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Population, Environment and De-Responsibilities: Case Studies from the Rural Areas of Pakistan

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**Population, Environment
and De-Responsibilisation:
Case Studies from the
Rural Areas of Pakistan**

by

**Tariq Banuri, Franck Amalric
1992**

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Population, Environment and De-Responsibilisation: Case Studies from the Rural Areas of Pakistan

Tariq Banuri, Franck Amalric

Introduction

Population growth is considered by many scientists and intellectuals as the main problem facing the world today. The stress that a growing population would place on civilisation was already predicted by Malthus in the nineteenth century. Yet, scientific and technological advances and the accumulation of human-made capital have since then proven sufficient to support a much larger population with even more goods and services.

In recent years, the debate has been revived, with neo-Malthusian writers warning that the world population would soon out-grow the resources (Ehrlich 1968), and that in any case resources were already over-used (Meadows, et al 1972). In the tradition of neo-classical economics, it was responded that science and technology had proved capable of coping with the previous scarcity constraints, and that natural resources were not as scarce as some wanted to believe—as

shown by the declining prices of most commodities (Simon 1981).

The novelty in the debate comes from a number of factors, which have the effect of uncoupling the consequences of population growth from the size of the population, from the resources directly used, and from the local economic or political context. First, as Shaw (1989) aptly argues, population growth has become a major issue because the development of modern societies has led to environmental degradation for reasons broadly unrelated to the size of the population itself. Second, this uncoupling is compounded by the discovery in the eighties that the resources that had hitherto been taken for granted—such as the atmosphere or bio-diversity—were also being used at their limit. Since there is no known technological fix for these resources, and since their marketisation appears quite difficult, the economic counter-argument to the Malthusian logic breaks down.

Lastly, since the resources in question are global in nature, the population growth is rendering almost obsolete the debate over whether population growth enhances poverty or its the other way around. Unlike in Malthus's times, population growth does not only threaten local or national sustainability: it now threatens world civilisation as a whole, and notably the sustainability of the modern life style.

That the last point has been a major source of concern in the North is perfectly clear from the following declaration of the Club of Earth, whose members all belong to both the U.S. National Academy of Sciences and the American Academy of Arts and Sciences. The declaration was released in 1988, and is cited in Paul and Anne Ehrlich's *The Population Explosion* (1990: 18).

Arresting population growth should be second in importance only to avoiding nuclear war on humanity's agenda. Overpopulation and rapid

population growth are intimately connected with most aspects of the current human predicament, including rapid depletion of non-renewable resources, deterioration of the environment (including rapid climate change), and increasing international tensions.

Other, more conventional writers, such as the authors of the World Commission on Environment and Development (1987), express similar concerns but without the single-minded focus on population growth. They argue that a sustainable path of development requires, in addition to population control, the reorientation of technology, and the incorporation of environmental constraints into decision making. Calls for a change in “the quality of growth” are also often added, but they do not carry the same quantifiability and power as the others. Lastly, some writers, such as Barry Commoner (1988) argue that “environmental impact is not correlated with the rate of population growth” (Commoner 1988, cited in Shaw 1989).

In this respect, particularly revealing is Shaw (1989)'s paper, in which he contrasts the intellectual roots of Commoner's position with that of the other extreme and apparently opposite one of Nafis Sadik (1988, cited in Shaw 1989) who claims that “high fertility and population growth are contributing to the damaging of the natural resources base” (Shaw 1989: 199). Shaw suggests that Commoner's claim is one of ultimate causality in which the major contributor to environmental degradation is the high and wasteful consumption of countries with low population growth rates, while Sadik's claim is one of proximate causality, where the question is not about the factors that produce a particular outcome, but those that aggravate, trigger or catalyse the incidence in a situation specific way. Shaw's argument is that the latter position has become particularly important today because the control of the ultimate causes of environmental

degradation has remained out of reach. In other words, between the two forms of expansion of human activity, demographic and economic, Shaw sees the former easier to tackle than the latter.

This diversion of the debate is clearly, in part, political. Of interest here are the assumptions that give it intellectual support, and enables Shaw to argue explicitly that people who have large families should change their behaviour because the ones who created the problem in the first place cannot change. The first assumption is that population growth is a fairly independent phenomenon; this is supported by the generally accepted idea that it stems mechanically from the introduction of modern medicine in developing countries. Second is the demographic transition theory, which presents low fertility rates as a characteristic of development, and therefore something desirable in themselves. The control of population, therefore, becomes a legitimate development strategy. Thus in the end, the view that the problem could be straightforwardly tackled if enough effort was devoted to it, notably through proper education and the purveyance of contraceptives.

The present study on population dynamics, environmental change and economic development in rural communities, carried out in Pakistan, is at odds with this emerging view of both what the issue is and what solutions it calls forth.

As a premise, we discard the mechanical fertility view, what Simon (1981) calls the “untrammelled copulation” view which identifies the poor's fertility behaviour with that of non-human living species (Simon 1981: 175-7). Our view is that high fertility rates are the results of rational decisions that deserve to be understood as such. Of course, the person taking the decision, as well as the realisation of the decision—use of contraceptives, abortion or delayed marriage—will vary

according to different social settings.¹ This being precised, the rest will be clearer.

Our major finding is that although the population of Pakistan is reaching alarming levels and still growing at about 3 percent a year, population growth is not perceived as a major issue at the village level. In other words, population growth is a problem at the global or national level, but not at the local level. This is not because of a lack of education about national priorities, but because of a conflict between national and local goals. In fact people's strategies to make a living are such that demographic or environmental concerns are at best marginal and at worst in direct opposition with what is needed for success and survival.

In some cases labour out-migration has become so important that the local environment is no longer the central source of local income. In other cases, the village environment, with the commercialisation of its products, has become part of the larger economy, to such an extent that the way it is managed responds more to external constraints than to village-based requirements. In short, the communities have out-grown their environment or the environment has out-grown the communities. The consequence is that both resource management and fertility decisions are subject to the way the community interacts with the larger politico-economic framework. But this interaction, instead of leading to a nation-wide coherence in behaviour, has been the source of even more conflicts between local and national goals.

This brings out two important points. First, that it is often not because the people are poor that the environment is degraded, but that the poor people are marginalised, because their poverty is no more the condition of exploitation of natural resources. In such situations where the direct link between subsistence and local resources has slackened, environmental degradation is best viewed not as a consequence of necessity,

but as a luxury, a waste people can afford because they are not threatened by it.

Second, since the decision to have children will be considered with respect to access to external rather than only local resources, the degradation of the local environment will have only a marginal impact on the level of fertility. Crucial, by contrast, is the mode of integration of the community within the larger economic and political order, namely the form of development. In this perspective, large families should be seen as development strategies.

Thus we view (over-) population growth as a response to and consequence of mis-development, comparable in this regard to environmental degradation.² Heuristically speaking, the adverse link between population growth and environmental degradation exists at a national or global level. However, there are no institutions at those levels that can influence behaviour to respond to this problem. What we find is that in Pakistan, the existing institutional structure has created a local level indifference and even hostility for the national problems.

At the local level too, strategies available to individuals and communities operate only in the context of higher levels of aggregation. Local mechanisms for collective decision making are either non-existent, or have been excluded from all but a few narrow areas. This includes not only the growing erosion of local government systems, but also of many institutions of the civil society—the family, the neighbourhood, cultural and religious associations.

In the end, development has led to a *de-responsibilisation* of the populace for public matters. The question is not only of the power of the state, nor of the efficiency of the market, but also of the general ability of the institutions to help people live together and co-operate with each other, the conflicting

interests notwithstanding. Simply put, and in the Keynesian tradition, it is a problem of governance.

It follows that the population-environment issue is not so much a question of education, nor of access to contraceptives (although these factors clearly have their importance), but a question of responsibility. Who is responsible for what, what are the state, local bodies, communities and individuals responsible for, and how can these different spheres of responsibility be kept mutually consistent during the development process? For us, these are the key questions for understanding both environmental degradation and population growth.

Presentation of the Study

The present study was conducted for the United Nations Research Institute for Social Development (UNRISD), Geneva. It focuses on the interaction between population dynamics, environmental change and economic development through several case studies of rural communities in Pakistan in three different ecological zones: the coastal areas, the mountainous zone, and the agricultural land of the Indus plains. The individual studies are presented in detail in chapters 2, 3 and 4.

In the coastal villages described in chapter 2, the main activity is fishing. The two selected villages lie at the outskirts of Karachi and are therefore relatively close to modern life. Many factories have been built in the direct vicinity of the villages, further affirming the presence of a particular form of development. Depletion of the mangrove forest and over-fishing of shrimps are the prime environmental threats of the region.

Chapter 3 presents villages from a completely different ecological zone, the mountainous areas of the North. There most of the land is unproductive. Only through irrigation can

the small percales of arable land be made cultivable. Other productive parts include rangeland and forests. With steep slopes, water erosion is the main form of degradation of the environment. If this phenomenon is in part a natural one, it becomes more acute on land used for arable crops, and minimal under closed forest canopy. Deforestation is therefore a double problem. Eight villages have been selected, which gives a broad picture of how different communities cope with an almost desert like environment.

Chapter 4 deals with still another ecological zone, the vast agricultural lands of the Indus Basin. One of the main issues is the availability of water for agriculture. With a yearlong frost free growing season, and abundant energy heat though long hours of sunshine, the region has many of the ingredients to attain very high productivity levels on irrigated lands. Since the issue of water appears fundamental, we have selected two communities, one of which lives on irrigated land (canals and tube-wells), the other on barani or rain-irrigated land.

The fieldwork, undertaken in the fall of 1991 and in January 1992, comprised both open-ended discussions with villagers (individually or collectively) and structured questionnaires. In some cases, a direct appraisal of the existing infrastructure has been carried out. All studies have also relied heavily upon second-hand data. The reports (chapters 2, 3 and 4) have been written independently, the different perspective taken by the authors enriching thereby the overall study.

Chapter 5 brings together the major findings of the case studies and defines some common trends. It then sets a possible path towards responsabilization as a prerequisite to sustainable development, and notably argues for the need of adequate governance to support efforts in local participation.

The remainder of this chapter sets out the background to the following discussions. First, it presents in more detail the concept of *de-responsibilisation* and how it relates with previous discussions of the issues. Second, it describes in general terms the case of Pakistan, including the state of its population and environment and its record of development.

Forms of De-Responsibilisation

What we have termed the de-responsibilisation process, number of different elements, each of which has been analysed independently in the literature. Among them—and this is clearly not an exhaustive list—are four components that have played an important role in the Pakistani experience: Creation of uncertainty, powerlessness, disembeddedness, and the contradiction between needs and responsibility. All these have, in different ways, diverted the process of development from its initial modernist project.

It is important to clarify that this process can apply to individuals as well as to communities. Anthropological works have shown how specific to modern society is the vision of the individual as a *moral* subject, independent and intrinsically non-social, as opposed to the *empirical* subject, indivisible element of the human race, as we find it in all societies (Dumont 1983). In a society where the individual is subordinated to a group (the family, the tribe, the village, the nation), it is this group that in some cases will be responsible in a hostile sense, that is in a way in which individual responsibilities cannot be easily singled out. A good example from modern societies is the responsibility of a sports team: the team is considered as a whole and only in extreme cases the responsibility for a win or loss will be attributed to a single player.

This distinction is particularly important here since we are mainly dealing with collective decision-making and actions, and hence about responsibility at the community level. Such responsibility can be of either type: individualist if it is based

on contract or subordination; hold the community as a whole is responsible for a given resource.

Uncertainty

It will certainly sound ironical, and perhaps even iconoclastic to speak about modernisation as a process creating uncertainty. The initial project of modernity was precisely to liberate women and men from the tyrannies of scarcity and uncertainty, notably in the form of natural calamities.

But today the future appears more ‘indecipherable’ than ever. Matters of concern are numerous and more and more on everybody’s lips: depletion of the ozone layer, global warming, de-forestation, loss of bio-diversity, population growth, etc. It is true that at the local level and in rich countries the future appears clearer; or, to put it differently, that people do not feel threatened by these issues. But even this is not the case in other parts of the world where people have been rendered more vulnerable to economic shock, to political upheavals, to droughts and floods.

Thus development³ creates new sources of uncertainty, which replace and sometimes even outweigh the older ones. These include economic forces (notably changing prices), irregular availability of supplies (such as fertilisers, see Chapter 4), inconsistency of government policies or dubious judiciary. In the end, the integration of the community; within a larger political and economic framework does not necessarily help ensure life in the community; for it renders the latter dependent of external forces that are broadly beyond its control.

In fact, such cries as ‘It is the role of the government’, which are recurrent in the case studies and that have been noted in other works (Max-Neef 1982), can be interpreted as a way to circumscribe the world in the face of uncertainty to make it manageable, thereby playing a role comparable to the

Muslim's cry of *Insha Allah* or to a Christian's crossing of himself/herself (Geertz 1983). In this perspective, F. Amalric and S. Javeed argue in Chapter 2 that what may first appear as fatalism is in fact a way of coping with growing uncertainty. Thus the creation of uncertainty becomes an integral part of the *de-responsibilisation* process.

Powerlessness

Powerlessness is, as Chambers (1982) noted, one central feature of the poverty 'trap'. It has recently attracted the attention of researchers for it is now widely recognised that environmental conservation is bound to fail if not supported by local participation: first, because it would lead to conflict and resistance; second, because it would lead to bad management. At another level, it acknowledges that these communities were, at one time, deprived of their control over the local environment.

In certain cases, dis-empowerment has led to resistance and confrontation during which degradation of local resources was turned into a symbol of protest and powerlessness (for a review of different forms of local resistance, see Ghimire 1992a). For instance in the state of Bihar in India: "despite having an ancient tradition of respect for forests, including the preservation of sacred groves for religious ceremonies, the Ho have turned to forest clearance as a means of asserting their rights to use the lands which forestry law denies them" (Colchester 1991, cited in Ghimire 1992a). Krishna Ghimire (1992a) gives other examples from the Philippines and Malaysia. Similarly, Susan Joeke notes that the dismantling of common property has "often provoked immediate abuse in the shape of a scramble for surreptitious exploitation of forest and grazing by previous users" (Joeke 1991: 5).⁴

Another argument against powerlessness is that local participation leads to better management (WCED 1987). In short, only by involving local communities can natural

resources or development schemes (such as roads, schools, canal irrigation, etc.) be managed efficiently. One aspect of the argument focuses on monitoring (Banuri 1992a; Hussain 1990): a smaller unit of management will necessarily be better at the local level because the flow of information is better; the simple reason is that there are fewer intermediaries between those who experience a problem and those who have the power of making decisions. Moreover, monitoring by those who have direct access to the resource reduces the risks of corruption. It is, of course, a direct way to make people feel responsible (again) for their environment.

Disembeddedness

One oft-noted characteristic of modernisation is the separation of man from his physical environment, and even more generally from his labour, in the sense of sustaining life (see Schumacher 1970; Banuri and Apffel Marglin 1993; Apffel Marglin and Marglin 1990; Berry 1977).

One of the oldest arguments is over the question of how much is necessary. How much must humans do in their own behalf in order to be fully human? [...?]

We have no way to work at this question, it seems to me, except by perceiving that, in order to have the world, we must share it, both with each and with other creatures, which is immediately complicated by the further perception that, in order to live in the world, we must use it somewhat at the expense of other creatures. We must acknowledge both the centrality and the limits of our self-interest. (Berry 1987: 148).

This is exactly why usual discussions on the question of needs are so sterile, for, as part of the modern ideology, they focus on the centrality of self-interest without weighing it against the limits of self-interest. What the American philosopher Wendell Berry says so limpidly is that needs can only be defined in its tension with sharing.

Sharing, however, is alien to the modern economic world, governed by the postulate that there is no absolute scarcity, that relative scarcity is alleviated through individuals' competing in the economic arena, and that this competition eventually benefits all participants.⁵

This postulate, which in a different form can be traced back at least to Mandeville (see Dumont 1977), provides the ethical foundation for freedom in economic matters in capitalist societies. It also legitimises the practice of determining distribution within the economic sphere, in sharp contrast with non-capitalist societies where the distribution of goods was/is socially or politically determined. In those societies, the problem of subsistence, and correlatively of scarcity, were not the responsibility of the individual, but that of the community. Hence the individual's prior strategy was to remain part of the community. Such a strategy was political, and not economic.⁶ Needs and sharing; were therefore simultaneously defined in opposition to one another. By separating "society into an economic and political sphere", the self-regulating market did nothing less than evict sharing from the set of basic elements sustaining society (Polanyi 1944: 71).

As a consequence the difference between need and greed is blurred, transforming people's needs into a playing ground where greediness and survival mix, thus rendering it more difficult to speak of other people's needs, and in the end of responsibility towards others. And in its ultimate evolution (and contradiction) modern society has even instituted the need for greed.

For at least another hundred years we must pretend to ourselves and to everyone that fair is foul and foul is fair; for foul is useful and fair is not. Avarice and usury and precaution must be our gods for a little

longer still. For only they can lead us out of the tunnel of economic necessity into daylight. (Keynes 1963: 372)

To summarise, the installation of greed as an engine of growth displaces people's capacity to speak about needs and sharing. It further undermines the capacity to build some common goal, and to make people responsible for the achievement of this goal. Whereas the development process has hitherto been about breaking boundaries in the world, circumscribing it, allowing for margins, as Berry would say, is a condition of development, of democracy, of humanness. It is no more true that everybody's greed can provide for everybody's need, and it is time to remember Gandhi's words, that the earth can provide for everybody's need but not for everybody's greed.

Conclusion

Perhaps the main advantage of the concept of *de-responsibilization* is that it cuts through different disciplines—at least economics and politics—and that, ironically, it does not bring forward an evident solution. Ironically, for it has often been the case that analyses of failures of development have focused on one aspect of the question, thus coming up with magical solutions, which eventually proved just as futile as all the others.⁷ One can be forgiven for being suspicious of such analysis.

It is clear from the list of points made above that neither a purely economic nor political solution will do. Local participation, for instance, is no panacea, for it does not solve the question of integration of the community with the larger society, and thus of uncertainty and disembeddedness (at least).

In fact the issue is not about the mis-functioning of one institution (say the market or the state) but about the coherence of the different institutions regulating a given society, in short, of governance. And what may be possible

somewhere might not be possible in another society, because the nature and history of economic, social, and political institutions, the cultural milieu, and even the nature and history of ideological controversies will put barriers on what is politically feasible in a certain context (Banuri 1992).

The path towards *responsibilization* is not a straight line but involves rather the convergence of a network of single paths. The main one perhaps is to bring back the issues at a level at which they can be discussed. As Berry (1987) argued, there is a futility about global thinking for its rhetoric is necessarily out of context. One prescription is therefore to re-create local social responsibility through the strengthening and creation of local, social and political institutions, at levels at which common issues can become public matter.

At the national level, one of the main goals of the government should be to stabilise the politico-economic environment in the country. Beyond the traditional stabilisation economic policies, it includes the maintenance of an independent judiciary that could guarantee the normal functioning of civil institutions (like the market) and improve public service, so that public functionaries act in national interest rather than for their own interest. Instead of filling the spaces—“It is [always] the role of the government”—the government, as any institution, should have a clearly defined role so as to create a space in which responsibilised people can act.

The Case of Pakistan

Pakistan—Land of the Pure—was created in 1947 out of the Muslim majority provinces of former British India. This child of colonialism comprises today the desert landscape of Balochistan in the west, the rich Indus Basin which runs across Punjab and Sindh, and the high mountains of the North West Frontier Province and of the Northern Areas.⁸

At first sight, Pakistan could be held as a perfect example in support of neo-Malthusian views. A soaring population—growing at 3.1 percent a year—, an environmental crisis coupled with limited resources—NCS (1991) has clearly shown that the country will not be able to provide for the 400 million people expected to live there in 2035—, imbalanced record of economic growth (see table 1.1), are the basic elements which suggest that population growth restrains development. To take but one example, the building of new shelters has not been able to keep pace with the high rate of population growth, thereby leading to an increase of the number of persons living in the same house (NIPS 1988). Moreover, high illiteracy rate and a strong tradition of large families makes it easy to advocate that population growth is an altogether independent process.

Table 1.1: Comparative Statistics on Social and Economic Development

| | Pakistan | Low Income Countries | Middle Income Countries | Industrial Countries |
|--|----------|----------------------------|-------------------------------|-------------------------|
| GNP/capita 1989 (\$) | 370 | 30 | 2040 | 2.4 |
| Growth rate of GNP/capita 1965-89 (% per year) | 2.5 | 2.9 | 2.3 | 2.4 |
| Infant mortality rate 1989 (per thousands) | 106 | 70 | 51 | 9.0 |
| Life expectancy 1989 (yr.) | 55 | 62 | 66 | 76 |
| Illiteracy 1988 (%) | | | | |
| Total | 70 | 44 | 25 | - |
| Female | 81 | 58 | 31 | - |
| Daily calories supply 1988 | 2,200 | 2,331 | 2,834 | 3,398 |
| Primary enrolment 1988 (% of age groups) | | | | |
| Total | 40 | 103 | 105 | 103 |
| Female | 28 | 101 | 95 | 102 |
| Maternal mortality rate 1980 (per 100,000 live births) | 600 | - | - | - |
| Total fertility rate 1989 | 6.6 | 3.9 | 3.7 | 1.8 |
| Government revenue (% of GNP) | 17.8 | - | - | - |
| Budget deficit (% of GNP) | 7.0 | - | - | - |
| Expenditure on: | | | | |
| Education | 1.2 | | | |
| Health | 1.1 | - | - | - |
| Defence | 39.9 | - | - | - |
| (% of Government expenditure) | | - | - | - |

Source: WB 1991

The different case studies show how, at the local level, this view does not hold, notably because changes brought about by economic or political forces overwhelm any possible impact of population growth. Here, we review the different sectors—population, environment, and development—at the national level.⁹ At this level again, the question

is whether population growth has had an impact on national environmental changes or on economic development, notably through specific government policies. The review shows three things: first that development at the national level has followed a path broadly independent with population needs. Thus the imbalanced growth record appears clearly as a consequence of political choice rather than as a consequence of population growth. Second, that the existing institutions have been unable to implement some political decisions, notably regarding family planning and rural development. Third, that there are family planning and rural development. Third, that there are several features, reviewed in the conclusion, which are in clear contradiction with the neo-Malthusian approach.

The following paragraphs, therefore, set the stage for the different case studies. What is particular in the different villages will then be seen as the epitome of a larger situation.

Population

One of the major dynamics of evolution of the Pakistani society has been the very important rate of population growth. From a mere 34 million in 1951, the population has grown at an annual rate of 3.1 percent to 114 million in 1991. It is expected to reach 200 million around 2010 and 400 million around 2035. Pakistan, now ranked as the tenth most populous country in the world, has the highest population growth among the ten most populous countries along with Nigeria. Put another way, Pakistan covers only 0.67% of the world's land, contains 2% of world's people, and in the next ten years is expected to account for 4% of the world's population growth.

This high population growth is due to high and sustained levels of fertility (a sustained crude birth rate of over 40 per thousand) and rapid decline in mortality in the 1940s and 1950s (from about 43 per thousand prior to 1941 to 23 per thousand in 1953-61 to around 11 now), commonly attributed to the introduction of modern medicine and various public health measures.

Although life expectancy has been rising in the last decades, it remains lower than average in low-income countries. Similarly, infant and maternal mortality rates have remained particularly high (106 per 1000 and 600 per 100,000 respectively), pointing to a lack of basic health throughout the country. In this line also is the high rate of illiteracy (see Table 1.1) which compares unfavourably with other low-income countries.

The total fertility rate has remained very stable during the last decades, currently about 6.5 living children per woman. Contraceptive usage rates among ever-married women remain below 10 percent despite of 25 years of an official Population Planning Programme (see below). These figures are respectively high and low when compared with other South Asian and Islamic countries (Table 1.2). High and stable fertility levels are the proximate cause of rapid population increase. A corollary is the youthful age structure of the population, with about 45 percent under the age of 15, which creates a heavy dependency on the adult population and the potential for further rapid growth.

Table 1.2: Fertility and Contraceptive Use

| | Total Fertility Rate (1990) | Contraceptive Use (1985-89) |
|------------|--------------------------------|--------------------------------|
| Bangladesh | 5.3 | 25 |
| India | 4.3 | 35 |
| Morocco | 4.6 | 36 |
| Nepal | 5.7 | 15 |
| Pakistan | 6.2 | 11 |
| Sri Lanka | 2.6 | 62 |
| Tunisia | 3.7 | 50 |

Source: UNDP 1992

These figures hold for all regions and for both rural and urban areas. Thus, exposure to urban facilities and the 'modern outlook' did not have the expected effect of lowering fertility rates in urban areas. The only significant

variable associated with lower rates of fertility is post primary education of women.

Wide disparities in rural densities of population and migration are another important element of the population profile. It must be noted, however, that growth of cities is mainly the result of natural increase (up to 70 percent between 1972 and 1981) rather than in-migration (22 percent respectively). Migration still poses a dilemma: retention of the population in the rural areas will lead, in some cases, to an over-exploitation of the local resources, thereby jeopardising further development. On the other hand, massive rural-urban migration will put an excessive burden on already over-crowded cities, with the absorption cost out-weighing the benefits in terms of economic growth.¹⁰ Hence, “from a sustainability point of view, the most important issue is where rural-urban migration emanates from” (Qutub 1992: 49). Migration is needed in fragile ecological zones while retention is needed in the robust ones.

Policies

At the national level, such a rapidly growing population has been perceived as a problem and a major impediment to social development issue since the early sixties.¹¹ However, until now, the issue has been approached in a purely sectoral manner, with a focus on the spread of contraceptive usage. But even this limited goal has remained out of reach, possibly because of the inconsistency of the approaches followed, the lack of coverage and, in the end, the lack of political will (Sooro and Ali 1981; Manzoor 1991).¹² However, the government had committed itself to lower the population growth rate down to 2.5 percent per year by the year 2000.

The Pakistan Family Planning Programme was started during the third five-year plan (1965-70). The first programme was

based on widespread dissemination of family planning information through mass media and other means of communication. A new programme was started in the mid-seventies, based on the inundation approach to contraceptive distribution and backed by an army of motivators as part of the Continuous Motivation Scheme. The programme was interrupted between 1977 and 1979 following the change of political regime and the rising opposition from religious leaders.

Today, the programme has been restructured into the Population Welfare Programme (PWP) which functions mainly through a number of Family Welfare Centres (FWCs) spread throughout the country (1254 centres in March 1991, with an average of only 152 clients by centres). It is supported by the Information, Education and Communication (IEC) programme whose goal is to create family planning consciousness and inculcate a small family norm. The PWP logo stating that 'two children make a happy family' can be viewed on television, in the newspapers, in hospitals or heard on radio. In 1988, a study showed that 73 percent of people surveyed were familiar with family planning messages carried out by the IEC programme (Rukannudin, et al 1988).

Environment

We treat here only issues related to rural areas.

Natural Resource Endowment

Table 1.3 Trends in Land Use

Total area = 79.61 million hectares. (million hectares)

| Land Use | Reported Area | Forest Area | Not Cultiv. | Cultiv. Waste | Current Fallow | Net Area Sown | Sown more than once | Cropped Area |
|----------|---------------|-------------|-------------|---------------|----------------|---------------|---------------------|--------------|
| 1947-52 | 46.33 | 1.38 | 20.73 | 9.19 | 3.74 | 11.27 | 1.04 | 12.31 |
| 53-57 | 46.61 | 1.27 | 20.68 | 9.10 | 3.53 | 12.03 | 1.30 | 13.33 |
| 58-62 | 49.46 | 1.46 | 19.76 | 11.25 | 3.90 | 13.09 | 1.52 | 14.61 |
| 63-67 | 52.20 | 1.92 | 18.57 | 13.00 | 4.81 | 13.90 | 1.89 | 15.79 |
| 68-72 | 53.22 | 2.31 | 20.13 | 11.53 | 4.76 | 14.49 | 2.14 | 16.63 |
| 73-77 | 54.09 | 2.83 | 20.74 | 11.00 | 4.69 | 14.83 | 2.95 | 17.78 |
| 78-82 | 54.82 | 2.82 | 20.28 | 11.51 | 4.77 | 15.43 | 3.78 | 19.22 |
| 82-87 | 57.96 | 3.03 | 22.69 | 11.72 | 4.88 | 15.64 | 4.39 | 20.03 |

Source: National Commission on Agriculture (1988)

Pakistan has 79.61 million hectares of land within its borders, of which 57.86 have now been surveyed. Approximately 20 million hectares are used for agriculture (16 million in irrigated areas, the rest in barani areas). The vast bulk of the land is in forest or rangeland or unutilisable (see table 1.3).

Between 1947 and 1989, the “total cropped area” expanded by a total 8.2 million hectares, of which 4.3 million hectares were due to the extension of irrigated cropping in new areas, while the balance resulted from an increase in the area double-cropped. Double-cropping has become in the recent years, the major reason for increase of the total cropped area, and it is constrained today by the availability of water.

However, gains in productivity per hectare rather than extension of the total cropped area seem the best prospects for increasing output in the future. In fact, Pakistan's crop production per hectare is one of the lowest in the world¹³, despite good natural endowments, especially in the Indus Basin. This is attributed to the poor quality of

soils, notably a deficiency in organic matter, and different socio-economic constraints, such as the system of land tenure and poor access to modern inputs.

Pakistan has one of the poorest forest endowments in the world, but yet it is difficult to get a precise idea of the areas covered, notably because in the different surveys, forests are defined as lands belonging to the Forest Department irrespective of the number of trees on them. However, widespread anecdotal evidence suggests that there has been a significant reduction in natural forest over the last 30-40 years (NCS 1991; GOP 1991).

Table 1.4: Overall Water Availability (MAF)

| Year | Surface of Water at | | Ground Water | | Total Water Available |
|---------|---------------------|-----------|--------------|-----------|-----------------------|
| | Canal Head | Farm gate | Public | Private | |
| | | | Tube well | Tube well | |
| 1975-76 | 98.91 | 59.42 | 6.61 | 19.63 | 85.95 |
| 1976-77 | 97.33 | 58.40 | 5.65 | 20.52 | 84.57 |
| 1977-78 | 102.69 | 61.62 | 6.21 | 21.61 | 89.44 |
| 1978-79 | 96.63 | 105.24 | 6.62 | 22.79 | 87.44 |
| 1979-80 | 105.24 | 63.14 | 7.03 | 23.79 | 94.14 |
| 1980-81 | 104.81 | 65.21 | 7.44 | 25.14 | 97.79 |
| 1981-82 | 102.83 | 64.39 | 8.16 | 26.31 | 96.45 |
| 1982-83 | 108.73 | 65.24 | 9.96 | 26.29 | 101.40 |
| 1983-84 | 100.51 | 66.47 | 10.20 | 27.02 | 103.69 |
| 1984-85 | 98.43 | 59.50 | 10.08 | 27.75 | 102.81 |
| 1985-86 | 96.34 | 60.81 | 10.74 | 28.48 | 104.73 |
| 1986-87 | 97.57 | 69.69 | 10.84 | 29.19 | 109.72 |
| 1987-88 | 15.10 | 71.24 | 11.06 | 29.92 | 112.22 |

Source: Agricultural Statistics of Pakistan (1989)

Water, as noted, is today Pakistan's critical resource as it is the binding constraint on future agricultural development. The main source of surface water in the Indus Basin irrigation system, one of the largest and oldest in the world, which covers about 70 percent of Pakistan through an extended

network of canals. The total length of the officially managed main canals alone is 57,000 kms. Altogether, from the 137.2 million acre-feet (MAF) of ground water available on average, about 104.5 MAF are diverted at canal heads. But only about 30 percent of this amount reach the crop root. The rest is lost in canals and watercourses or during application in the fields.

Groundwater is a secondary or derived source: Of the estimated 46 MAF annual recharge of groundwater, more than 41 MAF are drawn up by tube-wells or open wells and used.

Environmental Problems

Just as one cannot speak of a population problem without referring to the environment that supports it, one cannot speak about environmental problems without referring to population. In this sense, the major environmental problem is whether or not it will be robust enough to provide for the growing population. Since this is precisely the subject of the case studies, to give a broad picture at this point would render vain the rest of this volume. What should be noted, however, are the national level constraints: full utilisation of land and full utilisation of water.

In this line, the major issues of concern in the rural areas are: soil degradation (loss of organic content); water pollution because of run-off of pesticides and fertiliser as well as underground seepage; water-logging and salinity; deforestation, when it leads to increased soil erosion or when it undermines further supply of fuel wood; and rangeland degradation due to over-grazing and pasturing.

For the rest, specific issues, relevant to each case study, are presented in the corresponding chapters.

Institutions

The government institutions for natural resources management are sectorally organised, in line with the general arrangements between the Federation, provinces and local bodies (see below).

For environmental protection and the prevention of pollution, the Environment and Urban Affairs Division (EUAD) was established in 1974. However, it has a staff of only four professionals, none of whom are environmental specialists.

At the local level, land and revenue settlement, demarcating state, private and common property, is the function of the district administration under the provincial boards of revenue, while the forest departments oversee local rights to produce in forestlands.

It has been noted that traditional local institutions have been undermined by the development process, and that it has led to weaker forms of management of natural resources. This is one of the hypotheses that the current study was set to inform. In any case, the experiences of some NGOs throughout the country have shown the possibilities of local participation on the path of sustainable development, and focus on institution building is indeed a central element of the National Conservation Strategy.

Development

The colonial experience had led to a centralisation of decision-making throughout the sub-continent, and after independence matters did not change much. Pakistan embarked on an ambitious programme of development based on centralisation and five-year plans, so as to transform its inherited agrarian economy and upgrade its rather poor physical and social infrastructures. In part, such a strategy was required for security reasons because of the sensitive relations between Pakistan and India.¹⁴

Be that as it may, the record of development in Pakistan during the four decades of independence is strikingly imbalanced (Table 1.1;

Banuri 1992). Despite a fairly respectable growth performance—the GNP has grown at an average of 5.2 percent annum over the period—there has been no significant improvement in meeting the basic needs of the population. As seen previously, indicators such as infant mortality or literacy rates place Pakistan under the average achievement of other low income countries.

Institutions

Pakistan is a federation of four provinces and as such allocation of functions and distribution of revenues between federal and provincial governments assume great significance. The distribution of functions between federal and provincial government in Pakistan is governed by the 1973 constitution. It allocates defence, external affairs, foreign aid, banking and currency, air, sea and rail transport, national highways and strategic roads, communications, oil and natural gas, as well as environment, law and order, labour legislation and population planning, to the federal government. Major responsibilities of provincial governments include education, health, agricultural support services, maintenance of irrigation system, provincial and rural roads and internal law and order.

Table 1.5: Public Expenditures and Revenues: 1984-85 and 1990-91

| | 1984-85 | | | | 1990-91 | | | |
|------------|--------------|---------|-------------|---------|--------------|---------|-------------|---------|
| | Expenditures | | Revenues | | Expenditures | | Revenues | |
| | Million Rs. | Percent | Million Rs. | Percent | Million Rs. | Percent | Million Rs. | Percent |
| Federal | 90,074 | 73.8 | 73,105 | 88.4 | 198,801 | 77.7 | 172,206 | 91.2 |
| Provincial | 26,745 | 21.9 | 4,298 | 5.2 | 47,705 | 18.6 | 7,173 | 3.8 |
| Local | 5,177 | 4.2 | 5,294 | 6.4 | 9,039 | 3.6 | 9,346 | 5.0 |
| Total | 121,996 | 100.0 | 82,697 | 100.0 | 255,815 | 100.0 | 188,725 | 100.0 |

Source: GOP 1991

In turn, provincial governments have delegated or shared some of their functions with local governments, including provision of basic rural and urban infrastructure such as roads, portable water and sanitation. Yet local institutions are still far from autonomous or effective. They depend upon the provincial governments for the bulk of their finances, are subject to supervision by provincial department

for local governments and their power of making and implementing laws is virtually non-existent.

Although provincial governments raise revenues, these cover only about 15 percent of their expenditure (see Table 1.5). The rest is met by allocations made by the federal government. Deficits in provincial budgets until 1990-91 were financed through special subventions made by the federal government to provincial governments. Similarly, expenditure at local level is financed through taxes and tolls raised by local governments, returns on remunerable projects and grants from the provincial governments.

This structure creates several problems. First, since provincial governments cannot chalk out their programmes independently, their priorities are vulnerable to competing federal priorities. Second, uncertainty looms around implementation of the provincial programmes. Third, it creates an incentive for over-spending by the provinces.

Policies

In short, Pakistan has a relatively centralised system of macro-economic management, focussed on economic growth and the maintenance of external solvency. In the last two decades, two different political regimes have predominated: the Keynesian-populist regime of Zulfikar Ali Bhutto from 1971 to 1977 and the structural adjustment regime thenceforth.

The Bhutto regime was brought in following violent reaction to precedent policies that, by focusing too heavily on growth, has led to a polarisation of the society between the rich getting richer and the poor poorer (Kemal and Mahmood 1992; Ercelawn, et al 1991). The new regime changed the economy from a private to a mixed one and vastly increased state expenditure through public investment, employment creation, subsidies and social services. An important part was for development, whose share in the total expenditure soared from a negligible level in 1971 to 38 percent in 1977. These

policies created an important budget deficit and reduced the level of economic growth, eventually leading to its demise.

Table 1.4: Shares of Total Expenditure

| Years | Total Expen | Devel. Expen. | Current Expenditure | | | | | | |
|---------|-------------|---------------|---------------------|---------|----------|-----------|-----------|-----------|--------|
| | | | Total | Defence | Interest | Subsidies | Gen. Admn | Soc. Serv | Others |
| 1971/72 | 100 | 1.6 | 98.4 | 52.0 | 20.7 | 0.0 | 9.4 | NA | 16.3 |
| 1975/76 | 100 | 38.3 | 61.8 | 25.1 | 7.6 | 9.2 | 4.5 | 1.3 | 14.1 |
| 1976/77 | 100 | 42.8 | 57.3 | 23.1 | 7.9 | 6.9 | 4.5 | 1.6 | 13.3 |
| 1977/78 | 100 | 37.5 | 62.5 | 23.7 | 8.2 | 8.0 | 5.7 | 5.2 | 12.5 |
| 1978/79 | 100 | 37.7 | 62.3 | 21.0 | 8.1 | 9.8 | 5.4 | 6.0 | 12.0 |
| 1979/80 | 100 | 39.9 | 60.1 | 23.2 | 9.3 | 7.0 | 5.5 | 7.3 | 7.8 |
| 1980/81 | 100 | 38.5 | 61.5 | 24.5 | 9.4 | 6.6 | 4.6 | 8.0 | 8.4 |
| 1981/82 | 100 | 37.3 | 62.7 | 26.2 | 10.8 | 3.5 | 4.8 | 7.6 | 9.8 |
| 1982/83 | 100 | 33.7 | 66.3 | 26.7 | 12.6 | 3.2 | 4.7 | 8.5 | 10.3 |
| 1983/84 | 100 | 28.0 | 72.0 | 26.8 | 14.1 | 4.7 | 6.1 | 9.8 | 10.6 |
| 1984/85 | 100 | 28.3 | 71.7 | 27.3 | 14.1 | 4.6 | 5.6 | 9.0 | 11.1 |
| 1985/86 | 100 | 29.6 | 70.4 | 26.5 | 14.7 | 4.2 | 5.5 | 9.2 | 10.3 |
| 1986/87 | 100 | 23.7 | 76.3 | 27.1 | 15.7 | 3.8 | 6.8 | 10.1 | 12.8 |
| 1987/88 | 100 | 25.9 | 74.1 | 26.1 | 18.4 | 4.4 | 4.7 | 9.6 | 10.9 |
| 1988/89 | 100 | 23.9 | 76.1 | 25.4 | 18.9 | 6.6 | 5.1 | 9.6 | 10.5 |
| 1989/90 | 100 | 25.1 | 74.9 | 26.5 | 20.7 | 5.1 | 4.7 | 9.0 | 8.9 |
| 1990/91 | 100 | 25.6 | 74.4 | 25.7 | 22.3 | 3.6 | 4.8 | 8.1 | 9.9 |

Source: GOP 1991

The military regime that followed launched a structural adjustment policy, as advocated by the IMF and the conditions set in return for loans.¹⁵ The main tool for domestic adjustment was a decrease in expenditures. The most affected sector was development expenditure, which declined from 37 percent in 1980-81 to its present level of 25 percent. Similarly, the share of subsidies decreased sharply from 12.9 percent in 1979-80 to a mere 3 percent in 1982-83. Social services have also been affected, especially at the end of the eighties when its share of total public expenditure fell from 10.1 percent to 9.3 percent. Banuri, Kemal and Mumtaz (1992) note that social sector expenditures are highly correlated with aggregate public expenditures, meaning that as public expenditures decline as a percentage of GNP as part of the structural adjustment plan, it leads to a parallel decline of the share of social expenditures in terms of GNP. By contrast, the compounded share of defence and interest has increased from a low 29 percent in 1978-79 to 48 percent today, which shows that these two sectors have been highly protected during the adjustment process. These figures echo what we had hinted at earlier, that is the federal priorities (defence for national cohesion, debt repayment for national solvency) command over provincial priorities (such as social services).

An interesting example of the failure of the government to improve the condition of the poor—and one that is particularly relevant for this study—is the story of the succeeding rural development programmes. Although the Pakistani government has traditionally favoured industrialisation, it has also continuously initiated different rural development programmes, from the Village-Aid programme (1952-61) to the People's Programme (1989-90). In spite of declared intentions to focus on local participation, self-controlled by the centre, which tried to co-ordinate the services of all the provincial development departments right down to the village level. In the end, these programmes have achieved little towards reducing poverty and social, or regional, inequalities (H. Frey 1989, Haider 1991, Siddiqi 1980).¹⁶

In the end, it is worth noting that the alleviation of poverty and the general amelioration of the conditions of life which have occurred during the 1970s and the 1980s are mostly imputable to remittances sent back by Pakistani workers in the Middle East and to the development of a large informal sector. In other words, to factors that are beyond the scope of the government.

Conclusion

This short review of population, environment and development profiles of Pakistan has brought up some questions, which cannot be answered within a neo-Malthusian framework. For instance: why is population growth as important in urban areas as in rural areas in spite of higher literacy rates and easier access to contraceptives; why has there not been more support for family planning policies; why has awareness of environmental degradation been initiated by urban elite rather than by those who are in direct contact with the issues; why have rural development programmes failed so dramatically.

In the end, it seems that there is a problem of communication between the government and the population. In one direction, the needs of the population are not treated as priorities by the government; in the other direction, government policies do not gather

the participation they would require to be successful. The result is bad governance on one side and de-responsibilisation on the other.

Endnotes

1. For a review of anthropological works showing how all societies have exercised some form of population control, see Carr-Saunders (1922), Ford (1952). (Cited in Simon 1981).
2. An oft-cited argument is that it is an optimal strategy for the poor to have many children; and even more, that is their only survival strategy (see for instance Hamdani 1973). However, such a strategy is new, just as population growth is quite a new phenomenon. Thus, it is a response to a new situation, brought about by the experience of development.
3. By development, we mean here the process of market-building and state-building which integrate more extensively and more intensively people into a larger political and economic framework.
4. In the case of the setting of national parks and other reserves, see Ghimire (1992b).
5. For a complete discussion of absolute versus relative scarcity, see Barbier (1989). A perfect example of the modern credo is Simon (1981).
6. In his work on the issue, Karl Polanyi wrote: "The outstanding discovery of recent historical and anthropological research is that man's economy, as a rule, is submerged in his social relationships. He does his social standing, his social claims, his social assets.... The individual's economic interest is rarely paramount, for the community keeps all its members from starving unless it is itself borne down by catastrophe, in which case interests are again threatened collectively, not individual. The maintenance of societies, on the contrary is crucial." (Polanyi 1944: 46).
7. In case of the current fashion for economic liberalisation, see Banuri (1991).
8. In 1971, former East Pakistan fought for its independence and gave birth to Bangladesh.
9. The sections on population and the environment draw heavily on NCS (1991) and Pakistan's National Report to UNCED, GOP (1991).
10. Qutub (1992) notes that at current standards the per capita absorption cost in urban areas is 6 times larger than in rural areas. He cites the national Human Settlements Policy Study of Pakistan that estimates that in that at best an annual 6.9 percent GNP growth will cover only 49 percent of urbanisation costs.

11. It would be inappropriate to present here some ‘consequences’ of population growth, since this is precisely the heart of the matter.
12. The failure of the programmes is even more striking if we consider that the women bear, on average, two more children than they would desire (Ahmed and Ali 1992).
13. For instance wheat production is 44% of that in Mexico; rice, 43% of that in Egypt; maize, 33% of that in Turkey; sugarcane, 66% of that in India.
14. The dispute over Kashmir has led the two countries to war on three occasions—in 1948, 1965 and 1971—and remains very sensitive up to this day.
15. Pakistan took a loan from the IMF assorted with some form of conditionalities for 1979-80, 1980-81 to 1982-83 and again in November 1988.
16. J. Siddiqi, commenting on the different rural development programmes, wrote:

“Each rural development programme was launched with great fanfare raising hopes to revolutionise the rural areas. But it ended up with poor implementation at the field-input level, making little dent in rural poverty. (...) The findings disclosed that the major beneficiaries, whatever the few benefits, were from the upper rural strata. (...) This further strengthened the existing power structure and kept the inegalitarian rural social structure intact. (...) Each subsequent programme ignored the lessons of the past, causing much waste of resources and the loss of public credibility about the programme.”

Case Study from the Coastal Area of Pakistan

Franck Amalric and Sarah Javeed

Introduction

Rehri and Lad Basti are two fishermen villages that lie on the banks of the Korangi creek in the Indus delta system, are about forty-five minutes drive from the centre of Karachi. This proximity to the megalopolis raises the question whether to consider them representative of rural communities. However, as their economic organisation, centred around fishing, seems similar to the kind of organisations that can be found deeper in the Indus delta, and that the degree of their direct interaction with the city close-by is limited, it can be assumed that these villages still function as independent communities. This means that the two villages are physically outside the city regardless of their closeness to it, and have an independent political organisation. Hence, as each 'community' is clearly enough defined as the inhabitants of one of the villages, it is possible to meaningfully carry out our study on population growth and environmental degradation with a particular focus on community decision making (see chapter 1). For the record, it must be noted that these villages are among the few coastal villages where fieldwork could be undertaken safely, because of political unrest in the other parts of the coast.

The current study was undertaken in Karachi in October 1991. It consisted of open-ended interviews with different members of the community, including the headman of the Lad Basti, middlemen, boat owners, fishermen, school teachers, social workers, health workers, housewives, NGO representatives, children. Altogether, about fifty people were individually interviewed in the villages, and more participated in group discussions. Secondary data were mainly drawn from earlier studies made in the villages as part of the IUCN-Korangi ecosystem project.

General Profile of the Region

The Korangi creek, on the banks of which Rehri and Lad Basti lie, is the most (north)-western creek of the Indus delta (see map 1). The villages stand on the thin (and shrinking) buffer zone between the coastal part of the delta and the growing megalopolis of Karachi. This zone, 500 to 1000 metres wide, is bounded towards the south by the creek and mud flats on which mangrove trees grow, and towards the north by a 50-foot high cliff which is also a natural boundary for the city (see fig. 1).

Reliable demographic statistics are not available for the specific area under study, since the censuses do not always differentiate between the localities. However, according to the 1981 Census, the population of Rehri was 12,429.

The best estimate available is the one done by the IUCN (1987) Socio-Economic and Public Health Survey. The total population residing in the Korangi area was estimated to be approximately 100,000. According to the survey estimates, the population of Rehri was 18,500 and that of Lad Basti 2,500. The method of estimation used was to multiply the number of dwelling units (which were counted) by the average number of residents in the dwelling units, derived from surveying systematically one dwelling unit out of every twenty counted.

Mangrove Ecosystem

The entire coastline of Sindh is studded with mangrove forests. They are a principal coastal feature of tropical and sub-tropical climates and cover mainly estuaries, as they need a certain amount of fresh water. The ecosystem, in which they play a central role, is characterised as open. Mangroves receive and produce a large amount of organic material exported from the system and utilised by a large variety of organisms such as fish, shrimp, etc. They also function as nursery grounds for larvae, fish fry, crustacea, etc., adults of which often live in other offshore-ecosystems. Finally, they form a natural protection for the coastal area against the erosive action of the sea.

All this makes the mangrove forests a central element for the economic development of the area. Besides protecting the coast, it also provides a sustained supply of fuel wood and timber to the entire population residing along the seacoast, and helps to balance the ecosystem that provides livelihood to the coastline population through fish and shrimp catches. The preservation of the mangrove forest is therefore on the agenda of any sustainable development scheme.

Expansion of Karachi

Karachi has emerged as a megalopolis and an industrial centre after independence. The population of Karachi was 136,000 in 1901, 387,000 in 1941, 1,068,000 in 1951 and 5,208,000 in 1981. After independence (1947) Karachi attracted Pakistani migrants (through the urbanisation process) together with a high number of refugees (from India in 1947, from Bangladesh and India in 1970). It is today the biggest city in Pakistan with an estimated population of eight million.

Karachi is also the main industrial centre in Pakistan. Among the major industries in the vicinity of Rehri and Lad Basti are four major power plants, two steel mills, one paper mill, two oil refineries, a cattle colony and nineteen tanneries. Air pollution does not appear to be a great problem in the area. The major emitters of air pollutants, such as the power plants and steel mill,

have controlled emissions via reasonably tall stacks providing good dispersion. In addition, the meteorological conditions are particularly conducive to the dispersion of air pollutants.

As with air pollution, the major industrial units produce the largest quantity of liquid effluent, but this probably has less impact on the environment than the large number of smaller industries. The steel mill, for example, discharges very a high quantity of iron-bearing particulate. However, this will have little impact upon the environment other than a small local reduction in productivity due to reduced light penetration, and local modification of the composition of benthic communities due to amended particle size distribution. The tanneries, which by comparison produce a relatively small volume of effluent, which is high in suspended solids, organic load and toxic metals, is discharged untreated into the Korangi *nullah* system. This surface drainage system is totally unable to cope with such effluents, which can consequently enter the environment via a number of pathways.

Another important environmental impact of the major industrial and power units is the 'sterilisation' of large quantities of water used for cooling. Given the relatively restricted turnover of water in parts of the creek system, and the importance of this area to the larvae of numerous marine organisms, thermal effluents are considered to be an important and growing stress factor on the mangrove ecosystem.

However, a baseline survey of marine pollution in the Korangi-Phitti Creek area concluded, after analysing a set of sediment, sea water and biota samples collected from the area, that the pollution did not present an immediate problem in the zone. (IAEA 1987)

Theoretical Interlude

Before entering into the study of the two villages, it seems necessary to give a short theoretical indication on the approach followed. The goal is to clarify the rest of the exposé.

To analyse the inter-linkages between population growth, environmental degradation and economic development is, by essence, an inter-disciplinary task. One possible *démarche* would be to study separately each field, and eventually try to link them together. Another possibility is to find a 'point of entry' into the organisation of life in the villages, and build upon this point of entry to capture the other characteristics of the village. This point of entry should clearly correspond to what appears to be the central organising factor of the villages. This is the *démarche* followed in this report. The risk, however, is to become prisoner of the discipline to which pertains the point of entry chosen. The risk is even greater when, as it is the case here, this point of entry pertains to economics, which, as a discipline, has tried to explain every and anything. A bias of this approach could be, for instance, to try to account for high fertility rates by focusing only on the economic value attached to children.

There is also a wide bias in the literature on sustainable development to consider the environment only as an economic good. To incorporate the environment into the economic discipline is as simple as adding a 'sustainability' constraint to the classical maximisation programme (Barbier 1989, Pearce 1991). The rationale behind this *démarche* is to create a device through which decisions can be made. However, to argue that the environment must be quantified to be taken into account in a decision making process assumes, seemingly without problems, that all decisions are economic by nature.

Yet people will take decisions 'economically' only in the realm of things which they perceive as relevant to economics. There are clearly different ways of perceiving the same thing: one is economically, another is morally, and another still can be religiously and so on. It follows that if we want to understand the rationale behind people's behaviour we have to understand the way they compartment their perception of the world into economic, moral, religious, and other spheres. Doing so will also

lead to introduce people's imagery as actor in the socio-economic realm.

In this perspective, our analysis of the two coastal villages tries to grasp the economic dynamics of development as well as the way development changes people's perception of what it is that they can do, what is that they control, what is that they feel responsible for, what is it that they think is *just* for them, and for others, to do.

We firstly argue that 'development' in Rehri and Lad Basti has taken the form of turning outward of the mode of production because of modernization of life in the village through commercialisation. Credit became essential to the economic organisation, and this is because it also became the centre of a particular system of exploitation, linked with political control, that the turning outward process was consolidated. Thus, for the villagers the experience of development is not one of widened possibilities of action, but on the contrary, of de-responsibilisation. We will then be able to interpret how the environment is managed and perceived, and thereby deduce some policy implications.

Characterising 'Development' In Rehri and Lad Basti

The two villages are old settlements with people living there for about four hundred years. Some more recent immigration took place, from some remote places in the Indus Delta for economic reasons, or from India following the 1965 war. In both villages, new settlers still live apart from the rest of the villages in straw and wood huts, whereas other houses are partly *pakka* or concrete structures.

All inhabitants from Lad Basti and some from Rehri belong to the Karmati tribe and are also called Jats. Women from this clan observe strict *purdah*. Thus they remain most of the time indoors and only on rare occasions do they cross the village limits. Furthermore, no outsider (male) is allowed to enter the village

boundaries, and only close relatives are allowed inside the houses. The Jamoots, the other clan in Rehri, is by contrast more liberal towards women, who participate more in outside labour activities.

Both villages have electricity. There are two primary schools (one for boys, one for girls) in Lad Basti, and four in Rehri. However the girls school in Lad Basti is not in operation currently as there is no teacher. Although people do acknowledge the importance of education in theory, school attendance is quite small and parents often argue that “yes, we would like to educate our children, but what is the use since they will become fishermen like us.” In Lad Basti, 85 percent of the population is illiterate (IUCN 1987).

Production

Fishing has always been the main activity in Rehri and Lad Basti, as the land in the area is of poor quality and today about 85 percent of the workers are fishermen. However, this activity has been subject to a small revolution in the last thirty years, mainly due to the emergence of an international demand for Pakistani fish, especially shrimps, and the development of the poultry industry and its requirement of fishmeal as an important input. As a consequence, a technological revolution took place in the fishing sector changing its orientation from that of a subsistence activity to one geared largely for commercial production.¹

The initial capital that made this transformation possible was mainly provided by outsiders—merchants or businessmen engaged in the export of fish—whose interest was to secure a steady inflow of fish. (In Lad Basti, part of the initial capital was provided by the ‘headman’ of the village who owns land further inland). The outside investors entered the village through ‘middlemen’, usually members of the fishermen communities, whose role was to grant loans directly to the fishermen. This mechanism of credit has been central to the transformation that

has taken place in the villages. We shall come back to it in details.

In Rehri and Lad Basti, this process was somewhat moderate and the fishing production still uses a mixture of traditional techniques and modern technology. The large trawlers that dominate the industry in Karachi have not been introduced in the villages, where fishing takes place on two types of boats built in the village. The first one is sailboats, which average 25 to 30 feet in length. Most of them also have a small engine. These boats require hired hands and in certain seasons go out in the open sea. The second type is small boats of 6 to 10 feet length, which are operated by family members, and propelled by a small engine. However, with these boats, fishermen cannot earn enough to subsist on.

The wood used for the building of boats is imported from Punjab and Bangladesh, which replace the indigenous wood of lesser quality used in the past. Similarly, nets, which used to be woven in the village, are now imported from outside. This is just one of the many traditional crafts that have disappeared in the villages, due to the appeal of 'modern' goods,² and to the emigration of craftsmen (like carpenters, masons, etc.) attracted by the high wages offered in the city.

Another change linked to the production process is that ice has become necessary to store the catch, because boats go to sea for long periods, and because catches (especially shrimps) are not consumed in the village. Ice is bought in cash from nearby factories, (which in Lad Basti belongs to the family of the 'headman' of the village).

All these changes have rendered cash necessary for the production process. Even more so, the availability of cash is today replacing co-ordination of labour³ as the main requirement. Some fishermen told us that they worked only when they needed money urgently. Hence, if that was not the case, and if a boat-

owner would ask them to work for him, they would refuse. In short, the inter-dependence that previously existed between the fishermen has evolved into the dependence of fishermen upon the givers of credit.

Social organisation

This shift is the reflection of larger social changes brought about with the technological revolution. Social stratification today is organised around three main classes:

- *Khalasi*: *Khalasi* are fishermen who do not own (large) boats⁴ but work as hired hands on the boats of others. Around 80 percent of the population engaged in fishing are *khalsis*.
- Boat-owners: about 15 percent of the population engaged in fishing own boats larger than 20 feet. Most of the boat-owners in Rehri have borrowed money from middlemen for the construction of their boats and the engines.
- *Bayparis*: *Bayparis* are middlemen. They purchase the fish from the fishermen and then sell it to the Karachi market. They also make arrangements for providing credit to the boat-owners and supply nets, ice and provision for the crew.

Bayparis also existed in the pre-modern⁵ order. They used to sell fish from the village to the city and buy agricultural goods. However, their importance has risen dramatically with the technological revolution. Whereas before they held a marginal position in the life of the village (since subsistence rested on indigenous production), they are now at the centre of the economy of the village, because they control access to the exterior economy. On one hand they are the agents of city merchants who want to secure a steady inflow of fish. On the other hand, they are the ones who provide credit to the fishermen without which production could not take place. As Ismail (1990) concludes:

Thus the major impacts of the technological revolution [in Indus-Delta-based fishing

communities] can be said to be increased social differentiation, with a dominant role for fish merchants and middlemen, and a shifting of the centre of the system outside the fishing community to the source of credit and market for the output (p. 5).

The two parallel shifts (centre of production outside the boat to the fisherman-middleman relationship; centre of the system 'development' in the village. They correspond to two shifts of focus: from the fellow fisherman to the middleman, from the village to the outside world. Central to these transformations is the mechanism of credit, to which we now turn.

The loan mechanism

Loans in Rehri or Lad Basti work the following way. When a fisherman needs money, he goes to see the village headman, whose house is located in the village, and to whom he addresses his request. The conditions of repayment form the centre of the bargaining process that takes place directly. In taking a loan from a middleman, the fisherman promises to sell him his catch at a price lower than the market price, usually 50 percent lower. Out of these 50 percent, 10 to 20 percent are for the loan repayment, the rest for the middleman's services. From the rest of the catch is deduced the functioning costs (fuel, net, etc.) and the remaining is equally divided among the number of crewmen plus one for the owner of the boat. The deal is such that the fishermen are almost never able to pay back their loans, because they always need a new one (for a new net or a new engine) before the previous one is paid back. They remain indebted all their lives to the middlemen to which they must abandon the control over the catch. In Rehri, most fishermen are indebted up to 30,000 to 40,000 rupees for monthly earning averaging 1500 rupees.

As soon as the two parties have reached an agreement, the headman pulls out a stamp paper that both parties sign and then gives the money to the fisherman. The whole process does not take more than an hour or two.

This process differs from usual market transactions on two important points. The first one is that there is no credit market as such: the credit transactions are interlinked with transactions involving the product of the fishing activity. The second one is that these transactions are highly personalised (the headman and the fisherman know each other and have worked together in the past) and contextual (it takes place within the village and the modalities of repayment are set in accordance with the specific conditions of the life in the community). It is not a clear-cut independent event in the life of the fisherman, but a component of the whole production process and takes place within the order defined by the organisation of the community.

Hence two questions arise: what is the rationale behind this type of transactions? What are the consequences of it on people's behaviour? We shall argue that these credit transactions⁶ have created and presented a situation of exploitation of the fishermen by the middlemen.

The middleman economy

What must be first considered in the discussion on the organisation of the economy in Rehri and Lad Basti is the clear and visible state of exploitation in which the fishermen live. The first thing that strikes the observer upon his arrival in Lad Basti is a huge, one storey-high modern house that emerges from the centre of the village and above surrounding small mud-houses. The owner of the house is at the same time head of the village, banker, middleman, judge, peace-enforcer, counsellor.... He alleges that he derives his wealth from the fishing business. This seems possible in the light of Hassan's estimates that a middleman in the Keti Bunder⁷ can make as much as 720,000 rupees a year compared to the fishermen's 6000 rupees.

This system of exploitation is not based on the ownership of capital, or on a special organisation of production, but on the control of the marketing process.

The services rendered by the middlemen are to provide credit and to market the catches in Karachi. Taken separately, these two types of services could well be priced as function of the price of credit and of the price of transport respectively. However, the linking together of the two different services deters straightforward pricing. In a way, they become unquantifiable and in fact unquantified: during the loan transaction, what is discussed is the rate of interest to be paid to the middlemen; but the amount the middleman receives for his other services (mainly transporting the fish from Rehri to Karachi) is never spelled out. And it is this unquantifiability that creates the possibility of exploitation.

Another benefit the middleman derives from this kind of transaction is that it gives him control over the catches without incurring the cost of controlling the production process. In fact some fishermen claimed that they could organise their work, as they wanted. Moreover, such a control would be particularly costly here because of the kind of activity involved: work on a boat cannot be subject to the same kind of discipline as work in a factory (the cost would be even higher in the case of small scale boats).

We have explained how the mechanism of credit, under the form of interrelated transactions, led to a system of exploitation. That the middlemen want to preserve this system is straightforward. How they manage to do so, especially when there is, as in the two villages under scrutiny, an alternative to loans from middlemen, namely government loans, remains to be analysed.

It is not how the moral economists argued in different contexts, because the fishermen also want to preserve the existing system. Witness to this are the numerous fishermen who complained about the inefficiencies of the headman of the village (who is also the middleman. *cf.* further down) or their reports of physical hardship for those who disobeyed the orders of the middlemen.

The explanation lies in that the alternative is not really an alternative, and that it is hard to seize it. First, there is the cost of entering the impersonal credit market. As seen previously, taking a loan from the middleman is embedded in the life of the village. By contrast, to get a loan from the government requires the submission to an order that is alien to the organisation of the community. This order takes the form of a series of steps the fishermen must follow to get a loan. Among them are to go to the city; to fill lengthy information forms; to wait some time before a decision is taken and the loan granted; to repay back the loans monthly instead of as part of the catch. In this case, the process is more impersonal and non-contextual. The mere going to the city represents a break in the life of the fishermen. To these 'cultural' costs must be added the often required bribery to the government agent, as many fishermen reported. All these obstacles add up to a sunk cost that a fisherman might not afford.

Second is the nature of the relationship of a fisherman with the middleman, which links them almost for life, and therefore does not allow the former to take new decisions. Rebellion for the individual is very difficult since there is almost no possibility for him to escape the influence of the middleman within the community (even if a fisherman can buy a boat without getting indebted to the middleman, he will still remain dependent upon him for the marketing of the catches). And rebellion of the entire community is in part impeded by the dividing effect of the 'outward shift'.

Environmental Degradation: The Need for Management Environmental pressures

There are three main environmental problems in the Korangi Creek area: shortage of water, waste disposal, depletion of the mangrove forest.⁸

The shortage and poor quality of water has been emphasised as the main problem of the area by the villagers throughout the

survey. This corresponds to the IUCN (1987) survey, in which 78 percent of the persons interviewed said that the shortage of water was the main problem.

In Lad Basti, after several deaths occurred because of bad drinking water in 1962, the government laid a pipeline (which was completed about two or three months after the deaths). Today, most of the households have private taps from which water is available ten hours per day.

In Rehri, people get water from community taps or private taps linked to a pipeline. But water flows for only half an hour per day. During that time people pump water and store it for the rest of the day. There is also a spring in the village, but the water is brackish and not suitable for human consumption. The villagers told us that several people died because of bad drinking water in the past months (one villager reported five cases of cholera in the last two months). People's response to this has been to complain to the headman, who said he would do something. But, yet to the dismay of the villagers, nothing was done. As we asked the villagers why they did not try to cope with the problem themselves (as, for instance, reopening wells that were used in the past), they dismissed the whole idea by arguing that it is the government's responsibility to find a solution. They also strongly blamed the headman of the village for his disinterest.

Solid waste disposal is again more acute in Rehri than in Lad Basti. In the former, there is no agreed upon way to dispose waste. Hence, most people just throw their waste out of the door into the street. The result is streets and beaches covered with plastic bags and other solid waste. The problem has become more acute with the consumption of non-recyclable products (plastic bags) and growth of the population. During several conversations the villagers stressed this state of things. And to the question why nothing was done about it, they answered that they could not do anything about it and that again, like the water problem, it was the government's responsibility to clean the

streets. And indeed, a municipal employee comes once a week in the village to pick up the waste. But, as we could tell by walking in the streets, the system is inefficient. We also suggested to a group of fishermen that they could dig a ditch somewhere in the village surroundings where everyone would have to bring their solid waste. This suggestion made them laugh, and they answered that nobody would accept such a digging on his own land. Following this line of reasoning, the streets and beaches being common, it is somewhat logical that they are the places where waste should be disposed.

Over-cutting of Mangroves: The depletion of the mangrove forest is seen as a major environmental threat. It is a result of 1) a reduction in fresh water flow, 2) a reduction in silt deposition, 3) browsing, and 4) over-cutting. Preliminary estimates from satellite images reveal the extent of the reduction in the total superficially covered by mangroves from 260,000 hectares in 1977 to 110,000 ha in 1990 (Peter-John Meynell: personal communication).

- Though mangroves are tolerant to saline water they depend upon a steady supply of fresh water to keep the salinity level within certain limits. The number of barrages built along River Indus has considerably reduced the flow of fresh water, and this is certainly the single most important factor affecting the mangroves (IUCN 1991).
- Another consequence is the reduction of silt deposition: silt, which was brought by the Indus river, acted as a fertiliser and improved the physical texture of the soil thereby accelerating the growth of trees.
- The Sindh mangroves play an important role in providing animal feed. Mangrove lands serve as rangeland for goats, buffalo's and camels. The damage on account of browsing by camels is serious and extensive (CEMK, chap 3). The camels migrate from the interior of Sindh to the mangrove forests for the flood season, from June/July to October. They are owned by professional grazers and are destined to

be sold predominantly to Arab countries. The herds of camels are left on coastal islands, usually at the same site year after year, and freely browse on the mangrove leaves.

- Mangrove wood is, or was, used for many purposes: as fuel-wood (its predominant use today), as timber for all purposes except boat making: anchorage, fencing material, fishing enclosures, etc. But mangrove wood is neither good fuel wood nor timber. Traditionally, ‘tai’ wood was preferred for fuel wood, but with its depletion, a direct consequence of the reduction in the flow of fresh water, people turned to the only available resource: mangrove.

The importance of the mangrove was formally acknowledged in 1958 when it was declared “Protected Forest” by the Forest Department with the provisions that, except with the permission of the Forest Department, it was prohibited:

- to cut any tree in the mangrove area, which were declared as reserve trees; or
- to cut or remove any other vegetative growth (including grass or cultivation of any type), to break the soil or remove soil or stones, to graze or browse any animals in the area, or to alter any other works inside the mangrove area.

This seems to be the first attempt made to manage the use of mangroves. There is no trace of a past traditional community level management of the mangroves.

The regulation may appear strict but the Sindh Forest Department never had the means to implement it. In the Korangi Creek area, people still cut the mangroves freely without any respect for the existing regulation.

After several years of planning, a working plan for the management of coastal forests was written in 1961. Among the goals stated were to maintain and improve the existing forests, to supply firewood to the local demand, and to provide sufficient

grazing grounds for camels. Some felling, grazing and lopping rules were installed as to gear the exploitation of mangroves towards sustainability.

The problem was therefore perceived as a problem of “how to exploit” and not so much as “how much to exploit”. The mangroves were perceived as potentially able to provide for the local demand inasmuch as the exploitation was done in a correct manner. This is also the conclusion drawn by the CEMP on the impact of browsing.

However, villagers do not recognise that the forest might be threatened (see Box). To substantiate this view, villagers in Lad Basti gave us the example of a field on which the forest had been cut down ten years back by the government to make salt ponds. This enterprise turned out to be unprofitable and was abandoned, and eventually the forest grew back. There is more to this example than the mere fact that the forest quickly grows back. There is the idea that the environment evolves under the action of nature and of the government, but that the villagers have no role to play.

Box 1:

| People's perception of the environment in Rehri | |
|--|----------------------|
| Attitude of Fishermen Regarding the Ban on Prawn/Shrimp Fishing | |
| Good: 12.8% | Bad: 87.2% |
| Fishermen's Observation of Ban | |
| Observe: 23.4% | Not observe: 76.6% |
| Use of Mangrove Trees for Fuel/Firewood | |
| Use: 91.7% | Not use: 8.3% |
| Respondent Perception Regarding Disappearance/Reduction of Mangroves | |
| Will disappear: 0% | Not disappear: 91.7% |
| | Don't know: 8.3% |

| | | |
|--|------------------|------------------|
| Respondent Perception Regarding the Change of Growth of Mangroves over the Last Three Years | | |
| More Dense: 61.5% | Less Dense: 1.8% | No Change: 24.8% |
| Don't Know: 11.9% | | |

Source: IUCN (1987)

The three environment problems have two things in common: that the villages, as communities, can do something about them but that they do not; that the villagers ask the government to find solution, as far as to clean their front doors! The first point is political, and the problem seems to be a lack of impetus for the community to organise itself. The second is a problem of perception of what development is.

Population pressure

Population growth is very important in the villages as in other parts of Pakistan. It is clear that population growth increases existing pressures on the environment: more people means more people to share the limited supply of water with, more waste produced, more cutting of mangroves for fuel-wood, and higher density of population.

It is hard to draw any lessons concerning population growth from this case study for it appears that high fertility rates are a characteristics of all case studies of this project (see other chapters). In fact, a large number of children is not characteristic of one particular setting, but is common to the whole of Pakistan.

Undoubtedly, people of Lad Basti and Rehri are conscious of the fact that their population is fast increasing. However they do not consider it as a main problem. Both Lad Basti and Rehri have large household sizes (around 10 to 9 respectively, IUCN 1987) compared to Pakistani standards (6.2, 1981 Census).

The main reason for high fertility rates is perhaps the unwillingness of the people to intervene in such matters. There is no doubt that people tend to have a fatalistic approach to the

issue, following the idea that such matters are left to the will of God. Hence, although a majority of the people is aware of family planning, there is very little practice.

Moreover, a large family, and more precisely many sons, is perceived as strength for the family. Each son represents an opportunity for the family to break away from poverty. So the more sons, the more opportunities. A typical example is this fisherman whose three sons work outside the village in the nearby Korangi, and bring back money. And interestingly enough, the headman of Lad Basti has twenty children from two wives.

Community-level decision making, community-level action

In Lad Basti⁹ a strong *biradiri* system prevails. All inhabitants belong to the same family, and like any traditional *biradiri* set-up, there is a *biradiri* head, Sabboo Din. Sabboo Din is also the union councillor for Chasma Goth, Lad Basti, Haji Amin Bahra and partially Rehri, as well as the head of the *Panchayat* of Lad Basti. All community decisions in the village are decided by him, and his influence is preponderant even when the *Panchayat* is consulted in case of feuds and other differences: he is the community-level-decision maker. As a fisherman put it: "Life in the village is good if the headman cares for the villagers; if he only cares about sitting on his money [like in Rehri] then life is miserable."

However there is a difference, and it is an important one, between community level decision-making, and community level actions. If the former is a precondition for the latter, it does not imply it. The difference lies in the difference between authority and legitimacy. We want to argue in this section, that although the headman of the village embodies community decision-making by deriving his authority from being the main middleman, he has neither the legitimacy or interest to encourage or organise certain community actions, and furthermore that this organisation of power has been strengthened by the role played by the state.

Sabboo Din derives his authority and legitimacy from being the main middleman of the village and from having strong political contacts with the outside world. Thus this authority is based on the organisation of the economy, but is not subject to the organisation of production. It is not contained within the village, but lies outside of it. His power is symbolised by the extent to which the government (or other exterior organisations) invests in the village: the government installed a pipeline for water, built a road to the village, two schools, two dispensaries (one of which is still under construction), a new pier, and set up a typing school (which teacher is paid by the government). To the question why the government provided so many facilities to the village (in comparison with other villages), Sabboo Din answered that he had good contacts, and that “this is how things work here.”

This authority is clearly strong enough to implement decisions at the community level, as exemplified by the ban on the use of ‘*bula*’ nets, which were jeopardising the sustainability of fishing in the creeks.¹⁰ Several fishermen from both villages also acknowledged that the authority of the headman could be, if necessary, enforced physically. There is therefore no lack of community-level authority.

As noted above, the villagers put the responsibility for solving the water shortage and waste disposal problems in the hands of the government through the headman. These are not marginal examples. They reflect the fact that in both villages the headman is perceived as the person to whom complaints are to be addressed, but not the person who is in charge of implementing a solution. In short, the headman is more of a spokesman than of a leader, and it is to the government that falls back the responsibility of action. That both the headman’s authority and the responsibility for action are located outside the village is not a coincidence: this only can assure the perpetuation of the organisation of the village.

By providing a solution to the people's problems through his connections the middleman reinforces his prestige and the view that he is a necessary figure to the village. On the contrary, by pressing the villagers to act, he would give away some of his power, since it would show that some actions can be undertaken by the villagers themselves instead of by the government through the headman. Moreover, it would provide an opportunity for action, and as Paulo Freire (1970) has stressed, only through action can the oppressed liberate themselves.

Managing the environment

If the organisation of the village in Rehri and Lad Basti are the same, there is an important difference in its degree of efficiency, as witness the fact that Rehri is dirtier and the fact that villagers in Rehri have a more acute water problem.

The difference stems from the nature of the system of organisation itself coupled with the fact that Rehri has larger population than Lad Basti. Hence, the interest of comparing Rehri and Lad Basti lies in that it reveals the shortcomings of their particular system of organisation in managing population growth.

It must also be noted that the headman of Rehri seems less willing to respond to the villagers' pressure. This can stem from a lack of interest. Some villagers in Rehri said he was just interested 'to sit on his money and get far'.

Be that as it may, the impact of population growth on the environment will depend on the nature of the management. In other words, the impact will not necessarily be direct because the form of management distorts it and because population growth may distort the form of management. This is illustrated by the different extent of environmental degradation in Rehri and Lad Basti. Each environmental problem previously identified will be considered in turn.

Water: As stated above, the problem here is mainly one of limited supply of drinking water in Rehri. Population growth will only make the problem more acute. The way people have hitherto responded to the issue was by bringing their complaints to the headman, and by asking him to find a solution with his contacts outside the village. By way of consequence, the protests will become louder and louder as the problem gets more and more intractable. In other words, population growth and severe water shortages will lead to greater confrontation with the headman, who thus acts as a buffer between village pressure and the people outside the village responsible for the issue (here the provision of water).

A possible solution is that the headman will respond positively to this louder noise, and will find a solution with the help of the government. This is the solution that was reached in Lad Basti on the same issue of drinking water. It is also the one that will preserve the existing socio-economic order.

If for one reason or the other this solution fails, than it is well possible that a small revolution will take place in the community and that will overthrow the headman. What will bring the new order is clearly open to question.

Waste disposal: The way this problem is managed is comparable to the way water is managed. Pressure from the population will have to increase up to a certain level before it can be translated into an action taken by the government through the headman.

In both villages, the same solution to waste disposal was reached: a government employee comes to each village once a week and picks up the waste. However, if this solution is quite efficient in Lad Basti, it is clearly unsatisfactory in Rehri because of too large a population.

The point is that the management of waste is not flexible to population growth. As population increases, more waste is produced while the capacity for recycling this waste remains constant. This is due to the fact that the villagers do not participate in the recycling process. Otherwise, each additional producer of waste would also be an additional recycle of it. Hence the problem is not necessarily inherent to population growth, but to the form of management, which cannot adjust to a growing population.

Over-cutting of mangroves: The case of over-cutting of mangroves is different because there is no particular management of the forest, neither by the village nor by the market. The mangrove forest is not yet a limited resource for the villagers, who freely use mangrove wood as fuel wood. However, this practice is almost exclusively followed by traditional fishing villages. Surrounding villages less than two kilometres away from the coast prefer using other kind of sources of energy. Hence, except for the selling of the wood in village stores, there is almost no commercial use of the forest. One of the reasons for this is that mangrove wood is neither adequate for building purposes neither very good as fuel wood.

Be that as it may, a growing population in the villages will increase directly the cutting of wood. It is here a typical Malthusian case: more population leads to a greater pressure on the environment that may eventually lead to environmental degradation. However, we can doubt whether this is indeed the main threat to the forest.

A Certain Conception of Development

The initial project of modernity, of which development theory is just an offspring, was to liberate mankind from all kinds of uncertainties and irrationalities. The idea was to enhance man's control over his environment, be it natural or societal. Science was to bring 'freedom from scarcity, want, and the arbitrariness of natural calamity' (Harvey 1989: 12).

It is interesting to confront this project (which could be a general definition of development) with the way fishermen in Rehri and Lad Basti have experienced development: clearly not as an empowering process but more, as we previously argued, as a de-responsibilising one.

It is true that the fishermen's cognitive space has expanded, in the sense that they are more aware and conscious of the happenings in the world. And they also have more access to a broad range of modern goods, such as nylon nets, engines, TVs, VCRs to cite but a few. However the shifting-outward process that characterises development in the village (centre of production outside the boat to the fisherman-middleman relationship; centre of the village system outside the village to the city) is not an opening up of the system so it can be filled from outside but a displacement of control, of responsibilities, from the interior to the exterior. Hence, although the cognitive space has expanded, the space in which people can act and feel responsible for may well have been narrowed.

The transformation of the environment under the action of the government is, besides the shifting/outward process, another element that forms the reality of the villagers' losses of control. Big factories (among others steel mill, several power plants) have been built around the creek and can be seen from the villages. Port Qasim, the second largest port of Pakistan, has been built in a nearby creek. Another port is under construction in the creek, just ten miles away from Rehri, as well as a larger road along the creek. There is also the example of this field near Lad Basti where the government cut the forest to build salt ponds before eventually pulling back.

But there is another dimension to the issue, the ideational dimension, which deals with how people perceive and *imagine* the world and development. For only an analysis of this dimension can explain why the villagers show no impetus, nor

even the idea, to organise themselves, or at least ask the headman to organise them. We have noted how villagers dismissed the idea of community self-help (in such matters as waste disposal for example) with a laugh. Development is the matter of the government.

There is a similarity between the way the fishermen invoke the government to solve their everyday problems and the way they argue that 'God will provide' when inquired about the risk of depletion of the forest or about the difficulties to provide for a large family. These invocations delimitate both the real space in which people can act and the imaginary space in which they think people should act.

At first glance, these cries of 'God will provide' or 'it is the responsibility of the government' may seem fatalistic, and as such not worthy of further scrutiny. A more fruitful approach is to consider them as a particular form of a more general behaviour, comparable for instance to the Muslim's cry of *Insha Allah* or to a Christian crossing himself/herself. In his essay "Common Sense as a Cultural System" (Geertz 1983), Clifford Geertz argues that these behaviours function as a way to "seal up" one's perception of the world, as a device that circumvents the extent to which the world is always put again into question. In this view the Muslim's cry of *Insha Allah* (for instance) does not function as a submission of man to the will of God, but as the recognition of the boundedness of man's control over things, just as, for instance a driver cannot control all the unponderables on the road however well he might he might drive. But this cry will carry some meaning insofar that a man does his best in that part of activity for which he is responsible. It is because the driver recognises that he cannot control all the variables on the road that he can concentrate on what he does control, thus that he can be *responsibilised*.

It is this conviction of the plain man that he is on top of things, and not only on economic things, that makes action possible for him at all, and which—here through invoking witchcraft to blunt

failures, with us by appealing to a long-tradition of cracker-barrel philosophising to commemorate successes—must therefore be protected at all costs. (p.80)

Shifting back to the villagers in Rehri and Lad Basti, their repeated invocation of the government can be interpreted as a way to secure the domain of action in which they feel responsible. In the midst of the development trend that tends to further and further de-responsibilise them, it is necessary for them to delimitate the government's sphere of intervention, and in retrospect, the sphere in which they can act. Conversely, if the fishermen were to claim responsibility for things for which they are, in fact, not responsible, it would only mirror their powerlessness and enhance their helplessness. Their claiming, loud and strong as they did, that they could organise their work as they wanted takes now a clearer meaning.

Another interesting analogy of 'God will provide' is one with the teachings of old traditions, as, for instance, expressed in Jesus' saying: "Therefore take no thought, saying, What shall we eat? Or, What shall we drink? Or, Wherewithal shall we be clothed?... But seek ye first the Kingdom of God, and His righteousness; and all these things shall be added unto you." (Matt. 6: 31, 33, cited in Berry 1987). For the American philosopher Wendell Berry (1987), this passage from the New Testament would be meaningless if it was to be interpreted as the uselessness of all economic activity. Rather, it sets an order of priority, 'to seek the Kingdom of God first', instead of concentrating one's attention on one's work. Wendell Berry interprets it as the priority of the 'Great economy', that is the economy of Nature, over the 'little economy', that is the economy of humans. By recognising the priority of the 'Great economy' over the 'little economy', man recognises the essential appurtenance of the little economy to the Great economy, and therefore the need to live in harmony with it.

If we alter slightly the definition of the 'Great economy' as the economy which is beyond man's control, than, for the fishermen,

it becomes the economy of Nature and the economy of the government. Thus such answer as 'God will provide' or 'it is the responsibility of the government', which for the modernist may seem fatalistic, only reflect people's effort to live in harmony with an environment that they less and less control. It is, in a way, the perfect non-revolutionary attitude. For Paulo Freire, "liberation is a praxis: the action and reflection of men upon their world in order to transform it" (1970: 66). By assimilating Nature and the government as agents of the 'Great economy', the villagers in fact negate the possibility of liberation, just as they negate the possibility of thinking their liberation by sealing their world view with cries of 'the government will provide'.

The two analogies suggest a different conception of how scarcity and action are related, one for which the existence of scarcity must be negated to render action possible, contrarily to the modern conception for which the existence of scarcity gives the impetus for action. Why then does the former view appear to predominate in Rehri and Lad Basti while the latter view generally predominates in the 'modern world'? Part of the answer is to be found in the particular association between economic development and the realisation of the modern project in the modern world.

Modernisation theory, mainly based on economics, has commonly blurred the difference between the realisation of the modern project and the dynamics of economic growth. More precisely, the realisation of the modern project was perceived as the driving force of economic development. The striving for 'freedom from scarcity, from want and from natural calamities' was mistaken for economic incentives. Yet, economic incentives, mainly under the form of money, are first and foremost incentives for economic power, in other words endowments that will enable persons to complete over the distribution of existing goods. Hence, economic growth results by essence from a struggle for power, not from a struggle for the alleviation of the sense of scarcity.¹¹ Hence, the conception that action is a reaction to the

existence of scarcity is a confusion between the dynamics of the economic struggle (action) and some of the consequences of this struggle (in some cases, the alleviation of scarcity).

Interestingly enough, the modern world has its own 'God will provide', which functions quite in the same way as in Rehri and Lad Basti, as boundaries for action. The recurrent assertion that 'Science will find a solution' to the problems of the depletion of non-renewable resources is perhaps one of the most striking example. Such a statement seals people's perception of the world, and makes them blind to the realities of environmental degradation as to make them avoid having to question their way of life. More generally, the faith in economics, be it economics as economic growth or economics as regulation, function as a screen to hide the many deficiencies of modern civilisation. Action in the economic sphere has become so predominant in modern life because scarcity in other spheres of life has been negated in one way or the other, but usually by confusingly incorporating them in the economic realm.

Shifting back to Rehri and Lad Basti, it is precisely the economic action that is denied to the fishermen. What appeared to be central to the organisation of the two villages is the credit mechanism based on interlinked transactions. Such setting is not specifically particular to those villages, and has been extensively discussed in the rural development literature. The main debate perhaps has been between the 'Moral Economy' view, developed by Scott (among others) on grounds laid by Polanyi, and the 'Political Economy' view developed by Popkin (again among others). The debate is in fact a debate on what approach to follow in studying villages; in Popkin's words, "villages are best viewed as corporations, not communes, and [...] patrons with multi-stranded ties to peasants are best seen as monopolists, not paternalists." (p. 4) And this is indeed the way we have viewed the headmen in Rehri and Lad Basti: as monopolists, who to preserve their monopoly, had to play at being paternalists. However, characterising in economic terms the middlemen's

behaviour does not imply by way of consequence that the same is valid for characterising the fishermen's behaviour. Do they behave in accordance with perceiving the middlemen as paternalists or as monopolists?

The epitome of the answer is given by this previously cited remark made by a fisherman: "Life in the village is good if the headman cares for the villagers [i.e. if he is a patriarch]; if he only cares about sitting on his money [i.e. if he is a monopolist] then life is miserable." The way the villagers behave in the public sphere is ingrained in this way of thinking; their strategy is to make the headman of the village indeed behave as a patriarch. That they remain indebted to the middlemen without trying to get loans from outside; that they report every happenings in the village to the headman; that it is through the headman that they seek a solution to any of their problems; that the government, behind the headman, is responsible for every and anything—from cleaning up the streets to managing the forest; all tend to show that the headman-middleman is viewed (willingly) as a patriarchal figure, and not as a monopolist against whom alternatives have to be found.

In the same line, the dialogue between the headman and the villagers is not based, to use Hirschman's terminology, on the possibility of 'exit', so characteristic of (market) economic transactions, but on the use of 'voice', characteristic of political spheres. In other words, the villagers' power to act upon their life is not economic—because of lack of endowment and of the lack of adequate of institutions—but lies in their capacity to influence the headmen through repeated complaints.

At this point, we can only note that the ideology followed by the state in Pakistan, and the view that development can be best fostered by plannification and a 'top-down' approach, can only have enhanced the villagers' perception of development as a de-responsibilisation process.

What all this comes down to is that the villagers' behaviour are not just the consequence of excessive fatalism or of misplaced religiosity, but stems from a particular perception for the world which has been built in response to the experience of this world. Their 'learned helplessness' cannot be transformed into instant actions and initiatives by the mere pointing out to things to do or to things that need to be done in their own interest. It has been a long time since experts have started pointing out the dangers inherent to the pursuit of modern life style, but it seems still a long way before people decide to do something about it.

Conclusion

It appears quite clearly from our analysis that population growth is not a direct cause of environmental degradation in Rehri or Lad Basti. In the case of the depletion of the mangrove forest, one could argue with Shaw (1989) that population growth does have an impact, but that it is only a proximate cause aggravating the effect of an ultimate cause, namely the reduction in the flow of fresh water. In the cases of water and waste, the main issue is that of the political organisation within the villages, and has very little to do with the level of population growth.

At first sight, one could think that the villagers have a very fatalistic approach to life. Including on such matters as health, fertility, development, conservation of the forest, etc. But our point, as presented at length in the preceding section, is that there is 'no fatalism about fatalism'.

Such a view is a rebuke to Shaw's argument. In short, Shaw argues that since the ultimate causes of environmental degradation cannot be acted upon, we should concentrate on reducing exacerbating factors such as population growth or mismanagement. However, to be able to act on these latter causes necessitates to responsabilise people for these issues. Yet, the very reason why people do not feel responsible in the first place for things that have a direct effect on their lives is because they

know that there exist ultimate causes that they cannot control, but that other people can, notably the government.

From this analysis stems two major prescriptions as initial steps towards coping with environmental degradation in the villages, and notably conserving the mangrove forest.

First, a priority should be to clearly delimitate the intervention of outside actors in the area. This includes the government, the Forest Department, Karachi Development Authority, Port Qasim Authority and the Authority governing over the flow of fresh water in the delta. This delimitation could be made by each agency separately. However, the possibility to control the implementation of the different acts seem quite weak given the general judiciary environment in Pakistan.

A more promising approach could be to organise a conference involving all parties and under the patronage of an outside agency whose neutrality would be recognised by all. The idea is that by dealing with all parties at the same time, at least the responsibility of the group to preserve the Mangrove forest will be recognised. How much of the forest each party is allowed to use during a certain period of time would then be determined in the presence of all the parties, which would therefore become mutually responsible of their engagements. The point is that the villagers cannot be asked to better manage and develop the forest if they have no say on how the resource will be used eventually.

Second, since local participation in Rehri and Lat Basti is constrained by the whole economic organisation of the villages, community level solution to environment problems (notably waste disposal and in a certain measure depletion of the forest) will necessitate the undermining of these organisations. Thus, in Rehri and Lat Basti, it would suppose a delinking of credit from the other services rendered by the headman/patriarch, as to open a new space in which people could start helping themselves. Providing the villagers with a real alternative to the existing credit

system could well be a first step towards tackling the different environmental issues. And in the end, it is only at this condition that the cost of excessive population growth will be felt.

Endnotes

1. The extent of this technological revolution can be gauged from the changing statistics relating to the fishing fleet: in 1959 the total number of vessels on the Karachi-Sindh coast was 1223 of which only 168 were motorised; in 1984 the corresponding numbers were 7125 and 4586 respectively (*Handbook of Fisheries Statistics of Pakistan*). This rapid development was fostered by government loans for the sector. They benefited mainly the large fishing companies in Karachi, which adopted modern fishing techniques.
2. This is not limited to goods used for the production process. There is a clear tendency, in the village, to buy modern goods, like televisions or even VCRs, at the expense of a betterment of the conditions of life.
3. For Platteau (1984), a traditional fishing village is “characterised by a high degree of economic interdependence among the households and by a comparatively low degree of class differentiations. The picture that emerges is one of a society where the product unit does not coincide with the household, and where very few households are self-sufficient in respect of their needs, labour and capital.” This is due to the difficulty for one household to own all the craft-gear combinations that are required during the varying fishing seasons.
4. Some of them do own small boats. But they have to work on larger ones to earn enough to live on.
5. By pre-modern understand before the transformation of the fishing activity.
6. This is a political economy approach. Another theory that stands out in the rural economy literature on multi-stranded transactions is the ‘moral economy’ theory, based on what is called the ‘subsistence ethic’. In short, the organisation of the economy based on interlinked transactions was argued to have an optimal organisation for communities living at the subsistence margin and facing high uncertainty as to their income. (Scott 1976) However, this view can be sustained only in those cases where the centre of the economic organisation is within the community, which is no more the case in Rehri and Lad Basti.

7. See Hassan (1990: 9). Keti Bunder is a small fishermen community in the Indus Delta.
8. We do not consider here is the larger problem of over-fishing of shrimps, for the production in the villages contributes very little to the national production. The villagers' perception of the problem is given in the box.
9. We concentrate now on Lad Basti but the organisation is similar in Rehri.
10. And fishing in the creek is the only means of subsistence for number of fishermen in the area. The headmen of the villages in the creek organised a meeting on the issue, which gathered the different fishing communities and the importers of net, and banned unilaterally the use of it within the creek. 'Bula' nets set in the creek would be withdrawn and burnt. Recalcitrant fishermen would be beaten up by headmen. All fishermen interviewed said that the ban was respected.
11. Consider a fully developed market (that is one in which none consumes what he produces) which production is a set (or pie) Q , and consider a potential investor (a person deciding to take a job is also an investor in the sense that he decides to invest is only driven by the desire to acquire a part of the initial pie (or Q). Hence, ex-ante, the driving force of investment is the desire to act upon the distribution pattern: it is a struggle for power. Only at the macro level and ex-post will the decision to invest result, under favourable conditions, in an increase in the size of the pie, hence in economic growth.

Case Study from the Northern Areas

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Introduction

The primary purpose of the study is to understand the interrelationship between demographic change, environmental degradation and livelihood systems. A major objective is to examine the collective response to the problem posed by rapid population growth in the northern mountains. The hypothesis that will be tested is that both population growth and environmental degradation are a reflection of the breakdown of systems of collective decision making. It is generally felt that traditional system of decision making have eroded during this century and that the erosion became more pronounced as the state and the market both began to intervene aggressively in the rural communities. The breakdown of the traditional system was not replaced by the establishment of alternative systems, but rather by a loose reliance on the state. This reliance has worked only in cases where the presence of the state is viewed as legitimate.

Methodology

The survey was divided into several stages. In the first stage the team reviewed secondary data for the selection of villages for the study. Eight villages were selected from the Northern Areas of Pakistan. The selection was based on factors that would enable

the survey team to study the variation and change in livelihood systems, population dynamics and environmental change. Some of the criterion used for selection were proximity to Gilgit, access from the Karakorum Highway, and cropping zone. The team conducted a rapid appraisal survey of all the selected villages. Table 3.1 below gives a brief profile of each of the villages.

Table 3.1: Profile of Selected Villages

| Name of Village | Valley | Number of households | Total Population | Area Under Cultivation (Knls ^a) | Cropping Zones |
|---------------------|-----------|----------------------|------------------|---|----------------|
| Sherquilla Hamochal | Punyal | 32 | 380 | 325 | Double |
| Rahimabad II | Gilgit | 70 | 560 | 2400 | Double |
| Chalt Chaprote | Nagar | 583 | 4400 | 45000 | Double |
| Broshal | Nagar | 105 | 1095 | 6718 | Single |
| Ahmedabad Bala | Hunza | 80 | 530 | 2936 | Single |
| Passu | Gojal | 70 | 610 | 1997 | Single |
| Risht | Chapurson | 30 | 210 | 1726 | Single |
| Misgar Paecen | Misgar | 72 | 500 | 800 | Single |

Note: a: Knls = Kanals = 1/8 acre.

A rapid appraisal of the eight villages was conducted by the entire team to identify issues that were relevant for further analysis. Semi-structured interviews were held with key resource persons and groups of villagers and preliminary assessments were made about the parameters that were important for the purposes of this study. The rapid appraisal survey was used for an understanding of the overall socio-economic issues confronting these high mountain communities.

Based on the rapid appraisal survey, a structured questionnaire was prepared and administered in the eight selected communities. The questionnaire was administered to 240 households through locally hired enumerators. About 30 households were randomly selected from each village for the questionnaire and it was administered to a male and a female member of each household. Thus our sample consists of approximately 450 respondents. The questionnaire was divided into four main sections: demographic

issues, environmental issues, economic activities and collective decision making.

Environmental Profile of the Region

The Northern Areas were isolated from the rest of the world until quite recently. They form the northern frontiers of Pakistan and share borders with China and Afghanistan. Four mountain ranges, the Himalayas, Karakoram, Hindukush and Pamir meet in the Northern Areas. These mountains vary in altitude from 15,000 to 28,000 feet and support life in narrow, inter-linked valleys between 4,500 to 10,000 feet above sea level. The environmental conditions in the area are very harsh and the livelihood support systems very meagre. In addition, the difficult terrain has kept the region secluded from outside developments.

As typical of any mountain environment, the Northern Areas display acute environmental variations, both horizontally and vertically. These variations are a consequence of a number of factors, principally, altitude, aspect, soil conditions, water availability, precipitation and temperature. Temperatures vary sharply between winters and summers. Winters generally witness temperatures decreasing to minus 10 degrees Celsius, with a summer time high of above 40 degrees Celsius. In addition, heavy snows in winters isolate the valleys from the rest of the world.

The Northern Areas are often described as a mountain desert as they fall in a partial rain shadow. The average annual precipitation for the Gilgit area is less than 10 inches, giving rise to virtual desert conditions. The name of the area Karakoram literally means crumbling rock. The area lies at the confluence of the Indian and Eurasian plates, and geological instability is a salient feature of the region. The Karakoram are very young mountains in geological terms and are still rising. Accordingly there is considerable erosion owing to the geological uplift of the region.

The resources base of the area is very meagre to begin with. There is very scant original vegetation in the valleys, and most of it is concentrated on higher elevations, and more inaccessible parts of the mountains. The vegetation consists mostly of short grasses and short coniferous forests on the northern aspects of the mountains. The northerly location of the area provides for less solar radiation on the northern aspects and thus allows greater moisture retention on them. The southern aspects get the bulk of the solar radiation and consequently retain little moisture to sustain any type of vegetation to speak of. The intensely cold climate of the region during winters, coupled with the extreme seasonal and diurnal ranges of temperature, precludes the possibility of the existence of the classical luxuriant coniferous forests of the type that can be found further down south. There are, however, a considerable number of small high altitude coniferous trees covering the northern aspects of the mountains. These trees have developed over a very long period of time owing to the paucity of soil nutrients available to them, and the unfavourable climate of the region. It also means that any forests already cut down have little chance of regenerating themselves for a long period to come.

Agriculture depends crucially on the availability of water. In most villages of the area, water is supplied by canals that catch water from glaciers. The mountain slopes around villages is thus clearly divided by the canal: below the canal, vegetation can grow and everything is green; above, the mountain is grey and brown, of the colour of the rocks.

Comparative Advantage of the Eco-Systems

The environmental resource base of the area is best visualised as a vertical system of livelihood. It is useful to think of the irrigation channel as a dividing line between the various economic zones of the village. The area below the irrigation channel comprises the cultivated area together with the human settlements. Land, which it is difficult to develop into terraces is

generally used for tree plantation. Trees are also cultivated along the channel to ensure its protection against erosion. The area above the irrigation channel consists of the marginal lands. These are either collectively owned or individually owned and are generally used for growing hardy fuel wood species, or for winter grazing. Newly reclaimed lands are generally used for the cultivation of perennial fodder crops, which are also efficient nitrogen fixers. At higher elevations lie the common property pastures, rangelands and the alpine forests. The transact presented in Figure 2 typifies a village in the Northern mountains.

Due to the existence of different eco-niches at each elevation level, land fragmentation occurs for two specific reasons; on the basis of male heirs in each household and on the basis of each heir getting a share in each of the eco-zones. It is through the successful utilisation of these microenvironments that the communities have sustained themselves by a diverse livelihood regime.

Diversity in economic enterprises was necessitated by an isolated and subsistence farming system. The restrictions on mobility imposed by the traditional Mirs (rulers) of the region, coupled with the actual physical inaccessibility of the region, restricted the people to working within their own spatially limited eco-niches. Their dependence on the environment in those days was much more direct, and the resources of their immediate environment much more critical to their survival. This system of land use thus made optimal use of the natural environment that existed in the region.

Environmental Change

Deforestation, soil erosion, productivity of the high land pastures, and glacial movements are some of the physical environmental changes of some consequence in the Northern Areas. Environmental change has occurred in the valleys due as much to natural causes as to the interaction of humans with their environment.

There is clear evidence of the deforestation caused by an increase in the human population. On the other hand there is very little evidence to support that overgrazing has seriously eroded the productive potential of the high land pastures. There is also little evidence to suggest that there has been any appreciable accelerated soil erosion induced by human activity. Erosion is an integral part of the natural cycle in the region and it is difficult to isolate evidence of accelerated erosion from natural rate of erosion. Glacial movements which disrupt the water sources of the irrigation system have a critical impact on the agriculture systems but are not in any way affected by the humans.

Response of the Community

The community's response to changes in the highly unstable ecological environment of the Northern Areas has been diverse, and in some cases, very innovative. In the survey villages, several examples of the type of environmental change listed above can be found. The response of the community is both at the individual and the collective level. At the collective level, the community in Passu has played an active role in the protection of their land against further erosion, by collectively building protective *bunds* in concrete along the riverbanks. Soil erosion has destroyed cultivated land in Passu. At one time, the problem was so severe that a major part of the population of 300 households left the village. In Chalt, e.g. the community grouped together and formed a forest committee to stop further destruction of their forests. Again, in Passu, the community collectively built a new irrigation channel after the glacial water source receded.

There is one singular feature about all these collective measures. They only succeeded with the intervention of an outside agent. The critical fact was not that internally, there was a breakdown in the traditional collective decision making process but that on its own the community had exhausted its internal resources for undertaking any of the tasks. The Aga Khan Rural Support Programme (AKRSP) provided the gabions and the technical

assistance for the Passu irrigation channel. In Chalt, AKRSP only provided a new vision about the future of forest resources. Once an outside agency provided the critical input, the traditional systems of collective management were very quickly brought together for resources protection and management.

Local Perceptions Regarding Environmental Degradation

Local perceptions regarding environmental protection are very closely linked with resource use and perceptions about scarcity. For this reason there is a difference in the manner in which environmental protection measures are taken and enforced by the community. The common property regimes for the forest resources and the high land pastures are less well developed by the community because in relation to these resources it has traditionally perceived labour as a scarce resource. Thus in relation to these resources it has economised the use of labour. Communities have justified the open use of forests by looking upon individual effort required to travel to the forest and collect fuel wood. Similarly, rules regarding grazing areas were more strictly enforced in the winter pastures than in summer grazing areas for the simple reason that labour in relation to the summer areas was a scarce resource but in relation to the winter pastures it was not. Sanctions systems regarding the free grazing of animals on cultivated land are very strictly enforced because crops are a scarce resource. In Chalt, rapid deforestation encouraged people to correct traditional perceptions about resource use. The community has ousted the big lumbering contractors from the forest and is now managing the resource itself.

Table 3.2 lists the perceptions of the local communities regarding the environmental problems that exist in the area. Deforestation appears to be a more clearly perceived problem and is mentioned by more than 50 percent of the sample households in each village. Soil erosion is not generally a problem but was critical for Passu and Misgar Paen, both villages that have suffered

severe loss of cultivated land through the erosive action of the river.

Table 3.2: Perception on Environmental Problems

| Village Name | Percent Identifying Deforestation as a Problem | Percent Identifying Soil Erosion as a Problem |
|---------------------|--|---|
| Sherquilla Hamochal | 69.6 | 0.0 |
| Rahimabad II | 70.0 | 16.7 |
| Chalt Chaprote | 56.7 | 23.3 |
| Broshal | 100.0 | 8.3 |
| Ahmedabad Bala | 76.7 | 16.7 |
| Passu | 90.0 | 63.3 |
| Risht | 80.0 | 6.7 |
| Misgar Paen | 90.2 | 61.1 |
| Total Average | 79.2 | 24.5 |

It appears that excessive deforestation was carried out by the local people in all the villages visited during this research. This is further substantiated by Table 3.3, which gives the local communities estimate of the survey villages. In each case, the perception is that the time to get to the forest appears more so than in any area but this maybe due to the closure of forest resources to which the village previously had access and which may have been closed off as a result of political boundaries (China). The forests have been cut down by the local people to meet their subsistence needs for firewood and timber. The older people either recalled or had heard from their ancestors of the existence of greater forest cover in their surroundings.

Table 3.3: Change in Time to Get to the Forest

| Village Name | Time it Used to Take to Get to the Forest (hours) | Time it Now Takes to Get to the Forest (hours) |
|---------------------|---|--|
| Sherquilla Hamochal | 9.5 | 21.5 |
| Rahimabad II | 3.0 | 5.0 |
| Chalt Chaprote | 1.9 | 4.4 |
| Broshal | 3.1 | 6.3 |
| Ahmedabad Bala | 5.2 | 12.8 |
| Passu | 2.6 | 6.3 |
| Risht | 4.7 | 29.1 |
| Misgar Paeen | 2.9 | 7.9 |
| Total Average | 4.1 | 11.6 |

Table 3.4 presents the sample household's perception on the institutions that had been responsible for environmental degradation. In Chalt, where a government sponsored lumbering agency had been responsible for depleting a rich forest, a majority of the sample households felt that the *thekedar* or contractor had been responsible for the degradation. In the seven other villages, the perception of between 40 to 100 percent of the sample households was that the villagers themselves have been responsible for the environmental degradation.

With the physical fact of the Karakoram Highway breaking into the traditionally closed spatial systems, the region has undergone a transformation. The cognitive and functional space of the people is no longer limited to their traditionally small microcosms but has expanded to include all of Pakistan and even the Middle East. The mechanics of such a transformation have had some consequences on the people's perceptions of their environments.

The team found the concern with humanly induced environmental problems acutest in villages which were either too remote as in case of Risht or their environmental resources were still sufficient to have substantial commercial value. In Risht the time to get the forest has almost quadrupled. Owing to the remote location of the village it was most heavily dependent on the natural forests for fuel wood. In Risht the concern with the

environment was much more pronounced than in other survey villages.

Table 3.4: Agents of Environmental Degradation Identified by Local Population

| Village | Thekedars | Government | Villagers | All Three |
|---------------------|-----------|------------|-----------|-----------|
| Sherquilla Hamochal | 4.3 | 17.4 | 78.3 | 0.0 |
| Rahimabad II | 0.0 | 3.3 | 46.7 | 50.0 |
| Chalt Chaprote | 60.0 | 13 | 26.7 | 0.0 |
| Broshal | 0.0 | 0.0 | 100.0 | 0.0 |
| Ahmedabad Bala | 0.0 | 3.3 | 93.3 | 3.3 |
| Passu | 6.7 | 6.7 | 40.0 | 46.7 |
| Risht | 0.0 | 6.7 | 90.0 | 3.3 |
| Misgar Paeen | 1.4 | 1.4 | 91.5 | 2.8 |

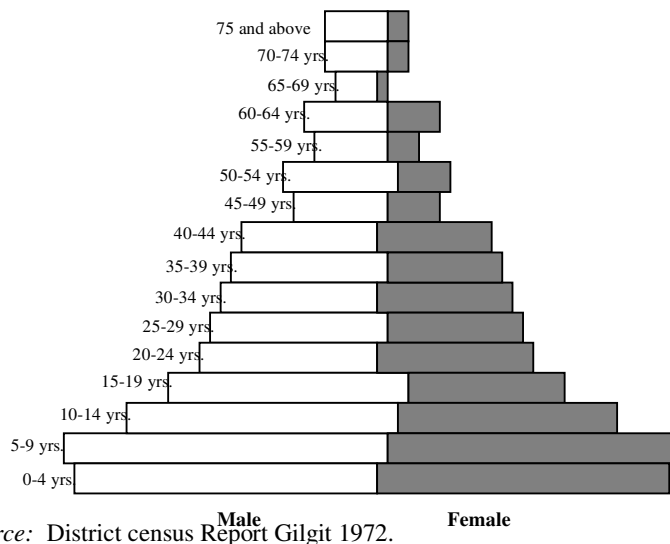
Population Dynamics

Demographic Profile of the Area

Gilgit District presents a demographic profile typical of an underdeveloped region. It seems that over time fertility rates have remained constant whereas the mortality rates have gone down. The classic demographic transition model seems relevant in this case. The high birth rate was being cancelled out by high mortality rates, and with the passage of time there does seem to be a gap developing between the fertility and the mortality rates. It is however difficult to speculate if the demographic trends in the Northern Areas would follow the subsequent stage of low fertility and mortality as predicted in the model.

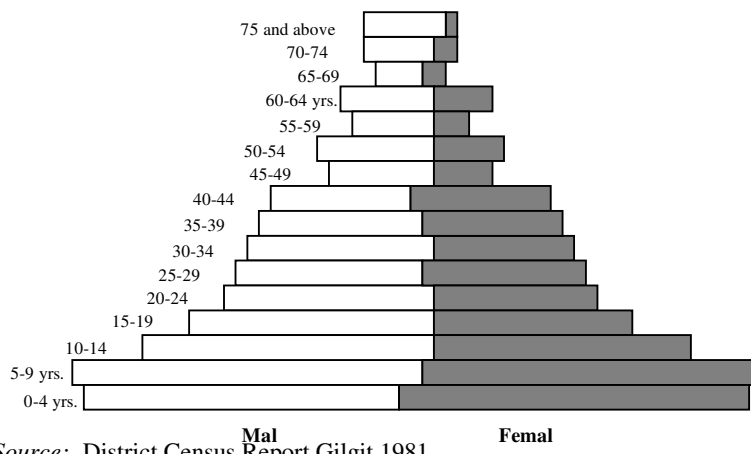
The lower mortality rates in the region can be accounted for by a combination of factors, chiefly improved hygiene and greater accessibility to medical care. In Chalt for instance it was brought to the team's notice that in the past the new born were kept tied in a piece of clothing lined with cow dung and they were not taken out of it until they were at least six months of age. Now days that practice is almost non-existent among the people.

Figure 2: Population Structure for Gilgit District 1972



Source: District census Report Gilgit 1972.

Figure 3: Population Structure for Gilgit District



Source: District Census Report Gilgit 1981.
The proportions are same as that of the 1972 pyramid.

The Traditional Birth Attendants (TBAs) have started encouraging basic hygienic practices during childbirth. While looking through the birth register of the TBA in Passu we found a record of only one death out of the total of twenty three children born in that village during January-November 1990. The incidence of child deaths due to diarrhoeal diseases was considerably reduced due to the use of Oral Rehydration Salts. Greater proportion of children was now immunised and had access to medical care.

Table 3.5: Number of Children Born Alive and those Still Living

(Gilgit District 1972)

| Age Group of Women (Years) | Number of Children Born Alive | Number of Children Still Living | Percent of Children Still Alive |
|----------------------------|-------------------------------|---------------------------------|---------------------------------|
| 35 – 39 | 5.69 | 4.03 | 71% |
| 40 – 44 | 6.19 | 4.21 | 68% |
| 45 – 49 | 6.51 | 4.37 | 67% |
| 50 – 54 | 6.31 | 3.9 | 62% |
| 55 – 59 | 6.81 | 4.13 | 61% |
| 60 and above | 6.12 | 3.61 | 59% |

Population pyramids for Gilgit district for the years 1972 (figure 1) and 1981 (figure 2) enable us to examine the population structure and its likely future shape. The population pyramid for the year 1972 is fairly typical of a region going through the initial stages of the demographic transition. There is a very substantial portion of the population in the lowest two age cohorts. The base of the pyramid is much wider than its middle and upper parts indicating a high fertility rate. The abrupt narrowing of the cohorts above the age of 10 points to the high infant and child mortality rates. The very narrow top of the pyramid is evidence of lower life expectancy. There are few people who have progressed through the age cohorts to live beyond sixty.

The pyramid for 1981 is not very different from that of the year 1972. The demographic trends demonstrated by the 1972 pyramid seem to have continued through the 70s and into the 80s.

From 1972 to 1981 there seems to be a greater proportion of the pyramid. This proportion is substantially more than the proportion of population below the age of ten in 1951. Unfortunately, a comparable age breakdown of the population in 1951 is not available, and it is therefore not possible to construct a population pyramid for the period, and give a more graphic description of the transformation that came about from 1951 to 1972.

Population Growth and the Status of Women

Both the pyramids show an uneven sex ratio heavily in favour of males, especially in the higher age cohorts. Theoretically, the higher age cohorts are expected to be dominated by females as they generally have a higher life expectancy and are also more likely to survive infancy. The pyramids presented here show a reverse trend. This situation could be due to the lower social status and relative lack of access of women to basic facilities. It is difficult to divorce the study of the population structure in the Northern Areas from the lower status of women in the society.

Reasons for Higher Fertility Rates

Despite the decrease in the infant mortality rates, the cultural bias continues to be in favour of having larger families. There are traditional utilities attributed to children, which may be designated 'consumption utility' (children as a source of personal satisfaction and pleasure), 'income utility' (children as contributors to family income), and 'status, security and insurance utility' (status, e.g. when position and power are established through children-generated familial ties). To these traditional utilities is added the new element of their utility as facilitators of transformation of production (Stark 1987: 219-21). All these factors seem to be relevant in the Northern Areas. More specifically, the following reasons emerged from interviews with villagers as being principally responsible for the high fertility rates in the region:

- Traditional bias towards male children induces individual couples to keep having children until such time that they have enough male children. But since one can never really have enough sons, so the tendency is to continue bearing children throughout the reproductive life of the female.
- There are religious inhibitions against practising family planning. Many of the orthodox semi-literate religious leaders of the communities describe family planning as a form of murder and inexcusable interference in the work of God. Even if an individual couple decides that they have had enough, there is tremendous social pressure brought to bear on them to desist them from continuing in their 'immoral ways'.
- There is also an economic reason for the high fertility rates in the Northern Areas. In a market economy where one only has one's labour to offer in exchange for the goods and services one desires, it pays to have the maximum amount of the asset that has any value in the market. The labour of a person and his children being the asset in question in this case. The surplus economic value of having more children outweighs the cost of raising such a family (Mazumdar 1987: 259-67).
- In a transitional economy like that of the Northern Areas of Pakistan, grown children as migrant workers bridge the essential gap between the traditional subsistence economy of their village, and the new market economy that it is being transformed into. They are their parents' insurance policy during the phases of transformation.
- There is the debilitating factor of the non-availability of safe family planning methods. In almost all the villages visited by the team people expressed varying degrees of interest in family planning methods. But the example of women falling ill after being given injections by the FPAP paramedics, served as a deterrent for other women who may be contemplating temporary or permanent sterilisation. Also in places like Risht and Misgar where people seemed particularly sensitive to the need for family planning they

felt helpless because there simply wasn't any help or guidance available to them short of Aliabad in Hunza, about five hours away by road.

Perceptions on Population Growth and Fertility

The pattern of population growth in the survey villages provides a classic illustration of the tragedy of the commons principle as applied to population dynamics. People perceive that it is in their individual interest to have a big family, for the reasons outlined above. However, they also realise that their immediate environment is not sufficient for a growing population. As such, they perceive population. As such, they perceive population as a problem but in their minds this does not imply a reduced fertility rate. The communal psyche is in favour of having larger families and the people seem to conform to this communal bias.

Table 3.6 gives the perceptions of the sample households regarding population issues. Women in each village perceived population as a less serious problem than men. There is no positive correlation between the villages where population was perceived as a problem and the desire to practice family planning. In Misgar Paean, for example, where population was perceived as a problem by over 90 percent of the sample men and women, less than 10 percent indicated that they would use family planning if they had access to it. As opposed to this, 12.5 percent of the men and women respondents in Broshal replied that they would practice family planning if they has access to it, although it was reported as a problem in relation to the natural resource base but people feel that they do not have to do anything about it in terms of reduced fertility rates. There is a sense of fatalistic inevitability about the issue of natural rate of increase.

Rahimabad II is an outlier as far as the female's access to family planning is concerned. The very high percentage of females with access to family planning is concerned. The very high percentage of females with access to family planning can only be explained by the Family Planning Association of Pakistan's special

concentration on the females in the village. This high percentage also pulls up the average for the total sample.

Table 3.6: People's Perceptions about Family Planning

| Village Name | Percent Perceiving Population Growth as a Problem | | Percent With Access to Contraception | | Percent that would Practice Contraception if they had Access to it | |
|----------------|---|--------|--------------------------------------|--------|--|--------|
| | Male | Female | Male | Female | Male | Female |
| Sherquilla | | | | | | |
| Hamochal | 47.8 | 30.4 | 0 | 0 | 4.3 | 13.3 |
| Rahimabad II | 60 | 23.3 | 36.7 | 66.7 | 30 | 33.3 |
| Chalt Chaprote | 76.7 | 43.3 | 13.3 | 10 | 13.3 | 23.3 |
| Broshal | 33.3 | 4.2 | 0 | 4.2 | 12.5 | 12.5 |
| Ahmedabad Bala | 53.3 | N.A. | 19 | N.A. | 43.3 | N.A. |
| Passu | 70 | 50 | 36.7 | 26.7 | 16.7 | 20 |
| Risht | 76.7 | 53.3 | 13.3 | 6.7 | 43.3 | 33.3 |
| Misgar Pacen | 93 | 91.5 | 25.4 | 18.3 | 9.9 | 4.2 |
| Average | 63.9 | 49.3 | 18.1 | 18.9 | 21.7 | 20 |

The analysis of the quantitative data showed very little variation in the number of children that men and women prefer to have. On average, males showed a preference for a family size of 8.23 and females a family size of 7.96. On average, less than 18 percent of the men and women respondents had access to family planning services. There is no clear pattern between men and women in their perceptions about access to family planning practices of they had access to them.

Women interviewed during the field visits generally felt that large families were preferable and perceived child bearing and rearing as their primary responsibility.

Table 3.7 shows the average household sizes in the sample villages. It is interesting to note that the more accessible villages like Chalt Chaprote or Sherquilla Hamochal in general have the biggest average household size. The remotest and poorest villages like Risht, Misgar and Broshal have the lowest. Since the team did not come across any evidence of a substantial contraceptive use in any of the villages, the only conclusion can be that the more accessible location of the villages ensured the people's access to medical and other facilities much earlier than the remoter villages. More infants survived in those villages and thus account for the big household sizes there.

Table 3.7: Household Sizes and Age of the Sample Villages

| Village Name | Average Household Size | Average Number Above 15 in a Household | Average Number Below 15 in a Household | Percent Below 15 in a Household |
|---------------------|------------------------|--|--|---------------------------------|
| Sherquilla Hamochal | 11.4 | 5.3 | 6.0 | 52.6 |
| Rahimabad II | 9.2 | 5.1 | 4.1 | 44.6 |
| Chalt Chaprote | 11.8 | 6.4 | 5.4 | 45.8 |
| Broshal | 7.9 | 4.2 | 3.6 | 45.6 |
| Ahmedabad Bala | 9.0 | 5.0 | 4.0 | 44.4 |
| Passu | 9.6 | 5.1 | 4.4 | 45.8 |
| Risht | 7.8 | 3.6 | 4.2 | 53.8 |
| Misgar Paeen | 8.4 | 4.7 | 3.6 | 42.9 |

In terms of the age structure Risht and Sherquilla Hamochal are the two outliers in the sample. Although we do not have enough evidence to explain the two outliers but one can speculate in case of Risht that its remote location and relatively recent accessibility to modern amenities could account for a high proportion of population below 15.

For an illustration example of the inter-linkages between population and environment please refer to Annexure I.

Economic Activities

The Traditional Economy

The local economy of the Northern Areas is primarily based on a subsistence farming system. The system combines various farm enterprises to take advantage of the agro-ecological diversity of the region. The integrated mixed farming systems maximise on the crop-livestock interactions. Animals provide farmyard manure and ploughing, while crops provide straw and stubble for grazing. Agriculture is the major economic activity in the region and it dominates the eight villages surveyed. The cultivated holdings in the area are small¹ and there is equitable distribution of land. The particular farming system that is followed in each village depends upon the natural resource base that is available to the farmers. The survey villages fall in both the single and double cropping zones.² Single cropping zones generally have

higher cropping intensities than double cropping areas. Owing to the shortage of fodder crops, reliance on livestock is much more pronounced in villages that have access to pastures.

Economic Change and Demographic Pattern

Since the construction of the Karakorum Highway, the Northern Areas' economy is being gradually integrated with the rest of the country. A market oriented production system is replacing a subsistence farming system. Factor markets are being developed and increasing amount of improved inputs are finding their way to the Northern Areas. Traders from down country are increasingly utilising the comparative advantage of the Northern Areas for growing specialised crops like seed potato. The opening of the border with Kashgar has increased trading possibilities and placed the Northern Areas at the crossroads of an important trade route.

The principal factors responsible for some of the changes in the livelihood systems are:

- Increase in the population size, and it's increased expectations from life.
- Migration of the young male labour force outside the village
- Increased enrolment of young children in schools.

The local population is increasingly engaging in off-farm employment both within and outside the Northern Areas. The search for off-farm income became essential in view of the limited capacity of the Northern Areas to support a growing population. Most of the young men between the ages of 15 and 45 are working outside the village.

The increased migration of young men is also changing the gender division of labour on the farm. The Agricultural Census (1980) data for the Northern Areas indicates that the number of female family members on farms is higher than that of males.

The availability of off-farm jobs has also increased in the Northern Areas due to its economic integration with the rest of the country. This has increased the opportunity cost of farm labour that begins to move off the farm.

The increase in the enrolment of young child into schools has also created a labour shortage on farms. This shortage of farm labour is being increasingly met in the Northern Areas through hired labour from surrounding villages. Table 3.8 gives the percentage of sample households using outside labour. These figures range from less than 2 percent to 100 percent for the respondent households in the survey. On average, 29 percent of the sample households reported hiring labour from outside.

Table 3.8: Use of Outside Labour

| Name of Village | Percent Respondents Hiring Outside Labour |
|---------------------|--|
| Sherquilla Hamochal | 26.1 |
| Rahimabad II | 13.3 |
| Chalt Chaprote | 100 |
| Broshal | 20.8 |
| Ahmedabad Bala | 10.0 |
| Passu | 56.7 |
| Risht | 6.7 |
| Misgar Paeen | 1.4 |
| Average | 29.3 |

One of the ways the local farmers have responded to the increase in population size is by increasing the productivity of existing resources. Increasing productivity became important in view of the limited resources and the inability of the traditional farming practices to sustain the growing population. None of the survey villages produce sufficient grain to sustain the local population. The use of new inputs is one principal method of increasing productivity. Table 3.9 shows the high number of respondents using chemical fertilisers and tractors³.

Table 3.9: Use of Improved Inputs

| Name of Village | Percent Respondents Using Chemical Fertilisers | Percent Respondent Using Tractor for Activities |
|---------------------|--|---|
| Sherquilla Hamochal | 78.3 | 34.8 |
| Rahimabad II | 80.0 | 86.7 |
| Chalt Chaprote | 100 | 96.7 |
| Broshal | 83.3 | 91.7 |
| Ahmedabad Bala | 83.3 | 3.3 |
| Passu | 100.0 | 100.0 |
| Risht | 100.0 | 100.0 |
| Misgar Paeen | 62.0 | 95.8 |
| Average | 85.8 | 76.1 |

The data does not indicate any correlation between the households using improved inputs and the reliance on outside resources. The transition from a subsistence to a market economy is also inducing farmers to specialise in sectors and crops in which they have a relative advantage.

Thus potato cultivation is replacing wheat, and fodder crops are being grown to support an increasing number of livestock. Fruit orchards are being established in place of crops in the newly cultivated land.

Table 3.10: Marketing Farm Produce

| Name of Village | Percent Respondents Marketing Their Farm Produce |
|---------------------|--|
| Sherquilla Hamochal | 34.8 |
| Rahimabad II | 56.7 |
| Chalt Chaprote | 83.3 |
| Broshal | 87.5 |
| Ahmedabad Bala | 86.7 |
| Passu | 66.7 |
| Risht | 6.7 |
| Misgar Paeen | 12.7 |
| Average | 54.3 |

With specialisation, marketing of agricultural produce has become important. Table 3.10 gives the percentage of respondents marketing their farm produce. Risht and Misgar have the lowest number of households that are marketing their produce. Incidentally these also happen to be the remotest villages in the sample.

Another manifestation of the demographically induced change is the change in land-man ratios and in the livestock population in the area. Table 3.11 shows that 87 percent of the farms had undergone a change in their size⁴. It is certain that this change implied a decrease in cultivated holdings in most cases due to the division of land between male heirs.

However, the productivity of land has been increasing. The use of improved technologies, irrigation investments, improved seed, high yielding varieties, new crops and additional land development options have all increased the productivity of the farming economy.

The livestock management systems in the Northern Areas are also changing. Table 3.12 summarises the change in livestock number in the survey villages. The transformation in traditional farming

systems is evident from the large number of respondent households indicating a change in the number of livestock. This change is in both directions. About 46 percent of the households reported a decrease in their livestock population.

Table 3.11: Changes in Land Holdings

| Name of Village | Percent Respondents Reporting Changes in Land Holdings | Percent Respondents Reporting Decreases in Land Holdings |
|---------------------|--|--|
| Sherquilla Hamochal | 91.3 | 78.3 |
| Rahimabad II | 90.7 | 43.3 |
| Chalt Chaprote | 90 | 28.6 |
| Broshal | 75 | 23.8 |
| Ahmedabad Bala | 100 | 13.3 |
| Passu | 100 | 26.7 |
| Risht | 66.7 | 45.2 |
| Misgar Paeen | 83.1 | 65 |
| Average | 87.1 | 40.5 |

The pattern of change indicates that some farming households are specialising in livestock and increasing their holdings, while others are divesting themselves of their current holding as they move to other areas of specialisation, and towards off-farm employment. During the field visit it was observed that in villages of upper Hunza, like Passu and Misgar, farmers were raising more livestock than they ever did. The village organisation of Misgar has opened a Yak cattle farm by obtaining a loan of Rs 700,000 from AKRSP and have devised a collective management system which relies heavily on the traditional system of common herding.

The traditional system of pasture management is also changing in the Northern Areas due to the changing productivity of the enterprise. No generalisation however would be valid, as each form of management was village specific. One traditional and quite spread system was to hire some herders to take care of the livestock. Herders were responsible for bringing back the animals as well as the corresponding dairy products, such as butter and cheese. Today, where the old system of herders is still present, it is loosely bound: herders are now responsible only for

bringing back the livestock. There is much less concern with the pattern of distribution of dairy products that formed such an important part of the local diet.

In places like Passu or Misgar where livestock has become an important source of income, members of the family have replaced herders. By contrast, in other places, the decrease in livestock number and new economic opportunities have undermined the rationale for the family type form of pasture management, and led to community forms of management such as hiring herders. The change in the Northern Areas is also affecting the traditional livestock ownership and management system.

Table 3.12: Change in Livestock Ownership

| Name of Village | Percent Respondents Reporting Changes in their Livestock Number | Percent Respondents Reporting Decrease in their Livestock Number |
|---------------------|---|--|
| Sherquilla Hamochal | 82.6 | 69.6 |
| Rahimabad II | 96.7 | 50.0 |
| Chalt Chaprote | 76.7 | 78.6 |
| Broshal | 87.5 | 19.0 |
| Ahmedabad Bala | 100.0 | 63.3 |
| Passu | 90.0 | 43.3 |
| Risht | 90.0 | 45.2 |
| Misgar Paeen | 85.9 | 67.5 |
| Average | 88.6 | 46.07 |

Local Perception Regarding Outside Space

An assessment of people's perception about outside reliance was based on their desire to work outside the village, and on their perceptions about the importance of outside remittances. There was a great deal of variation between villages, in the desire to work outside the village. The data did not capture the reasons for this variation.

In case of the villagers not wanting to work outside, the average age was approximately 47 years. Although the average age of the respondents all over was above forty, the average for the

respondents wishing to stay in their village is still higher. Old age and the necessity for a male to look after the females were the two most commonly cited reasons for them to stay in the village.

There is an even greater variation among villages in their perception about the importance of outside remittances. On average, 52 percent of the respondents felt that outside remittances were essential. Villages with a relatively better indigenous resource base appear to have a lower reliance on outside resources e.g. Chalt.

There is a negative correlation between reliance on outside labour and the importance of outside remittances (Table 3.8 and Table 3.13). For example, Misgar Paen has the lowest percentage of households hiring outside labour and the highest percentage of households describing outside remittance as essential. In Chalt, these percentages are reversed. This indicates that the use of hired labour is the highest in villages where the productive potential of available village resources is the highest.

Table 3.13: Reliance on Outside Resources

| Name of Village | Percent Wanting to Work Outside the Village | Percent Describing Outside Remittance as Essential | Percent Describing Outside Remittance as Marginal |
|---------------------|---|--|---|
| Sherquilla Hamochal | 78.2 | 56.5 | 21.7 |
| Rahimabad II | 43.3 | 36.7 | 50.0 |
| Chalt Chaprote | 39.3 | 14.3 | 85.7 |
| Broshal | 57.1 | 28.6 | 14.3 |
| Ahmedabad Bala | 83.3 | 70.0 | 6.7 |
| Passu | 30.0 | 56.7 | 16.7 |
| Risht | 80.6 | 51.7 | 25.8 |
| Misgar Paen | 47.7 | 97.5 | 0.0 |
| Average | 57.4 | 51.5 | 27.6 |

Sustainable Resource Utilisation, Environmental and Demographic Change

The vertical system of livelihood, specialisation and trade between villages, seasonal and out-migration, land-livestock and land-man ratios are the economic response to the environmental

conditions that exist in the Northern Areas. The farming practices in the Northern Areas combine crops and livestock in a manner that maximises crop-livestock interactions, which exist in the special environment of the mountain regions.

The vertically integrated farm with a distinct function for each level ensures efficient and sustainable use of the existing resources. The pattern of tree plantation (along the channel, or scary slopes, near the riverbed), and fodder crops (on newly reclaimed land), point to a pattern of the local environment. The vertical livelihood system devised to make the optimal use of the existing environmental conditions in the Northern Areas are a testimony of the innovative management system.

The manner in which the altitudinal variations have been used in the cultivation of crops also point to a system of cultivation that is highly sensitive to the local environment. Thus cropping intensities in single cropping areas are higher than in double cropping areas, and the reliance on livestock is higher in villages at higher altitudes. The system of seasonal migration to high land pastures for both livestock and human population assists in dampening the effect of the existing extreme climatic variations, in the region.

The pattern of trade between different valleys also made use of the cropping seasons at different altitudes. Thus the villages at lower altitudes had a barter arrangement with the high altitude villages, and provide them with crops that ripened in their areas sooner.

Table 3.14: Crop Area and Yields

| Name of the Village | Average Crop Per Household (in Kanals) | | | Yield Per Kanal of Land (maunds) | | |
|---------------------|---|-------|--------|-------------------------------------|-------|--------|
| | Wheat | Maize | Fodder | Wheat | Maize | Fodder |
| Sherquilla Hamochal | 6.85 | 5.87 | 1.54 | 2.6 | 4.7 | 6.2 |
| Rahimabad II | 10.08 | 9.16 | 2.11 | 2.3 | 2.9 | 4.5 |
| Chalt Chaprote | 10.8 | 7.9 | 19.9 | 2.9 | 3.0 | 5.9 |
| Broshal | 10.6 | 0 | 10.1 | 1.9 | 0 | 6.1 |
| Ahmedabad Bala | 5.3 | 0 | 11.4 | 3 | 0 | 3.2 |
| Passu | 11.5 | 0 | 23.1 | 2.9 | 0 | 1.7 |
| Risht | 20.7 | 0 | 0 | 1.2 | 0 | 0 |
| Misgar Paean | 9.8 | 0 | 5.1 | 1.7 | 0 | 3.3 |

The relationship between yields and cropping pattern supports the hypothesis that farmers economise on resources, which are relatively scarce. Table 3.14 gives the average area of various crops per household and the yield per kanal of land cultivated. The area under wheat per household is the highest in Risht that also has the lowest yields per kanal. Rahimabad has the highest average area of maize per household and the lowest yields.

Similarly, Passu has the highest area per household under fodder crops and the lowest yields. In the case of each of these crops, the villages with the lowest area per household also have the highest yields. This inverse relationship between area and yields can only be explained with reference to the alternate hypothesis presented in this paper that in the context of the Northern Areas, the critical concept is the relative scarcity of resources.

Despite the communities' successful adoption of more efficient resource utilisation practices, the fact remains that the population has exceeded the carrying capacity of the local environment. People's numbers and their expectations out of life are out of proportions with their indigenous resource base. The above mentioned percentage of people wishing to work outside of their villages, especially in the remoter and poorer villages is evidence of the people's realization of this limitation of their indigenous environment. The communities still work hard at maximising

their return from their resource base, but now it is more often to complement their off farm income, rather than as their only source of livelihood.

Collective Management Systems

Internal System of Collective Management

The communities in the Northern Areas had a well-established system of collective management for critical local resources. This system extended to development and management of the irrigation system, water allocation, land development, distribution, livestock management, crop cultivation and house building. Several factors become evident from an analysis of the collective management system; (i) the principal contribution of the local Mir was in regulating property rights and providing a framework for local development (ii) collective management systems became effective only under conditions of resource scarcity (iii) these systems economised on resources which were scarce relative to others.

The local Mir or feudal ruler—Mirdom was abolished only in 1974—held a dominant position in the political and economic sense. However, he did not provide the resources for development but only provided the framework within which development could take place by defining local property rights between himself and the local people. For example, a new channel would be developed under the sponsorship of the Mir not because he would contribute resources or an institutional arrangement for its development but when he would allow communities property rights to the land, which was within the command of the new channel. Investments in the local irrigation system were undertaken almost exclusively in this manner. The Mir extracted revenue from the agriculture produce on this land. Similarly, the Mir enjoyed certain rights to forests and pastures and he would sometimes share these with the community or allow them use rights on his property.

A study of the collective management systems of the Northern Areas clearly reveals that the refinement and enforcement of the system is most effective for resources that are scarce. Thus, the system of *warabandi* or water allocation is practised more rigorously in Sherquilla, Chalt Chaprote, Broshal, Ahmedabad and Misgar where water is scarce. On the other hand, the *warabandi* system in Passu and Risht is structured to ensure the timely delivery of water within the short growing season to all the households as there is generally abundance of water. The survey villages follow the traditional system of *dehegans* in which a guard is vested with the responsibility of guarding the channel and ensuring that the established system of water allocation is followed. The *dehegans* are selected by the community and are paid an honorarium for their services. All water users participate in the annual cleaning of the irrigation channel, which is undertaken once or twice a year.

Farmers with land along the head of the channel have first access followed by the ones along the middle and tail reaches. This traditional system was better equipped to handle water allocation when the households were all growing the same crops. With increased specialisation and cultivation of water intensive crops the farmers with landholding in the head reaches of the channel will be at more advantageous position than those did in the tail reaches of the channel. This system may come under considerable strain due to the changing cropping system and the resulting inequity in water distribution. However, the strain is not yet in evidence.

The collective system of distribution and development of new land is significant and in some ways was equitable than the water distribution system. The greater equity in the distribution of land can be seen as an indication of land being a more important resource than water. Furthermore, water rights in the Northern Areas are vested in land and therefore the equity in land distribution may have been expected to redress the inequities in the water allocation system. New land development in the

Northern Areas was undertaken on a small scale prior to outside intervention due to the lack of resources available to undertake it. However, with the intervention of AKRSP a substantial amount of new land has been developed by the local communities.

All survey villages selected for this research have reclaimed some land except for Risht. In Passu alone, 275 hectares of new land has been developed for cultivation. In most cases, the people used a collective system to undertake this development and combined it with some innovative aspects. Each household contributed an equal amount of labour to develop the land. Once the land was developed it was divided into portions of different sizes. The inequality in land portions reflected the difference in land quality and terrain. Thus the portions were unequal but in the community's perception the portions were fair. The community would then decide on the allocation on the basis of lots.

Collective Management and Market Forces

It was hypothesised that traditional systems of decision making had eroded during this century and that the erosion became more pronounced as the state and the market both began to intervene aggressively in the rural communities. Although, it is generally true that market forces erode the traditional systems of decision making, in the context of the Northern Areas, the situation is somewhat complex. In some cases, market forces have changed the productive potential of some activities and induced communities to build upon the traditional systems of decision making for specialisation e.g. the Misgar yak farm, land development, potato cultivation. In other cases, market forces by rewarding individual initiative and risk taking will erode the traditional systems.

External Agents and Collective Management Practices

In addition to the external forces which have been highlighted throughout this presentation a principal outside intervention has

been provided by outside development agencies. The most significant among these is the AKRSP. This non-governmental organisation was established by core funding from the Aga Khan for the economic development of the area. The principal objective of the programme is to establish sustainable village organisations, which undertake the task of development. AKRSP started its work in Gilgit District in December 1982 and in the last nine years it has transformed the manner in which the local people think about their development.

AKRSP's contribution to development in the region can be gauged by the fact that until June 1989, it had established 446 Village Organisations which had initiated 326 village development projects (irrigation channels, roads, land development, forest plantations, etc.), a system of collective savings and credit had been established and the village organisations were charting into new areas of activity on a collective basis.

The success of AKRSP is due in part to the fact that it (i) established a system of planning and implementation which allowed the participation of local communities, (ii) it enabled them to use their traditional system of collective management and decision making, (iii) it worked within the given system of rights, and (iv) it made its terms of partnership with local people explicit thus clearly specifying the costs and benefits of each project at the outset. Wherever AKRSP has diverged from these aspects it has not succeeded in inducing collective action. Its initial plan of efficient land use did not succeed because it conceived of a village as one large farm, which it was not. The government's attempt at development at the village level has had limited success because it has tried to replace the existing systems of management and the existing institutional rules rather than building upon them.

After the abolition of the institution of the Mir, there were very few, if any investments in local resources until the intervention of

outside development agencies. It is significant that no irrigation channels were constructed and no new land was developed in the Northern Areas after the abolition of the Miri system and until outside intervention. This was due not to the breakdown of the local institutions but because on their own the people had exhausted their local resources to develop the system with the available technology. In all the survey villages, it was evident that AKRSP had provided a crucial input in each case and capitalised on the traditional system to enhance the productivity and the development of the resource base. Thus Chalt Chaprote has initiated the protection of the forest, Ahmedabad Bala has set-up a micro-hydel power plant, Passu has constructed a protective spur and irrigation channel, and Misgar has initiated a collective Yak farm. All the survey villages have developed their land resources.

Charismatic Leadership and Collective Vision

The local people in Chalt and Misgar very clearly identified the reasons for their change in their attitude towards the management of the forest in Chalt and livestock in Misgar. The principal reason given for this change by both communities was the vision inspired by Dr Akhtar Hameed Khan on a visit to these villages. In Chalt, he had very graphically pointed out that the forest was like their mother and it was incomprehensible to him why the villagers were indifferent to its careless plunder by outsiders. Their behaviour was like that of children who stand by and watch their mother's *chaddar* which is the symbol of her sanctity being torn away. This vision is said to have been the major factor that changed people's attitude and since then they have undertaken a system of collective management of their forest. It was the same thing in Misgar. People described in an almost identical fashion how Dr Akhtar Hameed Khan had come to their village and inspired in them this vision about their future being inextricably linked with investments in the livestock sector.

The Ismaili community has a religious hierarchy, which extends from the Aga Khan, the spiritual leader of the Ismaili community⁵

down to the village level. In each Ismaili village there is a *mukhi* who is the representative of the Imam. The *farmans* or religious edicts of the Aga Khan are transmitted to the community through the village *mukhi*. The Aga Khan's views on education of girls, on development, etc., are treated with great reverence and strictly followed by his community. The Ismaili community is generally a much more progressive and cohesive community when compared with other ethnic groups. It seems the AKRSP as a programme that has religious sanction and thus their attitude to the organisation is far more responsive than that of other communities.

The field team tried to investigate how people's behaviour towards family planning could be influenced through religious edicts but it was impossible to determine. The *mukhi* or the representative of the Ismaili community at the village level was non-committal. This happened without exception in all Ismaili villages where questions about family planning were asked. It appears that there are collective decisions about the domain within which it is acceptable for an agency to work. AKRSP has not broached the issue of family planning because it perceives the issue as sensitive and one that does not fall within its domain.

Limitations to Collective Decision Making

It is as instructive to examine the areas in which collective decision making has succeeded as it is to look at areas in which it has not succeeded. Collective decision-making tends to break down or is weak wherever property rights are not clearly defined, benefits are uncertain and critical inputs are lacking. The absence of clearly defined property rights explains the deterioration of common forests and overgrazing in the Northern Areas. The absence of critical inputs explains the lack of investment in the irrigation and physical infrastructure and a combination of reasons explains AKRSP's failure to implement its original conception of a village being developed as one collective farm based on principals of efficient land use. It is difficult to induce

collective behaviour where individual initiatives differ and benefits and costs are shared unevenly.

Conclusions

In this concluding section the resource management practices in the Northern Areas are studied with reference to some key concepts like cognitive space, property regimes and the notion of scarcity. In the context of the Northern Areas, this analysis will provide an insight into the mechanisms of collective decision making and individual behavioural patterns. Within this framework an attempt has also been made to understand people's perceptions about population growth and family size, their management of their environment and economic behaviour. The concept of cognitive space and scarcity provides the psychological framework and the system of property rights provides the institutional framework within which to study human behaviour.

The extent of the influence of external factors operative in a community seemed like a function of its physical proximity to the KKH, the main agent of development in the Gilgit District. It is this physical proximity or remoteness that seemed to be one of the primary factors in deciding the people's perceptions of the inter-linkages between population growth, environmental degradation and development processes.

An Expanding Cognitive Space

People's behaviour is deeply influenced by their perception about their cognitive space. In the Northern Areas people see their cognitive space as gradually expanding. This expansion is not only upward but also outward. The upward expansion is due to the greater utilisation of resources, which are at higher elevations in a vertically integrated farming system. The outward expansion is due to greater access to the outside world in these high mountain areas that have virtually been cut-off from the rest of the world. The principal factors responsible for the outward expansion are

the construction of the KKH and the improved communication network, lifting of restrictions on mobility which were imposed by the Mir, access to improved factors and product markets and the inability of the local resources to sustain a growing population. Valleys are no longer seen as isolated microcosms, which have to provide the sustenance for the local population and down country is not seen as inaccessible.

This expansion in the cognitive pace is changing livelihood systems and the manner in which people manage their resources in the Northern Areas. Farmers are moving from subsistence farming to a market oriented production pattern. There is a greater degree of out-migration, higher literacy rates, change in the gender division of labour; greater use of hired outside labour. The local population is no longer restricted to its immediate environment. As a result, the traditional direct relationship of interdependence between the humans and the environment is not as critical to survival as it once was. Almost all of the respondents underlined the necessity of supplementing their farm income with an outside source. The cognitive and functional space of the people is no longer restricted to the valley they were born in. It now includes a much broader horizon that extends to Karachi and outside Pakistan.

It is this notion of an expanding cognitive space, which shapes people's behaviour towards population growth and fertility. People make their reproductive decisions with reference to their expanded functional space. In the Northern Areas people do not perceive of the population issue to be a problem which affects them. Although, people consider that the growth in population is responsible for the depletion of their forests this does not imply a reduced family size. The preference of both men and women is to have a large family and the figures indicate an ideal family size, which is much larger than elsewhere in Pakistan.

Understanding Collective Decision Making and Regime of Property Rights

One of the hypotheses that was being tested in the course of this study was that both population growth and environmental degradation are a reflection of the breakdown of systems of collective decision making. In the case of the Northern Areas it is clear that the systems had become weak but they are still in place and can be reactivated by the community when there is an incentive to do so. The fact that no new development had been undertaken in the Northern Areas gave the mistaken impression that the collective systems did not exist anymore. AKRSP has shown that it was the lack of critical inputs and the method of development by the state that led to the situation of inaction by the community.

Collective decision making behaviour appears to be influenced by the regime of property rights. In the Northern Areas collective decision making has been undertaken in areas where the institutional rules are clear. The traditional system is innovative in that it also regulates rights on new areas that are brought within the domain of individual control. Thus the existing system of rights is used to expand the system of rights. There is consensus because the system is well defined. In spaces where the rights are not well defined the incentives for collective action are weak. Thus land and irrigation development have been rapid after AKRSP removed the critical constraint of resources. There is a well-defined system that regulates the distribution of new land and new water. According to this analysis, the environmental degradation in the Northern Areas is due to the lack of clearly defined system of property rights. The depletion of forests and overgrazing in some areas is explained by the lack of institutional rules guiding their use.

The vertical variation in the agro-ecological system has led to the formation of property rules that vary vertically. These rules were essential to protect the interest of the community in all areas perceived to be part of the functional space. The system of rules

and rights also optimise the use of resources which are scarce relative to other resources. Thus people have individual rights to the cultivated landholding where the rewards to individual efforts are the greatest. The scarcity of labour is evident from this system. Private labour is used in all labour intensive tasks except in the pasturelands where it is pooled. Land is private where it is most scarce (terraced-cropped areas) and is common property in high altitude areas.

Perceptions about Scarcity and Resource Management

Local perceptions regarding environmental protection are very closely linked with resource use and perception about scarcity. For this reason there is a difference in the manner in which environmental protection measures are taken and enforced by the community. The common property regimes for the forest resources and the high land pastures are less well developed by the community because in relation to these resources it has traditionally perceived of labour as the scarce resource. Thus in relation to forests and the high land pastures it has economised the use of labour.

Communities have allowed the open use of forests by individuals since they perceived that the effort required to travel to the forest and collect fuel wood was a sufficient cost. Similarly, rules regarding grazing areas were more strictly enforced in the winter pastures than in summer grazing areas for the simple reason that labour in relation to the summer areas was a scarce resource but in relation to the winter pastures it was not. Sanctions systems regarding the free grazing of animals on cultivated land are very strictly enforced because crops are a scarce resource. In Chalt, rapid deforestation encouraged people to correct traditional perceptions about resource use. The community has ousted the big lumbering contractors from the forest and is now managing the resource itself.

Risht: Microcosmic Survival

In a more accessible village like Passu, people did perceive a population problem and a problem with environmental degradation, but they did not perceive any direct linkage between the two. In Passu like in almost all of the more accessible villages people readily availed themselves of the opportunities for off farm employment and out migration. They had also become increasingly dependent on imports for their everyday needs. Their consumption patterns were wholly insufficient to sustain their desired life style. One of the most undesirable consequences of their increasing dependence on the outside and the expansion of their functional space had been the break down of their traditional direct relationship with their immediate surroundings.

Before the influences of the modern twentieth century started penetrating deep into the Northern Areas, most of the villages had closed local economies. People were basically employed in cultivation, animal husbandry and other such activities, which involved a much more direct utilisation of the environmental resources of their immediate surroundings. Now with the people's increasing dependence on the wider economy for sustenance, their traditional direct relationship with their immediate environment has broken down. In Passu, for example it was seen that the fact of environmental degradation in their surroundings is less of a concern to the villagers because its importance is not as preponderant as it used to be. Not that there is complete callousness towards environmental issues, or complete ignorance of the inter-linkages between population growth and environmental change, there is simply less of a sensitivity towards them than in case of Risht. In Passu any enquiries about the state of the village's indigenous resources first drew complacent answers about the poor state of it. The respondents sometimes even had to think for a little while as to where the jungles were located. In case of Risht, however any enquires about the trees drew spirited responses and the

conversation most of the time centred on the sorry state of the environment.

The case study of Risht provides an illustration of the relationship of man to his environment and the factors that are critical in shaping it. Risht is a remote village located in the Chapurson valley. Its inhabitants' perceptions about their environment and population growth were different from those of the people of other villages in the sample.

In this case too, people like any other place we had visited, had developed the level of expectations and consumption patterns for which their environmental resources were entirely insufficient. But in its case, however, the physical inaccessibility of the village, coupled with the particularly hostile environmental conditions, made life particularly difficult for the inhabitants of the village. Their cognitive space was still relatively constricted compared to the other villages. Even though functionally the people still went down country for education and employment, the physical distance from the KKH, and the rest of the world, seemed to make people more insular in their approach, and more dependant on their immediate physical environment.

They were consequently more sensitive to any change in it, and about the need to redress the man-environment imbalance. Unlike the more accessible samples of other villages, in Risht, the option of dependency on imported resources was not readily available. People also did not feel as integrated in the broader economy of the Northern Areas as the people in other villages did. Not that the inhabitants of the other villages felt very integrated or part of the mainstream, but they were definitely much more comfortable talking about the possibility of importing wood from down country, or seeking employment opportunities there, or depending on the ubiquitous tourists. In Risht people tended to view their environment as more of a closed system, and consequently more in need of preservation and management.

Resources like fuel wood were of crucial importance to the people of Risht for their survival during the long and bitterly cold winters. But apparently all the local forests of alpine coniferous trees had been cut down in their quest for fuel wood. Now even the most parsimonious and judicious use of the fuel wood was not enough to preserve the very fragile forest cover that was left after centuries of use. The intensely cold climate didn't seem to help the plantations either.

People of Risht have introduced strictly enforced quotas for fuel wood per household from the natural forest. Nobody is allowed more than two trolley loads of wood per year. But the forests have become so depleted that the people have to travel increasing distances to get to them. The People are also aware that even with the present rate of use it is only a matter of time before even these forests disappear. The community as a result is more concerned and receptive to any ideas about population control or other management practices that may serve to preserve their meagre resource base.

Endnotes

1. On average 3 acres in the surveyed households.
2. Generally, double cropping is possible only at altitudes below 7000 feet.
3. The low percentage of tractor use reported in Ahmedabad Bala is due to the unsuitability of terrain in that village.
4. Due to the manner in which the question was phrased it is only possible to deduce that landholding has changed. However, field interviews and secondary information indicate that cultivated landholding has decreased in all cases.
5. It forms about 40% of the population of Gilgit District.

Two Case Studies from the Punjab

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Population, Environment and Development

The two case studies of the Punjab are an attempt to understand individual behaviour in a given community environment. By this we mean a production and consumption environment shared by a group of people. In agrarian Punjab, the village has emerged as a stable production and consumption unit over at least ten centuries of recorded history (Mahmood 1988). This production and consumption environment is defined by a set of conditions. The more important conditions are the distribution of owned and operated area, irrigation endowments, the state of factor markets, other infrastructure, and the level of human skilling. Both macro and micro factors operate to define these conditions.

Individual behaviour, demographic, environmental, and production, can be explained to a large extent by this village environment. The method of analysis is to observe individual and collective behaviour, to construct behaviour at the level of the village. This village behaviour is then explained in terms of the behaviour of dominant component groups of individuals.

The initial theoretical assumption of these two case studies in the Punjab is the following. Of the three phenomena, population,

environmental and production, there can be major changes in any or all of these. We make no preconditions that any one of these phenomena must necessarily be *a priori* major causal factor, leading to change in the others. Therefore change in a phenomenon is observed relative to change in the other phenomenon. The relative dominance of one phenomenon, like say demographic, is then explained in terms of the village environment. The explanation of observed change, say demographic, may or may not involve change in the other phenomena, environmental, and production. This depends upon the levels of change observed in the environment and production. The explanation may well involve other determinants.

An abstract of the results of the two villages

The Punjab divides into three distinct regions, based on geophysical and social characteristics. One region, major in terms of population and area, is defined by the central canal colonies, falling in the administrative divisions of Lahore and Faisalabad. The second major region is defined by south-west Punjab, falling in the divisions of Multan, Bahawalpur, and Sargodha. The third, a minor region, is defined by north Punjab, falling in the administrative division of Rawalpindi.

The central canal colonies geographically fall in the plain lying between three major rivers, the Ravi, Jhelum, and Chenab. This region has the highest irrigation endowments. British colonial rule linked the three rivers with canals resulting in the largest irrigation scheme in South Asia at the turn of the century. The newly irrigated areas were settled with entire villages plucked from more densely populated areas in East Punjab. This transformed the canal colonies into a growth pole in the Punjab, and the Punjab into a growth pole in the Indian subcontinent since the beginning of the century (Mahmood 1988). This first agrarian revolution was followed by the second Green Revolution in the mid-1960s. The new High Yielding Variety (HYV) seeds, commercial fertiliser, and controlled irrigation in

the form of tubewells, package has had the highest rate of adoption in these canal colonies.

This gave the canal colonies two important characteristics, which are captured by the village environment in our study. One, this region has had the highest agricultural growth over the last three decades. Two, the concentration of owned and operated areas in this region is medium, lying between the high of south-west Punjab, and the low of the north Punjab. As a result, the tenurial forms that characterise high concentrations of area, like sharecropping, have a low incidence in the region.

The south-west Punjab geographically falls in the lower plain of the rivers Sutlej and Indus, and it is in part semi-arid. This region has lower irrigation endowments relative to the canal colonies. Canal colonisation started here at least three decades after the initial canal colonies. The expansion of irrigation here was lower. Subsequent expansion of irrigation from the 1960s onwards has also been lower here. Consequently adoption of the HYV package has also been lower here relative to the canal colonies.

This region is characterised by low agricultural growth relative to the canal colonies. The concentration of owned and operated area here is the highest. Absentee forms of tenure like sharecropping are also the highest here.

The north Punjab region falls geographically in the Potohar plateau. It is submontane. It has virtually no irrigation endowments except in the southern most lower reaches that fall into the plain. Therefore the agriculture here is rainfed, or *barani*. This region has historically has low agricultural growth. The British used the region for horse and mule breeding. The HYV package has had the lowest rates of adoption in this region.

This region has three important characteristics that are captured in the village environment in our study. One, agricultural growth here is very low. Two, the concentration of owned and operated

area is low here relative to the canal colonies and of course the south. Three, this region has a long history of migration for employment. Under colonial rule the region began providing the bulk of the soldiery, and this continues. This region also provided the earliest migration overseas, first to the UK in the 1950s, and then to the Gulf from 1970s onwards.

We have based the study of the Punjab on two villages. The constraints of the study did not permit the addition of the third village. In an ideal world this would have allowed us to sample one village from each of the three regions of the Punjab. As it is, we surveyed two villages, one from northern Punjab, and one from the canal colonies. This sampling has allowed us to contrast a high agricultural growth area with a low growth area.

The villages were chosen to represent the typical characteristics of their region. Mandher is the village surveyed in the northern Punjab district of Gujar Khan. The village is rainfed, and submontane. It has a low concentration of owned and operated area. The incidence of area sharecropped out is also low. Its factor markets are not well developed.

Chalk 323 is the village surveyed in the central canal colony district of Toba Tek Singh. The village is irrigated by a perennial annual canal and tubewells. It is a low-emigration village, with a medium concentration of owned and operated area a low incidence of sharecropping and highly developed markets for output as well as for land, labour and other inputs.

Mandher

In Mandher the major change over time has been demographic. This demographic change has not been biological, but social. Mandher has a very high incidence of outmigration. Approximately two-thirds of the households had one or more family member residing elsewhere. A large proportion had migrated abroad while a smaller proportion were army servicemen. Therefore remittance income (especially from

abroad) finances a high proportion of consumption in the village, and a much lower proportion of agricultural investment. These findings are in keeping with macro level estimates (PIDE 1992). Remittance income financed virtually no fixed capital infrastructure for the village, either privately, or collectively.

This major change of migration appears to be due to both classic push and pull factors. The main push factor is low value of agricultural output. The only cash crop, peanuts, permitted by the rainfall and the topography is of low value, as compared with cash crops—e.g. cotton, rice, sugarcane and orchard—in other regions of the Punjab. Another factor is the low productivity because of the lack and expensiveness of irrigation in an area with a low water table. A contributing factor is that of small farm sizes which do not permit the full capacity utilisation of a high investment tubewell. Neither a rental market for watered nor joint ownership of durable assets has yet developed.

Finally, marginally, the rate of growth of output is also low because of soil erosion through rainfall. Again investment in conservation of the soil would be less than the returns from the increased output, but the absence of collective institutions makes such investment unprofitable for single investors. Even the high remittance income does not generate a high increase in employment through the demand for consumption goods. A high proportion of remittance income is consumed in the form of durable goods purchased abroad. Again this is in keeping with the pattern of macro estimates of remittances (ILO, ARTEP 1986).

The pull factor is both (i) the higher level of wages and income outside the region, and abroad; and (ii) the higher rate of increase of these wages and income outside the region and abroad. The pull factor does not work indiscriminately. The transaction costs for migration outside the village, especially abroad, are high, so there is an entry price. These transaction costs and risks can be lowered, and the probability of employment outside increased

through the use of a kinship network. Our findings of the mechanisms of migration support Khan's (1991) detailed analysis of the moral economy of the barani peasantry.¹ We find that the mechanism explaining migration out of Mandher is based on three conditions. There are push factors that lower employment and income in the village relative to other regions. There are pull factors that raise employment and income in other regions and abroad relative to the village and the region. Third the rate of growth of the population is much higher than the employment generated in the village. And given the ability to migrate, there is no attempt to lower the population growth rate.

Chak 323

In Chak 323 the major change over time has been a high rate of growth of output. This has kept social demographic change, migration, low. The village is also handicapped by an environmental problem of salinity. This has been reduced over time through the high use of tubewells. The high rate of growth of output is explained through the fulfilment of a set of production conditions.

The primary condition has been irrigation. The village was settled at the turn of the century with 60 percent of the present area reliant entirely on canal water the year round. Over time, the demand for irrigation has increased, through more irrigation intensive varieties of crops, through a higher cropping intensity, and through a 40 percent addition in the village area. This demand has been met only partly through an increase in public canal water, and largely through an increase in private tubewell water.

The subsoil water is highly saline. The region has a high level of salinity and water logging. These twin environmental hazards have been caused by the development of canals in the regions. Prior to the vast expansion of canal irrigation at the turn of the century, the water cycle was in equilibrium. The recharge of subaquifers was equal to their discharge to the surface,

maintaining a deep water table. The expansion of canal irrigation under the British, and then over the 1960s and the 1970s increased the surface water. Since these canals are all unlined, surface water seepage has increased the recharge of the subaquifers, raising the water table. This rising water table brings salts to the surface, lower crop productivity, and in the extreme, preventing growth. The government solution to this hazard has been to promote tubewells to pump up the sub-surface water, lowering the water table, and using the water to leach salts from the surface. In Chak 323 salinity has been eroding productivity. However the large scale adoption of tubewells has lowered the water table over time, and levelled out the productivity loss over the last half decade.

The second major production condition that has been fulfilled is the adoption of the HYV package of seeds, fertiliser, and pesticides. The third major condition that is being fulfilled is the growth of human capital. The village has a higher educational attainment rate than the country mean.

This high rate of growth of output in Chak 323 has been accompanied by a high rate of growth of labour displacing mechanisation, in the form of tractors and threshers. The village area of approximately 600 hectares has about 50 tractors, giving a ratio of one tractor per 12 hectares.

The adoption of HYVs combined with mechanisation have increased landlessness through a complex mechanism glimpsed in Chak 323 and investigated in detail in other studies (Mahmood 1989). The adoption of HYVs has increased profitability per acre. These HYVs have been evenly adopted by owner-cultivators, and by sharecroppers renting in land. However landlords rent out land, and sharecroppers rent in land. But, the landlords have to share half of the increase in profitability with their sharecroppers, unlike owner-cultivators. This differential in the increase in profitability with the owner cultivators and landlords leads to a powerful incentive for landlords to evict

sharecroppers and resume this area for self-cultivation. The ability to self cultivate has historically been constrained by the problems of monitoring and supervising hired labour which has lead to the contractual form of sharecropping. This supervision constraint is eased through the introduction of labour augmenting tractorisation. Tractors permit an increase in output without a proportional increase in the labour use. In Pakistan a 40 HP tractor is estimated to displace a net of 10-11 permanently hired labourers. By using tractors landlords have been able to evict tenants.

Macro estimates of this structural change for Pakistan, and the Panjab show that the distribution of operated area increased in concentration between the census years of 1960, 1972, and 1980 (Mahmood 1992), largely due to a decrease in sharecropped area (Mahmood 1992). This trend was also observed in Chak 323 in an earlier study (Mahmood 1989), which estimated a polarisation in the distribution of operated area (Mahmood 1989), and a further increase in the proportion of landless households to approximately 60 percent of the total. Landless households have always occupied a defined area in the habitation site of the village. Over the last decade, the village habitation area has been expanded only to accommodate the growing number of landless households. So the increase in landlessness, combined with demographic growth of this largest group has resulted in two thirds of Chak 323 consisting of landless households.

The high rate of growth of output has also generated a high rate of growth level of employment in the village, despite the decline in employment of sharecroppers and permanently hired labour due to tractorisation. As a result, out-migration has also remained low, as our estimates show.

In general, the growth in inputs use, the fixed shift from sharecropping to fixed land rents, and expansion in the use of hired labour has contributed to the development of factor markets in Chak 323. The high use of inputs has created good input and

output markets. These are very important for small producers unable to buy large amounts, in cash, from outside the village. The high use of fixed capital equipment like tractors and tubewells has resulted in a large rental market. This is again very necessary for small producers who cannot buy this lumpy technology. The high use of fixed capital equipment has also created over time, the market for joint ownership of capital equipment like tubewells. This has also allowed small producers allotted unirrigated and so uncultivable land by the land reforms in 1970 to bring this into production. The large hired labour market in the village also appears to have increased the bargaining power of the landless class relative to the declining sharecropper class.

So change in Chak 323 presents a very interesting contrast to change in Mandher. In Mandher, low growth rates of income and employment relative to the rest of the world have led to a high rate of migration. In Chak 323, high growth rates of income and employment have led to migration remaining low and marginally positive environmental change. The high rate of growth of the landless population however cannot continue to be absorbed in agriculture alone.

The policy implications of these two case studies of the Panjab are also very clear, and take us back to the theoretical introduction to the study. The production and consumption environment defined by the village community is a useful level at which individual and community behaviour can be analysed. The case studies of the two contrasting villages shows that behavioural rationality changes with the potential mobility of the individual outside the community environment. In the case of Mandher, high potential mobility of the individual out of the village leads to a rationality, which will not increase the production and consumption infrastructure of the village. It is not rational to irrigate, to conserve the soil, to introduce technical change in production suited to the topography, to accumulate human capital, to invest in collective infrastructure for the village.

In the case of Chak 323, a low potential mobility of the individual out of the village leads to a different rationality. This rationality has increased the production and consumption infrastructure of the village. It is rational to irrigate, to reduce salinity, to introduce technical change in production, to accumulate human capital, to invest in collective infrastructure for the village like roads and medical units.

Migration-led Change in a Rainfed Village—Mandher

This case study is based on primary and secondary data. To get primary data, a sample of 34 households was drawn from different strata (farming and non-farming) of the village, and village level information was collected from different groups of villagers. For secondary data, besides published data, we will use an ESCAP Study on Social Participation in Rural Development.

Mandher village is located in the north of Gujar Khan tehsil, the southern tehsil of Rawalpindi district. The village is about 4 miles off the main highway linking the tehsil headquarters to the district headquarter, and about 30 miles from Rawalpindi, the district headquarter. The district is wholly rainfed or *barani*, and has a varied topography with high hills, plateau's, valleys, ravines and plains. Thus, there is great variation in soil depth, slopes and susceptibility to erosion. The land surface has been eaten away by gully erosion, leaving tableland, which constitutes the main cultivated area. The fields are massively embanked to retain moisture. The soil is mainly medium textured, with a fair proportion of clay. Mean annual rainfall is 30 inches, and is concentrated during July to September in summer and January to March in winter. Temperatures range between 0 and 40 degree Celsius.

The area of the village is 1421 acres.² The village is spread over six *dhoks* (hamlets) containing a total of 355 households. Dhoks Chathian, Kumharan, Para Mora, Gurandi, Borian and Lodhran, have respectively 140, 43, 49, 58, 42, and 23 households. In 1976 the total number of households were 287 giving a 23.7

percent increase in 15 years, at an average annual growth rate of 1.6 percent.

The settlement of the village is claimed by a caste called the Chattas. Their ancestors apparently laid down the foundation of the village some 400 years ago. Since they were the principal landowners, they bought in landless artisans to organise the division of labour. These included barbers, potters, blacksmiths and carpenters³. The various dhoks are the original settlements of the various occupational groups.

A large number of houses are semi-bricked or *katcha/pucca*⁴. A large number of *pucca* houses in the main dhok Chattian, and a few in other dhoks, all belong mostly to migrant households (i.e. those who have one or more male members abroad). Buildings for public use include three commercial structures, in addition to three school buildings, and seven mosques (one for each dhok and two for Dhok Chattian).

There is no common land for grazing. There are 17 common wells shared by 3/4ths of the households; the rest have private hand pumps or wells in their courtyards. Since 1985 almost all the houses in the village have electricity.

Population

In 1991 Mandher had a recorded population of 2636. The population below 15 years of age was 38 percent. The sex ratio of males per 100 females was 88 excluding non-residents and 116 including migrants so male migration had increased the female ratio in the village. The average household size was 6 excluding non-residents and 7.4 including non-residents.

According to the 1981 Census, the literacy ratio in the village was 17.9 percent. Currently, the village has 409 persons—i.e. 15.5 percent, 353 males and 54 females—who have received education till the primary level or beyond. Out of the 353 males, 210, 98, 33, 12, had completed primary, middle, matriculation

and intermediate respectively. Only two of the women have studied up to the matric level. Both matriculated 15 years ago, and are now teaching in the girls school. Current school enrolment shows 359 males and 160 females.

The majority of the households are agriculturists. Only 12 percent are landless. A relatively large proportion of the heads of landless households is migrants, mostly to the army. Of the rest, 21 percent are labourers, 34 percent traditional artisans working for a share of the harvest and 7 percent retail traders.

Table 4.1: Population and its Characteristics in Village Mandher

| | Census | | | | Sample | |
|---|--------|-------|------------------|--------|--------|---------|
| | Number | | Percent of Total | | Number | Percent |
| | 1976 | 1991 | 1976 | 1991 | | |
| Total population (including non-residents) | 1,697 | 2,636 | 100.00 | 100.00 | 238 | 100.00 |
| Total population (excluding non-residents) | 1,499 | 2,129 | 88.33 | 80.07 | 207 | 86.97 |
| Total number of non-residents | 198 | 507 | 11.66 | 19.23 | 31 | 13.02 |
| Population less than 15 years of age (included non-residents) | 622 | 994 | 36.65 | 37.71 | 94 | 39.50 |
| Child per household (included non-residents) | 2.17 | 2.8 | .. | .. | .. | 2.76 |
| Population 15 years and above (included non-resident's) | 1,075 | 1,642 | 63.35 | 62.29 | 144 | 60.50 |
| Population growth rate (included non-resident's) | 2.97 | | .. | .. | .. | .. |
| Population growth rate (excluded non-resident's) | 2.37 | | .. | .. | .. | .. |
| Average household size (included non-resident's) | 6.00 | 7.42 | .. | .. | .. | 7.00 |
| Average household size (excluded non-resident's) | 5.22 | 6.00 | .. | .. | .. | 6.08 |
| Sex ratio (included non-resident's) | 103 | n.a. | .. | .. | 116 | .. |
| Sex ratio (excluded non-residents) | 80 | n.a. | .. | .. | 80 | .. |
| Total number of households | 287 | 355 | .. | .. | 34 | .. |
| Households growth rate | 1.48 | | .. | .. | .. | .. |
| Joint household | 72.00 | | .. | .. | 14 | 41.17 |
| Nuclear household | 28.00 | | .. | .. | 20 | 59.00 |

| | | | | | | |
|---|--------|-----|----|----|----|----|
| Population density (including non-resident) | 295 | 458 | .. | .. | .. | .. |
| | (sqkm) | | | | | |
| Population density (excluding non-resident) | 260 | 370 | .. | .. | .. | .. |
| | (sqkm) | | | | | |

Table 4.1 shows population growth between a previous estimate in 1976 and the 1991 census that we carried out.

- The table gives a growth rate of 2.97 percent over this 15-year period, including non-residents. This is closer to the population growth rate for district Rawalpindi (during 1972-1981) but much higher than the estimate given by population census of 1981 for the village.
- There has been a small increase in the population below 15 years from 36.6 percent to 37.7 percent, which shows an increase in the dependency ratio.
- The average household size has increased.

Appendix Table A2 shows that in this village women generally marry at a very early age, and certainly much earlier than men. 72 percent of the women in the sample were married between the ages of 14 and 18, against which only 17 percent of the men married before 22 years. Early age at marriage for women increases their fertility, as well as child mortality rates, which too increase the demand for children.

The relationship between high fertility and high mortality can be seen in Table 4.2. The village has a child mortality rate (below 5 years), of 102 per thousand, which is related to low birth spacing. Table 4.3 shows that half the women in the sample had a birth spacing of 2.5 years or less, and that 75 percent of the reported infant deaths were their children.

Table 4.2: Women by Number of Children ever Born and Number of Children Died

| No. of Children | Women by No. of Children ever born | Percent | Women by No. of Children Died |
|-----------------|------------------------------------|---------|-------------------------------|
| 1 | 3 | 9.68 | 7 |

Population, Environment and De-Responsibilisation

| | | | |
|-------|----|--------|---|
| 2 | 3 | 9.68 | 3 |
| 3 | 5 | 16.12 | 1 |
| 4 | 3 | 9.68 | |
| 5 | 3 | 9.68 | |
| 6 | 6 | 19.35 | |
| 7 | 2 | 6.45 | |
| 8 | 2 | 6.45 | |
| 9 | 1 | 3.22 | |
| 10 | 2 | 6.44 | |
| 11 | 1 | 3.22 | |
| Total | 31 | 100.00 | |

Currently there is no family planning facility in the village. A facility was set up in 1980 but lasted only a few months due to a lack of staff members and non-co-operation by the villagers. 59 percent (24) of the sampled women were favourably inclined towards a small family, but only 2 were using any contraceptives, while 7 said they would use them if they were available. Several people said that large family sizes permitted both cultivation at home, and migration abroad, bringing remittances.

Natural Endowment

The land is eroded by both rainfall and the wind. Heavy rains wash away the soil, decreasing soil depth. The land itself is medium-textured with a fair proportion of clayey soils. But it is deficient in nitrogen and phosphorus. The low soil depth and mineral deficiency constrain crop yields.

Table 4.3: Birth Spacing and its Impact on Child Deaths

| Birth Spacing (in months) | No. of Women | Percent | No. of Child Deaths | Percent |
|------------------------------|-----------------|---------|------------------------|---------|
| 12-17 | 4 | 13.33 | 4 | 25.00 |
| 18-23 | 8 | 26.66 | 4 | 25.00 |
| 24-29 | 4 | 13.33 | 4 | 25.00 |
| 30-35 | 8 | 26.66 | 3 | 18.75 |
| 36-41 | 3 | 10.00 | 1 | 6.25 |
| Above | *3 | 10.00 | 0 | 0.00 |
| Total | 30 | 100.00 | 16 | 100.00 |

Note: *: Those who have only one child

Since there is no irrigation system, crop production depends entirely on rain. Tube-well irrigation is difficult because the subaquifers are scanty and deep. Rainwater is lost through high runoff in the uneven terrain. And the subsoil layers composed of rock, clay or silt do not store ground water well. Although the village sits on a monsoon stream, it is about 30-40 feet above the stream and has been unable to use this water for irrigation.

Trees are scarce. The very limited number of trees consist mainly of slow-growing, small-growing, small-sized, less shaded trees of *Phulai (acaciarbica)*, and *drek (milia sem pervirens)*. Most villagers grow these trees on their farms to protect the soil from erosion, and to get firewood. Sale of firewood is not common. 61 percent of the sample households use wood and dung as fuel. Migrant households however were substituting wood with liquefied gas and kerosene oil.

Social Infrastructure

Except for two traditional midwives, there are no health care facilities, public or private in the village. The nearest formal health care facility is in Gujar Khan town, about eight miles from the village. Two private buses ply daily to the town on this road, at least half of which is just a dirt track.

The village has one high school for boys and two primary schools for girls. The student-teacher ratio in both the boy and the girl schools is approximately 50:1. The boys school was established in 1968, as a primary school, up-graded to the middle level in 1977, and to high school in 1988. The girls' schools were established through the cooperation of the state and the villagers, in 1968. The villagers provided the land and some money. Remittance money certainly helped. The village has 11 meagrely stocked, household-run shops. For more provisions, people go to Gujar Khan. There is no drainage for the village or most of the houses. Only sample three houses have toilets connected to a soak pit. Village streets are brick paved through a state scheme, but because of absence of proper drains, the streets are often inundated with the refuse water flowing out of the houses.

Migration

Out-migration is the most important distinguishing feature in Mandher. This is an old phenomenon, but has intensified over time. There is a long history of male migration to join the army. Migration abroad began in the 1950s and the 1960s, initially to the UK. Later, as the British government imposed restriction on new immigration and economic expansion accelerated in oil rich countries the trend of migration diverted towards the Gulf States. The two oil price hikes in the 1970s dramatically increased the demand for unskilled and semi-skilled labour in the Gulf. At a macro level the rate of outmigration peaked in the early 1980s with remittances to Pakistan touching \$3 billion per annum. Out-migration from Mandher continues to be high.

Table 4.4: Percentage Distribution of Households with and without Migrant Members in Village Mandher by 1976, 1991 Census and by Sample Survey.

| Households | 1976 | | 1991 | | Sample | |
|------------------|------|---------|------|---------|--------|---------|
| | No. | Percent | No. | Percent | No. | Percent |
| With Migrants | 163 | 56.67 | 226 | 63.66 | 23 | 67.64 |
| Without Migrants | 124 | 43.32 | 129 | 36.33 | 11 | 32.35 |
| Total | 287 | 100.00 | 355 | 100.00 | 34 | 100.00 |

Table 4.5: Percentage Distribution of Households by Migrant Members, in Village Mandher

| No. of Migrants | Census Households | | Sample Households | |
|-----------------|-------------------|---------|-------------------|---------|
| | No. | Percent | No. | Percent |
| 1 | 129 | 57.08 | 15 | 65.22 |
| 2 | 61 | 27.00 | 8 | 34.78 |
| 3 | 8 | 3.54 | | |
| 4 | 8 | 3.54 | | |
| 5 | 4 | 1.77 | | |
| 6 | 3 | 1.33 | | |
| 7 | 3 | 1.33 | | |
| 8 | 2 | 0.88 | | |
| 9 | 1 | 0.44 | | |
| 10+ | 6 | 2.65 | | |
| Total | 226 | 100.00 | 23 | 100.00 |

Table 4.6: Percentage Distribution of Households Having only Local Migrant, Overseas, or Both Local and Overseas Migrants by 1991 Census and Sample Household.

| No. of Non Residence | Overseas (a) Migrant | | Local (b) Migrant | | No. of Overseas | Migrant (c) | |
|----------------------|----------------------|--------|-------------------|--------|-----------------|-------------|--------|
| | No. | % age | No. | % age | | Local | No. |
| 1 | *34,8 | 50.74 | *95,7 | 68.34 | 1+1 | *15,2 | 75.00 |
| 2 | *14,1 | 20.89 | *32,3 | 23.02 | 1+2 | 2 | 10.00 |
| 3 | 2 | 2.98 | 4 | 2.88 | 1+3 | 1 | 5.00 |
| 4 | 2 | 2.98 | 4 | 2.88 | 3+1 | 1 | 5.00 |
| 5 | 3 | 4.48 | 1 | 0.72 | 4+2 | 1 | 5.00 |
| 6 | 1 | 1.49 | 1 | 0.72 | | | |
| 7 | 1 | 1.49 | 2 | 1.44 | | | |
| 8 | 2 | 2.99 | | | | | |
| 9 | 1 | 1.49 | | | | | |
| 10 | 1 | 1.49 | | | | | |
| 10+ | 6 | 8.95 | | | | | |
| Total | *67,9 | 100.00 | *139,12 | 100.00 | - | *20,2 | 100.00 |

Note: *: Refer sample households with reference to migrant members.

Table 4.4 shows that in 1991, 64 percent of the households in Mandher had at least one member from their family residing elsewhere. This shows an increase of about 10 percent over the last 15 years. An average of 1.4 members per household reside out side the village. Of these, more than half the households have only one and 27 percent have two migrant members (Table 4.5). Table 4.6 shows that migrants form 60 percent of the households were living within the country, while those from 30 percent were residing abroad. The remaining 9 percent households had family members (more than one clearly) in both places (Table 4.6). However, the proportion of migrants who live abroad is 53 percent.

Table 4.7 shows that 58 percent of the sampled urban migrants were between 16 and 20 years old. Half of these had permanent jobs in the army. Migrants to Europe too had a relatively permanent status, but migrants to the Gulf were on temporary

contracts. 77 percent of the migrants had at least primary education. Interestingly, the proportion of educated migrants was higher within the country (95 percent) than (50 percent) abroad. Of the former, almost 60 percent have a high school education. This suggests the shortage of employment opportunities for the educated within the village. Among overseas migrants, the number of married migrants are higher, while local migrant tend to be younger (below 25 years of age) and unmarried (Table 4.8).

When questioned about the mechanisms of migration, a villager responded, "poverty shows the way." Kinship mechanism played an important role in pulling migrants abroad, by providing information about jobs. The migration to the Gulf has also been facilitated by recruiting agencies that mediate between potential migrants and employers. But the migrant pays a large fee to recruiting agents, and runs the risk of fraud or default.

Table 4.7: Distribution of Migrants by their Age at the time of Migration, Education and Destination (Sample Households)

| Age at the Time of Migration | Overseas | | | | | Local | | | | | |
|------------------------------|-----------|-----|---------|--------|--------|-----------|-----|---------|--------|--------|-----------|
| | Total No. | Non | Primary | Middle | Matric | Total No. | Non | Primary | Middle | Matric | Total No. |
| 16-20 | 1 | - | - | 1 | - | 11 | - | - | 1 | 10 | 12 |
| 21-25 | 2 | 2 | - | - | - | 4 | 1 | 1 | 2 | - | 6 |
| 26-30 | 3 | - | 1 | 1 | 1 | - | - | - | - | - | 3 |
| 31-35 | 2 | - | 1 | - | 1 | 2 | - | 1 | - | 1 | 4 |
| 36-40 | - | - | - | - | - | 1 | - | 1 | - | - | 1 |
| 41-45 | 3 | 3 | - | - | - | 1 | - | 1 | - | - | 4 |
| 46-50 | 1 | 1 | - | - | - | - | - | - | - | - | 1 |
| Total | 12 | 6 | 2 | 2 | 2 | 19 | 1 | 4 | 3 | 11 | |

Table 4.8: Distribution of Migrants by their Present Age, Marital Status and Destination (Sample Households)

| Present Age | Overseas | | | Local | | |
|-------------|----------|---------|-----------|-------|---------|-----------|
| | Total | Married | Unmarried | Total | Married | Unmarried |
| 16-20 | - | - | - | 3 | - | 3 |
| 21-25 | - | - | - | 8 | 1 | 7 |
| 26-30 | 2 | 1 | 1 | 3 | 2 | 1 |
| 31-35 | - | - | - | 1 | 1 | - |
| 36-40 | 5 | 4 | 1 | 2 | 2 | - |
| 41-45 | 2 | 2 | - | - | - | - |
| +45 | 3 | 3 | - | 2 | 2 | - |
| Total | 12 | 10 | 2 | 19 | 8 | 11 |

Remittances

Lack of information at the village level does not permit us to make an accurate estimate of remittances. But the sample data are revealing on broad trends. Appendix Table A3 shows that in the sample 27 migrants (about 93 percent) send money regularly to their homes, amounting to an aggregate of about Rs. 50,000 a month. About 70 percent of this amount comes from abroad. On average a local migrant contributes less than Rs. 650 per month while an overseas migrant sends more than Rs. 3000 per month. If the durable goods and savings that migrants bring on their visits or on their return to the village are included, then the net capital inflow to village Mandher from migration would be even higher.

The use of remittances is heavily biased towards consumption rather than investment or savings. In Mandher, besides tractors, one bus and three small vans can be related to remittances. There is no hard evidence of the use of remittances for variable input into agriculture. On the other hand the remittances clearly contribute towards consumption, some of it conspicuous, such as on marriages or consumer durables. The pucca houses are largely constructed from remittances. At the poorer end of the scale remittances also allow daily consumption.

Migration has had three observable types of impact on Mandher. First and most obvious, it has provided jobs outside because there are hardly any in the village. Second, because migration is largely male, and somewhat skilled, it has left behind a village of women and low skilled labour. Third remittances have polarised the village starkly into the migrant households, and the non-migrant households.

Production

In Mandher about 88 percent of the total households cultivate land. The limited census data does not permit a village estimate of the distribution of operated area, so we have to use our limited sample data of 30 households. Table 4.9 shows that the mean owned area is low at about 8 acres. Only 5 households out of 30 owned more than the village mean. The largest owned area is about 50 acres.

Table 4.9: Distribution of Land Ownership (Sample Household)

| Village Land Owned | No. of Household | Percentage of Household | Land Area | Percentage of Land | Average Size of Holding |
|--------------------|------------------|-------------------------|-----------|--------------------|-------------------------|
| > 2.49 Acre | 8 | 26.66 | 9.12 | 3.95 | 1.14 |
| 2.50 - 4.99 | 5 | 16.66 | 14.50 | 6.27 | 2.90 |
| 5.00 - 7.49 | 5 | 16.66 | 28.00 | 12.11 | 5.60 |
| 7.50 - 9.99 | 7 | 23.33 | 57.00 | 24.66 | 8.14 |
| 10.00 - 12.49 | 1 | 3.33 | 10.00 | 4.33 | 10.00 |
| 12.50 - 17.49 | 1 | 3.33 | 12.50 | 5.40 | 12.50 |
| 17.50 - 24.99 | 1 | 3.33 | 20.00 | 8.65 | 20.00 |
| 25.00 - 49.49 | 1 | 3.33 | 30.00 | 12.98 | 30.00 |
| 50 and above | 1 | 3.33 | 50.00 | 21.63 | 50.00 |
| Total | 30 | 100.00 | 231.12 | 100.00 | 7.78 |

Moreover, it appears from Table 4.10 that much of the owned area is uncultivated or uncultivable due to erosion. The distribution of operated area actually reduces the mean farm size to about 5 acres. For instance the largest owned area of 50 acres falls into the 12 to 17 operated area category after accounting for

uncultivable area. The largest operated area falls down to 20 acres.

The main crop is wheat, covering more than 80 percent of the cropped area, while the main cash crop is groundnut. Only half the households grow maize on one acre of land on average, and 60 percent grow groundnuts, also on one acre each.

Table 4.10: Distribution of Operational Holdings (Sample Household)

| Size of Operational Holding | No. of Household | Percentage of Household | Land in Area | Percentage of Land | Average Size |
|-----------------------------|------------------|-------------------------|--------------|--------------------|--------------|
| > 2.49 Acre | 9 | 30.00 | 8.75 | 6.17 | 0.97 |
| 2.50 - 4.99 | 8 | 26.66 | 26.00 | 18.34 | 3.25 |
| 5.00 - 7.49 | 9 | 30.00 | 47.00 | 33.15 | 5.22 |
| 7.50 - 9.99 | - | - | - | - | - |
| 10.00 - 12.49 | 1 | 3.33 | 12.00 | 8.46 | 12.00 |
| 12.50 - 17.49 | 2 | 6.66 | 28.00 | 19.75 | 14.00 |
| 17.50 - 24.99 | 1 | 3.33 | 20.00 | 14.10 | 20.00 |
| 25.00 - 49.49 | | | | | |
| Total | 30 | 100.00 | 141.75 | 100.00 | 4.72 |

Use of external inputs (of all types) is very low. Fertiliser use is low because of the complete lack of irrigation, adoption of new seeds appropriate for *barani* area is sporadic, and virtually no hired labour is used. So the only labour is family labour. Women have increasingly entered into production in the absence of male members who have migrated.

The low input levels imply low yields. Wheat has a mean yield of about 10 maunds per acre, showing a very low increase of about 1.8 maunds over 15 years. Groundnuts have a low mean yield of about 7 maunds per acre.

Since arable agriculture has not been the dynamic sector, livestock could substitute for it. However over 15 years the number of animals per household seems to have dropped from

5.8 to 2.7. This may reflect a macro trend with the reduction of common areas for grazing, and the increased use of mechanisation. However in Mandher, Table 4.11 shows that the number of bullocks is low and the number of cows is high. Small farms cannot afford the more expensive bullock.

Table 4.11: Distribution of Livestock

| Livestock | Number | Percentage |
|-----------|--------|------------|
| Buffaloes | 10 | 11.63 |
| Bullocks | 4 | 4.65 |
| Cows | 41 | 47.67 |
| Goats | 27 | 31.39 |
| Donkeys | 4 | 4.65 |

The non-agricultural sector is limited for two reasons. One, the needs of the agricultural sector is very low. There are few durable assets to be serviced and low-level of variable inputs to be provided. So these needs are met from outside the village. Two, remittance income does not appear to have been invested in the non-agricultural sector in the village on any sustained basis. The transport sector is the only evidence of this form of investment.

However, a limited number of traditional artisans persists in the village. There are three potters, one shoemaker, and two to three women tailors. Over time the role of these artisans is being marginalised, but no modern non-agricultural sector is emerging within the village to replace them. They are being replaced by the outside world.

Production-Led Change in an Irrigated Village: Chak 323

Chak 323 is located in Toba Tek Singh tehsil, in Toba Tek Singh district, in Faisalabad division. The district headquarter, Toba Tek Singh, is situated west of Faisalabad city, close to the River Ravi and the River Chenab and its connected with its divisional

headquarters, about 70 miles distant, both by road and rail. The district consists of a level plain, with fertile soil, wholly irrigated by the Chenab canal. From the village the district head quarter is about 30 miles away. The village is on a metalled road, a recent link.

The village was settled in 1906 by the British under the canal colony scheme. Under this system the most prominent settlers were allotted one square of land (27.67 acres) each, and also appointed as *lumberdars* (village headmen) to collect land revenue. At that time two *lumberdars* were appointed, each responsible for 550 acres of area. In 1947, the two *lumberdars* were granted 12.5 acres of land in return for their services. The present *lumberdars* are the eldest sons of the original incumbents. Both belong to the *Arain* caste.

Most of the houses are located together in one main cluster, planned during the original settlement. Two years ago the main village habitation site was extended to accommodate landless labourers. The central part of the habitation site is occupied by the landed class. This is surrounded on three sides by landless and artisan households, both groups residing in independent clusters.

The total number of houses is 315, out of which 62 percent are *katcha*, 28 percent *katcha/pucca* and only 16 percent *pucca* houses. Almost all *pucca* houses are owned by big landowners, while *katcha/pucca* houses are owned by small landowners, tenants or those running some enterprise. Almost all landless labourers and artisans own *katcha* houses (Appendix Table A4). Almost all houses in the village have electricity and a water source inside.

Collective infrastructure includes two brick-lined village ponds for animals, which are cleaned on a collective basis; two school buildings, one for boys and one for girls; and two mosques. The graveyard is outside the habitation site, between the old and new

settlements. Chak 323 has a number of shops, clustered at two different points at opposite ends of the residential area.

Population

Table 4.12 shows that the village population falls into two distinct groups, the landed and the landless. Out of 315 households, 46 percent had access to the land, while 54 percent had no access.

Table 4.12: Breakdown in Terms of Agrarian Structure: Sample of 315 Households

| | Those with Access to Land | | | | | Landless | | |
|-------------------|---------------------------|----------|-------------------|-----------------|---------|----------|----------|-------|
| | All | Landlord | Owners farmers | Owner tenant | Tenants | All | Labourer | Other |
| No. of H.H. (315) | 145 | 5 | 96 | 1 | 43 | 170 | 94 | 76 |
| % (100.0) | 46.3 | - | - | - | - | 53.96 | - | - |
| | 100 | 3.45 | 66.2 | 00.68 | 29.65 | 100 | 55.29 | 44.70 |

The recorded census for 1992 gives a population of 2130. Table 4.13 below shows a male-female sex ratio of 104. Migration out of the village is recorded at 38 males and 6 females, which is low. The relatively even sex ratio is also evidence of low male out-migration.

Children below 15 years of age are 45 percent of the population. This child dependency ratio is higher than that reported for the district, but close to the national average. There is an average of 6.6 person per household that is below the district average of 7.1. The village mean is 2.95 children per household.

The breakdown of households by social groups shows that landless population has a higher percentage (48 percent) of children below 15 years than landed group (41 percent). The landless have 82 children per 100 adults compared to the 72 per 100 adults for the landed. This gives the landless households an average of 3.00 children per household; while landed households have a lower average of 2.95 children per households. So the landless poor have a higher fertility rate, and a higher dependency ratio.

Appendix Table A5 shows that in Chak 323, women generally marry early but less so than in Mandher. This is true for both landless and landed class. Roughly half of the women were married between the age of 14-18 years.

Table 4.14: Women by number of Children Ever Born and Number of Children Died (Sample households)

| Number of Children | Women by No. of Children Ever Born | | Women by No. of Children Died | |
|--------------------|------------------------------------|--------|-------------------------------|--------|
| | Landless | Landed | Landless | Landed |
| 1 | - | 2 | 1 | 4 |
| 2 | 1 | 2 | - | 1 |
| 3 | 1 | 3 | - | 1 |
| 4 | 5 | 7 | - | - |
| 5 | 2 | 1 | - | - |
| 6 | - | 1 | - | - |
| 7 | 1 | 2 | - | - |
| 8 | - | 1 | - | - |
| 9 | 1 | 1 | - | - |
| 11 | - | 1 | - | - |
| Total | 11 | 21 | 1 | 6 |

It is interesting that in Chak 323 high fertility for the landless is not related to high infant mortality. Table 4.14 shows a relatively low infant mortality rate for both landless and landed households in the sample. Birth spacing however is clearly linked to high fertility. Table 4.15 shows that landless households in the sample had a higher proportion of women giving birth with a spacing of less than 1.5

years. In landed households, 62 percent of the women had birth space greater than 2 years. From the sample households, only 6 women used contraception, although all of them were aware of it. 3 of these were from landless and 3 from landed households.

Education Attainment and School Enrolment

According to the 1981 census, the literacy ratio for the village was 38 percent. 646 persons had passed primary or higher levels of education—302 primary, 171 middle and 173 matric and intermediate. The last group includes 135 males and 38 females. Notwithstanding the shortage of school facilities in the Chak, the level of education in the village has increased rapidly since then and people appear very motivated in this respect. The village boasts 12 graduates, 3 with postgraduate qualification (including one medical doctor) and 3 PhDs. We do not have good estimates for matriculation or intermediate levels, but it is much higher than in 1981, and above the national average. Among women, four have completed the intermediate level, one is a graduate, and there are many matriculates. Educational attainment is clearly higher among landed households than among landless households (Table 4.16).

Table 4.15: Birth Spacing and its Impact on Child Death (Sample Household)

| Birth Spacing in Months | Number of Women | | Number of Deaths | |
|-------------------------|-----------------|--------|------------------|--------|
| | Landless | Landed | Landless | Landed |
| 12-17 | 6 | 6 | 1 | 4 |
| 18-23 | 1 | 2 | - | 1 |
| 24-29 | 2 | 8 | - | 2 |
| 30-35 | 1 | 3 | - | 2 |
| 36-41 | - | 1 | - | - |
| 42-47 | 1 | 1 | - | - |
| 48-53 | | | | |
| 54-59 | | | | |
| 60+ | | | | |
| Total | 11 | 21 | 1 | 9 |

Table 4.16: Distribution of respondents and their Spouse by their Education Attainment

| Educational Level | Landless | | Landed | |
|-------------------|----------|---------|--------|---------|
| | Males | Females | Males | Females |
| None | 7 | 10 | 2 | 8 |
| Primary | 1 | 1 | 3 | 10 |
| Middle | 3 | - | 4 | 2 |
| Matric | | | 11 | 2 |
| FA | | | 1 | |
| BA | | | 1 | |
| Total | 11 | 11 | 22 | 22 |

Table 4.17: Households Sending their Children to School

| Households | Landless | Landed Class |
|---|----------|--------------|
| Sending both girls and boys | 2 | 23 |
| Only boys are going to school | 1 | - |
| Both are not going to school | 3 | - |
| Few children are going to school and other doing child labour | 5 | - |
| Total | 11 | 23 |

For an equal sample, Table 4.17 shows that many more landed than landless households send their children to school. The total number of boys going to school in the village was much higher at 340 because it was middle school. The total number of girls going to school was 150 because they only had a primary school in the village. For a higher level of schooling girls had to go to a neighbouring village, which inhibited some parents.

46 percent of the heads of the households are in agriculture. Of these 3 percent are pure rentier landlords sharecropping out all their area, 67 percent are self-cultivators, and the remaining 30 percent are tenants, both share-croppers and lease holders. Landless households fall into two broad categories, labourers (55 percent) and artisans 45 (percent). Among wage labourers, 85 per cent are unskilled casual day labourers, either inside the village or in its environs, 10 percent are skilled labourers (e.g. masons) and 5 percent permanent farm workers on fixed yearly incomes. The breakdown of artisans shows a variety of occupations, including potter, barbers, shopkeepers, weavers, shoemakers, blacksmiths, butchers and mechanics (Appendix Table A8).

The village has a total area of 1662 acres, out of which 88 percent is cultivated, and the remaining covered by houses, schools, roads or ponds. The village soil is fertile with no area currently affected by waterlogging or salinity. In previous years the water table was at 60 feet, but due to installation of tubewells, it has now dropped to about 110 feet. The village has no forest cover. A limited number of trees are grown for fuel, although cotton brush is also used as a substitute fuel.

Irrigation still mainly depends on canals. 78 percent of the cultivated area is irrigated by canals and tubewells, and only 22 percent by tubewells alone. At present twenty-five tubewells are working in the village. Rainfall is limited, averaging 10-15 inches yearly. One-sixth of the area is served by cemented water channels. This has been achieved through a joint state-cum-village scheme, with the state providing the material inputs, and the villagers providing the labour.

Although there is no public health care centre in the village, there is a private doctor in the village itself, and a dispensary in the next village, Chak 324, a half mile away. The nearest hospital is in Pirmahal, 6 miles away. There are also two traditional midwives in the village, and very few women go to the hospital for childbirth. The only health facility provided at site by the state is free vaccination for children through mobile teams whose arrival is announced by the mosque loudspeaker. The incidence of vaccination is high.

The village has a middle school for boys and a primary school for girls. The boys school has a student teacher ratio of 27:1. This is kept down by a number of boys going to neighbouring schools. The girls school was started in 1969. It has a very unfavourable student teacher ratio of 75:1.

The boys schools was opened in 1912 as a primary school, and was upgraded to middle level in 1952. Since there is a high

school in the neighbouring village, Chak 324, the local school cannot be upgraded further because of state policy restricting the number of high schools in an area.

The market town for commercial activities and for livestock is Pirmahal. But there are a relatively large number of enterprises and small businesses in the village. The following table shows the nature of non-farm activities within the village. The village has 23 shops of different nature, and the Pirmahal market is mostly used for purchases of inputs. The villagers have no need to go to Pirmahal to sell their output, because commodity traders (*arhtis*) themselves come to the village to buy crops directly from farms.

Table 4.18: Nature of Non-Farm Activities

| Enterprise | No. | Enterprise | No. |
|------------------|-----|-------------------|-----|
| Tailor | 1 | Cycle Repair | 1 |
| Butcher | 5 | Sweetmeat | 3 |
| Workshop | 1 | General merchants | 9 |
| Cloth | 1 | Potter | 3 |
| Electrician | 1 | Ghee seller | 1 |
| Barber | 4 | Doctor | 1 |
| Water man | 1 | Grinding machines | 3 |
| Goldsmith | 1 | Blacksmith | 1 |
| Shoemaker | 1 | Oil press | 1 |
| Weaver | 3 | Livestock trader | 5 |
| Pesticide dealer | 1 | Fertiliser dealer | 1 |

Virtually all houses have hand pumps in their courtyards, and some have electric motors to pump up water as well. The ground water is saline. There is a post office and a private telephone in the village. Since 1988 the village has been linked to the main Faisalabad artery by a metalled road. This road was constructed by a matching grant. The villagers paid for the land, and government paid for the construction. Eighty percent of the total cost was paid by the government, and the remaining twenty percent shared between the villagers. Rs. 78,000 were

contributed by the villagers, who also participated in the construction so that no outside labour was hired. At present three wagons run between the village and Pirmahal daily. Two of the owners belong to the village, and the third to Chak 324.

The Major Dynamic of Production

The major dynamic in Chak 323 is clearly agricultural production. This is indicated through both structural change in the distribution of operated area, and through the observed growth of production. There are several structural indicators of agrarian growth in Chak 323. One, the percentage of pure rentier landlords is now very low, at 3 percent of the total agricultural households. Of the total cultivated area, share-cropped area has dropped from approximately 50 percent in 1970 to 26 percent in 1992. So landowners are resuming land over time from share-tenants to cultivate it themselves.

Two, the nature of the share contract has also changed over time. The traditional share contract was based on a 50 percent share of the inputs and output for the landlord. Our current estimates show although that 65 percent of the share contracts are still at this 50 percent level, the remaining give the landlord 55 percent (and even up to 66 percent) share in the inputs as well as output. This contractual change indicates the landlords' desire to increase their profitability per acre, supporting others studies cited earlier.

Three, a land rental market has developed over time. Sharecropping is a personalised contract, resorted to partly because the fixed rental market is very insecure in the early stages of development of a region. The existing land revenue record shows that from the total cultivated area in Chak 323, 60 percent is self-cultivated, 26 percent is sharecropped. And the remaining 14 percent is on a fixed rental. So both self-cultivation and fixed rental contracts are encroaching on share contracts.

The growth of output is also clearly observable in Chak 323. This village is highly irrigated, but it still faces water shortages.

Farmers supplement canal water from the Gogera branch of the canal with tubewell water. One-sixth of the village land is entirely dependent on tubewell water. This is the land allotted to landless share tenants under the land reforms of 1970. The small holders with 12.5 acres each did not have the internal resources to buy individual tubewells. However, over time they have managed to co-operate to buy joint tubewells to bring their land into cultivation. There is a flourishing market in tubewell water. The level of installation of tubewells is now approximately one tubewell per 50 acres.

Despite this high rate of growth of irrigation, producers complain that their crop yields have levelled out because of insufficient water. Therefore, the rate of growth of cropping intensity is obviously higher than the rate of growth of irrigation.

The important food crop grown in the village is wheat; cotton is the main cash crop, while *bajra*, fodder, sesame and mustard are also grown for consumption. In 1991/92, out of 832 acres of land used for the winter *Rabi* crop, 88 percent was used for wheat, 8 percent for fodder, and the rest for mustard, pulses and vegetables. In 1991, out of the 843 acres of the summer *Kharif* crop, 85 percent for cotton, 8 percent for fodder and 5 percent maize.

There is a high level of investment in capital assets on the farm. The village has more than 50 tractors, 30 tubewells and 10 threshers. There is a large rental market for these capital assets by small farms.

The rate of adoption of the HYV package of inputs has been high. The high level of input use, and its adaptation to soil quality also shows a high level of human capital investment. Small producers were observed to be resentful of the information advantage enjoyed by the larger producers.

As a result of this investment in material inputs, wheat yield in Chak 323 is high around 30 maunds per acre. Cotton yield is also high at about 25 maunds per acre. Farmers estimate that their yields had been declining with the rising water table until about 5 years back. With the drop in the water table, they feel that their yields have begun to at least level out. The major constraint on yield is water.

The high levels of output have generated considerable wage employment in the farm sector, despite the large-scale tractorisation. The use of casual labour is very high, while the use of permanent labour is lower. This is the pattern of labour use resulting from the high use of tractors. In spite of this, as seen above, the level of migration out of the village is relatively low. Clearly then, the farm sector generates some of this employment to keep this casual labour in the village. In addition, as seen, the buoyant farm sector generates a demand for inputs and consumption that has created a significant non-farm sector in the village. This non-farm sector also accounts for some employment of wage labour.

The entire region has a high level of salinity. It is clearly observable on barren tracts of land left for construction outside Pirmahal and other towns. However, neither Chak 323, nor its surrounding villages show any evidence of salinity on the soil surface. Moreover, the water table which producers claim had risen up to 60 feet and more has now dropped.

This decline in salinity has resulted entirely from private investment, because there is no state scheme in evidence in the environs of Chak 323. In Chak 323 the level of investment in tubewells with large bores has been very high. The impact of 30 odd tubewells pumping up water has lowered the water table to about 110 feet.

In addition, villagers are aware that unlined water channels across the village increase seepage and raise the water table, besides wasting precious water. So the village has participated in a government scheme to line the water channels gradually. The government provided 90 percent of the material cost, while individual landowners

provided labour or its cost. This scheme is ongoing, with one-sixth of the village area covered so far. The neighbouring village of Chak 324 has covered almost half its area's water channels through this scheme.

There is no drainage or sewerage system either for the village, or most of the houses. A few of the rich *pucca* houses have built soak pits for their toilets. The majority of the village still spews its refuse water into the village streets. Since the streets are mud tracks, stagnant pools of water accumulate all over the village. Combined with animal refuse this stagnant water becomes a major health hazard. Despite the high growth of incomes in the village, and their expenditure on housing, consumer durable, and transport, this problem at their doorsteps has not been tackled.

There is a free rider problem here. Co-operation in production has increased in the village, because individual investment can be equated to returns. However co-operation for consumption which will be equal poses a problem. Poor households cannot be charged as much as rich households, but they will benefit equally from draining and lining the streets. The same analogy applies to the slow expansion of the school system. The rich will have to pay more for a benefit that can be equally derives by the poor. This explains why the richer households are willing to send their children to neighbouring private schools and colleges, because they keep the benefit that accrues proportional to their investment.

Table 4.19: Distribution of Livestock

| Livestock | Landed | Landless |
|-----------|--------|----------|
| Buffaloes | 33 | 6 |
| Bullocks | 10 | - |
| Cows | 9 | 7 |
| Goats | 3 | 5 |
| Donkeys | 2 | 3 |
| Sheep | 6 | - |
| Total | 63 | 21 |
| Average | 2.73 | 1.90 |

Table 4.20: Distribution of Households by Purpose of Having Livestock (Sample Households)

| Animals are for | Landless | Landed |
|--------------------------------|----------|--------|
| For family use | 9 | 12 |
| For both family use and income | 0 | 8 |
| Having no animal | 2 | 3 |
| Total | 11 | 23 |

Table 4.21: Source of Fuel, for Cooking by Social Class (Sample Household)

| Source | Landless | Landed |
|----------------------------------|----------|--------|
| Fuel wood and cotton straw | 4 | 10 |
| Fuel wood, cotton straw, and gas | 1 | 8 |
| Cotton straw, kerosene oil, gas | - | 1 |
| Fuel wood, cow dung | 5 | 2 |
| Fuel wood and kerosene oil | - | 2 |
| Fuel wood, cow dung, oil | 1 | - |
| Total | 11 | 23 |

In Chak 323 draught animals are being replaced by mechanisation very rapidly. Table 4.19 shows that among sample households, landed households have a relatively greater reliance on livestock than landless households. This is expected because of the high price of fodder and the disappearance of common grazing grounds. About 75 percent of the total livestock are owned by landed households.

19 percent of the animals owned by landed households are mostly draught animals, compared to 14 percent for landless households. These too are mostly donkeys used for freighting. Compared to landed households, landless households have a higher proportion of smaller animals, such as goats, because they are cheaper to maintain without land. Table 4.20 shows that landless households keep animals mostly for domestic use, while landed households still maintain as a source of farm power.

In Chak 323, cotton straw is commonly used for fuel. After cotton picking landowners simply store this brush. The non-landed households collect or buy this brush. The current price of cotton brush was an exorbitant Rs. 200 per acre. Table 4.21 shows that even for landed households, a higher proportion of households use cotton brush and fuel wood. Although a few have gas cylinders, they use them only for emergencies. Landless households tend to use cotton straw and cow dung with fuel wood.

The use of fuel indicates an interesting divergence in expenditure patterns between the two villages. The poorer rainfed village living on remittance income has a high consumption pattern. This is illustrated by the greater use of gas cylinders in that village. The much richer irrigated village has perhaps not increased its consumption in proportion to its income levels and still continues to rely on cotton brush for fuel.

Conclusion

The two villages presented in this chapter have gone through development as different as one can imagine, and yet fostered by the same sector, namely the economy. In the first village, labour out-migration and remittances sent back to the village have shaped changes in the village. In the second, production for the market and modernisation of the mode of production have been the engines of change.

It is worth noting that neither change has been fostered by population growth. These two villages, in spite of the different experiences they have gone through, thus show that the process of integration with the outside world—through participation in the labour market or through commercialisation of local products outside the village—is the overwhelming cause of transformation of the life in the villages, reducing to a marginal role population growth.

An interesting aspect is that in spite of the economic difference between the two villages, people's attitude towards population is quite similar in both cases. There is no overall significant difference in terms of fertility rates or in terms of contraceptive use (see tables 4 and 13). The only significant difference to be noted is between landed and landless people in Chak 323, these latter having a higher dependency ratio.

Concerns over population growth are alien to both places. For the landed of Chak 323, population growth creates surplus of labour from which they benefit directly. As for their own progeny, they have enough capital to invest in out of agriculture businesses, thereby solving the division of land issue. For the landless, population growth can be seen as a strategy for survival or development. As shown in table 4.17, most of them do not send their children to school and instead are working. In Mandher, many sons mean more chances that one of them will go abroad and send back remittances. In all cases, except perhaps for the landed people in Chak 323—but they constitute a minority—there is no real incentive to reduce the size of the families.

Concerns over the environment are also individually defined. In Mandher, as was noted, the whole development of agriculture suffers from more collective actions and investments, notably for irrigation or against land erosion. At the individual level, of course, it is more profitable to invest in migration rather than in local production. However, more collective actions among those who stay back prove beneficial for the community as a whole, notably concerning irrigation and controlling land erosion. The point is that migration has privatised life in the village, which in turn has undermined people's capacity to address common issues. As elsewhere, people invoke the government to solve their problems.

In Chak 323 as in Mandher, the building of schools or of sewage system is hampered by a lack of collective actions. Here, the

richer landed class, and notably the *lumberdars*, do not see it in their interest to foster 'human' development in the village. In a way, since they enjoy other opportunities, they do not need to develop new ones within the village. Moreover, doing so might undermine their position as dominating class.

Hence, although both villages have enjoyed important growth of income over the recent past, this new income has been utilised for individual goals and very little for collective investments. Thus we find here at the local level what had been described in the introduction for the national level as a very imbalanced record of growth: important economic growth but very poor 'human' growth.

That this should be so in two places as different as Mandher and Chak 323 tends to show that the issue is not so much of the level of economic growth but that of the 'quality' of growth, and more precisely the fact that people are not involved in developing public spheres of life. In both villages people have scolded the government for its inefficiency and the way it enjoys a good life in Islamabad far away from people's problems. And yet they ask the government to solve all their problems.

Endnotes

1. Khan uses Scott's notion of the moral economy of the peasantry to theorise the kinship determinants of migration and remittance channels.
2. A village is a chunk of households known by a certain name. A village, which is a community in the sociological sense, can be contrasted with a *mauza*, which is the smallest and lowest land revenue unit. The latter may consist of more than one village, and is the basic unit for which land records are maintained, although they contain information about each of the villages within the *mauza*.
3. Barbers besides hair cutting and shaving, act as messengers at time of births, marriages or deaths, also perform important functions on special occasion, they cook food at marriage and death occasions. Potters make pots for cooking, bricks, etc. Blacksmiths and carpenters maintain agricultural implements.
4. *Katcha/pucca*: The outside of the walls of the house are brick made, inner side cemented, the roof supported by wooden beams and floor mostly of clay. Some houses contain one cemented room and the other *katcha/pucca*.
Pucca: Totally cement and brick structure, with the roof supported by iron beams with latrine, bathroom and kitchen and amenities like water source, electricity.

Appendix

Table A1: Population by Sex, Population Density, Household Size, Decennial Change and Annual Growth Rate of Rawalpindi District

| Area (Sq. Km) | Both Sexes | Population 1981 | | Sex Ratio | Pop. Dens. | Average House- hold size | Urban Propor- tion | Pop. 1972 | 1972-81 Pop. Gr. Rates (%) | |
|---------------------|---------------|-----------------|---------|--------------|---------------|--------------------------------|--------------------------|--------------|----------------------------------|------|
| | | Male | Female | | | | | | | |
| Rawalpindi District | 5286 | 2121450 | 1099104 | 1022346 | 107.5 | 401.3 | 4.2 | 47.8 | 174760 5 | 2.31 |
| Gujar Khan Tehsil | 1457 | 360588 | 173924 | 186664 | 93.1 | 247.5 | 5.8 | 9.4 | 348222 | .41 |
| Kahuta Tehsil | 1180 | 249353 | 121546 | 127807 | 95.1 | 211.3 | 6.0 | 3.7 | 218795 | 1.55 |
| Murree Tehsil | 654 | 223023 | 116807 | 106216 | 109.9 | 341.0 | 6.5 | 7.1 | 187649 | 2.06 |
| Rawalpindi Tehsil | 1995 | 1288486 | 686827 | 601659 | 114.1 | 645.9 | 6.3 | 74.1 | 993019 | 3.12 |

Source: (1981 District Census Report)

Table A2: Mandher: Distribution of Respondents and Their Husbands by Age at Current Marriage

| Age at Marriage | Respondents (Nos) | Percentage | Husbands | Percentage |
|-----------------|----------------------|------------|----------|------------|
| <14 Years | 1 | 3.44 | - | - |
| <14 Years | 2 | 6.89 | - | - |
| 15 Years | 2 | 6.89 | 1 | 3.44 |
| 16 Years | 10 | 34.48 | - | - |
| 17 Years | 1 | 3.44 | 1 | 3.44 |
| 18 Years | 4 | 13.79 | - | - |
| 19 Years | - | - | 2 | 6.89 |
| 20 Years | 8 | 27.59 | 1 | 3.44 |
| 21 Years | - | - | - | - |
| 22 Years | - | - | 4 | 13.79 |
| 23 Years | - | - | 1 | 3.44 |
| 24 Years | - | - | 1 | 3.44 |
| 25 Years | - | - | 5 | 17.24 |
| 26 Years | - | - | 2 | 6.89 |
| 27 Years | 1 | 3.44 | 2 | 6.89 |
| 28 Years | - | - | - | - |
| 29 Years | - | - | - | - |
| 30 Years | - | - | 6 | 20.69 |
| Above 30 Years | - | - | 3 | 10.34 |

Table A3: Mandher: Inflow of Remittances
a. Migrants Currently Working in Urban Pakistan

| Monthly | No. of Migrants |
|----------------|-----------------|
| <500 Rs | 1 |
| 500 | 8 |
| 600 | 2 |
| 700 | - |
| 800 | 1 |
| 900 | - |
| 1000 | 1 |
| 1100 | 1 |
| 1200 | - |
| 1300 | - |
| 1400 | 1 |
| 1500 | 2 |
| Irregular | 1 |
| Just join army | 1 |
| Total | 19 |

b. Migrants currently working overseas

| Monthly | No. of Migrants |
|-------------|-----------------|
| Rs. 1000 | 1 |
| 1200 - 1500 | 2 |
| 2000 - 3000 | 1 |
| 4000 - 5000 | 5 |
| 6000 - 7000 | 1 |
| No response | 2 |
| Total | 12 |

Table A4: Chak 323: Type of House by Social Class

| Social Class | Katcha | Katcha/Pucca | Pucca | Total |
|---|--------|--------------|-------|-------|
| Landlords | 2 | 2 | 1 | 5 |
| Tenants (1/2, 1/4 leaser) | 34 | 7 | 2 | 43 |
| Self cultivators + owner tenant | 28 | 32 | 37 | 97 |
| Labourers | 68 | 12 | 1 | 81 |
| Drivers | 8 | - | - | 8 |
| Livestock trader | 5 | - | - | 5 |
| Permanent Labourer | 4 | 1 | - | 5 |
| Barber, blacksmith, oil press, butcher, vendor | 9 | 3 | - | 12 |
| Shopkeepers (only shopkeepers) | 6 | 4 | 1 | 11 |
| Migrant | 7 | 3 | 5 | 15 |
| Others etc. | 21 | 9 | 3 | 33 |
| Total | 192 | 73 | 50 | 315 |

Table A5: Distribution of Respondents and Their Husbands by Age at Marriage (Sample Households)

| Age at Marriage | Landless No. | | Landed No. | |
|---------------------|--------------|------|------------|------|
| | Husband | Wife | Husband | Wife |
| < 14 Years | 1 | 1 | - | - |
| 14 Years | - | - | - | - |
| 15 Years | - | - | - | - |
| 16 Years | - | 1 | - | 2 |
| 17 Years | - | 1 | - | 4 |
| 18 Years | 1 | 4 | 4 | 5 |
| 19 Years | - | - | 1 | 1 |
| 20 Years | 2 | 2 | 2 | 7 |
| 21 Years | - | - | 2 | 1 |
| 22 Years | 1 | 2 | 2 | 1 |
| 23 Years | - | - | - | 1 |
| 24 Years | - | - | - | 1 |
| 25 Years | 2 | - | 3 | - |
| 26 Years | 2 | - | 2 | - |
| 27 Years | - | - | 1 | - |
| 28 Years | - | - | - | - |
| 29 years | 1 | - | 1 | - |
| 30 Years & above | - | - | 4 | - |
| Total | 10 | 11 | 22 | 23 |

Table A6: Type of Fertiliser by its Price

| Fertiliser | Price |
|----------------|-----------------|
| Super Sulphate | Rs. 80 per bag |
| DAP | Rs. 249 per bag |
| 23/23 | Rs. 150 per bag |
| Urea | Rs. 205 per bag |

Table A7: A Permanent Labour Gets in a Year

| | |
|----------------------|-------------|
| Pay in cash (yearly) | Rs. 5000/- |
| Wheat once a year | Maunds 22 |
| Fodder once a year | Maunds 15 |
| Bersem twice a year | Acre 0.12 |
| Sugar | Maunds 0.75 |
| Gur | Maunds 0.75 |
| Tobacco | Maunds 0.62 |
| Cotton | Maunds 0.50 |
| Clothes and shoes | Two |
| Wood | |

Table A8: Occupation of the Heads of the Households

| Occupation | No. |
|---|-----|
| A. Landed class | 145 |
| a. Landlords | 5 |
| b. Owner farmers (including owner tenant) | 97 |
| c. Tenants (Leaser + share croppers) | 43 |
| B. Landless | 170 |
| a. Labourers | 94 |
| b. Artisans etc. | 76 |
| A. Labourers | 94 |
| a. Daily labourers | 80 |
| b. Skilled labourers | 9 |
| c. Permanent farm labour | 5 |
| B. Artisans etc. | 76 |
| a. Weavers | 2 |
| b. Shoemaker | 1 |
| c. Blacksmith | 1 |
| d. Goldsmith | 1 |
| e. Barbers | 4 |
| f. Potters | 3 |
| g. Shopkeepers + chakis + ghee sellers | 17 |
| h. Butchers | 5 |
| i. Drivers | 8 |
| j. Livestock traders | 5 |
| k. Migrants | 15 |
| l. Others, etc. | 14 |

Population Dynamics, Environmental Changes and Economic Development in Pakistan: A Case for the Restoration of local Responsibility

Frank Amalric and Tariq Banuri

The question of sustainability poses itself at different levels: local, regional, national and global. The preceding chapters have tried to analyse the dynamics of change and the impact of population growth in different villages, i.e. at the local level. This chapter reviews the main findings of the case studies and looks at the integration of these villages within a region or the country as a whole, that is at regional or national sustainability.

Let's first come back to some common trends that have been observed at the local level. First, and not surprisingly, it appears that the relationship between population growth and environment degradation is a very complex one, and except perhaps in some remote villages (like Risht, chapter 3), not a direct one. This is merely a consequence of the growing divorce between the village-as-community and the village-as-environment. In some cases—as in Mandher or in the Northern Areas villages—labour

out-migration has become so important that the local environment no longer provides the central source of local income. In other cases, the village environment, with the commercialisation of its products, has become part of the larger economy, at such an extent that the way it is managed responds more to external constraints than to village-based requirements. In short, the communities have out-grown their environment or the environments have out-grown their community.

Thus, one way or the other, the interaction between the community and its environment is not determined by the interior tension between needs and resources but by the interaction of the community with the outside world. Concern and care for the environment become subordinated to the integration of the community within a broader economic, political and cognitive system. This means that population growth is neither a direct cause of environmental degradation, nor a direct cause of economic development.

Second, and in part as a consequence of the preceding, population growth is not perceived as a major issue, or even as an issue at all.

Third, and also related to the first point, is a certain carelessness for the environment: dirty streets, de-forestation, land erosion are issues people do not really care about although they interact directly with those issues. It was argued that this apparent carelessness could be interpreted as an avowal of powerlessness.

Fourth, there is an important bias for private consumption and against public forms of consumption, such as education, health, sewage system and environmental conservation. This could simply stem from people's preferences. By contrast, we suggest that it comes from a lack of a local institution through which common needs could be addressed.

The first section of this chapter shows how these common trends are the result of an excessive modernisation of the mode of production or of excessive reliance on outsiders for development. The second section reviews the failure of usual aggregating institutions, the market and the state. One side of the coin is that the intervention of both these institutions has weakened the ability of communities to take decision. The other side of the coin is that it has thereby *de-responsibilised* people for common issues to the point that people's strategies have become indifferent or even antagonist to national priorities such as controlling population growth, conserving the environment or fostering economic development. The role of local institutions is therefore dual: provide means for collective action within the village; provide the possibility for political de-centralisation and the creation of some national consensus over crucial issues.

The last section draws on the experience of AKRSP in the Northern Areas to discuss both the success and limits of local participation. It then argues that *responsibilisation* requires more than just local participation, and notably a circumscribing of national resources to which a community can aspire.

A Story of (Under)-Development

The Market: Economic Growth and De-Responsibilisation

In some villages, the possibility for local populations to manage their environment has been undermined by a general process of de-responsibilisation brought about by the modernisation of the mode of production. In itself this is a paradox. Development, as modernisation, was to empower people, to give them more control over their environment, to liberate them from such arbitrariness as natural calamities. In other words, the space in which people could act was to be expanded. The expansion of the market, for instance, is seen as widening people's economic sphere. Similarly, the development of a modern democratic state is seen as widening people's political power.

In the coastal villages and in Chak 323, Punjab, the market and the modern state have not opened new spheres in which people could act. On the contrary, they have imposed forms of management, of organisation, of production that reduce people's capacity to control their lives.¹

The modernisation of production in Rehri and Lad Basti (see chapter 2) has induced greater dependence of fishermen on the outside world. This greater dependence is controlled by middlemen, who, through a particular form of credit transactions, have restrained the fishermen's freedom to act in the economic sphere. This setting is strengthened by the political power of the middlemen, and the absence of counter-balancing institutions such as an independent judiciary. In turn, the middlemen derive their legitimacy by embodying the solution to people's problems through their connections with the outside world. Today all problems in the village—such as waste disposal—are no more perceived as the responsibility of the villagers but as the responsibility of the government through the middlemen. As a result, the form of management of village affairs has been completely disembodied from the context, and implementing a solution for a problem depends on the ability of the middlemen to foster governmental intervention. For instance, cleaning of the streets is done by a government employee who comes once a week to the villages. But if this form of management is sufficient for the little populated Lad Basti it is clearly insufficient for Rehri. The point is that the dirtiness of streets, that is the state of the environment, has no direct impact on the form of management. Under these conditions, population growth, or a change in the consumption pattern of the villagers, such as a greater use of plastics, cannot be coped with.

A similar setting prevails in Chak 323 (see chapter 4). Again the opportunities provided by modernisation have been monopolised by few large landlords and more specially by the *lumberdar* (tax collector). His control over life in the village stems also from a combination of economic power, political connections with the

outside world and the absence of an independent judiciary. Like the middleman in the coastal villages, the *lumberdar* is seen as the one who can solve disputes and other problems in the Chak 323. However, the solutions he implements are constrained by his own economic and political interests. If he has organised the villagers to build a road, there is by contrast nothing done to build a sewage system, or to up-grade the schools.

In those three villages, the issue is therefore not of a lack of management, nor of a lack of initiative from the villagers. Institutions to cope with the village problems, be they economic, social or environmental, exist in the person of the middleman or the *lumberdar*. The problem is that these institutions are selective; the solution they can reach are constrained by the institution itself.

Looking Outward for Development

The other villages studied show an opposite story. In those villages there is no collective form of management of communal problems that crowds out other, possibly more efficient, forms. Rather the primary obstacle seems to be a resistance to any form of collective management.

The environment in those villages is quite poor. In the eight villages surveyed in the mountainous Northern Areas cultivable land is scarce, forests are disappearing. In Mandher, a village in the rainfed area of Punjab, prospects for indigenous development may appear limited compared to what development means. Soil erosion is the main environmental problem, but investing in land maintenance can be counter-productive as compared to sending one member of the family abroad. Another particularity of these villages is the egalitarian distribution of land, preventing economic domination by few persons.

However, good prospects for local development do exist, as shown in the Northern Areas under the impulse of AKRSP (see chapter 3), and by a study in the rainfed area which assessed the

potential yield of wheat at 7,500 kilograms per hectare as compared to a mere 650-1,225 kilograms today.² Be that as it may, the villages are characterised by high labour migration to cities in the country or abroad. It is at the same time a strategy of development and a strategy to cope with population growth. But since the villagers then rely more heavily on outside resources, the sustainability of such a strategy can only be assessed at a higher level of aggregation. Thus, the question of whether environmental development should take place in Mandher and the villages of the Northern Areas should be asked at different levels: is it in the interest of individuals, but not realised because of market imperfections or socio-cultural constraints? Is it in the interest of the community but not realised because of a lack of community level institutions? Is it in the interest of the nation, but not realised because it is in contradiction with both individual and communal interests?

At the national level, the question is not whether local development would be more beneficial than out-migration, for remittances provide more needed hard currencies than local production would. However, the aspiration to migrate (especially abroad) may conceal local opportunities, notably under the form of collective investments that would raise productivity without a corresponding increase in labour. The question is, therefore, between different forms of consumption. In this line, more 'public' consumption in the villages would indeed be in the interest of the nation as a whole.

What the success of certain NGOs tends to show, notably in the Northern Areas (see below) is that there is scope for more collective actions at the village level, and that such actions will eventually benefit the individuals while being coherent with national goals. By contrast, in a village like Mandher, there seems to be a lack of political leadership that could instil a collective image of development and foster collective action.

In fact, in Mandher (chapter 4), labour out-migration has led to a privatisation of life. It contrasts with the view that development usually leads to an expansion of the public sphere at the expense of the private sphere, through such processes as the division of labour, schooling, health services, etc. Activities that people used to do separately are brought together under public institutions such as companies, schools, and hospitals. In Mandher, and notably in the production sector, the inverse phenomenon has occurred. Labour-migration has shifted the dependence of the villagers from the sole product of the land, and hence of the village, to remittances sent back by relatives. There is, therefore, no communal vision of development in the economic sphere. Issues such as land erosion, lack of irrigation, are not shared problems but individual ones to which only individuals can find solution.

On the Sustainability of Managing Population Growth

It was noted in chapter 1 that one of the key elements to the sustainability of population growth is the pattern of rural-urban development. Migration is needed out of fragile ecological zones, while retention is needed in robust ones to limit the burden put on cities.

Robustness must not be mistaken for the richness of an environment. It must be understood in a relative sense; a robust environment is one, which has the potentiality to support a greater intensity of man's activity. This difference, as we shall see, is important as changes in the different villages are not always the function of the potentialities of a given environment, but more often depend on the history of changes.

We can confront this sustainability constraint at the national level with the experience of migration in the different villages of the case studies. As we have seen, two broad forms of management of population growth exist. One is to exteriorise the responsibility for development (and hence for managing population growth) as the role of the government. This is the case in Chak 323 and in

the coastal villages. The other is through labour out-migration as in Mandher and in most of the villages in the Northern Areas.

The choice of the strategy is clearly related to the richness of the environment. In the coastal villages and in Chak 323, the environment has provided the base for development. By contrast, in the rainfed Mandher and in the quasi-desert like northern villages, people chose to migrate in the face of adversity. However, as noted above, this distinction between rich and poor does not correspond necessarily with the distinction between robust and fragile.

If Risht (in the Northern Areas) is a typical example of both a poor and fragile environment, Mandher, although today environmentally poor is not environmentally fragile. It is more the absence than the excess of man's activity there that poses a problem. As noted in the preceding section, prospects for higher yield in agriculture are important. In this case, migration is counter-productive in the long run from a sustainability point of view because it deters villagers from further developing potential local resources.

In the coastal villages, the environment is rich. However, that will it be robust enough to sustain a growing population can be questioned. One problem is over-fishing in the area, especially of shrimps that constitute the main source of earnings for the fishermen. Another threat is the depletion of the mangrove forest. Here again, the growing population imposes a greater burden on the forest for fuel wood. Hence although today the environment is rich, too much reliance on this wealth can be unsustainable in the long run.

Chak 323 provides yet a different picture of an environment, which is rich and quite robust at the same time.

It is thus the historical process of development and not the conditions for further sustainable development that explains the

pattern of migration. Although precise figures are not available, the condition of life in the coastal villages or in Chak 323 appeared worse than in Mandher, for instance. To explain migration in terms of a difference in wages (like in the Todaro model) falls short of providing a satisfactory explanation. The paradox is that villagers in Chak 323 do not try to migrate, although their living standard is below the one of villagers who does migrate.

Again, the lack of relevant data renders rather tentative any explanation advanced. However, some points can be made. One is that villagers in Mandher or in the northern villages do not depend solely on remittances. The produce of the land is still an important source of income, about 50 percent of total income on average in a district near Mandher in 1987.³ By contrast, poor villagers in Chak 323, who are landless, would depend completely on remittances if they were to migrate. The difference lies is that the ownership of land provides jobs to the entire family (notably women), whereas women are less associated to income generating activities in Chak 323 or in the coastal villages.

More important perhaps is the degree of economic freedom one enjoys in different contexts. Labour-migration is a conspicuously individualistic behaviour in villages where other forms of behaviour are the norm (coastal villages, Chak 323). By doing so, one exposes himself/herself to some form of retaliation in cases of disputes which engage the community. By contrast, migration in other villages is the norm. Doing so is therefore not a breaking away from the community.

The Failure of Institutions

Intervention of the State

From an ecological point of view, the process of development in the villages studied has been unbalanced: it has led to over-reliance on rich environments at the expense of improving the potential of poorer ones. At the village level, it has provided in

the first case the foundations for an exploitative system that has more in common with feudalism than with competitive markets, and in the second case the source for a growing disinterest towards local production.

The role of the state in this process has been important. Pakistan, as shown in chapter 1, has a long tradition of economic planning and of government intervention in the economic sphere. In agriculture, this tradition goes back to colonial times, with the building of numerous irrigation canals by the English. The development of the fishing industry geared for exports has also been fostered by government policies (see chapter 2). Altogether, the expansion of the resource base has traditionally been the doing of the government, and not of local communities (with some exceptions such as in the Northern Areas with AKRSP (see next section)). Thus, the state's long interventionism has contributed in creating a form of dependency which results today in people from all villages claiming that "it is the role of the state" to do every and any thing.

The resources of the state are limited and far from capable of fulfilling every village's expectations, leading some to note the tendency of the state to finance investment but not recurring costs of establishments (UNDP 1991). The quality of education, for instance, is often pathetic in rural areas, as well as in inner cities, because most teachers are "over-burdened, poorly motivated, badly educated, ill-paid and inadequately trained or supervised" (Banuri, Kemal, and Mumtaz 1992). Similarly, although the coverage of curative health facilities (estimated at 55 percent of the country's population by UNDP) compares favourably with that in other developing countries, the result in terms of life expectancy at birth, infant mortality or crude death rate are poor compared to those in low and middle income countries (Burney, et al, cited in Banuri, et al 1992).⁴

In the villages surveyed, this translates into the government facing problems in organising people in cleaning the irrigation

canals (Chak 323), delivering drinking water (coastal villages), managing forests (coastal villages, Chalt). Hence, although in times the state has provided the funds to develop a particular resource, funds and adequate community participation for a good management of these resources have often been lacking.

The Illegitimacy of the Market

Economic theory shows that good functioning markets are the most efficient way to co-ordinate different people's behaviour. Furthermore, the spread of the market, by giving access to a greater choice of goods, should lead to an improvement in people's welfare. Indeed, in some of the villages surveyed, notably in the Northern Areas, access to new goods and opportunities through the market has had a somewhat beneficial effect on people's welfare (see chapter 3: 23). Yet, even if some modernisation of the mode of production did take place under market forces in those villages, it would be far from being the main dynamic of change.

By contrast, where market forces were indeed the main factors of change, it did not significantly raise people's welfare, as seen in the previous section. In fact, and as a vivid example of the national case (chapter 1), economic growth has not generated higher income for the bulk of the villagers, nor enhanced markedly human development. One characteristic of the spread of the market has thus been the non-redistribution of the benefits of economic growth.

Another characteristic of development is the villagers' perception of the state as the agent of change. Interestingly enough, both characteristics conflict with the basic modern economic postulate—that economic growth is brought about by individuals' competitive behaviour in the economic arena and that economic competition eventually benefits all participants (see chapter 1).

It is clear in all villages, and especially in the ones where growth of local production has been important, that there is no

institutional separation of the societies into economic and political spheres. This is in fact in accordance with findings at the national level.⁵ A consequence is the difficulty to implement the market as an institution for economic growth. The saying that ‘it is the role of the government’ or ‘God will provide’, recurrent in all case studies, is another way to assert one's powerlessness to change the world. It is coherent with the experience of economic growth which, in the three villages, and generally in Pakistan, has been more the doing of the government and other outsiders than the result of competing economic agents.

Another way to put it is to say that there is a lack of entrepreneurship, be it collective or individual. However, for entrepreneurship spirit to gather requires appropriate social conditions. In fact in the villages, there is no social legitimacy to compete economically within the community, for economic growth is not associated with the improvement of all, but with the improvement of one at the expense of the others. Thus the coastal villagers perceive the headman as a patriarch rather than as a monopolist (chapter 2). What it means is that the market has not gained any legitimacy as a co-ordinating institution. Consequently the expansion of the resource base is generally left to the discretion of outside agents, who act with respect to their own interest and constraints rather than with respect to local needs.

Interestingly enough, the success story of AKRSP in the Northern Areas, which is the focus of the next section, rests precisely on methods of development different from market forces. AKRSP has not made the market work better: it has created the conditions for alternatives to market forces to work.

Towards Responsibilisation

Local Participation: Successes and Limits

In the villages surveyed in the Northern Areas, the “looking-outward” movement, comparable to the one observed in Mandher, has been mitigated by the apparently successful

intervention of an NGO which has helped villagers re-direct their efforts towards local based development.

The Aga Khan Rural Support Programme (AKRSP) started its work in Gilgit district in December 1982, with the goal to establish sustainable village organisations as a means for further development. AKRSP has tried to play the role of a catalyst, first by motivating villagers to create village organisations (VOs), and second by providing support services (e.g. technical training, managerial skills, etc.) for the realisation of development projects (e.g. irrigation canals, bridges) defined by the VOs. Village organisations are also encouraged to save, the savings serving as collateral for development loans. AKRSP's success can be gauged by the number of projects realised with its help: as to 1989, the AKRSP programme has helped establish more than 1,000 village organisations, which have completed 560 physical infrastructure projects (WB 1990).

This experience is interesting at different levels. First it shows that there is a scope for collective action, which is compatible both with individual interests and national goals. Second, that this potential can be realised through the intervention of an external agency. And third, that this approach is intrinsically limited because it does not offer a solution to the question of integration with the larger socio-economic and political network.

The traditional economic scope for collective decision making is well known, namely cases of market failures such as externalities or public goods. In the villages surveyed, such market failures are common: management of commons such as forests or rangelands, development of infrastructures such as roads, irrigation canals or schools.

In theory, market solutions—notably with the creation of new individual rights or titles of ownership—can be implemented to curtail inefficiencies due to market failures. As Nobel Laureate Ronald Coase (1960) argued, all what is needed are explicit

property rights. To whom the rights are vested then, does not matter.

If this is true in pure economic theory, it is nonetheless constrained by several problems in reality.

In the Northern Areas, for instance, sophisticated rules prevail over the distribution of new land, whereas in other cases, the absence of such rules impedes the appropriation of commons (see chapter 3). This is an example that illustrates the fact that if the rights are not viewed as legitimate and equitable, they will not be politically sustainable. Resistance movements to illegitimate rights leading to a waste of resources are common features (see chapter 1).

Second, it is important to ensure that whoever has rights over a resource also has the capacity to manage and protect the resource. In the coastal villages, although the villagers own their land, they claim that they cannot exercise this right because the government agents will not give them their titles of property without a bribe.

A third problem will be discussed below.

Through local participation and respect for traditional rules, AKRSP has been able to foster community level actions. Where rights, such as for the distribution of new land or of water, are well defined, it was easy to reach a consensus among the community towards collective management. In such cases, and as was noted in chapter 3, AKRSP has provided the critical inputs which have given an incentive to reactivate community actions. But there is more to it than that, both positive and negative. On the positive side, and in some cases, the VOs have been able to take action in areas where traditional rules did not exist.⁶ In those cases, AKRSP has not only revived collective decision making, but also fostered its application to even new areas.

On the other side, the picture should not be idealised: the problem of community decision-making, which is also the problem of creating a public space, is larger than a lack of inputs. It also involve questions of trust, of justice, as is shown in the following passage:

The AKRSP model which seeks to organise the local population into co-operatives, that dispose of joint (and not individual) savings, to resolve individual and collective perceived constraints (whether these lie in the social, or the economic sector), is not as effective as might be expected, because the posts of office bearers, which require the keeping of account and qualities of leadership, are monopolised by the affluent and influential who embody these qualities.... The co-operative, as a consequence, comes to function as a quasi-exploitative organisation of a small minority of dominating office bearers, and the majority of dominated members. (Mumtaz et al 1989:146)

The system works, however, because the AKRSP is perceived as just and uncorrupted and can therefore always be called in as an impartial judge to solve an intra-village conflict. But this implies that AKRSP's role is larger than that of a spark or catalyser. It also questions the sustainability of the project beyond AKRSP's existence.

An external impartial judge is not necessary, however, in cases where an undisputed leader can gather people's trust. This opens the important question of charisma. In Chalt, for instance, the villagers took control over the forest following a visit by Dr. Akhtar Hameed Khan, a charismatic figure in rural development. Villagers recognise that the vision Dr. Akhtar Hameed Khan gave them of the forest being like their mother, and the critical role it was to play in their future, was the major factor which changed people's attitude and encouraged them to take over the control of the forest. In fact Dr. Akhtar Hameed Khan conveyed a sense of

holist responsibility to the villagers over the forest. It is the kind of political leadership that is lacking in other settings, as argued previously.

Whether such an experience is unique or replicable is an open question. In an interview on Orangi Pilot Project, an NGO in the slums of Karachi which he started and which inspired the AKRSP model, Dr. Akhtar Hameed Khan bluntly said that “Orangi is not unique, I am” (Wilkinson 1992). Which would mean that such successes are replicable if some people were willing to consecrate their lives to such endeavours.

The point is not to create an army of volunteers who would dedicate their lives to one cause. AKRSP and Dr. Akhtar Hameed Khan have been successful and able to gain some authority because they have always pursued public welfare in their handling of public affairs. By contrast are the examples of the coastal villages and Chak 323 where local leaders have used their power to strengthen their stronghold over the economy of the villages, at the expense of public welfare.

In fact, in many cases, local participation is perhaps not the first step on the agenda. As argued previously, local participation will be successful inasmuch as there is space for it. This was the case in the Northern Areas where there existed a partial political and social vacuum, due in part to their remoteness (Haider 1991). In other cases, room for local participation needs to be created. In this line, and analysing the failure of the different rural development programmes in Pakistan, Inayatullah (1987) notes:

Between the state and rural masses stood an intermediate structure of power—feudalism—that performed dual functions. Feudal class generally supported the rulers and the state apparatus which in turn helped them influence rural development policies and their implementation through local bureaucracy, and pre-empt most of the benefits of rural development.

As a reward of this support, the central rulers permitted them a free hand to control the rural society, maintain the status quo, thus stabilise it and immunise it from significant structural transformation. The feudal intermediary structure prevented the emergence of autonomous rural organisations, captured and controlled the local government institutions whenever they were introduced as well as the co-operatives.

In such a case, the first step should be the dismantling of this intermediary structure, through the provision of alternative supplies to the services they control. In other, words, liberation is a pre-condition to local participation. This requires notably the installation of an independent (and just) judiciary.

Circumscribing the World

The literature on local participation often over-emphasises the notion of community, as if it existed as such, instead of focussing on integration. Thus it seems at times that the real issue is bypassed, for the opposition between communities and society at large, which has *de facto* eroded, remains at the heart of the rhetoric. For no community today—at least in Pakistan—is isolated from the broader economic and political setting, and the process of integration, for better or worse, is irreversible. Thus local participation alone, whatever the strength of the arguments supporting it, is no panacea.

Thus collective decision-making, or local participation, on matters dealing with life in the village is not the only goal of strengthening of local institutions. On the other side of the coin, it must lead to better coherence between different community development and regional or national goals. For, on most issues, as has been discussed at length previously, the community is not the level of aggregation at which sustainability can be assessed: local participation does not solve the issue of defining objectives at higher levels of aggregation, and responsabilising the populace for those objectives.

This is the third problem with Coase (1960)'s solution: that if the social interest lies in ensuring that natural resources are not degraded, rights must be vested in people who share this concern. While, for instance, it may be in an individual or community's interest to cut down a forest and invest the money in a better paying financial instrument, this may not be in the general interest.⁷

Beyond local participation, the real challenge is therefore to create forums at a level of aggregation coherent with the problem treated. This forum should involve all implicated parties, and at the same time, responsabilise these parties for the goals set. Just as in the global context, local sustainable development requires the different actors to recognise that they are part of the same world, and that they need to co-operate in order to live together in it. This may imply that state level agencies have a word to say in community level matters, and reciprocally those communities have a word to say on larger issues. More importantly it will lead to the recognition that national resources are limited and to be shared between a great many different communities. In short, it requires circumscribing the world.

A similar point came out from other studies. For instance, in his enlightening book *From the Outside Looking in: Experience in "Barefoot Economics"*, M.A. Max-Neef (1982) noted, in the context of remote villages in Ecuador, that communities tried to find solutions to their problems by requesting systematically help from the government, and that they perceived their problems as unique and not as part of problems of larger proportion. Such an attitude was identified as a major impediment to local participation, one which could only be lifted through the formation of a regional consciousness, that is of a circumscription of resources.

In this perspective, let's consider the case of the mangrove forest. As seen in chapter 2, the forest is threatened by different forces,

from a reduction of fresh water to over-cutting by local communities. However, if each group of users is approached independently, it will argue that it is not responsible, and that it is the other users' fault.

Such escape is not possible; however, if all users are brought together, for there will not be any outside users left to be blamed. In fact, responsabilisation is possible only if people acknowledge that they live in a finite world. The bringing together of all users of a given resource circumscribes this world, and thus makes it finite. A possible strategy to save the forest could be, therefore, to organise a conference on the issue involving all the implicated parties, and under the patronage of an outside agency whose neutrality would be recognised by all. All users could then disclose their particular point of view to each other and this would highlight their inter-related responsibilities. Moreover, with such an approach, different compensations could be negotiated simultaneously by the direct bargaining of the agents involved.

In conclusion, the goal of decentralisation, or of local participation, is not to change the distribution of power *per se*, but to create the conditions of more horizontal communication between agents facing similar or related issues. Reciprocally, only through such communication can the agents be imbued with a broader consciousness of the issues, which in turn will make decentralisation successful and local participation a reality. Responsibility is a structural concept: it requires both empowerment and awareness of how this power is inter-related with other people's power.

Endnotes

1. Marglin (1990) argues that modernisation, far from being chosen by people, generally imposes itself on people.
2. Master Plan for Barani Area Development (1988).
3. Figure from a Punjab Economic Research Institute (PERI) study cited in the MPBAD.

4. Infant mortality still exceeds 100 per thousand in Pakistan compared to 72 and 52 in low and middle-income countries respectively. Crude death rate is 10.8 compared to 10 and 8.
5. Among the socio-economic constraints in the implementation of previous plans listed by the Seventh Five Year Plan is: "Political constraint: policies and projects which are economically viable are not adopted if these do not meet with political approval because of the self-interest of those in power. The reverse is also true; economically unsound policies and projects are approved for the same reason."
6. See in Chapter 3, for instance, the story of the management of the forest in Chalt.
7. For instance, Ghimire (1992b), notes that in some cases, communities are voluntarily "leasing out their lands to logging and mining companies for immediate financial gains" (p.11). Similarly in Northern Pakistan some communities push for the commercial logging of forests they own for the financial gains they entail. But these strategies can prove unsustainable if recast in a broader framework.

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