



MOUNTAIN FARMING SYSTEMS

Discussion Paper Series

**STRATEGIES AND OPTIONS IN THE PROVISION
OF AGRICULTURAL SUPPORT SERVICES IN MOUNTAIN REGIONS
OF PAKISTAN**

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International Centre for Integrated Mountain Development

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PREFACE

ICIMOD's approach to problem oriented research involves both knowledge reviews and field studies. The focused reviews and field studies conducted by the Mountain Farming Systems Division cover various aspects of agricultural development. Since early 1983, a series of 'state of the art' reviews of agricultural policies were sponsored by ICIMOD in different countries of the HKH Region. The studies and the subsequent National Workshops in different countries was to understand some of the constraints and prospects of Mountain area development. These exercises were also aimed at acquiring comparative perspectives of development approaches in different countries.

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This paper was also a part of this series of studies, commissioned by ICIMOD, and was also presented at the Workshop on 'Mountain Agriculture in Pakistan', held by ICIMOD in February, 1989, in Swat, Pakistan. The specific issues that are discussed in this study concern the strategies and options in the provision of agricultural support services. The responsibility of the content rests with the author.

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CONTENTS

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CONTENTS

Objectives, Scope, and Methodology

The main objective of this paper is to examine the social dimensions of mountain environments and identify the distinct features which should guide development and institutional strategy in the provision of a broad range of agricultural support services to small farmers. The paper will document the response of traditional farming systems to the mountain environments and study how these small farming communities adapt to the special conditions of mountain regions. The production and consumption patterns in these areas will define the range of agricultural support services that are crucial for these subsistence farmers.

The specific areas of services that will be covered in this paper include input supply, credit, fertiliser, extension, and marketing. The delivery mechanisms by which these services are provided to small farmers will be included in this review and these issues will be discussed in detail. Due to the inadequate nature of the physical and marketing infrastructure, extension services are often more resilient in the mountain regions. The institutional structures are unavailable. This review will examine the management of production systems and their interaction with agricultural support services.

This paper will be published by the Non-Governmental Organisation (NGO) sector. The study of the Agricultural Knowledge Resource Support Programme (AKRSP), a development programme which has distinguished itself as a flexible approach which responds to the special conditions of mountain regions can be a precursor to realising equitable economic growth.

This paper will examine the areas of Gilgit, Baltistan, and the FATA. The AKRSP is designing a programme of extension, extension training, and extension. The policy framework suggested in the report also draws on the experience of some African and Asian countries. This programme was incorporated on the understanding that the mountain regions of the Himalayas-Karakoram-Hindu Kush share common features with other mountain regions.

Organisation of the Paper

This paper is divided into four main sections. The first section deals with the nature and distribution of mountain environments. The second section covers the special conditions of mountain environments. The third section covers issues in mountain development. The fourth section covers issues in the mountain environment. The paper also briefly discusses the mountain environment.

Objectives and Scope of the Study

Page

1

Objectives, Scope, and Methodology

1

Organisation of the Paper

1

Traditional Support Systems in a Mountain Environment

2

Production Systems in a Subsistence Economy

2

Traditional Marketing Systems

2

Traditional Input Supply Sources

3

Case Study of an Agricultural Support Programme

3

Characteristics of the Programme Area

3

Characteristics of the AKRSP Approach

7

Summary and Conclusions

11

Incorporating Traditional Institutions in Development

11

Transaction Cost Approach to Programming

11

Agro-ecological Variation and Commodity Sub-system

12

From Subsistence Production to Market Exchange Production

13

Selected Innovations and Techniques for Extension

13

Alternative Government Policy and Structures

13

Objective and Scope of the Study

Objectives, Scope, and Methodology

The basic objective of this paper is to examine the special circumstances of mountain environments and identify the distinct features which should guide development and implementation strategy in the provision of a broad range of agricultural support services to small farmers. The paper will document the response of traditional farming systems to the mountain environment and study how these small farming communities adapt to the special conditions in mountain regions. The production and consumption pattern in these areas will define the range of agricultural support services that are crucial for these subsistence farmers.

The specific range of services that will be covered in this paper include input supply (credit, fertilizer, seeds, etc.), extension training, and marketing. The delivery mechanisms by which these services are made accessible to small farmers will be included in this review since these issues gain added significance in mountain regions due to the inadequate nature of the physical and marketing infrastructures. Secluded communities are often more resilient in the use of traditional institutions when other more formal structures are unavailable. This study will examine these traditional systems in their management of production systems and their interrelationship with indigenous and external agricultural support services.

This paper will also outline the role of the Government and the Non-Governmental Organisation (NGO) sector in responding to the special development needs of the mountain areas. The case study of the Aga Khan Rural Support Programme (AKRSP), a development programme which has distinguished itself in the mountain areas of Northern Pakistan, will be outlined. This development programme has successfully demonstrated that a flexible approach which recognises the special constraints and potentiality of mountain regions can be a precursor to rapid and equitable economic growth.

This paper is based on field experiences in the mountain areas of Gilgit, Baltistan, and Chitral and draws heavily from the conceptual model development by AKRSP in designing a programme of institutional development, credit and savings, input supply, extension training, and marketing. The policy framework and the broad recommendations suggested in the report also combine the experience of development practitioners in establishing a marketing system and infrastructure in some African and Asian countries. The latter experience was incorporated on the understanding that the mountain regions of the Himalaya-Karakorum-Hindu Kush share common features with other developing countries.

Organisation of the Paper

This paper is divided into three main sections. The first section outlines some aspects of the nature and development of traditional support systems in mountain environments. This section covers the special potential and constraints of mountain areas and highlights some of the special issues in mountain production and consumption systems. In particular, this section discusses issues in the context of poor accessibility, resource fragility, land scarcity, and other features of mountain areas. Government policy and NGO programmes in the mountain regions of Pakistan are also briefly mentioned in this section.

The second section presents a case study of the Aga Khan Rural Support Programme and describes, in some detail, aspects of its institutional model, delivery system, marketing strategy, extension training, and input supply system. This section helps in understanding how sustainability, equitability, and growth can be combined in the development of diverse and highly sensitive agro-ecological systems. This programme has been described by a recent World Bank evaluation team as one of the most successful examples of a development programme and it provides an excellent conceptual framework for designing effective development strategies and policy options for the development of high mountain areas.

The third and final section gives a summary and conclusion and describes the issues which are important in the provision of agricultural support services in high mountain valleys. This section derives effective principles for the development of strategies which are relevant for high mountain areas and identifies effective policy options.

Traditional Support Systems in a Mountain Environment

Production Systems in a Subsistence Economy

The production system in a mountain economy is characterised by certain special features which require special treatment. Among these special features one can enumerate the following.

Mountain environments represent vertical, rather than horizontal farming systems. This fact draws attention to the agro-ecological variation in mountain regions and the range of farming systems possible at different altitudes. The high altitudinal range in the Karakorum, Hindu Kush, and the Himalayan region allows both single and double cropping farming systems. The first is liable to follow a more land intensive cultivation regime and the second a more labour intensive regime. Thus, in one area land will be the more scarce resource and in the other, labour. The farmers' cropping decisions and the decision on the dominant farming system (livestock production vs crop production, perennial crops vs annual crops) will be guided by these factors and the whole range of extension, input, and marketing services will need to be oriented towards these varying needs.

The isolation, poor communication, and the marketing infrastructure in mountain regions often persuade farming communities to disregard considerations of comparative advantage in favour of food security considerations. In such farming systems, farmers consume what they produce. When security considerations are overriding, the government subsidisation of staple crops has a minimal affect and is likely to bring down the price of the major crops even further as the farmers continue to grow the subsidized crop, fearing that the fragile communication link may cut off supply lines indefinitely.

The rapid development of communication leads to an immediate change in production orientation; from a system of subsistence production to market exchange production. Comparative advantage considerations then take precedence over food security concerns. This transformation is often a difficult one due to the deficient nature of the supply system for new inputs required, lack of new skills required in high mountain valleys in transition, and lack of concurrent development in complementary facilities required for effective development.

Traditional Marketing Systems

The traditional marketing systems in high mountain valleys are underdeveloped due to the home

consumption oriented production system. The unplanned surpluses that are generated, are also used internally at a high cost because of the lack of a marketing system. The traditional marketing systems are limited to the management of local surpluses and shortages as well as regulation of internal marketing between the valleys. A valley, surplus in fuelwood, exchanges its surpluses with another which is surplus in forage crops or livestock. These traditional systems are highly dependent on personal and informal interaction and, the exchange of information relies on personal contact.

The only marketing functions that are performed at the village-level are limited to inter-valley trading and storage, using very traditional techniques. Storage techniques consist almost entirely of digging pits in the ground and storing fruits, butter, and potatoes. Processing of farm products is limited to household level processing of dairy products and the dehydration of fruits and vegetables using traditional methods which do not contribute to the shelf-life of the processed products. The stored and processed products are for family - consumption during the severe winter months when very little grows and when communication is cut off both between valleys and with down- country markets.

Traditional Input Supply Sources

In the absence of markets, an informal system of input supply develops in these isolated communities. The village shopkeeper becomes a source of informal credit for the villagers. He is often unable to charge a premium for his services due to the close social interaction which accompanies his transactions. The exchange, often does not involve any money changing hands. Farm families "borrow" grain or other items of daily use and pay it back after the harvest. Similar exchange is conducted between households for seeds, saplings, grains etc.

The system is resilient and reliable, but has drawbacks. For example, in the absence of an extensive system for seed production and marketing, new variety seeds, over time, become mixed with local varieties and, very soon there is no significant difference in yields between old and new varieties. The traditional exchange systems, often do not put the required premium on new variety seeds of good quality.

The mountain walls are an effective barrier against the introduction of new technologies and techniques. There is very little exchange of information on new technologies. Dissemination that does take place, is at an informal level and is passed on from farmer to farmer and from one generation to another. In the Northern Areas a lot of the information on new varieties and new innovations was introduced during the construction of the Karakorum Highway by the Chinese.

Case Study of an Agricultural Support Programme

Characteristics of the Programme Area

Physical Environment. The programme area of AKRSP extends to the three districts of Gilgit, Baltistan, and Chitral. Together, these districts have a population of about 750,000 settled in 1,030 villages in an area of about 66,000 sq km. These three districts of Northern Pakistan are situated in one of the most rugged and remote regions of the world. Four of the highest mountain ranges in the world, the Himalayas, the Karakorums, the Pamirs, and the Hindu Kush intersect in this region. These mountain ecosystems make for a very fragile and unstable

environment. Frequent landslides, soil erosion by flooding rivers, and uncertain water courses compound the problems of living in these high mountain valleys.

The region is located just outside the monsoon zone in a partial rain-shadow. It receives about 100-500 mm of precipitation annually, mainly in the form of snow in the winter months. Due to the paucity of rainfall and water resources, the area is characterized as a vertical desert. Agricultural production is sustained by irrigation systems that are fed by glacial snow-melt. The region has an arid continental Mediterranean type of climate and its ecological variation dictates the potential growing period. The major constraints to agricultural production are the poor quality soil low in organic content and the scarcity of flat land and irrigation water.

The region is connected to the rest of the country by the Karakorum Highway which is a tenuous link due to the precarious physical environment through which it passes. Link roads which connect the Highway to villages are unmetalled and limit the type of traffic that has access to the village. In the villages of the HKH, the position is further exacerbated by service roads which are highly susceptible to weather conditions. The uncertain communication network entails high costs in the production and management of local resources. The lack of adequate physical and marketing infrastructure has discouraged specialisation in the local farming systems.

The area lacks basic communication, health, education, and sanitation infrastructure. The development of local industries has been severely hampered due to the problem of communication, prohibitive transportation costs, and lack of physical support services. The Government has been unable to encourage private entrepreneurship in the region despite credit incentives and tax concessions. The comparative advantage of the area in fruit production remains unexploited.

Farming Community and Systems. The basic unit of production in the Northern Areas is the household. This household is expected to function as a self-contained economic unit. The average farm family of the project area consists of about 8 members who live off a cultivated area of about 0.76 ha. Per capita income ranges from \$120 to \$150 per annum. This is about one-half of the national average of Pakistan. On an average, a village consists of about 100 households. The small size of the villages combined with familial bonds ensure close social interaction within the village.

Agriculture is by far the largest economic activity in Gilgit District, and forms the principal means of livelihood of 85 to 90 per cent of the population. The region supports a range of farming systems displaying a number of common crop types: some cereals, grain legumes, fodder crops, livestock, fruit and fuel trees, and vegetable crops. The choice of farming system is determined by considerations of climate, aspect, location, and the resource-ownership of the farm household. Local farming systems vary greatly in their use of labour and land. Farming systems in which livestock rearing is the predominant feature are relatively more land intensive while, given the current production techniques and technology, cereal production is the most labour intensive.

Another principal reason for the range of possible farming systems is the variation in land characteristics. Within each village, this variation has led to a functional diversity. Thus, typically, landholdings within a village are not consolidated but remain small and scattered. The fields nearest to a farmers' homestead are intensively used for the labour intensive staple crops. The marginal lands surrounding a village provide hippophae bushes and other sources of fuelwood. The marginal lands are also used as winter grazing and are an important determinant in the livestock sustaining capacity of a village.

Resource Ownership, Management, and Distribution. There are very few landless people in the area and the distribution of property is relatively egalitarian. Available data indicates that the average developed landholdings vary from 0.41 ha to 1.26 ha. Undeveloped landholdings vary from 0.39 to 1.12 ha. The distribution of land per capita is even less skewed. Each family cultivates its own land. There are virtually no tenants in the region. The constant division of land among the male heirs in a family has led to the fragmentation of larger holdings. Despite the absence of formalisation of land titles, there are some disputes concerning land ownership. There is a well established, traditional method of distributing new land. Variations in land quality are taken into consideration in land distribution decisions.

A major portion of the land in a village is communally owned. This land is principally used for winter grazing, fuelwood reserve, highland summer pastures, and forests. Although rigorous management regimes guide the use of this land, it is still susceptible to externalities (overgrazing and non-optimal rates of utilization) which generally accompany common property resources. Indigenous village-level institutions guided the management of common property resources, defined use-rights for individual households and adjoining villages, and enforced sanctions against misusers.

A sophisticated system of *warabandi* specifies rights for water users from the common irrigation system in a village. Factors which were considered in the allocative decisions of water use among households were hereditary rights, cropping pattern, distance from water source, etc. A well regulated system for the development and maintenance of irrigation channels was in operation in most villages. A strict system of sanctioning was used to enforce the use of the water resource of a village.

Institutional Infrastructure. The institutional infrastructure in the Northern Areas consists of both formal and informal structures which have played a vital role in the development and management of the resources of the area. The issues of resource management were complex in the Northern Areas for two reasons : (i) the area was cut off from the mainstream of developmental and technological changes and had recourse to traditional methods only and (ii) the reliance of the farm economy on common property resources called for stringent enforcement of regimes for the use and development of these common resources. Both these factors required rigorous institutional mechanisms. Local institutions were able to perform some of these functions of development quite satisfactorily. However, there were limits to this indigenous institutional capacity.

At a formal level, local rulers or *Mirs* enjoyed almost exclusive control in the area, until a general decline in feudal authority with the arrival of colonial rule at the turn of the century. These local rulers were instrumental in helping develop basic irrigation infrastructure and in increasing the potentially cultivable landholdings. The system of land development under the *Mirs* worked well because it offered a support mechanism to households which diverted their labour from meeting immediate consumption needs to long-term investment efforts. However, there were natural limits to this model of development because it lacked the capacity to add to the productive potentiality of the human and natural resources of a village.

The '*Jirga*' or council of elders was another important institution at the village-level. The authority of this institution derived from the respect accorded to its members. It was empowered to adjudicate on a wide number of village-level issues, including use-rights on common property and enforcement in the system of sanctioning in cases of default. The '*Jirga*' was also used to intermediate on issues of social discourse and conflict.

At an informal level, the maintenance and construction of irrigation channels, new land development, and the labour pooling arrangements for house construction encouraged models of community participation which laid down the basic framework for village-level institution building. This experience with collective projects was the precursor of a grass roots institution oriented towards development at the village-level. This indigenous model of development had limitations because it too failed to enhance the productivity of the village natural resource base.

Development Environment. The Government is the principal body responsible for the development of the area. The low level of income, lack of basic infrastructure, the poor health and education status, and the isolation of the area have persuaded a host of international and non-governmental organisations to participate in the development efforts of the region.

The administrative structure designed for the development of the region is beset by several problems. A major problem is the identification and implementation of development schemes. The Government's diagnostic process is unable to take into account village-level priorities and selects schemes on the recommendations of members of the Union Councils. The political concerns of these council members often clouds their ability to effectively represent the needs of the villagers. The portfolio of projects approved in a given year does not reflect economic considerations, but is decided on the basis of political criteria.

The system of financial disbursements for village-level schemes is such, that payments are made to council members without reference to the cost of the schemes. The Union Council members represent several villages and, the allocation of funds to them is based on the population number in the represented villages. Important projects which cost more money than what the population of an area can justify are invariably left aside.

The implementation and follow-up of schemes, poses additional problems as the implementation is supervised through the Government's line departments and contracted to private contractors. The procedural delays and institutional bottlenecks which characterize government working everywhere are evident in the implementation of government schemes in this region.

The Aga Khan Foundation has spearheaded development in health, education, rural, and agricultural sectors but, with the exception of AKRSP and some areas in its Primary Health Care Programme, its efforts are limited to the Ismaili community. UNICEF runs a Community Basic Services Programme in partnership with the Aga Khan Foundation and the Government of Pakistan. The FAO has intermittently run a programme of crop production and development. The UNDP has a livestock and poultry development programme with some components for women.

Identifying Recent Trends. Significant trends which are having an affect on the region are improvement in the physical and marketing infrastructure, increased use of improved agricultural inputs, greater off-farm employment opportunities, the increase in tourist traffic. These factors have had an impact on the traditional resource management systems, gender work differentiation, cropping decisions, and in the emerging role of traditional informal institutions.

With improved communication, a majority of the farmers in the area are using improved agricultural inputs and agricultural technologies that were little used previously; the use of tractors, threshers, new wheat varieties, and chemical fertilizers is rapidly increasing. As market linkages are formalised and greater off-farm employment opportunities arise, the traditional division of labour begins to erode and a new employment structure emerges. Women, who are generally excluded from wage labour, become increasingly involved in farming activities which were previously under the domain of men.

More recently, with the increase of tourist traffic in the area, an indigenous tourist industry is emerging. Both the production and marketing patterns are affected - local demand is created and production patterns are shifted from household consumption towards meeting market demand. As local demand for consumption goods increases, there is evident increase in the trading activity to meet the changing demands of a village in transition and the supply to tourist traffic along the highway.

Characteristics of the AKRSP Approach

The Institutional Model. In designing an institutional model, AKRSP hoped to foster the growth of a sustainable village-level institution with a capacity to guide village decision-making and implementation of common village development projects. This local institution was designed to redress the institutional vacuum which existed in the northern villages following the abolition of the system that existed under the *Mirs*.

The institutional model which AKRSP has established relies heavily on a common village-level activity to consolidate the foundations of a local, village based institution. As an organisational incentive, AKRSP gives a grant for a village-level project. On presentation of the grant, "Terms of Partnership" are signed between the Village Organisation (VO) and AKRSP, specifying the responsibility of each party. AKRSP does not have any sanctioning authority but these "formal" terms provide a modicum of security that the contract will be adhered to. These terms specify the following :

- a majority of the village residents will be members of the Village Organisation;
- the VO will hold regular meetings in which it will initiate discussion on village-level development issues; and
- the members will start a system of collective savings.

As the programme has developed in scope, several other conditions have been added to these initial terms, such as the timely repayment of loans, maintenance of physical infrastructural projects, collective development of new land, management of common property resources of the village, and joint implementation responsibility for projects with substantial involvement of women.

Village office bearers are selected on the principle of one person, one vote. The decisions of the VO are made in general body meetings and are sacrosanct. The formation of sub-committees is discouraged on grounds that this destroys the representative nature of the Organisation and leads to the concentration of village-level decision-making in a few hands.

Indigenous village authority structures, sanctions' systems, and traditional decision-making processes have been incorporated into the VO decision-making system, and lend greater credence to the role of the VO in the village-level development initiatives. In matters of distribution of new land and water, land disputes, and other issues of property rights, AKRSP has followed the decisions made by the villagers.

The Village Organisation model builds on the experience of the local people in the collective management of common property resources such as grazing land, highland pastures, forests, irrigation channels, and undeveloped land. The maintenance and development of these resources

through cooperative action is therefore not an entirely new idea. The villagers have a well-defined system of apportioning work and deciding upon appropriate labour compensation for projects designed to benefit the entire village.

The structure of the Village Organisation does not disturb the prevailing distribution of wealth. The benefits from the programme are in relation to current resource-ownership at the village-level. Farm households with relatively more land and labour are likely to benefit more than those with a smaller resource base. The relatively egalitarian distribution of resources encourages the participation of farm households in VO activities.

One of the most important features of the AKRSP institutional model is that, it is designed to adhere to the traditional gender work differentiation and it works within the social parameters in involving women. Thus, the corporate entity of the Village Organisation does not interfere with the traditional division of work between the sexes, and it allows the women enough flexibility to participate in VO activities while respecting the social norms of seclusion and segregation.

The Production Model. The objectives of AKRSP's production model derive from its overall objective of increasing income-level in the project area. Some of AKRSP's most important objectives in designing a production model are the following :

- to increase production efficiency of the farm household by removing constraints and improving access to new technologies;
- to help the farmers reduce the risk of working in a highly uncertain environment and avoid production losses; and
- to guide the farmers in making the transition from subsistence production to commercial production.

The production model of AKRSP, incorporated decision-making both at the household-level and the village-level. At the household-level, AKRSP guides decision-making about cropping patterns, the use of improved technologies, and the prevention of losses. At the village-level, AKRSP helps villagers devise strategies which are aimed at reducing the cost of input supply and collective marketing, and help them to acquire skills and mechanisms which help prevent losses in crop production and livestock breeding. It also encourages the development of models of collective management of private and common property resources. These models of collective development are aimed at maximising production, given the current labour and capital constraints.

AKRSP has attempted a vertical and horizontal integration of the production process in the project area. At the vertical-level, it has established backward linkages by improving farmer's access to water, fertilizer, high quality seed, and mechanisation. Forward linkages are being achieved by improving techniques for processing and storing farm produce and by guiding farmers' decision-making in linking production and marketing activities. At the horizontal-level, AKRSP is helping to achieve economies of scale and reduction in transaction cost by collective village planning and cluster formation for production and marketing, at the village-level.

A major challenge to the AKRSP production model is how to guide farm households in making the transition from producing for household consumption to producing for the market. In addressing this need, AKRSP is sensitive to the farmers' decision-making matrix and has resisted the overwhelming temptation to be guided by purely technical considerations in influencing the farmers' cropping and production decisions. It has helped the farmers to establish contact with

some major seed and fruit wholesalers and has improved their access to information about down-country retail and wholesale outlets.

AKRSP has tried to ensure that women do not get marginalised in the transition process of the farm household, from home consumption production to market production. It is not uncommon that when an activity becomes more productive, the traditional division of labour is restructured to allow men to shift from the less productive to the more productive tasks within an enterprise. Women's labour is, in such situations, seen as marginal to the production process. AKRSP has tried to avoid this by integrating the traditional division of labour into programme planning and ensuring that women continue to perform tasks which they have traditionally performed, even when the activity becomes more productive.

The Savings and Credit Model. The main objective behind the savings and credit programme initiated by AKRSP for the project area is the following :

- to make the Village Organisation sustainable by building its capacity to finance household and village-level projects;
- to enable the villagers to invest in financing the productive potential of the farm household;
- to enable the villagers to invest in financing common village-level physical infrastructural projects and the development of common property resources; and
- to institute an inexpensive and efficient system of mobilising savings and improving farmers access to available commercial and cooperative credit.

The system of collective savings and borrowings operates in a very open, equitable, and accountable manner. Each member deposits his savings with the manager of the Village Organisation, regularly, at VO meetings. The Manager maintains individual savings' records in a register and in the passbooks issued to each member. The collective savings of the Village Organisation are deposited in one VO account with a commercial bank. Credit facilities are extended in a similar manner. The VO takes out a collective loan and then disburses individual loans according to individual needs. This system is aimed at minimising the transaction cost of savings and borrowings.

This system allows villagers a measure of flexibility and local control. The women of the area had a clear preference for starting a separate savings' account of their own. As such, all savings by the women members are deposited separately and their loans are also issued separately. For purposes of integration and administrative ease, the Village Organisation is held jointly responsible for loan repayment by the men and the women. Matters of delayed payment and default by individual members are regulated internally. The VO has also devised internal mechanisms for rewarding high-savers.

Two main types of loans are issued by AKRSP. There is a short-term production loan which is given interest free for a period of six months for inputs such as fertilizer, seed, poultry, marketing, etc. The other type of loan is the medium-term development loan which is given for a period of 2 to 5 years on a nominal interest rate. This loan is extended for productive physical projects, land development, and investment in capital intensive farm machinery. Women are also issued loans for activities which are within their specific control such as poultry production, improved seeds and fertilizers, and land development for vegetable and orchard production.

The Input Supply Model. AKRSP's input supply model is premised on the realisation that advising villagers on the use of improved inputs and loss prevention techniques would be futile without instituting a system which ensures the delivery of these inputs to the villagers in a cost effective, timely, and efficient manner. AKRSP uses the Village Organisation as the central figure in this system. Each VO is instructed to prepare detailed lists of the requirements of individual farm households for various items and to inform AKRSP about the collective demand for a specific input such as fertilisers, seeds, credits, etc. AKRSP arranges for the delivery of these inputs directly to the VO which is then responsible for the distribution to individual households.

The most significant aspect of the input supply model is in linking the credit programme with the existing agencies which are responsible for the delivery of specific inputs to the villagers of the Northern Areas. AKRSP arranges with agencies such as the National Fertiliser Corporation, UNDP, and other suppliers to deliver inputs directly to the Village Organisation. It extends the VO a credit facility to enable it to pay for the input and gives the credit directly to the suppliers. The transaction cost for all parties are minimised.

The Extension Training Model. The success of the extension training model devised by AKRSP hinges on effective participation by the Village Organisation. The VO can guide the selection of candidates to ensure that the nominees will return to the village after training, work in the chosen field, and be acceptable to the villagers. In the selection of women, a major consideration is to ensure that the women who are chosen are the ones who have been traditionally engaged in the activity in which they will be trained. The VO also plays a central role in ensuring that the trainee is reimbursed for expenses of medicine and paid a remuneration for specific services rendered to farm households. To help the trainee establish himself and avoid undue internal conflict and competition, the principle of one trainee per VO for a specific course, is attempted.

In selecting specific training fields, AKRSP conducts dialogues with villagers, though admittedly, these are not as rigorous as those conducted for some of the physical infrastructural projects. AKRSP is more adept at identifying some of the long-term trends and designing training courses consonant with these changing needs. In identifying the training needs, AKRSP has been particularly sensitive to the changing nature of the traditional division of on-farm work etc.

The Marketing Model. The strategy of AKRSP's marketing model is based on the concept of collective marketing of village produce. It has extended the scope of collective marketing beyond the confines of individual villages. In the more advanced villages, it is introducing marketing on "cluster" base i.e. grouping of the villages in a valley. This will make it worthwhile for the VOs to invest in more sophisticated market methods and equipment.

The Village Organisation assumes the responsibility for the collection of farm produce, its transportation to the market place, and the selection of suitable representatives who would conduct the market transaction on behalf of the VO. The profits from marketing are distributed among the members on the basis of the farm produce contributed by each household. Losses are equally shared. The extent to which individual producers are compensated for variations in the quality of their produce is not clear.

The most attractive aspects of collective marketing in this model, are the following;

- the aspects of collective bargaining which become even more important in the case of perishable commodities;

the reduction in transaction costs achieved through combined transportation of village produce and access to credit facilities for marketing; and

that AKRSP does not share in the profit or loss from the marketing venture of Village Organisations.

The specific package of marketing includes two main elements; training for specific aspects of marketing (i.e. processing, storing, and transporting) and the provision of credit for marketing and purchase of specific inputs which aid the marketing of local produce. AKRSP has also spent considerable time in encouraging private entrepreneurs to include the Village Organisations as partners in production and marketing functions.

Summary and Conclusions

Some of the findings above paint a remarkable picture of farmer-adaptation to changing circumstances in a rural economy that has only recently become integrated with national markets for food, labour, and livestock. Some specific recommendations based on the experience in Northern Pakistan are listed below.

Incorporating Traditional Institutions in Development

The fragility of the natural environment in the mountains of the Northern Areas has contributed to the development of institutional structures which are extremely efficient in managing their meagre productive resource base. Thus, traditional systems embody well-defined regimes for the management and maintenance of common property (highland pastures, forests, grazing lands, irrigation channels etc) and for the settlement of issues of resource-ownership and division (water rights, land distribution, etc.). While these institutions are very efficient in managing the existing resource base of the village, they are not oriented towards increasing their productive resource base. Thus, there was very little development of new land and no new irrigation channels were constructed in the Northern Areas prior to the intervention of AKRSP.

The pattern of management and development outlined above is typical of mountain areas. A major reason for this is that the isolation, lack of communication, poor physical infrastructure, and fragile and unstable ecosystems do not allow them access to new inputs or techniques which help them enhance their productive base. Risk aversion traits are also more pronounced in these unstable environments where food security is the predominant issue and farmers are slow in adopting new varieties and techniques even if they have access to them. In such an environment the extension, training, and input supply questions assume an added significance and call for a more vigorous delivery system. This system will be potentially more resilient and responsive to local conditions if it incorporates the traditional regimes of management and maintenance.

Transaction Cost Approach to Programming

The way development practitioners perceive and define the problems of the client or target population, has very important implications for the solutions they propose. Unfortunately, the special problems of mountain environments are little known or studied and the policy in one area is uniformly applied in another. The credits, fertilisers, seeds, extension training systems, and

delivery mechanisms are all based on a lop-sized view of the problems of small farmers. In such a situation they cannot even begin to cope with the special aspects of mountain regions.

For instance, the credit policy in Pakistan, as in most other developing countries, is based on the premise that the interest cost of the loans to farmers are too high and credit will be made available to them if this cost is reduced. The fact, that the interest payment is only a part of the cost to the farmers and that the transaction cost of the loan is often the more substantial cost in assessing credit sources, is not well understood. For mountain areas, the transaction cost is even more significant due to the underdeveloped nature of the information networks and the poor physical transport infrastructure. However, the credit policy is designed without attention to the delivery system. This is the reason why the interest free credit facilities offered to small farmers in the Northern Areas of Pakistan were not availed of even by one farmer.

The same applies to the policy regulating the supply of crucial inputs such as fertilizers, seeds, saplings, etc. The Government pursues a policy of subsidizing these inputs without improving the delivery system which would ensure timely delivery of these inputs to the farmers. Reducing their cost does not improve their inaccessibility to the farmer. Ensuring that he receives these time sensitive inputs at his door-step will be more beneficial. The problems of inaccessibility are enhanced manifold in mountain regions where roads are closed for a part of the year. A policy of storage depots and transport facilities will be more effective.

Similar issues surround the marketing of production surpluses of farm households. The small and scattered nature of land holdings and the small resource base of each farm household does not allow either specialisation or economies of scale in marketing the small surpluses. The marketing of small amounts of fruits and vegetables was done by individual farmers on an infrequent visit to the main town on some other business. It was not worth the farmers' time to bring a regular supply to the main town. The central markets, as a result, depended on an erratic but more regular supply source from down-country which further depressed the local prices. The aspects of on-the-spot bargaining became more important when the information system was non-existent and did not allow agreement before the farmer brought his produce for sale. The wholesalers take great advantage of this fact in negotiating the price further down.

A transaction cost approach to instituting a marketing system, credit, and an input delivery system can address some of the more immediate problems surrounding farmers in high mountain valleys. This approach argues for a change in policy as well as physical and institutional infrastructure to allow the farmers to gain access to some of these crucial inputs. A village-level institution can help in reducing some of the transaction cost of loan disbursement; input delivery and the production of individual households could be collected and processed in one central place and transported jointly to markets. This model also allows for the establishment of an effective extension training system. Most of the suggestions given here entail a two-tiered structure, patterned on the lines being followed by AKRSP.

Agro-ecological Variation and Commodity Sub-systems

The agro-ecological variation in mountain areas allow several different farming systems. The range of commodities produced require different marketing strategies. Marketing experience indicates that it may be productive to examine each of the commodity sub-sectors separately. The major production systems in mountain areas produce several distinct commodities such as fresh fruits, dry fruits, livestock and dairy products, fuel, forage, and grains. The marketing characteristics of each of these commodities is somewhat different. Fresh fruits are highly perishable and entail a considerable amount of risk. They require very efficient coordination on

a vertical-level. Processing, semi-processing, and collective bargaining would be crucial issues in the marketing of such perishable commodities. Dry fruits are high-value crops and their value can be further increased by transporting and storage methods. Livestock, fuel, and fodder crops also require special consideration because of different characteristics.

From Subsistence Production to Market Exchange Production

The transition from subsistence to market exchange production, is fraught with additional problems in mountain areas. Thus, while the opportunities for input supply and agricultural marketing expanded as a result of the construction of the Karakoram Highway, it also became cheaper to transport subsidized flour from the plains to Gilgit. Simultaneously, the opportunities for employment in tourism, construction, commerce, public sector agencies, and other non-agricultural activities have multiplied. As a result of such changes, it is possible that, after an initial improvement, there has been a significant decline in the relative profitability of wheat and other commodities' production in recent years. Anecdotal evidence from farmers suggests that, recent increases in flour purchases from outside the region have occurred simultaneously with an increase in the maize and fruit sold outside the region.

In addition to a possible decline in the relative profitability of grain production, there has also been a large increase in the numbers of livestock (particularly cattle) shipped up the HKH for marketing in Gilgit. At the same time, the Government has continued to enforce price controls for beef and mutton. There is, therefore, reason to believe that the demand for wheat-straw for livestock may have weakened in the recent years. Livelihood systems which are restricted by their resource base to a certain farming system cannot make adjustments to changing price signals even if they are allowed adjustment lags.

Selected Innovations and Techniques for Extension

In choosing information for dissemination and techniques and inputs for distribution in the mountain areas, one has to be specially mindful of the special needs of mountain farming systems. For example, innovations that mostly concern the farmers in the region are not just in terms of varieties that give bigger yields than local varieties, but in terms of innovations that help the most with the combined returns to labour and land within the multi-enterprise livelihood system. The same is true of cultivation techniques and new skills. It is not much use recommending a labour intensive harvesting technique to improve fodder yields in an area which has labour shortage.

Alternative Government Policy and Structures

By and large, the government policy does not distinguish between isolated mountain areas and the more accessible, central plains. Considerations of security and national unity sometimes persuade it to develop communication infrastructure, oriented towards defense (jeepable roads, airports etc.) and subsidise air and road travel for people and goods as well as grant tax concessions. Government pricing policy, development strategy, and factor and product delivery systems are uniformly applied country-wide. There is no mechanism which makes the framing of policy sensitive to the fragile resource management and production systems of high mountain areas. Even when there are some concessions granted to these areas, it is because of their classification under the general category of "rural areas" that their features as a distinct and fragile ecosystem are disregarded. The policy of credit and input supply agencies are characterised by a similar uniformity in their policy.

Not only is government policy in mountain areas indistinguishable from its policy in the plains, but the government implementation strategy and management structure is also similar. Thus, no special considerations are made to allow the government extension training department, agriculture department, credit institutions, and other line departments a different and more effective extension or delivery system for improved inputs. If a Field Assistant of the extension training department is given one union council to manage in the plains, he is given the same in the mountain areas, regardless of the communication problems in these areas. Thus, the few available services become even more inaccessible for people whose needs are often more immediate in view of the fragility of their natural environment.

ICIMOD is the first international centre in the field of mountain development. Founded out of widespread recognition of environmental degradation of mountain habitats and the increasing poverty of mountain communities, ICIMOD is concerned with the search for more effective development responses to promote the sustained well being of mountain people.

The Centre was established in 1983, and commenced professional activities in 1984. Though international in its concerns, ICIMOD focuses on the specific, complex, and practical problems of the Hindu Kush-Himalayan Region which covers all or part of eight Sovereign States.

ICIMOD serves as a multidisciplinary documentation centre on integrated mountain development; a focal point for the mobilisation, conduct, and coordination of applied and problem-solving research activities; a focal point for training on integrated mountain development, with special emphasis on the assessment of training needs, the development of relevant training materials based directly on field case studies; and a consultative centre providing expert services on mountain development and resource management.

Mountain Farming Systems constitutes one of the four thematic research and development programmes at ICIMOD. The programme deals with agriculture defined broadly to cover all land-based activities (cropping, horticulture, forestry, livestock farming, etc) and their support systems. Currently the major focus of the programme is on the factors and processes contributing to the sustainability/unsustainability of mountain agriculture. This is carried out by examining (through both knowledge reviews and field studies) the sensitivity of public and private interventions to specific mountain conditions. The explicit consideration of the latter conditions can alone assure a mountain perspective to public policies and programmes in the agricultural sector.

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