sites yields are significantly higher in the case of paddy, cotton, maize and wheat even during drought years. A large proportion of resettlement sites do fall under Narmada command but still there are about 43 new sites (out of the total of 126 new sites) where Narmada water will not reach. Agriculture in these areas is vulnerable to fluctuating weather. Special schemes and additional funds are needed for providing groundwater irrigation to PAPs relocated in these 43 new sites.

Nevertheless, in comparison to the submerging villages the yield obtained by PAPs in the new site is about two times higher in the case of main cereals, pulses and commercial crops. At constant prices, farm production per household has increased from about Rs. 4,100 in the submerging villages to about Rs. 10,048 in the new sites in 1993-94.

Variations in Calorie Intake: Distress at the Margin

The findings of productivity gains of PAPs have been based on average production during two normal years. This optimism of superior productivity and farm production in new sites should, however, be interpreted with caution, for there are wide variations in the productivity

over the years as well as in a year over farms (Table 3). Such weather induced fluctuations in this drought prone region are mainly owing to abnormal rainfall. During the last 16 years, two out of every five years have been agriculturally abnormal.

TABLE 3. YIELD, CALORIE INTAKE AND PERCEPTION OVER TIME

Particulars	Submerging villages	New sites			
		1991-92	1992-93	1993-94	1994-95
(1)	(2)	(3)	(4)	(5)	(6)
Sample size	610	670	578	536	718
Farm production (Rs.)	4,100	3,002	7,807	10,048	3,309
CV (per cent)	N.A.	(120)	N.A.	(110)	(107)
Farmers reported total crop failure (per cent)	@	40	@	@	30
Calorie intake/adult/day	2,588	2,476	2,493	2,446	2,529
CV (per cent)	N.A.	(33)	(28)	(21)	(27)
PAPs consuming <2400 calorie/day/adult (per cent)	53	72	48	57	33
PAPs reporting deterioration in economic condition compared to submerging villages (per cent)	-	2	13	25	38

Source: Sah (1994 a).
@ Less than 2 per cent. N.A. = Not available.

Although the average farm production of households after relocation has increased about two and a half times when compared with the submerging village, this production has been extremely low during 1991-92. The farm production has direct bearing on consumption pattern; the calorie intake per adult per day has reduced during abnormal year (1991-92) and the production of households reporting lower than 2400 calories per day per adult intake has increased (Table 3). In normal years, the proportion of households reporting less than 2400 calorie intake per adult per day is about 50 per cent, and in 1991-92 it increased to 72 per cent.

Even during normal years, this proportion is sizeable. This is so because there are some locations where farm productivity remains relatively low. Households located in new sites Ambavadi, Amroli, Chandanagar, Dabhvan, Dhamadra, Gora, Kavitha, Lachharas, Pipervati, Sandhia, and Vaghrali have reported relatively low farm income. A subset of households located in Dabhvan, Dhefa, Dormar, Jemalgadh, Kadila, Khandania, Lachharas and Rustampura have reported their calorie intake perpetually low over the years.

During the early years of resettlement, PAPs' perceptions about their economic conditions compared to what it was in their submerging villages were positive. Despite the fact that 1991-92 was an abnormal year, only 2 per cent of PAPs reported negative perception. This proportion reached to 38 per cent in 1994-95. Surprisingly, though as high as 30 per cent of the farmers have reported crop loss in the case of crops like maize and jowar and the farm production declined to Rs. 3,309 and a record 38 per cent of the farmers perceived that their economic condition has deteriorated, the consumption intake has not been affected

adversely. This may be owing to high food stock from last year's bumper crop, or past saving may have enabled the consumption to remain at higher levels, or current borrowing could have helped the PAPs. This reflects the increasing capability of the average farmer to meet crop failure without much loss in consumption intake. But it is not very often that a bumper crop precedes a crop failure.

Nonetheless, at the margin the effect of crop failure, low productivity and unproductive land is serious. The PAPs in Malu, Ambavadi, Pipervati, Chikda-1, Chikda-2 new sites have protested about these conditions. In order to substantiate the farm income, which is not sufficient to meet family demand, a large number of family members from Ambavadi and Pipervati new sites have sought wage paid employment. The situation of late has become so bad that 22 households from Malu, 12 households from Ambavadi and 10 households from Pipervati have gone back to their submerging villages. An organised protest is developing in these areas with a demand to change unproductive land. Although, all the PAPs do not desire to relocate, there is a growing demand for shifting to submerging villages. The agricultural productivity is low and avenues of employment are poor in this area. As a result, many PAPs cannot depend on agriculture alone. These PAPs prefer to lease out their land and (a) go back to submerging villages to do cultivation, (b) migrate to Surat, Ankleshwar and dam site to work as wage labourers; (c) move to other new sites where their close relatives have relocated. These tendencies indicate the inadequacy of some households to sustain only on own agriculture.

This is the situation where households face perpetually low yield due to unproductive agricultural land. The adjustment mechanism, however, is not significantly different for households who face scarcity.

III

COPING WITH SCARCITY

Crop failure has a number of simultaneous and sequential repercussions which disrupt the economy of the affected area. In submerging villages, access to forest and river, on the one hand, and social institutions and mutual exchange relations of the closely knit society, on the other, insulated the low level economy to sustain; even during the worst of the droughts, the households' consumption intake was marginally affected. The fall in crop production in new sites, however, directly reduces households' income and availability of food for consumption. It also reduces avenues of farm employment. While the current income is reduced, the need for cash to purchase food increases. The households in such situations make various adjustments to minimise the impact of the crop failure. These include migration of some family members, reduction in the use of purchased inputs, sale of milch animals, reducing expenditure, and changing the consumption pattern to less expensive items. It is hypothesised that households with (a) higher agricultural income, (b) access to additional purchasing power through agricultural labour, service and casual labour work, (c) milk production, and (d) larger outmigration cope with the drought more easily without having a severe impact on their consumption level.

The findings of Table 4 reveal that calorie intake is independent of avenues generated through agricultural labour, higher milk production, avenues for service, availability of loan, and size of cropped area. But these findings clearly establish that (i) those households which are engaged in casual labour are worst affected by crop failure and their calorie intake is significantly low; (ii) the sale of cattle is made in distress and those households who sold their cattle their calorie intake is significantly lower; (iii) households whose agricultural income is higher have significantly higher calorie intake; (iv) households with less number of family members to feed have significantly larger calorie intake; and (v) households with larger outmigration have significantly higher calorie intake.

TABLE 4. CORRELATION COEFFICIENT AND CHI-SQUARE† BETWEEN EXPLANATORY VARIABLES AND PER CAPITA CALORIE INTAKE

Explanatory variables (1)	Chi-square (2)	Correlation (3)
	With per capita calorie intake	
Casual labour work	22.78***	- 0.19***
Milk production	1.48	0.04
Cattle sale	4.75*	- 0.08*
Agricultural income	7.48*	+ 0.10**
Total members	65.16***	- 0.31***
Migration	20.43***	+ 0.13***
Agricultural labour	2.58	- 0.02
Service	1.70	0.05
Loan taken	-	-
Gross cropped area	3.38	0.01

Source: Sah (1994 a).
† Based on round III data with N = 565.
*, ** and *** Significant at 10, 5 and 1 per cent level respectively.

The findings on β coefficient (Table 5) reveal that among the variables explaining variations in calorie intake, the three most important are the size of the household, out-migration, and cattle sale. These three variables explained the bulk of the explained variance (16.2 per cent) in calorie intake across households. A low R^2 also indicates that some of the important variables like past savings, food stocks and current borrowings are missing from the explanation. Although these marginal products should not be considered as precise estimates of quantum of effect of explanatory factor on calorie intake, the findings of Table 5 indicate that (1) in 1991-92 when calorie intake per adult reduced (by about 18.50 per cent or roughly reduced by 480 calories/day/adult), some members of the household took decision to work as casual labour; (2) if household's size increased (by 1 member), it reduced the calorie intake (by about 3.7713 per cent or by about 98 calories per adult per day); (3) if household's agricultural income per head increased from low to medium level, its calorie intake increased (by 2.395 per cent or by about 65 calories per adult per day); and (4) as soon as the intake reduced (by 3.096 per cent or by about 100 calories per day per adult), the household took a decision to migrate some (10 per cent) of its family members.

TABLE 5. EFFECT OF CHANGES IN SOME IMPORTANT FACTORS ON PER ADULT CALORIE INTAKE IN 74 NEW SITES

Factors (1)	Coefficient[a] (2)	t statistics (3)	β rank[b] (4)
Cattle sale	- 0.1851*	- 2.332	III
Agricultural income	0.0240*	1.900	V
Migration	0.0031***	3.972	II
Casual labour	- 0.0040*	- 2.160	IV
Family size	- 0.0377***	- 7.684	I
	$R^2 = 0.162$	F = 22.82**	N = 565

Source: Sah (1994 a).

a Log (calorie = log a + b_1 cattle sale + b_2 income class + b_3 log (migration) + b_4 casual labour + b_5 (family size) + U_i.

where b_i = elasticity/coefficient; a = constant; and U_i = error term.

b Showing the importance of factors in explaining the variations in the calorie intake.

But the farmers' coping mechanism is operating without any external support, and relies mainly on migration, cattle sale, and decision to go for casual labour work. With traditional sustaining mechanism distorted due to randomness of resettlement,[6] all these options in the new site may create further social disruptions. Moreover, these options together explained less than 20 per cent of the variations in calorie intake, indicating that many of the distress options have not been revealed by the respondents. This situation may become concerning and may result in depletion of productive assets. The farmers' coping mechanism, therefore, has to be strengthened by external support in the form of (i) short-term immediate income generating avenues giving respite from falling stocks of foodgrains during drought, and (ii) long run efforts to insulate the farm economy from fluctuating rainfall. Moreover, the state has also to develop mechanisms so that with the onset of scarcity, short-term relief programmes can be taken up immediately.

IV

TECHNOLOGY ADOPTION

This section, using a case study,[7] tries to bring out the contrast, if any, between PAPs and the host villagers with respect to technology adoption, yield and income in the developed cotton zone, semi-developed paddy zone and in the undeveloped maize zone of the resettlement sites.

Farm Income

The sample farms in new sites are predominantly medium size whereas the farms located in host villages are small and medium. This is because agricultural land belonging to PAPs has yet not fragmented due to divisions in households. On the other hand, population pressure has resulted in division of large farms into smaller holdings in the host villages.

Cotton, an important commercial crop, accounts for about 20 per cent of the GCA in the host villages. The importance of cotton in the new site is relatively low and this differential area is allocated to food crops like jowar and paddy. More importantly, allocation of GCA to hybrids (HBs) and high-yielding varieties (HYVs) of seed in the case of cotton, jowar and paddy is significantly higher in host villages compared to new sites.

Gross income in rupees per acre aggregated for all crops is significantly higher on farms

located in the host villages. Gross income is estimated at Rs. 1,953 per acre in the new site and Rs. 2,464 per acre in the host village (Table 6). The difference grows larger as one moves from maize and paddy dominant zones to developed cotton zone. This difference is mainly because of a mix of superior cropping pattern, higher crop yield and better prices received by the farmers located in the host villages, specifically in developed cotton zone. Evidently, the new settlers have much less negotiating capability when it comes to new technology and institutions; this is true whether it is relating to choosing a cropping pattern, or yield of new crops or it is bargaining for remunerative prices for their crops.

TABLE 6. GROSS RETURNS OF THE SAMPLE FARMS

(Rs. per acre)

Crop zones (1)	New site (2)	Host village (3)
Developed cotton zone	3,264	4,482
Undeveloped maize zone	1,222	1,466
Semi-developed paddy zone	1,579	1,750
	1,953	2,464

Source: Sah (1994 a).

Input Use

The rate of fertiliser use is significantly high on the farms managed by the host farmers compared to the farms managed by PAPs. The difference is sizeable in the case of vegetables, paddy, fodder and cotton. This difference is extremely pronounced when the comparison is made keeping crop variety into consideration. All the HBs and HYVs of crops grown by the host farmers receive fertilisers at considerably higher rates. The case of HYVs of paddy, HB jowar, and HB cotton is specifically worth noting where either the crop variety is not grown by the oustee farmers, or if they have grown, it receives fertiliser at relatively low rates. It should be noted that all these crop varieties are new to PAPs who in their submerging villages were mainly growing maize, coarse cereals and pulse under dry conditions using local seeds.

The level of input use also widely deviated from the recommended rates: the seed rate and plant population are extremely high in the case of HB cotton compared to recommended levels; and in the case of paddy both the seed rate and plant population are significantly lower than recommended. Similarly, the rate of fertiliser use by the sample farmers on cotton is relatively higher than the recommended rate whereas on paddy and maize the rate of fertiliser use is much lower than recommended.

Fertiliser Use Technology

The findings on fertiliser use technology reveal that basal application of fertilisers is not practised at all by the farmers. It also means that phosphate use among the sample farmers is almost non-existent. This pattern of fertiliser use reveals a severe nutrient disequilibrium among the sample farmers located in both new sites as well as host villages. Those who have reported basal application do so without the use of seed-fertiliser drill. These farmers reported spreading phosphate by hand just after sowing. This, of course, is not an efficient

way of applying phosphatic fertilisers. Top dressing of fertiliser has been widely prevalent in the case of cotton and paddy but not on maize. This is true for the sample farmers located in both new sites as well as host villages. Urea is the main product used for the top dressing, and is applied in two or more splits by over 60 per cent of cotton and paddy growers.

Despite low fertiliser use, about half of the paddy growers felt that the top dressing doses are adequate. However, about 80 per cent of maize growers felt that the rate of application is inadequate. On the other hand, despite using more than recommended doses of fertiliser on cotton, three-fourths of the cotton growers in the developed cotton zone believed that these doses are adequate. A significant number of sample farmers who felt that the doses applied are adequate on cotton, maize and paddy believed so because they felt that for proper crop growth this much of nutrient use is just. Those farmers who believed that their top dressing doses are inadequate are constrained in increasing the use because of financial constraints or believed that rainfed crop would become susceptible to crop failure and pest attack with higher doses of urea. Rainfall has high impact on top dressing in all the three crop zones. With normal rainfall, over 80 per cent of the fertiliser users reported an increase in the rates of fertiliser use.

Extension Support

Low diffusion of HYVs and HB seeds, no seed treatment, total reliance of nitrogenous fertilisers and almost no use of phosphatic fertilisers, little reliance on plant protection chemicals, very high or very low seed rates, disregard for maintaining recommended plant population are evident from the foregoing analysis. It is not surprising to note that the number of farmers who claimed to know the recommendations regarding these inputs was extremely small. The major source of information among the sample farmers is non-institutional; fellow farmers and the input dealers located at taluka. A minority of farmers (less than 2 per cent) reported that the recommendations were made available from village level workers (VLWs). The access to VLWs, nevertheless, is significantly higher in the host village compared to the new site. The availability of VLWs is also high in the developed cotton and semi-developed paddy zones.

Efficiency of input use is an important component of yield-input cycle. Each farmer develops his own optimal input use pattern from either his experiences or from extension contact. Sub-optimal input use and poor quality of extension support, *ex ante*, reinforce the hypothesis that yield-input relationship is insignificant. Breaking the vicious circle of low yield --> low income --> low surplus --> low input use needs concentrated effort for increasing the demand for yield increasing inputs.

V

COMMERCIALISATION IN AGRICULTURE

Commercialisation is a social process which brings into focus relationship between producers, on the one hand, and agents engaged in input-output marketing, labour, credit agencies, etc., on the other. This process is governed either by a *normal mechanism* driven by market incentives or by involuntary processes like indebtedness, state coercion or involuntary migration. Forced commercialisation has been linked with interlocked product, credit, labour markets. In this situation economic agents (moneylender, landlord, trader)

exploit through dual channels. The normal process of commercialisation is associated with both larger production gains as well as its just distribution. However, both normal and forced commercialisation coexist simultaneously, and thus commercialisation proceeds unevenly across regions and over time. This may also happen in the case of PAPs, because of their varying response to various incentives and constrained access to markets.

In a normal commercialisation process, the size of marketed surplus depends on prices, level of output, size of holding, home requirement, and cash need of households. Thus if we divide the agricultural households into (a) various levels of consumption, (b) different size classes of holdings, and (c) varying levels of irrigation, it can be hypothesised that commercialisation in normal circumstances may not have negative implications for groups who are at disadvantage: the subsistence sector with smaller holdings, the group where normal agriculture does not offer an adequate living standard, and the less endowed. On the other hand, if commercialisation is involuntary, the surplus generated in the product market is dictated by a dominant group. In that case, (a) there may be negative relationship between standard of living and marketed surplus, (b) access to free market and hence price received by different size classes of holdings may be positively associated, and (c) there may exist an interlocked markets, for example, credit and output markets may be locked.

Input-Output Linkages

In this sub-section, an attempt has been made to examine the demand for market purchased inputs and marketing of production surplus by PAPs located in new sites. This analysis will help us in understanding the extent and nature of market integration the relocated households have achieved. These findings should, however, be interpreted with a backdrop that in their submerging villages such market links were only marginal and confined to villages of Zone I.

Table 7 gives the extent of market purchased input use by PAPs and the proportion of total purchase made during *kharif* season in 1993-94. The results show that purchased inputs like hired labour, seeds, fertilisers and pesticides have now found place in the production process of oustee farmers. These inputs were hardly purchased in the submerging villages. However, the bulk of the purchases are made during *kharif* season. In terms of nutrients, total fertiliser consumption is about 20 kg of NPK per acre. Keeping in mind the experience of oustee farmers with chemical fertilisers and the level of irrigation - only 11 per cent area is irrigated - this is not a mean achievement. However, the per acre expenditure on seeds and plant protection chemicals is relatively low. The findings of Table 7 also indicate the importance of socio-economic factors in influencing the input use. The PAPs have been uprooted from three submerging zones (Joshi, 1987; Sah, 1993). Five submerging villages of Zone I were relatively developed with established land, labour, credit, input and output markets. Services like school, transport, health care were easily accessible, and institutions like panchayats had made their presence in the villages of this zone. The major tribe in the villages of Zone I was *Tadavi*. Zone II comprising six submerging villages had *Bhil*, *Vasava* and *Tadavi* as main tribes. This zone was relatively under-developed with respect to various services and amenities. Institutions like panchayats were existing in only one village of the zone. Markets as institutions supporting agriculture were also present only in one village. Zone III comprising eight interior submerging villages was the most backward among the

three zones. *Bhil*, *Nayaka* and *Rathwa* were the major tribes of this zone. The economy of this zone was non-monetised exchange economy and PAPs were unfamiliar with modern institutions and agricultural markets. Nonetheless, relocation brought substantial changes in input use pattern. The use of hired labour has been relatively more in the case of PAPs from Zone I and also amongst *Tadavi* and *Rathwa* (Table 7). Whereas the PAPs relocated from Zones II and III and tribes like *Nayaka*, *Bhil* and *Vasava* have resorted to use of only family labour in agriculture. On the other hand, the findings of Table 7 reveal that input use like purchased seed, and chemical fertilisers are more intensely used by PAPs who are relocated from Zones II and III and by the tribes who have had no exposure to input markets (*Nayaka*, *Bhil* and *Vasava*). Factors like cultivated area and proportion of area under irrigation are positively and significantly associated with input use. Consequently, those farmers who have used purchased input at a higher level are also farmers whose farm income is relatively high.

TABLE 7. INPUT MARKET LINKAGES IN NEW SITES, 1993-94

(1)	Labour (day) (2)	Seed (Rs.) (3)	Urea (kg) (4)	DAP (kg) (5)	Pesticide (Rs.) (6)
Average			Per acre		
Average use	5	16	29	9	41
Percentage use in *kharif*	58	60	85	79	75
Factors governing use@			Chi square		
Submerging zone	-31.2***	+27.4***	+47.9***	+51.7***	NS
Tribe	+43.3***	-41.5***	-53.7***	-75.2***	NS
Farm size	+27.9***	+25.5***	-25.3***	+42.2***	+18.1***
Farm income	+9.8**	+42.1***	+21.2***	+31.6***	+36.7***
Calorie intake	NS	-9.1*	NS	-11.5**	-12.5**

Source: Sah (1996 a).
For estimating Chi-square and correlation coefficient (- or +), the level of factors and inputs are as follows:
Submerging zone : rock fill dyke villages=1; Semi-developed villages=2; interior undeveloped villages=3.
Tribe: Non-farming *Nayaka* = 2; *Bhil* gatherer farmer = 3; Settled *Vasava* = 4; Risk taker *Rathwa* = 5; Market oriented *Tadavi* = 6.
Farm size: <5 acres = 1; 5 - 10 acres = 2; >10 acres = 3.
Irrigation: Nil = 0; < 25 %=1; 25 - 50 %=2; > 50 %=3.
Migration: No = 1; Some family members migrated = 2.
Calorie intake: < 2000 cal per day per adult = 1; 2000 - 2400 cal/day/adult = 2; > 2400 cal/day/adult = 3.
Purchased inputs: Nil = 0; Low = 1; High = 2.
NS = Not significant. *, ** and *** Significant at 10, 5 and 1 per cent level respectively. + Positive correlation; - Negative correlation.

What the pattern of input use reveals is the fact that once the new techniques are introduced, its adoption spreads across farms irrespective of the impeding social factors like previous exposure to markets and techniques; tribe and submerging zone barriers are broken. The process is, however, governed by the economic factors like endowment of the user: irrigation, farm size and technology status. It is therefore feared that despite relatively higher diffusion of input use across deprived social groups, the efficiency of its use and thus productivity may still be constrained by social factors, at least during the initial stages of rehabilitation. This very fact calls for designing extension support based on social reality

of the displaced groups.

On the other hand, the market linkages in the form of sale of produce are extremely weak. Except for cotton, vegetable, *tur*, and to some extent paddy, the proportion of farmers marketing their produce is extremely low (Table 8). Among these crops, the proportion of farmers marketing their produce ranged from 5 per cent in the case of paddy to 90 per cent in the case of cotton. Cotton being a totally market oriented crop, all produce finds its way to the market. A large proportion of sales take place in the village itself. The price received by the farmers for their produce ranged from Rs. 58 per 20 kg for maize to Rs. 108 per 20 kg for wheat and Rs. 275 per 20 kg for cotton. Although a large part of the surplus is sold to the village trader, it is not a distress sale; the produce is sold over months after the harvest. For example, in the case of cotton some produce was stored for over 4 months before it was sold.

TABLE 8. OUTPUT MARKET LINKAGES IN NEW SITES, 1993-94

Crops	Proportion of farmers selling	Crop sold	Sale to trader	Average price
(1)	(2)	(3)	(4)	(5)
		Percentage		Rs./maund
Paddy	5	50	92	74
Maize	4	5	90	58
Jowar	2	2	75	68
Wheat	5	4	50	108
Tur	36	38	97	202
Other pulses	8	18	100	109
Oilseeds	10	9	100	190
Cotton	90	100	52	275
Vegetables	25	65	-	75

Source: Sah (1996 a).

Commercialisation

Commercialisation not only integrates the village traders and wholesalers into commercial structure, the agricultural economy also develops strong backward and forward linkages. To support the process large flows take place between and within agriculture and non-agricultural sector. It also creates avenues for input absorption and increased demand for credit. In forced commercialisation, the product and input markets could become exploitative. Some of these issues are examined in this sub-section.

Labour: In response to technology and price incentives in new sites, as seen in earlier sections, a substantial area has shifted to paddy, cotton, vegetable, fodder and oilseeds, and the yields of traditionally grown crops have increased about two times. Thus from subsistence farming the PAPs have turned to market oriented farmers. More equitable distribution of agricultural land and higher farm yields have resulted in improved allocation of workforce to agriculture both in terms of (a) intensity of employment and (b) employment during *rabi* season. Using such findings, it can be estimated that labour absorption per acre in agriculture is about 53 man-days per annum. About 91 per cent of total labour requirement is met by family labour, only 9 per cent of total labour absorbed in agriculture at present is

hired. A low hired labour component indicates relatively equitable land distribution and gainful employment on own farms among the oustee households in the new sites, but also that there are only a few operations at any time when demand for labour exceeds its supply from own sources.

Credit: Although the institutional and private informal credit sources co-exist in this drought-prone zone, what is unique in this area is that the proportion of PAPs availing of any working credit from formal or informal sector is significantly low. Despite having larger land assets, less than 3 per cent of the oustee farmers were members of co-operative society, and none had access to co-operative short-term credit. Only a few oustee farmers had access to bank finance, and fewer have shown any interest on private production credit sources (Sah, 1995 a, pp. 33-35).

This low reliance on formal and informal production credit in the new sites is not very surprising when one introduces behavioural factors in the analysis. The dominant phenomenon of exploitative nature of interlocked credit, land, and output markets is widely feared among South Gujarat farmers; the small borrowers of South Gujarat turned into bonded debtors for generations is well recorded (Sah, 1995 a). This interlocking of markets is also well understood by tribal resettlers in new sites. Thus the cautious approach of 'self financing' the current production and avoiding risk of losing land is not surprising. It should also be noted that the oustee farmers are late comers in credit nexus, where besides assets, social links also play an important role. Credit co-operatives are faction ridden and the supporter of the dominant faction gets, if other things remain equal, more easy access to credit and other benefits than those who belong to the dissident faction and/or the newcomers.

The role played by petty village traders in forming perception about risk involved in approaching institutional credit sources is also worth understanding (Sah, 1995 a). During the period of depleted food stocks, the current consumption is generally supported through kind loan from petty traders. In order to enhance their own business, these traders try to gain confidence of PAPs by eroding the credibility of institutional lending sources. These village traders propagate that it is much better to go to a trader for loan without any fear.

To sum up, the oustees in the dry zone regard production credit as an input that can be obtained at a very high cost, at the cost of their land. They also believe that production credit does more harm than its contribution to the productivity. Their belief is not far from the reality; their denial to all the formal and informal sources of production credit has not been detrimental to the production technology transfer in the dry region. It has been lack of public capital investment in agriculture that has constrained the transfer of technology in this drought-prone area.

Water Markets: Sale and purchase of water for irrigation in the new sites takes place in two different ways. Water markets are prevalent in some of the new sites located in Dabhoi taluka of Vadodara district. In these areas, the water sellers are not tribal resettlers but are Patel farmers. On the other hand, in some of the new sites like Kasundar, Khokhar and Karmdi a few PAPs have common property water resources managed on co-operative basis. About 10 per cent of the area in the new site is irrigated, of which over 90 per cent is through private market. The members of the co-operative groundwater societies are generally those PAPs who technically can receive water and they alone manage the water distribution. A scrutiny of water sale in these co-operatives reveals that the water source can not serve all the relocated PAPs. Sometimes defunct water sources were revived by coming together of

interested PAPs - as the case was in Kasunder,[8] and sometimes the land allotted to a PAP had come along with an energised well - as the case was in Karmdi.[9]

In many new sites of Dabhoi area the agriculture is totally irrigated. However, crop failures are frequent if irrigation is not availed. Host villagers, generally Patel farmers in these areas, prefer to service first their neighbours and friends, and then sell water to PAPs. Open market purchase of water in the area is fixed, depending on HP of motor used. For diesel energised wells, the rate depends on total discharge of the well per hour. This is also constant across farms in a village. It can be argued that if the market is free and operating efficiently, this system would enable the large majority to get water at crucial stages of moisture stress and sustain the income of individual buyers. Price advantages, if any, to the seller in such situation level out due to competition and become uniform and near to its marginal cost. When the purchaser has to decide from whom to purchase water, in case there are more than one supply source, location of the source, relative cost-effectiveness of various sources, timely availability from various sources, the tendencies of the seller, problems in receiving water from various sources especially related to transport of water are the major considerations.

Although it is imperative on the part of the seller to provide timely and adequate water, this happens when the relations between the host villager-sellers and PAPs are cordial. About 90 per cent of PAPs who purchase water feel dissatisfied with their relations with Patel sellers. Moreover, the sellers also try to sell water to more farmers than they can service adequately. In this process the losers are PAPs, who are asked to wait for a day or two. Though this results in some crop losses, total crop failures are rare in these irrigated farms. The lands where water does not reach are generally sharecropped between the water seller and PAP landowner. All the cost is borne by the landowner and the water seller provides water and receives one-third of the output. This is not a very economical proposition for the water purchaser. But to maintain the soil productivity, avoid crop failures and earn some net profit, water purchasers have to do so. Nevertheless, in this sharecropping contract, the seller has more stake and he ensures timely availability of water.

A small minority of PAPs have developed good social relations with Patel farmers and willingly pay charges before using water. In such cases the seller defers the payments for a crop season in case of genuine default. This is an indicator of strong relationship within the two agencies. The sellers in such cases prefer PAPs over the host villagers. But developing such social relations is difficult for all the PAPs. Unlike privately owned land, groundwater is a common property resource, privatised as soon as it is captured and ends up being appropriated. In fact, the right to use groundwater thus is provided by the right to own an energised groundwater source. Emergence of water markets, however, did provide opportunities for equitable access to water (Shah, 1991). The PAP farmers tend to gain more with water market than without it. Such venture (a) brings technological changes through HYVs, thus increasing income and risk bearing capability; (b) increases employment opportunity with higher wages; (c) leads to appreciation in land value; and (d) reduces the cost of operation to the entrepreneur.

In the dry zone, by and large, the resources have not been adequately developed; risk associated with capital investment, constraints in investment (Sah, 1993), and slow spread of HYVs and HB technology restrict the scope of groundwater development. Economic efficiency is a major issue in water market development. Where the water seller enjoys

monopoly power, the benefit of irrigated farming would be appropriated by the seller (Shah, 1993). In contrast, in an efficient market, more water will be sold to more buyers and the price of water will be near the cost of pumping. Higher dependence in protective irrigation, high cost of installation and government restrictions, non-availability of other sources, presence of insufficient delivery system by other sources are the major determinants of monopoly power enjoyed by a seller in this area. But the field reality operate in such a way that the few available water sellers work together to further their own economic interests. Thus water charges levied by these sellers reflect the degree of monopoly power enjoyed by them.

Output: Although the analysis on output market links was attempted in three dimensions, size-class specific, irrigation specific and calorie intake specific, only the last of the three has been presented here. When the phenomenon is analysed across different levels of calorie intake groups (Table 9), cropping intensity is found to be about 112 per cent in the case of low calorie intake households and 110 per cent in the case of high calorie intake group. Farm production among low calorie intake group at Rs. 1,433 per acre is also higher compared to Rs. 1,263 per acre amongst households with high calorie intake. But the proportion of paddy marketed is as high as 55 per cent of the total production among low calorie intake compared to negligible proportion among high calorie intake group. In the case of maize this proportion is 14 per cent in low calorie intake and only 2 per cent among the high intake group. Similar is the situation with the proportion of produce marketed in the case of jowar. But there is no significant difference in the proportion of *tur* production marketed among the three calorie intake groups.

TABLE 9. VARIATIONS IN PROPORTION OF MARKETED SURPLUS ACROSS THREE DIFFERENT CALORIE INTAKE GROUPS

Particulars	Calorie intake/adult/day		
(1)	<2000 (2)	2000-2400 (3)	>2400 (4)
GCA per farm (acre)	7.5	7.5	6.9
Cropping intensity (per cent)	112	112	110
Production			
Rs./farm	10,758	11,386	8,755
Rs./acre	1,433	1,502	1,263
Marketed surplus (per cent)		Percentage*	
Paddy	55 (75)**	80 (74)	@ (70)
Maize	14 (58)	3 (58)	2 (56)
Jowar	5 (71)	1 (63)	1 (65)
Wheat	1 (125)	7 (-)	@ (90)
Tur	34 (203)	39 (208)	39 (200)
Oilseeds	@ (-)	16 (190)	8 (190)
Cotton	100 (273)	100 (278)	89 (274)

Source: Sah (1996 a).
* Percentage of total output.
** Price received in Rs. per 20 kg.
@ Less than 0.5 per cent.

Thus among different calorie intake groups, there is no significant difference in either cropping intensity or yield per acre. But surprisingly, the proportion of total cereals production marketed is significantly high among those who have relatively low intake.

VI

CONCLUDING OBSERVATIONS

The findings of the present analysis can be summarised as follows: With a liberal relocation package, agriculture for PAPs after relocation has become the major economic activity. During normal years gross income from agriculture aggregated for all crops is over two times higher than the income accruing to farmers in the submerging villages. But the income is significantly lower in the new sites compared to the income of farmers located in host villages. The difference grows larger as one moves towards developed irrigated zone. This difference is mainly because of superior cropping pattern, higher crop yield, and better prices received by the farmers located in the host villages. With respect to technology adoption, rates of fertiliser use is significantly low on PAP farms compared to farms located in the host villages. Moreover, basal application of fertilisers is not practised by them at all. This pattern of fertiliser use reveals a severe nutrient disequilibrium among the PAP farmers. With relatively stagnating technology, the market links reveal a negative pattern: the proportion of total cereal production marketed is significantly high among those groups who have relatively low calorie intake.

Total dependence on agriculture, nonetheless, has its own problems especially in the dry villages. Erratic weather induces wide yield fluctuations. During abnormal years upto 40 per cent of the PAPs face total crop failure; yields of major crops register a fall of up to 35 per cent; households' access to foodgrains reduces by about 20 per cent and the level of consumption and calorie intake falls by about 17 per cent. In scarcity year PAPs' own coping mechanism hinges around (a) decision of household members to work as casual labour; (b) migration of some family members and (c) cattle sale. But these adjustments are not enough to maintain the calorie intake of the households. Moreover, agricultural growth in this dry zone is riddled with moderate increase in production and recurring crop failures. Even during normal years erratic yields constrain calorie intake. Households located in some new sites have reported year after year relatively low farm income. A subset from these new sites also reports that more than a fourth of the households are *perpetually* living under situation where per adult calorie intake is less than 2400 per day.

In the context of agrarian transformation,[10] these findings are disturbing.[11] For, agriculture growth is constrained not only by lack of technology transfer but is also accompanied by unfavourable marketing linkages. With little surplus left due to fluctuating yields, technology adoption even during normal years remains at a low level because of associated risks. The single most important reason behind persisting low level of agricultural development in these scarcity prone new sites seems to be technological stagnation. It is neither the backwardness of the farmers nor lack of socio-economic institutions but *lack of suitable technologies* for the *given* environment which is responsible for the stagnating agriculture. It is not that cultivators in these regions have not heard about fertiliser responding HYVs, but the fact is that under prevailing moisture stress situations these technologies are not superior economic alternatives to varieties grown there. *This underlines the need for*

allocating resources for adapting technologies for the agro-climatic environment.

On the other hand, despite the wide variation in calorie intake, inequality issue has remained secondary.[12] Only the political compulsions keep these issues alive in the bureaucratic circles. In India, the importance of agricultural growth in influencing rural poverty has been firmly established.[13] The negative relationship between growth and poverty, however, be accepted with caution,[14] for there may be time lag between growth in farm yield and reduction in rural poverty but there is no such lag between deceleration in farm productivity and reduction in availability of foodgrains and hence consumption levels. It means that no sooner the current year's crop failure is established beyond doubt, the current consumption and recurring expenditure on inputs are adversely affected but the reverse may not be true always. Efforts to accelerate agricultural growth, therefore, must be supplemented by short-term measures of employment generation and augmenting availability of foodgrains.[15] In a period when the purchasing power is low, revamping the Public Distribution System, though necessary, alone may not help, except in neutralising the trade effected distortion in foodgrain prices.

The solution to the problem is difficult because of its complexity. Three processes have to start simultaneously: first, creating avenues of irrigation and efforts for adapting modern seed-fertiliser technology for the agro-climatic conditions of new sites have to be initiated; second, organising PAPs around the institution so that rules of open markets are courteously respected by them; and third, strengthening the farmers' adjustment mechanisms of coping scarcity by creating more non-farm employment avenues.

Clearly, the need for understanding the operating constraints in *adapting technology for local environment, technology transfer, irrigation management, and scarcity management* can not be over-emphasised. After a successful relocation of over 4,500 PAPs, these processes are constraining rehabilitation of PAPs. If mid-course corrections through appropriate policy changes are not in-built and mandatory on R&R Package,[16] impoverishment risks due to second generation problems of involuntary migration can not be ruled out.

Received January 1997. *Revision accepted December 1997.*

NOTES

1. It is estimated that over 16 million people are displaced from their habitat owing to construction of dams since Independence and out of this, about 40 per cent belongs to the tribal population (Mitra, 1995). Experiences relating to relocation and rehabilitation (R&R) of displaced people is far from encouraging (Mathew, 1989; Reddy, 1994; Thukral, 1992). A review of the R&R of displaced population of development project reveals that in the absence of a National R&R Policy, inadequate legal provisions for land and property acquisition, and lack of institutional provisions to relocate and rehabilitate, the displaced population faces bureaucratic insensitivity and is forced to join the growing rank of wage labour.

2. Sardar Sarovar Project is one of the largest irrigation projects, costing the state a sum of Rs. 84,080 million in 1986-87 prices. It is estimated that it would (a) irrigate 1.8 million hectares of land, (b) provide drinking water to 4,720 villages and 131 urban centres, and (c) generate 1,450 MW power. All these benefits in monetary terms would be Rs. 14,000 million of additional production per year (Raj, 1990; Government of Gujarat, 1992; Patel, 1991).

3. The opponents of Sardar Sarovar Project argue that this project hides its social and environmental costs and over-estimates its benefits and believe that even under heroic assumption this project is nothing but environmental disaster. These activists have been critical of the techono-economic feasibility of the project. Their criticism has also been directed to (i) large area of submergence, (ii) destruction of forest and wildlife, (iii) interruptive approach to the natural flow of river and resultant sedimentation, (iv) problems of waterlogging and salinity, (v) seismic problems due to large reservoir, and (vi) risk of water-borne diseases to downstream population. We certainly don't want to project these issues as unimportant. Nevertheless, anyone who is observing SSP (Narmada) activities could substantiate the

fact that second generation human problems created because of SSP are no less important. The fate of over 20,000 people, who have been displaced and relocated do need concentrated efforts (Alvares and Billory, 1987; *Kalpavrikhsh*, 1985; Kothari and Singh, 1988; Paranjpye, 1989; Morse and Berger, 1992).

4. For a detailed discussion on first generation problems faced by PAPs, see Sah, 1994 b.

5. At the end of 1984, the Narmada Planning Group of the Government of Gujarat, commissioned the Centre for Social Studies (CSS) to carry out the task of monitoring and evaluating the process of rehabilitating the Gujarat PAPs. Since then, the CSS has been involved in this work. The CSS has, so far, submitted twenty-one six monthly reports to the Government of Gujarat. On the basis of the experience of the three monitoring agencies - Gujarat, Maharashtra and Madhya Pradesh - questionnaires were prepared. Each relocated household was visited three times a year to seek data on production, consumption and the demographic details of its members. The reports, *inter alia,* cover: (1) the socio-economic conditions of the PAPs and the changes therein; (2) allocation of land and problems thereupon; (3) infrastructure facilities; (4) development programmes; and (5) relationships between the PAPs and host villages. Almost each report carried recommendations related to policy and/or day-to-day problems faced by the PAPs. The government began to take note of our recommendations or observations from 1989 onwards (see Sah and Soni, 1993; Sah, 1993; 1994 a; 1995 a; 1996 a, b).

6. A total disregard for social implications of relocating PAPs from 19 submerging villages to 125 plus new sites is paradoxical. The relocation process could be seen from two different dimensions: first, the traditional social links and economic institutions at the submerging villages had an important place in the life of PAPs. These arrangements had helped in sustaining themselves in the submerging villages. The randomness of relocation in absence of these arrangements at the new sites has made the PAPs vulnerable to exploitation. The other dimension to the process is the appropriateness of the existing policy. The people associated with resettling the PAPs defend the policy and the process by reiterating that the decision of shifting is an individual decision. The strength to the argument is drawn from the fact that the village is not a homogeneous unit; even in a *phalia* the people do not always want to shift together. And since the PAPs were shown land in different locations, their moving to the new sites is voluntary, for PAPs have preferred the land they are cultivating in the new sites. The argument could have been accepted had there been some method in the randomness of the relocation. It is often argued that the policy provides avenues and instrument of choosing the new site. The fact is PAPs certainly had a choice; *to choose the best amongst the worst.* Thus the migration in the absence of social and economic arrangements is not only involuntary but also an outcome of a policy incapable of safeguarding the risk of social disruption. The misery could have been avoided with adequate policy frame and planning.

7. The evidences for this analysis are from primary data collected for a case study from (a) an irrigated cotton growing area where market and technology are well developed; (b) a semi-developed paddy growing area where water markets have become defunct recently; and (c) an unirrigated under-developed maize growing area. From these three areas, Tentalav and Gadkoi villages were purposely selected from the developed irrigated cotton zone, Ambavadi village was selected from the undeveloped maize zone, and Suka village group was selected from the semi-developed paddy zone. In all, 200 farmers (100 host villagers and 100 PAPs) were randomly selected for the case study (Sah, 1994 a).

8. Kasunder PAPs came to know after receiving land titles that the land has encumbrance of an order of about Rs. 18,000. Eight of them decided to clear this encumbrance and utilise bank resources to restart the defunct water source. Eight out of twenty PAPs are at present utilising this source. There are other than encumbrance-related causes which also contributed in non-participation of other 12 PAPs in the venture. For example, untimely availability of water to all the PAPs, infights among the oustees relating to water distribution, problems of leakage in administration of the venture, problems relating to transit of water to relatively far away locations (an household in a host village had to be given priority in giving water just because he allowed the pipes to pass through his land). These 12 oustees are demanding the Sardar Sarovar Narmada Nigam to invest in groundwater exploration so that the problem related to dry farming they are facing now can be tackled.

9. In Karmdi two motor driven borewells were part of the land transfer to PAPs, one 7.5 HP and another 10 HP motor. The cost of these energised wells was part of the deal. With these two sources about 80 acres of land belonging to 16 PAPs is irrigated. A progressive farmer, Devsingh Rathaw looks after the administration. On an average, the electricity bill for utilising these resources comes to about Rs. 440 per PAP. Water distribution is according to reach of water across the water sources. By any chance, if a need arises not in accordance with the distribution pattern, the project affected person generally purchases water from other sources, if available. Due to circumstances if a project affected person has to lease-in or lease-out his land, he is allowed to use irrigation up to 2.5 acres of such transacted pieces of land. The farmers generally have access to irrigation in about 3 to 4 acres. Unless land transaction has not taken place, the host village farmers are not encouraged to purchase water. The PAPs who do not receive water from such venture, purchase water from nearby host village.

10. In a developing economy like ours, one of the two sectors (agricultural sector) is traditional. It produces wage goods (foodgrains) and has excess supply of labour. The non-agricultural sector is modern and draws capital and labour from the traditional sector. The productive accumulation in the economy can be faster if the agricultural sector performs. This is so because only then (a) strong input-output linkages between the two sectors would establish; (b) terms of trade between sectors would support surplus transfer, and (c) demand for non-agricultural goods in the traditional sector would increase. The overall growth of the economy, in the long run, would be constrained if (i) technology in the traditional sector remains stagnant; (ii) market links between sectors remain weak or the terms of trade remain unfavourable for resource transfer to the non-agricultural sector; and (iii) contribution of various parts within the agricultural sector is unequal. The above constraints, in the short run, would also increase social and economic inequality.

11. The findings of this analysis may be seen from other dimensions too: the traditional social links and institutions at the submerging villages had important place in the life of PAPs. These arrangements had helped sustaining the PAPs in the submerging villages under harsh environment. Even in worst of the situations, the system was enabling a minimum level of consumption. The randomness of relocation in the absence of these traditional arrangements at the new sites has made the PAPs vulnerable to exploitation and subsequently risk aversion.

12. One can argue that all necessary support already exists in the systems, and it is the PAPs who are not taking advantage of the facilities. This is a faulty argument, for the PAPs are not facing a normal process; their unfamiliarity with markets, institutions, and technology makes them vulnerable. Thus it becomes pertinent on the part of the policy makers to facilitate the rehabilitation process by understanding the farmers' own adjustment behaviour first and then strengthening it by external support.

13. The Indian concept of poverty has moved from identifying a minimum normative absolute living standard in terms of per capita consumer expenditure - may it be the normative food basket or the minimum calorie intake towards explaining the poverty. It should, however, be noted that cross-sectional analysis of calorie intake by individuals of PAP households contain noises despite the fact of a large sample. Moreover, this approach of poverty measurement does not give adequate emphasis to quality of life: the PAPs' access to services, their environment relating to law and order, access to justice, the environment where they live, the air they breathe and the water they drink. In the absence of these concerns, the measurement of poverty is partial, reflecting only to food insecurity of PAPs.

14. Although it was observed that high agricultural growth reduces rural poverty and higher consumer price aggravates it, the process may be affected if (a) early growth takes place under extreme inequality and its benefits may not 'trickle down' to large rural masses; and (b) oligopsonic influence of landowners distorts the rural labour market, dampening the on-farm employment opportunities and wage rates.

15. Households located in Dhefa, Kukarda, Ambavadi and Thapavi are totally dependent on agriculture. Because of little off-farm employment opportunities and low yields, the calorie intake of households located there is the lowest.

16. Even the National Policy on R&R has not raised these second generation issues (Sah, 1995 b).

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