Rural Resettlement in an Arid Frontier:

Agricultural Development in Northwest India

Pamela Stanbury

Agricultural development in underutilized and marginal lands is often touted as one means of combatting problems of population growth where land is limited. Northwest India, and the Punjab in particular, is one notable example. Here, the last 100 years have witnessed a dramatic transformation from what was once considered waste land into some of India's most fertile and productive agricultural land. This development has occurred primarily through the construction of massive irrigation systems and associated rural resettlement. Resettlement has been in part spontaneous and in part planned through government established colonies.

This paper presents some results of recent fieldwork conducted in northwest India. The focus is the impact of agricultural development on a frontier agricultural region.[1] The study area is part of the northern fringe of the Thar desert on the southern Haryana/Rajasthan border. Until 30 years ago, this region was considered only marginally productive agriculturally and maintained a small scattered population. Irrigated agriculture has trickled into the region. Along with it, substantial growth in the form of spontaneous population in-migration and new economic opportunities has occurred. The following explores some demographic and social consequences of spontaneous migration, with particular emphasis on one village in this region.

I will discuss the process of rural settlement at three levels: 1) the village community, 2) the households that comprise that community and 3) finally, the region as a whole. Throughout, an analogy is made between the domestic cycle of the household as described by Fortes (1958) and the cycle of growth at the village and regional levels. The process of expansion, fissioning and replacement in the household cycle is also characteristic of these higher levels. Finally, each level is depicted as part of a single, overarching process: the development of a frontier into a socially complex and economically productive region.

The scenario I will describe is as follows: with the construction of irrigation canals, migrants were attracted to the area and sought land in villages which were previously considered extremely marginal. In those villages where land was available for purchase, the in-migrants swelled the ranks of the landowners and created a new demand for agricultural labor and services. This demand was met by a new type of immigrant -- landless laborers and service castes. The outcome: the growth of a frontier community, complete with a variety of specialists and socioeconomic statuses characteristic of villages in more established parts of north India. Today, after one generation of steady growth and household cycling, the village has reached a saturation point in popula-

tion size and a new wave of out-migration is beginning. The scenario is one of ebb and flow of personnel, creating villages which replicate the fully formed caste hierarchy of more densely populated regions.

Both the causes and consequences of migration have been a source of debate in the migration literature. As Woods (1982) tells us, those who focus on causes are concerned with 'why' and 'how;' researchers in this arena examine motivations and constraints in migration. On the other hand, those concerned with the consequences of migration focus on the effects on the physical, social and economic environment. The consequences are the focus of this paper, particularly the demographic and social consequences of migration in a newly developed agricultural region.

As Firebaugh notes, migration is frequently seen as "a contributor to development, a corrector of regional imbalances and a conqueror of the 'tyranny of space'" (1970:199). However, rural resettlement may entail a number of costs as well as benefits. Settlement, either spontaneous or planned, in areas of underutilized agricultural potential may result in an increase in agricultural output and relieve population pressure in more densely populated areas. However, it may also result in problems ranging from inequity in land ownership to environmental degradation in the newly developed regions. Indeed, in northwest India the detrimental effects of highly intensive land use have been documented (Gosal 1976, Farmer 1976).

A World Bank report notes (1978) that government planning, particularly in India, has emphasized intensification of land already under cultivation. Green Revolution technologies have, in large part, made this possible. In northwest India spontaneous migration has been a byproduct of its rural development policy. Enormous changes have taken place in the demographic profile of the previously underutilized lands. An understanding of the impact of spontaneous resettlement may reveal larger processes occurring in the development of a frontier region.

Village

The village, which I shall call "Bagarpur," is located on the Haryana/Rajasthan border in a region known as the "Bagar." This term loosely translates as 'wasteland.' Mean annual rainfall is less than 300 mm.; soils are extremely sandy and form shifting sanddunes which dot the otherwise sparse landscape. The water table is extremely deep (over 100 feet in some places) and otherwise brackish. As a result, tubewells are rare; there are only three in the village to date.

In 1954, the Bhakra canal irrigation system began servicing the Bagarpur land. This is an enormous system which at present, branches throughout the state of Haryana. Bagarpur, being on the state border, marks the tail end of the system. However, the canal system is beginning to make headway into northern Rajasthan under the Rajasthan canal project. This, coupled with a number of other historical events, combined to bring about a sudden and rapid growth in this village.

Before irrigation, the village was sparsely populated (see Tables 1 and 2 below). The few peasant farmers living in the village were more dependent on livestock as a supplement to their crops due to frequent droughts and crop failures under dry farming conditions. Older informants claim that before irrigation, most families owned herds of 10 to 15 cows, many more than owned today. Cattle were grazed on the open farmland. Agricultural work was minimal, with few inputs into the cultivation process.

Table 1

year	no. households	avg. household size
1945	22	7.41
1981	101	7.40

Table 2

Village population by 5 year intervals

yr.	1950	1955	1960	1965	1970	1975	1981
pop.	178	223	280	359	473	621	748

In caste composition, the pre-irrigation village consisted primarily of Jat upper caste peasant farmers. Only two untouchable families lived in the village. There was little need for wage work in agriculture since there was little labor involved in cultivation. Skilled services such as those provided by a carpenter or a Brahmin priest, were available in a neighboring village. Significantly, this neighboring village has been a larger center for some time, its size prior to irrigation being due to its accessible ground water.

Irrigation brought with it new crops, including cash crops such as wheat and cotton. New labor requirements emerged since land could be cultivated more intensively (from 45 to 109% cropping intensity); maintenance of channels was required and land had to be levelled for irrigation. And suddenly, local water for domestic and livestock use was available. While water in the irrigation channels remains uncertain (80% is under command but not all land is served regularly), irrigation has played a central role in the birth and growth of a full fledged village.

The caste composition and size of Bagarpur prior to the late 1940s does not conform to the typical north Indian village described in the literature (see Mandelbaum 1970). Bagarpur maintained none of the traditional service caste links within the village itself. The complex stratified caste system with its array of jajmani (patron-client) relationships was non-existent. Increasingly, Bagarpur residents have come to call upon their own set of service caste households.

Irrigation alone has not been fully responsible for the changes that have taken place. A number of other historical events also occurred around the time of irrigation. India achieved independence in 1947 and farmers, displaced by the partition of nearby Pakistan, were seeking land. Bagarpur was an attractive location. The migrant households

during the 1947-1953 period are all from the Bagar region of northern Punjab. However, looking at the actual migratory movements during the whole 30 years, most of the migration involves shorter distances.

Perhaps the most important factor luring in migrants was the Surplus Land Act instituted in the early 1950s and in which land was to be redistributed to attain greater equity. Under this act, a family of five may only own 32 acres of land (these numbers vary with the quality of the land). Consequently, a large portion of Bagarpur land, previously owned by an absentee landlord, was available for purchase. Clearly, this encouraged in-migration. However, if irrigation had not made the land more attractive to buyers, it is unlikely that much growth would have occurred. Moreover, as will be shown below, the in-migrant population since 1945 (table 6) has not been only land holders. Landless laborers and service castes have arrived because of irrigation-linked labor opportunities. These households would not have been lured directly by the possible purchase of land.

At the village level, the population, both native and migrant has grown, supporting more people on a limited (but increasingly productive) land base. The village has been allowed to expand, with a wider variety of services available. The result has been greater self sufficiency in the village itself. Labor requirements have increased. The small community of pre-irrigation times, constrained by uncertainties of arid land farming, has given way to a larger and more densely populated village with a variety of specialists who are replicating the caste relations of more resource-rich areas.

The story of Bagarpur does not end here though. The village has experienced a period of growth in the last generation but villagers, particularly young males and their families are beginning to seek work outside the community. Irrigation halted out-migration only temporarily. At present very little land is available for purchase and it is very expensive. While some new occupational options are opening up within the village, these remain limited. Particularly for those tied to agricultural or livestock pursuits, out-migration is the only answer to economic pressures.

Households

While migration is often viewed in terms of individuals who migrate, it is here viewed in terms of the household. This is a more accurate picture of the structure of the migrant population; viewing migration in this way highlights the dynamics of growth of the family and the village-wide/regional implications. A migrant household consists of individuals who migrate as a unit, set up a house together, share a common hearth when they arrive and share in joint ownership of property or other income. And this is, in fact the common pattern of migration in Bagarpur. 101 households now comprise the village, 45 of which are the result of in-migration since 1940. These 45 households are the result of domestic cycling in the 28 original in-migrant households.

While these new households contribute to changes in village social organization in Bagarpur, they must also be seen as the result of changes in the sending villages. The majority of migrant households were result of the fissioning of the joint family in sending villages. And, in Bagarpur, these young households have entered a new village with room for growth.

Table 3 shows the distribution of migrants since 1940, and the number of households produced as a result of

Table 3

In-Migration of Households by Years

year	number of households	number expanded to in 1981
1971-81	3	4
1961-70	9	14
1954-60	2	2
1946-53	12	20
1940-45	2	5
total	28	45

fissioning in these households in 1981. For example, between 1946 and 1953, 12 new households migrated in, marking the highest influx in any period. These 12 original households have now grown and fissioned, making a total of 20 households in 1981. This increase is consistent with the numerous changes taking place in this period.

Domestic Cycle

The joint family household is the preferred form among the Bagarpur villagers. In its most basic form, this consists of a multiple family unit in which parents and sons and their offspring live under one roof and share in productive tasks. Village exogamy and patrilocal residence maintain the clustering of close male kin. As the household expands, the youngest sons tend to remain in the parent household while older sons form new independent households. The average size of the parent households at time of fissioning is 12.9 (N=48) based on all splits during the last 40 years. This is significantly larger than the current (1981) average household size (at 7.4).

Considering these factors in the domestic cycle of the pre-irrigation households, the in-migrant households are most similar to the newly formed households. Table (4) indicates, the majority of in-migrant households consisted of parents with unmarried children or adult relative such as widowed mother or bachelor brother. Although not all ages of household heads were available (since some have died since their move), a fairly reliable calculation shows the age of migrant household heads at move to be 36 years old. (Only male household heads who were still living at time of census were considered in these calculations). Finally, the average household size among the in-migrant households (n=28) was 4.5 at the time

Table 4

Household composition of in-Migrants at move

type	number
parents and married son(s)	6
Parents and unmarried children (including addition of single adult relative)	16
married couple, no children	3
2 sibling couples	1
single person	2
total	28

of their move, smaller than the average household size of the non-migrant households of 7.6 in 1981 (n=56).

Occupations

The present occupations of in-migrants are shown in table 5. While all of the in-migrant households since 1940 are upper caste farming families, many owned land in Bagarpur prior to their move. This would suggest that the desire to be near the more productive irrigated land was as important as the lure of newly available land for purchase. It is likely that the greater management requirements of irrigated land lured in previous absentee owners.

The remaining 17 in-migrants' occupations are primarily in service and agricultural wage labor. As the village expanded and land was brought under more intensive cultivation with irrigation, landowners called upon service caste households to take on jobs in Bagarpur. The blacksmith, carpenter, Brahmin, flour mill owner, laborers and sweeper have all arrived in the last 30 years. Between service, labor and new landowners, these migrant households now comprise almost one half of the total number of households in the village.

Bachelors

The in-migrant population over the last 30 years has accounted for almost half of Bagarpur's growth, while the non-migrant population has increased at a slower rate. A key feature of the population dynamics of the pre-irrigation village was the high number of bachelors living in households of married brothers. In 1981, there were 15 bachelors, 4 of whom were recent migrants and all of whom represented the pre-irrigation population. All were over age 50 at the time of census. This is most likely a function of land poverty before irrigation when a large chunk of land was owned by a single landowner. Bachelorhood was one way of regulating population growth where resources were scarce. Bachelorhood however is no longer a

Table 5

In-Migrants by Time Period, Caste and Occupations

	caste	occupation
1940-45	Jat	landowner*
	Jat	landowner
1946-53	Siami (4 household)	landowner
	Jat	landowner*
	Chamar	wage labor
	Dhanak (6 household)	wage labor
1954-60	Jat	landowner*
	Nai	barber
1961-70	Jat (Bander	landowner*
	Bhaker	landowner*
	Dudi)	landowner*
	Soni	landowner*/goldsmith
	Brahmin	priest/wage labor
	Khati	carpenter
	Cheurda	sweeper, leather work
	Chamar	landowner
	Chamar	wage labor
1971-81	Jat (Dhidaria	wage labor
	Bhaker)	wage labor
	Lohar	blacksmith

* Owned land prior to move

necessity since other economic opportunities are available.

Recent Out-Migration

With the advent of increased agricultural productivity and land redistribution, the village experienced a Iburst of growth. Population, both native and migrant, thrived for a generation. However, hints of outmigration can be seen today, as shown in Table 6. The number of outmigrants, though still small, has increased and appears to be on the rise. Land fragmentation due to partible inheritance and consequently, land shortage in the village are pushing people out. And the opportunities provided by education are increasingly providing non-agricultural employment.

All of the 19 adult male outmigrants, were married at the time of their move. Most represent fissioning in the Bagarpur household. Upper caste migrants mostly have sought agricultural lands south in the desert of Rajasthan. Untouchables have left in search of wage work.

Table 6

Out-migrant adult males by time period

year	number
1971-81	11
1961-70	3
1954-60	5
1947-53	0

I have argued that irrigation brings with it new arrangements which rapidly enhance the growth process. Migrants lured in by the prospects of land and labor in a previously marginal environment have enjoyed the benefits for 30 years. Agricultural changes have brought in new young households; interhousehold ties are now formed along caste and service lines as well as kinship lines, comparable to arrangements in more resource rich areas. Yet, the benefits of the new technology are showing signs of wear and opportunities for growth have begun to diminish. As the domestic cycle has taken place in the household, it has transformed the village. Migrants are once again being lured south into Rajasthan where newly irrigated "Bagarpurs" are opening up.

Region

The growth of households and village in Bagarpur is paralleled by growth at the regional level. The irrigation system that services Bagarpur forms a small part of larger irrigation schemes begun by the British in the late 19th century. Paustian (1968) describes government activities in promoting irrigation and subsequently, canal colonies in the Punjab as far back as 1880. Irrigation has permitted the cultivable wastes of northwest India to become highly productive land. Drawing on the census of India, Gosal documents the rapid growth in the Punjab and Haryana between 1951 and 1961. He points out that in Sirsa district (where fieldwork was conducted) the rural population increased by 73% in one decade. Inmigration contributes about two thirds of the increase (1976:118).

The Bagar region itself was very sparsely populated prior to the introduction of irrigation. The inhabitants relied on a mixed economy of pastoralism and farming. In 1803, when the British annexed the district, there were only 20 inhabited villages; today there are more than 200. Villages were periodically abandoned due to severe droughts. The introduction of irrigation to the region has permitted stability not known to the region previously. New villages have appeared and old ones have grown, indicating a cycle of expansion, fissioning and replacement.

Hence, while agricultural development has provided new economic opportunities and greatly increased agricultural productivity in the Bagar region, it has also brought a new set of constraints. Agricultural development in this frontier area has not meant merely increasing income; it has also meant more people wanting parts of that income. And it is for these reasons that the social and

demographic impacts of agricultural development in frontier zones needs to be more clearly understood.

The Bagar region has been exposed to rapid changes and growth due to agricultural development programs. Coupled with land tenure changes and population pressure in other areas, the Bagar has been caught up in a cycle in which the frontier is being pushed further into Rajasthan as irrigation extends further south. What is now a frontier area is quickly finding itself in the center of a highly populated and agriculturally productive area. The cycle of regional growth is complemented by the cycle of the village and household.

Conclusions

Irrigation development in a frontier zone of northwest India has brought about rapid changes in village,household and regional structure. Individual households have migrated to small, relatively young villages and have transformed them into larger and more complex communities. Concomitantly, the region has been transformed from a sparsely settled frontier into a socially complex and economically productive region. The villages and, in turn the region have replicated villages in more resource rich areas of north India. Just as the household undergoes expansion, fissioning and replacement, so too have villages in the Bagar and the Bagar region as a whole. Young men are beginning to migrate out, leaving in their wake a village and region full of the complexities of caste stratification. As long as new frontiers are opening up in Rajasthan, it is likely that Rajasthan will be the destination of migrants out of the Bagar.

I have argued that irrigation is a central feature of this agricultural development process. Clearly, other factors, and land reform in particular, have been important in the changes that have taken place. It is hoped that continuing research at the regional level will shake out inter-village variation in the pattern of population growth and show the relevance of changes in land tenure, government programs and irrigation per se.

Finally, I have tried to show that the household is the most appropriate unit of analysis through which to look at village and regional migration processes. The dynamics of population growth and migration are based on the household's needs and desires. Through the growth and fissioning of the household, the village and region witness their own unique but related dynamic cycles.

Footnotes

1) The term "frontier" is used here in terms of economic changes, following Bailey's use of the term. (F. G. Bailey, **Caste and the Economic Frontier**, 1957, Manchester, Manchester University Press). While Bailey focused on the role of traders in the development of a frontier, this paper considers irrigation to be the key factor in the growth of a frontier.

2) Fieldwork was conducted during 1981 by David Groenfeldt and the author.

References

Connell, James
1976 **Migration from Rural Areas: The Evidence from Village Studies.** New Delhi: Oxford University Press.

Darling, Malcolm L.
1925 **The Punjab Peasant in Prosperity and Debt.** London: Oxford University Press.

Farmer, B.H.
1974 **Agricultural Colonization in India Since Independence.** London: Oxford University Press.

Firebaugh, G.
1979 "Structural Determinants of Urbanization in Asia and Latin America, 1950-1970." ASR 44:199-215.

Goody, Jack, ed.
1958 **The Developmental Cycle in Domestic Groups.** London: Cambridge University Press.

Gosal, G.S.
1970 "Demographic Dynamism in Punjab and Increasing Pressure on Its Resources." In L. Zelinsky, A. Kosinski and R.M. Prothero (eds), **Geography and a Crowding World.** London: Oxford University Press.

1967 "Redistribution of Population in Punjab during 1951-61." In A. Bose (ed), **Patterns of Population Change in India 1951-61.** Bombay: Allied Publishing Co..

Mandelbaum, David G.
1970 **Society in India: Continuity and Change.** Berkeley: University of California Press.

Paustian, Paul W.
1968 **Canal Irrigation in the Punjab.** New York: AMS Press.

Woods, Robert
1982 **Theoretical Population Geography.** New York: Longman.

World Bank
1978 **Agricultural Land Settlement: A World Bank Issue Paper.** Washington, DC: World Bank, January.