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## Rural development by extension and indigenous communication systems in Nepal

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**Rural development by extension and indigenous  
communication systems in Nepal**

by

Eryl Haf Roberts

A Doctoral Thesis

Submitted in fulfilment of the requirements for the award of  
Doctor of Philosophy of Loughborough University

January 1997

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## **Abstract**

The Mid-Hills of Nepal is an area characterised by its subsistence agriculture, isolation, limited extension services, poor transport and communication networks and farming communities which are identified according to their caste or ethnicity. Rural development in this area places emphasis on agricultural intensification with formal research being conducted. Research innovations are formally transferred by the research-extension-farmer information transfer mechanism.

This study revealed limitations in this formal information transfer mechanism. It included the limited applicability of the innovations for small farmers; the extensionists' unequal contact with farmers, favouring those who are progressive, of high social standing and relatively easily accessible; as well as communication problems between researchers, extensionists and farmers in general.


These limitations, as well as the lack of contact many farmers had with the extension service, prompted an investigation into the mechanism of farmer-to-farmer communication. Farmer-to-farmer communication was found to be effective for a wider cross-section of farmer categories and reached more farmers than did the extension service, including mass media. It was also more effective in areas without an extension service.

### **Key words:**

indigenous communication system, agricultural development, extension, Nepal, transfer of innovations.

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## **Glossary of Nepalese Terms**

Bari - rain-fed agricultural land

Dhikuti - indigenous community money raising system

Jhara - community labour exchange

Khet - irrigated agricultural land

Khola khet - permanently irrigated agricultural land

Kutwal - village [town] crier

Paka khet - seasonally irrigated agricultural land

Puja - religious festival or service

## **Glossary of Abbreviations**

ADB = Agricultural Development Bank

CGIAR = Consultative Group on International Agricultural Research

CIAT = International Centre for Tropical Agriculture

CIMMYT = International Centre for Maize and Wheat Improvement

CNAS = Centre for Nepal and Asia Studies

FAO = Food and Agriculture Organisation

FRD = Forestry Research Division

FRP = Forestry Research Project

HMG (N) = His Majesty's Government (Nepal)

IAALD/QB = International Association of Agricultural Librarians and Documentalists/ Quarterly Bulletin

ICIMOD = International Centre for Integrated Mountain Development

ICRAF = International Council for Research in Agroforestry

ICS = Indigenous Communication System

IDRC = International Development Research Centre

IK = Indigenous Knowledge

ILEIA = Information Centre for Low-External-Input and Sustainable Agriculture

IRC = Integrated Research Centre

ISNAR = International Service for National Agricultural Research

JT = Junior Technician

JTA = Junior Technical Assistant

LARC = Lumle Agricultural Research Centre

NACFP = Nepal-Australia Community Forestry Project

NARC = National Agricultural Research Centre

ODI = Overseas Development Institute

OFCOR = On-Farm Client-Oriented Research

PAC = Pakribas Agricultural Centre

PHI = Philippines

R-E-F = Researcher-Extensionist-Farmer

RNAST = Royal Nepal Academy for Science and Technology

T+V = Training and Visit Extension System

VDC = Village Development Committee

## **Chapter One**

### **Introduction**

#### **1.1. Introduction.**

This is a study of the communication of agricultural information. The formal two-way flow of communication between researchers, extensionists and farmers and the mechanism of informal farmer-to-farmer communication (indigenous communication system) were both studied in Nepal.

Rural development in Nepal, as well as other developing countries, is dependent on the flow of information to promote agricultural innovation. This can be achieved either by the transfer of innovations from researcher-to-extensionist-to-farmer or by farmer-to-farmer communication, or both. The relative effectiveness of these means of transfer are not fully understood and so a study of how researchers and extensionists communicate with each other and pass on research information to farmers for rural development can potentially make an important contribution to the design of better systems. This study first of all evaluates the extension service to the farmers, both in general, and according to the different socio-economic categories of farmers. The mechanism of farmer-to-farmer communication is then examined and its effectiveness is compared to that of the extension service.

#### **1.2. Research Hypotheses**

Three main hypotheses were tested in this study. These were as follows:

- (i) There is not an effective two-way flow of information between researcher, extensionist and farmer.
- (ii) Information does not flow equally to farmers, but its flows are mediated by the farmers' different socio-economic characteristics and accessibility levels.

(iii) In a community which has no extension or research contact, there will be an indigenous communication system for farming needs, which supplies an alternative and potentially more effective flow of information.

### **1.3. The Research Studies**

The hypotheses were tested by conducting three studies, as follows:

In order to make a preliminary test of the first hypothesis, that there is not an effective two-way flow of information between researcher, extensionist and farmer, a questionnaire survey of researchers and extensionists was conducted. The views of the farmers were established in subsequent stages of the research. The second hypothesis was tested by selecting a research site which had both extension contact and a cross-section of socio-economic groups of farmers. The Phulbari case study set out to evaluate the effectiveness of the extension service both in general and according to farmers' different socio-economic categories. Testing of the reliance farmers placed on the extension service was set against their use of farmer-to-farmer communication.

Testing the third hypothesis required selecting an isolated area with no research or extension contact. A village area called Kumpur, in Nepal, satisfied these requirements and was used as the case study. Attention was directed at how farming innovations spread into and within the area.

The three studies together provided perspectives on the extension process from all three groups of participants, but most significantly it examined farmer adoption of innovation both where there was contact with extension services and where there was not. It is in this comparison that there are potentially the most revealing insights into formal channels of communication, and clues as to the best means of ensuring that farming communities have the best possible access to relevant agricultural information.

#### **1.4. The Context of Researcher-Extension-Farmer Communication**

The principle behind the extension service is that it should act as a go-between for researchers and farmers. Within rural development planning, extension is allocated, what on the whole, is a very modest role. Its attention is focused on how specific innovations can be introduced, accepted and put into use by the farming population as quickly as possible. It is very openly a top-down technology transfer mechanism. The extension system does little to encourage mutual participation between extensionists and farmers.

Most developing countries, including Nepal, have tended to operate a form of extension policy known as a progressive farmer extension policy whereby progressive farmers are targeted for technology transfer by the extensionists. Other farmers are then intended to benefit via the diffusion of information from the progressive farmers to themselves. However this diffusion process has been heavily criticised for being ineffective. Furthermore Van den Ban (1963) found that in highly stratified and faction-ridden villages the village leaders may in fact deter the rest of the community from gaining access to information, inputs and credit, rather than act as opinion leaders for change. It has been suggested that most development programmes have inadvertently accentuated the gap between rich and poor farmers by primarily benefiting the rich farmers. Roling *et al.*, (1976) suggest that the diffusion of innovations would be more likely to occur equally within a community if official opinion leaders of each homogeneous group within that community could be recognised by the extension service. Such an approach might then further the cause of equity within rural development.

There are many studies which explain the weak link between researchers and extensionists in terms of communication problems (Brown and Deekins, 1958; McDermott, 1984). It is also suggested that the researchers' have insufficient contact with the extensionist. They are professionally isolated from their field staff which prevents them from directly approaching the extensionists to hear their advice and opinions about the new technologies which the researchers release. The extensionist may get to hear of problems which farmers are having with the new technologies, but this information is unlikely to reach the researchers. Hence

researchers will rarely get feedback about how their technologies fare in the farmers' field nor will they get information about what technologies the farmer himself believes he needs.

#### **1.4.1. Appropriate Technology in Developing Countries**

According to Bowen (pers. comm., 1992) most of the farming problems faced by farmers are unknown to researchers. Thus decisions on the choice of research projects continues to be done solely within the research centres. One consequence of this is that it leads to inadequacies in policy-making and programme planning (Day, 1977). Yet there is growing awareness that successful research will have to take into account the farmers' objectives and constraints and that it can benefit greatly from a continuing knowledge of local conditions (Farrington, 1988; Biggs, 1980). Within this context the researcher's role becomes one of widening the range of technology options available to the farmer and ensuring that the principles of any selected innovation are valid, and that they are broadly appropriate to the local physical and socio-cultural environment during its evaluation by the farmers.

#### **1.4.2. Feedback**

It is increasingly realised that extension should not be a one-way activity but rather a continuous two-way activity. It should not merely be about telling farmers what to do. Rather it should ideally be about working with the farmers and for them, listening to their problems and needs and acting on those as well as encouraging them to develop their own technologies.

Feedback from the farmers directly to the researchers or via the extensionists is also essential if the research work is to be appropriate to the local situation and have a high chance of practical success. Yet in practice this rarely happens. Hence there is a clear need to find ways of creating more effective information flows for rural development.

Again studies suggest that it is the progressive farmers and the local elites who receive and give information to the rural officials concerned with rural

development. Because it is only they who articulate the village's interests and wishes, their personal priorities are mistakenly labelled as the village's priorities for development, and so they receive a disproportionate amount of attention, advice and services from the development workers. Whereas the majority of poor farmers remain unaffected by development projects.

Usually even if researchers do try to get information from local farmers, the information they receive is likely to come from the resource-rich farmers who are vocal enough to communicate their needs either directly or through producers' organisations. Resource-poor farmers' comments are rarely heard or taken seriously.

Smith's (1989) study revealed that although scientists and policy makers are now recognising the need to understand indigenous farming systems before developing improved farming technologies, they have still failed to create institutional arrangements to gather this information. In addition social and cultural barriers inhibit the effective participation between farmers and researchers.

#### **1.4.3. Relevance of Farmer-to-Farmer Communication**

Studies have shown that the most effective means of technology transfer is person-to-person communication especially within the same ethnic group (Chaudhry, 1991; Sen, 1992). Hence interpersonal relationships and communication remain vital for the effective transmission of agricultural development information (Pathack and Majumdar, 1986). This is because information which is derived from personal sources rather than from researchers' research results via the extensionist, will be presented in an easy to understand language and is more likely to be in a form which is specific both to the locality of the farmer and his needs (Jones *et al.*, 1987).

#### **1.5. Nepal - the Research Location**

Agriculture and its related sectors is an area which the Nepalese government professes to be particularly eager to develop, as most of its population is engaged in agriculture. The government has a policy commitment to agricultural

intensification in the Mid-Hills of the country (which relies mostly on subsistence agriculture) and has a network of research establishments and an extension service intended to transfer new farming technologies to the farmers. Its resource-poor farmers are characterised by their lack of irrigated land and inability to purchase chemical fertilizers both of which are necessary for most High Yielding Seed Varieties developed by the researchers. In fact the Green Revolution<sup>1</sup> has had limited success in the Mid-Hills. Hughes (1985) suggests that this is partly due to the lack of research and technology which is appropriate for resource-poor farmers.

Nepal's communication infrastructure is poor even amongst developing countries due to limited resources and its mountainous location. As about seventy-eight per cent of Nepal is mountainous, this causes great difficulties in the establishment and maintenance of transport and communications networks. Formal research and extension services can only reach many of the farming communities with the greatest difficulty. Such communities either have to do without information or they need to rely on an indigenous communication mechanism. Even in more accessible areas such as near the Indian border, CAB (1992) found that some farmers would make visits to Indian farmers to observe new techniques and bring back new seed varieties.

With Nepal's particular geographic difficulties, its farming-related research activities would seem to require particularly dynamic and outgoing information support services to disseminate research information to the extensionists and ultimately to the farmers. There are reports however that there are major constraints in the formal transfer of technology mechanism in Nepal - that it is limited and needs improving (Mahoney, 1991 cited in CAB International, 1992).

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<sup>1</sup> The term Green Revolution describes the successful introduction of new varieties of high yielding cereal varieties (HYVs) in developing countries, often enabling a doubling of agricultural production.



## **Chapter Two**

### **Nepalese Context to the Research**

#### **2.1. Introduction**

This chapter deals with information about the Mid-Hills of Nepal which is considered relevant to the studies.

#### **2.2. Economy**

Nepal is classified by the World Bank as belonging to the category of Less Developed Countries as well as a Low Income Country. Development aid to Nepal has not succeeded in changing the lives of the rural poor to a significant degree. In fact development in Nepal has mainly benefited groups with high socio-economic positions within Nepalese society.

Villagers still tend to classify wealth according to the amount of surplus foodstuffs they produce. Many farmers in Nepal produce just enough food for subsistence needs.

#### **2.3. Administrative Divisions of Nepal**

Nepal is divided from east to west into five regions. Together these regions are sub-divided into 75 districts. A district is further divided into a number of Village Development Committees (VDCs) which are village level councils. These are the smallest administrative units and contain a small handful of hamlets with a total population of around 2,000 to 5,000 people. Each VDC is composed of nine wards which are the smallest socio-economic units comprising usually less than a hundred households (Dunsmore, 1988).

##### **2.3.1. Village-Level Politics and Administration**

The village-level administration is called the Village Development Committee

(VDC). VDCs and wards often have rather arbitrary boundaries and are usually very heterogeneous and faction-ridden, so one group (defined as such either by caste, faction or area) can easily dominate another through VDC politics. Many local leaders, especially by functioning through the VDC system, manage to monopolise the benefits of development schemes for themselves and their group. Many leaders influence decision-making to the disadvantage of others in the community, for instance they frequently control the selection of tree nursery sites, or labour opportunities as part of a political patronage system. Local power relationships can be a major constraint to development activities in that it becomes very difficult to identify the desires of poorer and socially disadvantaged members of a community as well as by the lower and less influential castes and ethnic groups.

## **2.4. Geographical Zones of Nepal**

There are three main geographical/ecological zones in Nepal running in an east-west direction across the country. These are the flat, fertile plains of the Terai in the south of the country, the Mid-Hills in the middle, and the Himalayas in the north. The Mid-Hills is the location of this research.

### **2.4.1. Mid-Hills**

This is a central region composed almost exclusively of a network of high ridges and valleys. Less than 5% of the zone is flat land. The lowest part of the zone is the river beds at about 300 m. and the highest points are on the ridges rising up to 3,000 m. The slopes of most of these hills (hills is used here as a relative term to the mountains of the Himalayas) are carved into innumerable terraces where most of the agriculture is undertaken. It covers nearly 44% of the total country.

#### **2.4.1.1. Isolation**

Most of the rural areas in the Mid-Hills do not have roads which are accessible to vehicles so they can only be entered by walking along mountain paths. Some rural areas are also isolated by being separated from roads by treacherous rivers. Because of this isolation and because villages are diverse and dispersed,

government administration, communication and other services are generally irregular or largely non-existent (Fisher, 1989). In particular, this restricted access to the villages makes the supply of agricultural inputs and the marketing of agricultural products, difficult, providing a serious constraint to moving out of the existing subsistence economy, regardless of the efforts of researchers and extensionists in agricultural systems.

## **2.5. Rivers**

There are basically two types of rivers in Nepal - perennial and seasonal. Rivers which originate in the Himalayas and are perennial, carrying snow-fed flows whereas the rivers which originate in the Mid-Hills are seasonal with 80% of their flow occurring during the monsoon months - mid-June to mid-September - when they cause severe river bank erosion and flooding. During the rest of the year these rivers are dry river beds only.

## **2.6. Climate**

Nepal experiences a summer monsoon from June to September where between 60% to 90% of the annual precipitation occurs. Typically between March and April the pre-monsoon rains arrive.

The temperature in the Mid-Hills varies from the subtropical at lower elevation to the temperate at higher elevation (i.e. above 2000m). South-facing slopes are also drier and hotter than north-facing slopes.

### **2.6.1. Micro-climate**

Topography, aspect and location affects the climate of Nepal. Within a short distance there can be considerable variation in micro-climate.

**Table 2.1**  
**Climatic Types of Nepal**

Climatic Types	Landscape Type	Summer Temp (°c) Mean, Min,Mx	Winter Temp(°c)	Altitude (m)
Hot, dry, sub-tropical	valley bottoms	25-10-32	24	300-500
Warm, dry, sub-tropical	valley bottom and southern Mid-Hills	22-8-30	22	500-1400
Warm, moist temperate	Mid-Hills	18-6-27	19	800-1700
Cool, moist, temperate	Mid-Hills	15-2-22	12	1700-2800
Cool, moist, temperate	High ridges above Mid-Hills	10-5-17	6	2800-4000
Alpine	Lower ridges of Himalayas	*	*	4000-5000
Arctic	" "	Permanent snow	Permanent snow	>5000

Key:-

\* Freezing possible every night of the year. Very short, cool summers and very cold winters.

Source: Adapted from Dunsmore (1988:3).

Temperature differences affect the type of farming practised. A difference of less than 300m in elevation can cause farming systems to change from predominantly triple-cropping to double cropping systems. In general, the potential for agricultural intensification decreases with altitude in mountains. Therefore it is very significant that the lower social groups occupy such areas. This was also apparent during the course of the fieldwork. South-facing slopes are considerably warmer than north-facing slopes. As a result south-facing slopes are generally more sparsely vegetated by comparison to north-facing slopes as it is difficult for vegetation to tolerate these less hospitable conditions. In contrast some areas may be in a rain shadow belt and hence receive more rain than the average in the surrounding areas.

## **2.7. Mid-Hills**

As the study is focused on this geographical zone a more detailed description of the area is desirable.

### **2.7.1. Population**

Nepal is a very heterogeneous country in terms of both its population (caste and ethnic tribes) and geography. Of its total population in 1990 (ie. 19,140,000), 91.7% was employed in agriculture (FAO, 1992).

The Mid-Hills is a densely populated area at 1,500 people per Km<sup>2</sup> as compared to the average 472 people per Km<sup>2</sup> for the total of cultivatable land in Nepal (World Bank, 1979). The majority of the population are farmers. The increasing population in this area is exceeding the sustainable capacity of the environment. Consequently, the area is heavily cultivated. Mathema (1988) states that in the Mid-Hills the populations of both humans and livestock exceed the sustainable capacity of the environment.

#### **2.7.1.1. Nepalese Society**

Nepalese society is different from Western society both in its standard and way of living as well as in people's different values and way of thinking. Most rural people in Nepal are illiterate farmers with low production rates. Nepal's history and geography has resulted in enormous cultural and physical differences among rural communities. For example people of different ethnic groups often speak different languages and have different beliefs and customs. Nepalese society is essentially segmented and hierarchical in nature, with low vertical mobility.

#### **2.7.1.2. Typical Household Composition**

Another characteristic of Nepalese society is the prevalence of joint or extended families. The household supports and reproduces itself through the labour of its individual members in subsistence agriculture, hence the more members a household has, the greater its production capabilities, to an extent.

### **2.7.1.3. Standard of Living**

The majority of villages in the Mid-Hills still do not have basic services such as electricity and piped water. Usually a village will have only one or two water taps for common use positioned in a public place within the village.

### **2.7.1.4. Caste and Ethnic Groups of Nepal (as encountered in the surveys).**

Nepalese society mirrors to some extent the Hindu hierarchical caste system present in India. It provides a framework by which Nepalese people relate to each other. For example, marriage between different castes is socially unacceptable, particularly in the rural villages. Yet according to Bistra (1991:55) caste regulations have never been applied strictly in Nepal as they have in India, remaining "a foreign importation with little proper support." He continues saying that "the caste system of Nepal has always been unique and not copied something from abroad. The reason is that it had to adopt and adjust to a socio-cultural system with a very different background."

**Figure 2.1.**  
**Nepalese Model of Caste Hierarchy**

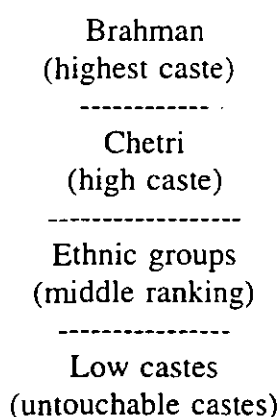


Figure 2.1. shows the hierarchical grading of the caste groups operational in Nepal. According to this model, all ethnic groups are equal such as Newar,

Gurung and Tamang. However in the Nepalese context, Newar people are viewed as a higher social group than any of the other ethnic groups. This may be due to their generally better economic position than that of other groups and their settlement in areas of economic activity, where many are successful businessmen.

On the basis of recorded mother tongue, Nepali-speaking caste Hindus are the largest and most dominant ethnic group in the hills of Nepal, accounting for at least two-thirds of the Mid-Hill population. Tamangs on the other hand, account for 7% of the hill population, and Newars for 5%. Magars, Gurung, Limbu and other distinct ethnic groups each account for 3% or less of the total hill population (Tuladhar, *et al.*, 1977:22).

The different ethnic groups and castes are brought up with various differences in economic, social, religious and moral backgrounds which causes them to react differently over the same thing (Caplan, 1972). Despite these differences people's superficial relations with other castes are generally sociable. Neither is interdependency nor full occupational differentiation a social fact in hill Nepal. Villages are frequently made up of only one or two groups whose relationship, although caste like, is not attuned to a totalizing caste structure. Despite this the lowest castes still suffer from out-casting whether from ethnic groups like the Newars or from the high castes such as the Brahmins. The main castes as encountered in the during my fieldwork are described as follows:

#### **(i) Brahman**

At the top of the hierarchy is the Brahman group. Their traditional occupation is that of priest and teacher, which requires them to be literate. Yet in the Mid-Hills most are full-time farmers. Despite this, they still form a powerful and educated elite amongst other castes and ethnic groups in general within their community. However, according to Bienen *et al.* (1990) high caste status does not guarantee membership in the elite, although it is a prerequisite. It is interesting to note from their findings also that collectively, the higher castes (Brahman, Chetri, Newar) account for 90% of all top civil service posts in Nepal, even though they only comprise about 22% of the total population of Nepal. Subedi (1988)

describes them as an "independent thinking and conscious people". Furthermore their settlement on the more fertile lower slopes and their possession of irrigated khet land meant that they had become one of the wealthier groups in Nepal, albeit not unanimously so.

## **(ii) Ethnic Groups**

Within this middle ranking category are included the Gurung, Tamang, Newar, and Ghale amongst many others. They are all on a similar level and are similarly half-way between Hindu and Buddhist. Some groups have inclined more towards Hinduism whereas others are more inclined towards Buddhism. This inclination depends also on the influence of dominating neighbour groups. The presence of dominating high caste neighbour groups will also influence their behaviour towards untouchable castes. Free from the criticisms of other castes they would freely employ untouchable people as servants in their own homes but where they are in contact with higher castes this practice usually stopped for fear of offending them and being considered as of similarly low status. Four of the main ethnic groups encountered during the study are described as follows:

### **The Tamang**

The Tamang are an ethnic group of people which are known to have moved into Nepal from Tibet within cultural memory. However they have been living for many centuries mostly in central and eastern Nepal. They are very community oriented rather than individualistic and tend to be suspicious of outsiders. This may have much to do with their history in Nepal as one of isolation from Tibet and enclosure in the feudal state of Nepal.

Although Tamangs have accepted the Hindu caste hierarchy, they maintain their own Buddhist religion rather than Hinduism. For religious functions they employ their own Buddhist priest (*Lama*), as well as or instead of the Brahman priests. Holmberg (1989) clearly believes that present-day Tamangs view themselves as a distinct religious society, one based on the authority of Lamas as opposed to Brahmans.



Traditionally Tamangs are cultivators of dry crops, including millet, wheat, barley, maize and buckwheat, with animal husbandry playing only a subsidiary role in their economy. Rice-growing does not traditionally feature in their cultivation patterns. According to local lore, it was not until recent generations that villagers cultivated rice in quantity at all, and it was not until intensive contact with immigrant Hindus from the south that they learnt of the techniques of rice cultivation. By now however, rice carries a high ritual and market value in their society and is a common feasting food, even though few households own enough khet land to produce a surplus and only manage to meet feasting and social obligations, if that (Holmberg, 1989).

### **The Gurung, including the Ghale sub-caste**

The Gurungs are an ethnic group of Tibeto-Burmese origin. Van Spengen (1987:138) indicates that "the first migrants from Tibet crossed the Himalayas at a very early date, inter-married with some kind of pro-Himalayan inhabitants of the Middle Hills, thereby establishing early Gurung society".

The Gurungs have a two-tiered social structure. The upper tier is composed of four patri-lineal exogamous clans one of which is the Ghale people who are a clan of ancient kings of paramount chiefs. The lower tier consists of over fifty patri-lineal exogamous clans. There is often still considerable rivalry and bitterness between members of the two tiers (Macfarlane, 1976). Doherty (1974) believes that one of the distinguishing principles of these people is their willingness to work formally in concert, with family or friends, preferring groups to separateness.

Traditionally the Gurungs planted maize and millet but by today the wealthier Gurungs prefer to plant rice. Traditions suggest that until a hundred and fifty years ago, they lived in villages at about 240 metres or above. Though they did not live too high to grow maize and millet, they were almost certainly too high for rice. During the twentieth century, population pressure forced them to establish villages lower down the mountains, ie. the areas low enough to practice terraced wet rice cultivation.

## **Newar**

The Newar are an ethnic group who have close links with the Kathmandu valley. Their origin is uncertain but is probably Tibeto-Burmese. They are strongly Hinduized and consider themselves a step above other ethnic groups. Traditionally they cultivate rice as well as maize and millet.

### **(iii) Low castes (Kami, Sarki and Damai).**

At the very bottom of the hierarchy are the 'untouchable' group. This group includes, amongst others the artisan castes of Kami (blacksmith), Sarki (leather worker) and Damai (tailor and ethnic musician). They are fully integrated into the beliefs of the caste system. Yet in Nepal they are not treated by other castes in such an inferior manner as they are in India. Bistra (1991) says that among the people of Kathmandu Valley, most of these occupational classes are not treated as untouchable. Hence although by birth they are classed as untouchable, they are treated as a people of low caste rather than as a class of people beneath the caste system. Despite this upliftment, they do have social restrictions imposed upon them. For instance it is customarily believed that they should not touch water which will be also used by the higher castes. Upadhyay (1990) in his study of the *untouchables* in parts of northern India found that although they were allowed to take drinking water from public taps, they were not allowed to use village wells maintained by the upper castes. In the past they had no access to education, it being denied to them, and as a consequence they tend to remain socially, economically and educationally backward.

They are generally either landless or invariably hold a very small piece of land received as a gift from their patron under worker ownership rights. In pre-colonial times they were prohibited from owning land and from cultivating new land without permission from high caste villagers. They survived by their trade and were paid in kind. This made them very dependent on their patrons. They were prevented from becoming economically independent rather than from farming at all. Thus low castes have been kept dependent and poor.

They are kept physically isolated as a group from other castes higher than themselves. Typically they are found living on the outskirts of the main village in a cluster. Despite this they often belong to the best informed people of the village because their occupational work brings them into contact with all the other villagers.

As a group they are characterised by their poverty. In her study of a village in rural Nepal, Hobley (1990) found that there were no low caste households represented in the grain surplus categories. Similarly, Seeley (1989a:12) found that the Kami and Damai "tend to have less land than other jat [castes] and their land is often of poorer quality. " Hofer (1972) claims that originally they only worked for higher castes and they had migrated together with these castes from Western Nepal. It is only recently that they have settled amongst ethnic groups of Tibetan origin.

The low castes' service structure has undergone considerable change. These days they are more self-sufficient producing their own food and owning livestock despite having generally smaller holdings than the other castes. By now, many have abandoned their trade and now work only as farmers.

#### **2.7.1.5. Women**

Women in Nepal as in many other developing countries are particularly diligent in agricultural work (Dixon-Mueller, 1985). In Nepal more than 94% of the female population is engaged in agricultural activities (Chitrakar, 1990:24) and furthermore an estimated 89-90% of agricultural production processes are the responsibility of women. Most, or in some cases, all the post-harvest operations are also done by women.

Both Schroeder and Schroeder (1979) and Hobley (1990) comment that certain agricultural or agriculturally-related tasks are generally regarded as low status and hence are considered women's work. For instance Hobley (1990) says that women hold the major responsibility for work on unirrigated land with the lower value

crops and are also responsible for low-value animals such as goats and hens. Men on the other hand carry out agricultural tasks which are considered more prestigious, such as work on the valuable irrigated land or managing the buffaloes. In addition, the amount of farm work expected of a family member is a clear indication of his or her status within that household. Any man who can afford to, will pay hired labour to do the heavy farm work for him. There is an assumption that neither respected elders nor any of the younger generation of men who have had some education, should demean themselves by doing farm work.

### **2.7.2. Farming in the Mid-Hills**

The hill farming scenario is characterised by an absence of mechanised power. Despite this it is still cultivated very intensively as indicated by the extensive terrace systems, and loss of forest cover.

It is estimated that the hills of Nepal produce sufficient basic foodstuffs to feed the resident population for approximately two-thirds of the year (Hughes, 1985). Within the last few decades farmers have intensified their farming practices by following as tight a sequential cropping pattern per annum as possible. However the degree of intensification possible is controlled by altitude, irrigation facilities and availability of fertilizers (Sen, 1992).

Nepalese subsistence systems are not very influenced by world market forces. Nepalese agriculture makes little use of non-locally produced agricultural inputs, and very little hill and mountain agricultural production reaches markets that are integrated into large economic spheres. As they are isolated from large markets and supply centres, farmers have not been so exposed to new agricultural technologies and the high-yielding varieties, chemical fertilizers, pesticides and irrigation facilities as experienced by farmers in many other parts of the developing world.

Cultivated land is categorized by farmers in several ways relevant to its productivity. The most important distinction is between irrigated and non-irrigated

land. However most of the farming is based on dry-land grain agriculture. Villagers also classify land by soil type and exposure to the sun. North-facing fields conserve more moisture and thus are preferred to the drier south-facing fields. Also fields below the village are preferred to fields higher up than the village because of the greater ease of carrying fertilizer to them.

**Table 2.2**  
**Contrasting Characteristics of Agricultural Systems**

<b>Subsistence Agriculture in Hill and Mountain Nepal</b>	<b>Market-Orientated, Energy-Intensive Agriculture</b>
Except for a popular variety of winter wheat, high yielding crop varieties are rarely planted.	High yielding and hybrid varieties are almost always used.
Virtually no chemical fertilizers or pesticides used.	Chemical fertilizer and pesticides are essential to producing high yields.
Farming is done by animal and human power.	Almost all agricultural tasks are done by machine.
Almost all agriculture is done under rain-fed conditions.	Water control through irrigation or drainage is essential to producing high yields.
Agricultural production is for domestic consumption.	Agricultural production is for market sale.
Average grain crop yields are typically below two metric tons per hectare.	Grain crop yields are usually four to six metric tons per hectare.
A large number of crops and crop varieties are grown by a single farmer.	The number of crops grown and varieties used are usually limited.
Very little cash is invested in producing a crop.	Agricultural production requires major market economy transactions.

Source: Schroeder (1985:42)

Nepalese hill farming is characterised by its subsistence-level agriculture and the relationship and interdependence between agriculture, livestock and forestry. It is very different to market-orientated, high input agricultural systems characteristic of developed countries (see Table 2.2). It is also negatively characterised by a high man-to-land ratio, a great disparity in land ownership, a large number of poorly fed livestock, with low productivity and declining forage base, inadequate

knowledge of new technologies, a deteriorating environment and declining soil fertility. Virtually all hill and mountain agriculture takes place under rain-fed conditions, with only 0.7% of farm land being perennially irrigated (Green, 1980:41).

The fertility of the soil in the Mid-Hills is maintained primarily by the application of animal manure and the extensive use of compost from the forest. In fact, according to Carson *et al.* (1986), Nepal has one of the lowest rates of chemical fertilizer use in all Asia (at an estimated 4% of total fertilizer used (Ives and Messerli, 1989)). In addition much of the chemical fertilizer which is used is wrongly administered (Blaikie and Brookfield, 1987).

#### **2.7.2.1. Subsistence Farming Economy**

Nepalese hill and mountain agricultural systems are largely subsistence systems, which means that almost all agricultural production is used locally and that farmers consume crops that they themselves produce. Any farm surplus which is produced will of necessity be small and is used locally for obtaining labour, services and indigenously produced goods rather than being sold for cash in the market place.

#### **2.7.2.2. Cropping Patterns**

As many as 18 dominant cropping patterns are recognised in the Mid-Hills (Carson, *et al.*, 1986). This diversity is due to its numerous micro-climatic pockets and different production potentials. Maize, rice, millet and wheat are the most important grain crops grown in the hills and mountains in this order (which accounts for 80-90% of the Nepalese diet), although wheat production has increased in recent years due to the more widespread practice of winter wheat sowing. Potatoes, barley, oats, and other cold-tolerant grains, buckwheat, sweet potatoes and amaranths are important bulk crops grown in selected communities (Schroeder, 1985).

### **2.7.2.3. Classification of Agricultural Land.**

Agricultural land in this area can basically be divided into three types: khet, bari and paka.

(a) **Khet:-** This is a relatively low land or a river valley or a flood plain which is of a level to gentle slope. The land is seasonally or permanently irrigated paddy land which is highly valued, both because of its productive crop and the fact that it is very resistant to erosion. Nowadays, rather than letting it fall fallow in the winter season, winter wheat is often grown on it. In some places, especially in the lower sub-tropical range, three crops are grown on khet land per year. There are two types of khet land:-

#### **i) Khola Khet**

Khet land which is close to the river enabling the farmer to have year-round irrigation for the land.

#### **ii) Paka Khet**

Although it is still classified as on lowland it has no irrigation facilities and relies on seasonal irrigation only.

(b) **Bari:-** This is rain-fed upland terraces. Typically maize, maize/millet and mustard are the dominant cropping patterns here. These sloping terraces are prone to erosion and landslides, especially during the monsoon period. Throughout the hill regions, soil erosion on rain-fed land has by far the most important effect on fertility management. The long-term maintenance of fertility on such slopes requires heavy fertilizer additions annually (Thapa, 1987). In addition, bari land soils are usually poor, sandy and loose. The cultivation of crops on bari is limited by a longer growing season, especially on land above 1,700 m. Only one summer crop (usually maize or millet) can be cultivated per annum, and one winter crop and wheat every second year, i.e. three crops in two years' time.

(c) **Paka Land (unterraced slopes or sloping terraces):-** Sloping terraces, in most cases laid out for the cultivation of maize and millet, are very prone to

erosion. Throughout the hill region, soil erosion on rain-fed land has by far the most important effect on fertility management.

#### **2.7.2.4. Agriculture-Forestry-Livestock Linkages**

Crop production, animal husbandry and forestry constitute the three main inseparably integrated components of the farming system in the Mid-Hills. Forests supply fuelwood, fodder, compost, timber, as well as food to the farming system. Although many farmers have private fodder trees, these are rarely sufficient to meet the year-round feed requirements of the livestock. Grass, crop-residues, and forest resources must supplement these, so the farmer naturally manages crop, forest, and pasture resources in a combined manner, using both private and communal resources (Denholm, 1989).

Forests directly influence crop production in the Mid-Hills by supplying compost materials. In addition, forests, as they are usually found on upper slopes, provide protection to crop lands against landslides and soil erosion. Forest biomass is mixed with animal dung to yield organic compost manure which forms the principal source of soil nutrients for hill agricultural land. However because this is a one-way flow of products from the forests to the farms, the long term ability of the forests to sustain themselves is a cause of concern.

Livestock production is also an integral part of the farming system. There exists a complementary relationship between crops and livestock whereby crops provide feed and bedding material to livestock, and, in return, receive draught power and manure from livestock. The importance of animal manure should not be overlooked given the low availability and high cost of chemical fertilizers for the farmers in the Mid-Hills. The type of livestock kept by farming households include cattle, buffaloes, goats and poultry but all in very small numbers due to the small size of the farms, limited livestock feed and grazing land available.

Even though the livestock sector is a vital component of the farming system, it



is also the most badly managed with an acute shortage of feed and a lack of an effective culling programme. The practice of uncontrolled grazing is also extremely degrading to the forest. However due to the population increase in the Mid-Hills and the greater pressure on the forests, many households have been encouraged to practice fodder collection and stall feeding of their cattle in an attempt to conserve the forests.

#### **2.7.2.5. Recent Trends in the Hill Farming System**

The increasing population in the Mid-Hills means agriculture needs to become more productive. Currently the average land holding in the Mid-Hills for a family of five to six persons is as little as 0.4 ha. This heavy land-use pressure has resulted amongst other things in terraced agriculture being taken to extremes of slopes. Farming of too steep a slope makes it very vulnerable to landslides.

In addition to increasing the amount of land under cultivation, crop intensification has also occurred. Crop intensification has been given much support by the government. However problems have arisen from this practice, typically that of exhaustion of the soil's fertility despite the increasing use of chemical fertilizers (Sthapit *et al.*, 1989; Subedi *et al.*, 1989). Many farmers have also adopted new varieties of crops to increase agricultural production, for example improved varieties of rice, wheat and maize.

#### **2.7.2.6. Research and Extension Services**

An outline of the research and extension services (agriculture and forestry) provided by the government is given below:

The Ministry of Agriculture (HMG/N) is composed of the Department of Agriculture and the Department of Livestock Development. There is also a National Agricultural Research Council (NARC) which co-ordinates several agricultural farms and research stations throughout the country and ten local training and research centres. The main objective of the Ministry of Agriculture is to improve the living standard of farmers by means of agricultural production.

The agricultural extension system is provided at the district level by the Agricultural Development Office, one in each of the seventy-five districts via the Junior Technicians (JTs) and Junior Technical Assistants (JTAs) and village level Agricultural Assistants in each of the Village Development Committees. Junior Technicians are responsible for one or more VDC. Junior Technical Assistants are responsible for field level contact with farmers as well as supervising the Agricultural Assistants. The latter are chosen from among the farmers as grass roots level extension agents (i.e. they are not government employees). Both JTs and JTAs have to serve an average of 2,500 farm households each in Nepal, there being from four to forty of them in each district, depending on its size, its agricultural potential and any on-going programme.

Under the agricultural extension system, Agricultural Service Centres were established (mostly in the Mid-Hill and Terai regions). They were set up with a view to making farmer extension services more readily available and permitting liaison between them. Each Service Centre acts as the base for services to farmers in four to six village VDCs. A few are in addition serviced by the Agricultural Development Bank of Nepal. The Agricultural Service Centres are also involved in generating technologies, with all the research programmes being co-ordinated by the National Agricultural Research Council co-ordinating body.

The Ministry of Forests and Environment has seven departments under its control, one of which is the Forestry Department. The aim of the Forestry Department is to promote the development of the forestry sector. It controls all extension activities. However all forestry related research is carried out by another department - the Forestry Research Division unit in Kathmandu. These two departments do not have any direct link with each other, communicating instead through the Ministry of Forests and Environment. Therefore there is often a communication gap between policy implementation and extension on the one hand and forestry research on the other hand. Furthermore there are no research centres at regional or district level, serving to further isolate research programmes from the real issues of the small farmers. Although by the outset of this study, a regional office had recently been established yet no research was

started during the period of the study.

The forestry extension system is hierarchically structured with the District Forest Officer being responsible for all forestry activities in his district. He is both forest estate manager and a facilitator of community forestry. Rangers work at village level (VDC level) and are responsible for conducting field activities with the village council and farmers. At the VDC level, forest guards are recruited from among the local villagers in order to encourage the villagers' participation in the community forestry programme. This network of field workers are the single most important channel of forestry extension.

The Forestry Department has set up a Community Forestry Development Project where extension is considered its key component. In community forestry, *extension* means a process through which people are encouraged to manage their trees and forests effectively and by their own efforts. The most important role of the extension services has been the provision of technical advice to the villagers and the continual assurance that tree growing will work for them and benefit them. The project has also established some demonstration plots for motivation of villagers as well as organising study tours.

Although in recent years a bottom-up process has been initiated within forestry to increase peoples' participation, two-way communication has not been happening. In fact very little exchange of information has been occurring at the village level resulting in major misunderstandings about governmental intentions, and the rights and responsibilities of villagers as well as a host of other issues. For real participation it is suggested that people should be considered as a part of the solution, not as part of the problem. It is also important that the people's voice should be echoed in the programmes.

## **Chapter Three**

### **Researcher-Extension-Farmer Linkages: A Critical Review**

#### **3.1. Introduction**

The long-run effects of the population explosion in the developing world and the recurring concern about food shortages, emphasize the importance of increasing agricultural production.

The amount of virgin land which can be taken into agricultural production within most developing countries is by now low. In addition because of the rapidly growing population, the proportion of small farmers has also increased resulting in the further decrease in the size of their farm holdings. Because of these problems attention has been directed at how to intensify crop production.

#### **3.2. Green Revolution**

The World Commission on Environment and Development (WCED) identified three main types of contemporary agriculture within the world: 'industrial' (largely confined to the industrialized world but also in specialized enclaves in the developing world), 'green revolution' agriculture (in areas of the developing world characterised by reliable rainfall or irrigation technologies) and 'resource-poor' agriculture (found throughout the developing world) (Elliott, 1994).

Researchers' success in improving staple crop varieties has created a Green Revolution as regards food production even within developing countries. However the success of the Green Revolution has only benefited large farmers or cash-crop farmers. Small farmers still lag behind with regard to productivity, typically because they own little or no irrigated land (Schultz, 1984) and lack the resources to buy the recommended inputs. The single message strategy of the Green Revolution does not fit the farming practice of the small farmer who needs

much more specialized information. The main focus of agricultural research continues to be directed at irrigated areas and the bulk of funding has been allocated to the development of crop varieties suitable for these more favourable conditions. Not only does unirrigated and rain-fed land constitute a significant proportion of farmlands within developing countries but also a significant proportion of the total population of these countries are eventually dependent on securing a farming livelihood from them.

Research stations experiment with improved crop varieties under virtually ideal environmental conditions, as regards soil fertility and irrigation. Rich farmers, otherwise known as resource-rich farmers, typically own the more fertile, irrigated land or at least have irrigation potential. These mimic the conditions in the experimental station, hence it is not surprising that it is the rich farmers who have prospered under the Green Revolution. Nepal's agricultural research activity is concentrated on the high-potential, low-altitude areas, ignoring the remote and resource-poor hill areas (Gibbon and Schultz, 1992).

### **3.3. Small Farmers**

Within the developing world, small farmers constitute the bulk of the farming population. They operate in a context of increasing local population pressure and have a very low resource base which gives rise to a very low standard of living -at basic subsistence levels or below that (Dillon and Hardaker, 1980).

Small farmers operate under resource-poor agricultural conditions. The Brundtland Commission defines 'resource-poor agriculture' as that which is characterised by the unfavourable or difficult farming conditions of mainly rain-fed areas, with fragile and/or problem soils and includes farm-lands in marginal areas such as mountains (WCED, 1987). Research is typically not geared towards the needs of the small farmer. Yet if resource-poor farmers are to benefit from public sector research they must be able to influence the direction and content of the research.

### **3.3.1. Characteristics of Small Farmers**

A high proportion of land is devoted to food crops in order to meet family subsistence needs. The crops grown are of a diverse mix in order to minimise both agro-climatic (such as weather and yields) and market (output price) risks. However few market linkages exist and those that do are weak. Labour is the most important input for the farming system as it is both free and relatively abundant. Operating capital turnover in production is very low and is often coupled with a debt burden which, in relation to their resources, is much higher. This contradiction is due to the small farmers' need to borrow heavily for consumption purposes in order to survive during the periods when they are not self-sufficient in food (Singh, 1979).

### **3.4. Constraints militating against an effective extension system**

Extension aims to change farmers' attitudes or knowledge levels via research, information transfer and finally through the adoption of the new technologies. The basic assumption is that technology and information are available but are not being used by farmers. If knowledge of these could be communicated to farmers, farm practices would be improved. It assumes a linear communication process from international research centres to national research centres to subject-matter specialists who translate the findings for extension purposes into technical recommendations (Roling, 1988).

Extensionists frequently deliver their messages to selected contact farmers rather than the community as a whole. The contact farmers are amongst the progressive farmers of a community. The extension service is best suited for areas where communities are readily accessible and where there are sufficient extensionists available such as an area surrounding a research station. Another criticism levelled at the extension system is its emphasis on a few individual farmers at the expense of the farming community as a whole.

Another inherent weakness in the system includes the assumption that the majority of farmers should be engaged in the same crops, at the same operation

and at the same time. This is not typical of the complex agro-climatic environments as found in the Himalayan regions (Malla, 1982).

It is the policy makers and researchers who decide what farmers should do, what they need to know and when they are to be told about it. In addition the feedback mechanism is usually ineffective. Feedback is inhibited by two sets of factors. First, it underrates the initiatives taken by farmers and NGOs. Secondly a premium has been placed on positive feedback. Hence feedback on the partial adoption or outright rejection of technologies by farmers is discouraged (Moore, 1984; Sutherland, 1987).

The extension system is input dominated. Its limitations are increasingly being appreciated. It is recognised for example that this approach results in the researchers setting the agenda, so that field level workers are faced with the problem of trying to persuade farmers to learn new approaches (again hierarchical) which have been devised far away from their farms and which typically have little relevance to their immediate farming needs.

#### **3.4.1. Lack of Manpower**

In developing countries the ratio of farmer to extension worker is typically much higher than the recommended levels. For example Williams (1974:24) recommends 1:750 as an ideal ratio of extension officers to farmers. Whereas in Nepal each extensionist is theoretically responsible for an average of 2,500 farm households (Ewell, 1989). Being a mountainous country with few roads, the extensionist in Nepal has to reach most places by foot. Hence it is not surprising that many extensionists are criticised for 'sitting in their offices'. Consequently many farmers may never come into contact with extension workers. Sofranko *et al.* (1988:293) pessimistically sum up the situation as follows: "relatively few farmers in developing nations have contact with extensionists and those who do, do not benefit from their contacts, and that those with contact are not representative of the farm population".

### **3.4.2. Selectivity on the part of the extensionist**

Extensionists have a habit of visiting primarily the progressive or rich farmers who are both eager to learn of new technologies and have the resources to experiment (Lele, 1975). The extensionists' job description typically place heavy emphasis on converting a target number of farmers to the prescribed technology, which encourage them to concentrate their efforts on those who are most likely to be converted quickly, i.e. the progressive farmers. The consequence of emphasising distribution targets is that the extensionist spends more time than ever with the larger farmers who take regular and large quantities of free commodities, rather than concerning himself with ascertaining the varied needs of the majority of those who are marginal farmers (Collinson, 1985; Jiggins, 1977).

### **3.4.3. Contact/Progressive Farmers**

There are many difficulties associated with the sole use of contact/progressive farmers for the diffusion of innovations. If the farmers chosen are truly representative of the farming community and they pass on their knowledge to other farmers, then the use of contact farmers is an acceptable strategy. However the choice of farmers is inherently biased towards the relatively 'resource-rich' farmers (who are not representative of the total population) in that it concentrates on capital intensive, large-scale, high-input and market-oriented agriculture (Francis and Rawlins-Branan, 1987; Roling, 1982). Roling (1988) also sees the progressive farmer as 'demanding' assistance. Often they complain if they are neglected and some are powerful enough to affect the career of the local extension worker. They are often of the same social standing as the extensionists so that it is easier for them to communicate with each other. Stavis (1979) believes that the progressive farmer has political influence.

Because of these reasons according to Roling (1988), nearly every extension service in the world operates a progressive farmer strategy. In contrast, the non-progressive farmers who comprise the majority of the farming community neither get visited by extension workers nor do they have good access to information resources or means of production.



Van den Ban and Hawkins (1988) stress the need for a contact farmer within each homogeneous group of the total farming community of a locality, as interaction between members of different social strata can be limited in communities with rigid social stratification. This includes women's groups as well because in many countries there are separate communication networks for men and women. "Information given by extension agent to male opinion leaders will often reach farm women very slowly and further distorted, if it reaches them at all" (Van den Ban and Hawkins, 1988:115). As women are farmers in their own right they too need equal support and advice as for male farmers. However there are obstacles which impede their involvement with extension workers - social and cultural restrictions as well as heavy farming and domestic workloads, which rarely leaves them any time for extensionists. In addition, because of their status they are neither expected nor encouraged to play an active role in development programmes (Oakley and Garforth, 1985).

According to Rogers and Shoemaker (1971) contact farmers are not effective in passing on the extensionists' message to the farming community as a whole. Instead they are very selective in who they choose to pass on their information to, favouring their friends, relatives and those within their clique. According to Rogers's theory of diffusion (Rogers, 1977), any given individual in a system is likely to contact certain other individuals and to avoid most others. Gogoi and Singh, (1986:38) found that rather than the contact farmer passing on his knowledge, farmers have to personally seek and ask him for information. Ashcroft *et al.* (1973) also view the concentration of extension activity on only a few farmers as leading to increased social and economic inequality. According to Biggs and Clay (1981), those who are economically better off and politically influential, will try to secure a disproportionately large share of the benefits from the transfer of technology and innovation.

Chamala *et al.* (1980) found in their study that in some cases the information flow from the contact farmer to the farming community was not only slow, but that certain information was deliberately withheld due to perceived competition amongst the farmers. Withheld information may be very critical to deciding

whether or not to adopt innovations.

### **3.5. Reasons Why Farmers may not Adopt Innovations**

According to Rogers and Shoemaker (1971), innovations have five characteristics from the farmer's point of view which affect their rate of adoption. These are:-

(a) compatibility with the farmer's needs, his particular agro-climatic conditions and socio-economic values.

(b) relative advantage over the old farming method.

(c) complexity - the farmer may not have fully grasped the technicalities of the innovation from the extensionist.

(d) observability - the majority of farmers are hesitant to be the first ones of their community to try out a new farming practice.

(e) trialability.

To this list Chaudhry (1984) adds faith in the extensionist.

Brown (1981) criticizes Rogers and Shoemaker's diffusion theory because it assumes that all potential adopters have an equal possibility of adopting. He develops instead his own perspective - the 'market and infrastructure perspective', whereby the emphasis is on the availability of the supply of innovations instead of on the personal characteristics of the farmers. The supply of innovations is, he says, in reality usually unequal, favouring proximity to communication networks. Hence a potential adopter's access to an innovation and thus the opportunity to adopt, differs among farmers of the same social system according to their geographical location. This is an issue of particular importance to rural areas. Also there is some empirical evidence to support the suggestion that the nearer to the diffusion centre, the higher the proportion of adopters at a particular time, and vice versa (Jones, 1992).

### **3.6. Communication Barrier Between Farmers and Extensionists**

Most extensionists see communication in narrow terms: as public relations,

printed extension materials and newspapers and so on. Such an attitude creates inequality in the communication process. Cristovao (1989:4-5) characterizes the communication process between farmers, extensionists and researchers in the following list:

1. They are far from reaching the majority of the people: bias exists towards the larger, more progressive and better-off farmers.
2. Small and poor farmers - the majority of the rural population - are overlooked.
3. A narrow concept of communication predominates.
4. Communication from the farmers, especially the small farmers, is not stimulated, and is typically disregarded.
5. Emphasis is given to one-way communication and authoritarian transmission of information.
6. Feedback, if it happens, is seen as a way to construct more effective persuasion next time around.

Formal extension channels are often beset with problems. For example the Integrated Cereals Project's Mini-Kit Programme<sup>1</sup> in Nepal has had considerable problems with distribution, including late delivery, poor geographical coverage, and repeated distribution to the same, often larger farmers. This example highlights the inefficiencies of the formal extension system for passing information to farmers.

There are also technical reasons to consider concerning the limitations of relying too much on the extension service. Farmers rarely remember or are given sufficiently precise technical information about new technologies by the extension workers. Another technical reason concerns the speed at which information and new seed varieties can be passed down to farmers. For instance in Pakistan the amount and speed at which wheat HYVs are being given to the farmers by the extensionists is not commensurate with the farmers' needs. This is of mounting concern to the country due to the fact that its resistance to leaf and stripe rust

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<sup>1</sup> A farming kit consisting of one or two improved seed varieties sufficient for planting 0.05 ha plus fertilizers if needed.

breaks down rapidly, often within a few years of the new variety being released (Cromwell, 1990).

### **3.7. Farmer Participatory Research and Extension**

The extension service, despite its relative success in the resource-rich lowlands, has only achieved limited success in the rain-fed uplands. To remedy its limitations, a new research/extension system has evolved called Farmer Participatory Research. This system evolved at the same time as the growing realisation of the importance of indigenous knowledge and farmers' experimentation within the farming process.

Small farms have survived for generations in a specific environment and have worked out a farming system which cannot be improved by a simple input of knowledge alone (Roling, 1984). A technology will be adopted and sustained by people only if it is appropriate to their resources, needs, and desires. Therefore the researcher needs to understand how the small farmer thinks. All too often rural societies and rural people have been expected to cope with new technologies about which they have not been consulted and for which they are unprepared (Longo, 1985). In addition "an adequate understanding of the various categories of land users within the target area, their differing needs and opportunities, their access to and control of resources - all these things that affect their ability to adopt and to benefit from innovations is essential to a successful extension programme" (Rocheleau, 1987:33). Rocheleau sees no substitute for the 'user perspective' in the design of extension innovations.

As the technology transfer approach is neither user-oriented nor farmer-led, the development projects developed by researchers are less likely to match the needs or capacities of the farmers. Rather than targeting the progressive farmers the emphasis in this approach is more on involving the poorest, least powerful members of the community in the research process. In addition, this lets the researchers have a better understanding of local-level farming conditions.

Farmer Participatory Research emphasises in-depth consultation with the farmers. According to Chambers and Ghildyal (1985), it should involve a reversal of the processes of explaining, learning and location. The major reversal is that the explanation for non-adoption lies with the deficiencies in the technology itself and not with the farmer. The reversal of learning requires that scientists start by systematically learning from farmers with transfer of technology from farmer to scientist as a basic and continuous process. The reversal in location means that Research and Design must take place on the farm and with the farmer, with the research stations as referral and consultancy centres only (Rhoades and Booth, 1982). However even within this extension method there are weaknesses. One of the limitations with the Farming Systems model is that the key decisions about what to try and what to do remain with the scientists (Chambers and Jiggins, 1987).

Many researchers are now convinced that farmers can provide valuable information for initiating research work. In order to demonstrate the validity of farmer-led research, and to ascertain farmers' methodologies, a new technology was introduced to a group of farmers in West Java, Indonesia - the cultivation of potato using seeds rather than potato tubers. It was found that the farmers' experimentation closely resembled that of the researchers at the experimental station (Potts *et al.*, 1992). In social forestry in particular, extensionists and researchers' participation with farmers is essential as "they are most likely to have the long-term working knowledge to carry out the social forestry programme that the professionals can best adopt and systemize as their learning processes" (Burch, 1988:81). Raintree and Hoskins (1988) note that nowadays there is a movement within forestry in developing countries towards increased participation of local people in development and a new awareness of the multiple roles trees can play in rural development. According to Van Wijk (1985:50) "local people should be involved in planning facilities aimed at improving their environment because they are the managers of their environment". In fact, an increasing number of case-studies have shown that participation in planning pays off. Bellaart (1988:17) says that "accumulated experience suggests that projects are likely to be more successful in the long run when local people are involved in design, decision-

making, implementation and evaluation activities". He also adds, "for people to become committed to a certain development plan some kind of participation seems indispensable." A further advantage of involving local people in development planning is that more sectors of people can be reached particularly the poor and other underprivileged groups of society. As Lisk (1985:53) says: "access to public decision-making can also be regarded as a means of ensuring a more equitable distribution of goods and services".

### **3.7.1. The Role of On-farm Research.**

Ideally, on-farm research is concerned with the flows of information from farmers and farm environments to researchers. It is concerned with maintaining a link between farmers, extension agencies and experimental station activities. However it often happens that researchers are simply transplanting conventional 'on-station' research designs onto farms. Such designs are for the most part beyond the comprehension of the average farmer hence they hinder farmer participation and interaction. Sumberg and Okali (1988) argue that on-farm research has too commonly been reduced to on-farm trials designed to validate and demonstrate work initiated on-station. Farmer participation in such a research process is largely limited to the passive role of simply providing land for the scientists to experiment with their 'on-farm' trials (Lightfoot, 1987). Similarly one of the major findings of a recent review of on-farm research for small farmers in nine countries was that at the field level the programmes had often not worked closely with small-scale, resource-poor farmers (Ewell, 1989; Biggs, 1989 cited in Biggs and Farrington, 1991).

### **3.7.2. Farmers' Experimentation and Adaptation of Innovations**

It is too simplistic to attribute innovation uptake solely to a farmer's economic position. The application of new technologies to any local situation depends on many factors, including cultural values and land rights, local soil and water conditions, farmer's skill and knowledge levels in addition to the economic resources available for change. Richards (1985) reported that some farmers in

Sierra Leone frequently changed their rice varieties - some changes were forced by need, but for about a third of all cases, the main factor was simply experimental curiosity.

The fact that farmers do conduct experiments on their farms can be easily illustrated by the many cited examples to be found in selected literature. One example is the rapid spread of improved wheat varieties in India and Bangladesh in the 1960s and 1970s. It was observed that after official demonstrations were made in farmers' fields to show the potential of the new seeds (often under optimal or high-input conditions) it was frequently the farmers themselves who adapted those packages to suit their own unique farming conditions (Biggs, 1980).

There are many detailed studies showing farmers adapting technology to fit into their unique farming system and within their resource constraints. An example is the development of the bamboo tube-well by farmers (Clay, 1980).

There are also numerous cited examples of farmers' own informal research. See for example Chambers *et al.*'s (1989) documentation of the spread of new rice varieties in India prior to extension activity and also Pachico and Ashby's (1983) account of Nepalese farmers who adopted a new rice variety whilst lacking full technological information so that consequently its adaptation had to be established by a process of trial and experimentation by local farmers.

### **3.7.3. The Importance of Indigenous Knowledge**

Historically, hill agriculture in Nepal has been characterized by farming systems which promoted a great degree of self-sufficiency and self-reliance. Farmers have traditionally relied on themselves or their neighbours for planting material. Thus there evolved a large number of cultivars and varieties, each adapted to the particular ecological niche where they originated. It is difficult to improve or replace these varieties because of the environmental diversity and physical isolation. This means that developing a "green revolution" covering all the cultivated areas of the Hills would be very difficult (Beets, 1981).

Recently increasing attention has been given to the knowledge and capabilities of small-scale farmers in developing countries as a potential basis for sustainable agricultural development. This knowledge has been given the name 'Indigenous Knowledge' (IK) and has been defined by Chambers (1983 cited in O'Brien and Flora, 1992:96) as follows:

" The term 'indigenous knowledge' refers to a population's way of relating to the social and/or physical environment that emerge in specific local contexts. These systems can fully originate in non-institutional settings, such as community organizations or through experimentation by farmers, although the localized modification of imported, institutional knowledge can also be included as indigenous knowledge."

Indigenous knowledge is often unknown to development workers because it is the farmers' domain as opposed to information which is passed through to farmers via researchers or extensionists. It is therefore rarely documented and is increasingly being lost because it is losing its value as younger generations see less need to continue to use it. According to an old African saying, when a knowledgeable old person dies, a whole library disappears (McNeely and Pitt, 1985). It is being forgotten as it is replaced by modern technology and education, being regarded as inferior beside modern technologies. Melnyk (1993) believes that loss of IK is an inevitable consequence of rural development.

Byers and Sainju (1994) have expressed the view that the agricultural extension system with its focus on high-yield crops, has contributed to reduced diversity and resilience of mountain agriculture. The use of pesticides, herbicides and reliance on a few crops and their varieties has encouraged this situation.

The working realisation that farmers' indigenous knowledge (IK) can be very important to researchers is only just emerging. Although the objective of a research organisation may state a two-way flow of information, in actual practice this is unlikely to happen. As researchers in their top-down approach hand out development packages and innovations to farmers this creates a dependency



feeling within the farmers and a feeling of the inferiority of their own farming knowledge and furthermore disinclines them from innovating. In this way farmers' indigenous knowledge is in as much danger of being lost as are the wild varieties of crops.

In order to make use of indigenous knowledge, local participation in planning is necessary. According to Bellaart (1988:18), "rural people always had to listen to what others wanted to teach them; if researchers become better listeners they will be better able to grasp the essence of rural people's problems and act on them accordingly. The knowledge of scientists and rural people should be seen as complementary". Hence participation and the use of indigenous knowledge are seen to go hand in hand with one another.

A research organisation in Bolivia which recognised the importance of indigenous knowledge has documented and disseminated farmers' knowledge in the form of *fiches* (printed cards), with each one presenting a particular piece of farmers' knowledge as a way of giving it its due research recognition. Several copies of the *fiches* are given to the farmer for distribution. Other copies are distributed through extension agents etc. In this way indigenous knowledge is tried, adopted and spread to other farmers using their own resources and skills (Saravia, 1992).

#### **3.7.4. Amalgamation of Farmers' Knowledge and Researchers' Expertise**

Another theory gaining popularity is the combination of indigenous knowledge with scientific knowledge. Given that researchers and farmers alike have only partial knowledge of the complex interactions involved and how to test and compare alternatives, amalgamating specific local knowledge with researchers' expertise is more powerful in designing appropriate technologies than either on their own. Indigenous knowledge on its own has limitations in that it is hard to extract and experiments are slow compared to those of researchers. Although local knowledge and objectives must be always respected, it should also be acknowledged that extension workers have a role to play in supplementing local knowledge and raising people's aims (Raintree and Hoskins, 1988). Also by

capitalising on farmers' contributions to research, this decreases the disadvantages of on-farm research, namely its high manpower, low area coverage and high cost. In India, the Honey Bee Network aims to encourage the responsible use of farmers' knowledge by researchers and to help break down artificial boundaries between formal and informal knowledge systems. The Network's quarterly newsletter 'Honey Bee' documents innovations produced by farmers, thereby encouraging discussion between people at grass roots level, researchers, politicians and social activists (Gupta, 1992).

### **3.7.5. Communication Problems Between Researchers and Farmers**

Some researchers insist that their role ends with the publication of results, that they are accountable only to their administrative hierarchy for the competent conduct of experiments, and that published work forms a major criterion of performance. These researchers will have limited interest in obtaining feedback from farmers.

Despite the recognition of the importance of achieving the participation of farmers in the research process and for the researcher to view the farming system from the farmers' perspective, in practice it is not easy to achieve. The problem of communication arises frequently at meetings involving researchers and farmers. Researchers often reflect their power and status when amongst farmers which intimidates farmers and prevents maximum interaction.

Yet for the successful transfer of technology, continuous problem diagnosis and feedback are essential. This should be carried out from one level of technology user to another (eg. from farmers to national research and extension services, and from these to international centres). Existing approaches have consistently failed to stimulate reverse flows of this kind, yet they are a powerful source of information and ideas and are likely to draw the research agenda closer to farmers' requirements (Kaimowitz, 1990 cited in Biggs and Farrington, 1991).

### **3.8. Researcher-to-researcher communication**

The closer collaboration between NGOs (Non Governmental Organisations) and government research and extension services could substantially benefit both sides. Biggs and Farrington (1991) conducted a survey comparing NGOs and governmental organisations (GOs). Their conclusions are listed below:

#### **NGOs**

1. Wide knowledge of local agro-ecological and socio-economic conditions.
2. A sharper identification of problems and opportunities for research.
3. Clearer feedback on the acceptability of technologies.
4. NGOs prefer to work with poor farmers in remote and difficult farming conditions.
5. NGOs are naturally inclined towards participatory methods that encourage local communities not only to have a voice in technology selection and the research agenda but also to develop their own capacity for experimentation.
6. The greater flexibility of NGOs to bring together several disciplines in order to focus on complex issues.

#### **GOs**

1. Greater access to technical knowledge, materials, methods and libraries, all of which are highly specialized and costly.
2. Training offered in specialist techniques such as propagation, pest and disease control and varietal improvement.
3. Prefer areas with better agro-ecological and infrastructural conditions.
4. Provide contact with technologies arising from research, whether conducted nationally or internationally.
5. Find it difficult to bring together several disciplines especially from different departments.

### **3.9 Significance of Indigenous Communication Systems for Rural Development**

Given the ecological diversity and the physical remoteness of the hills, the

diffusion of innovations and agricultural inputs, especially HYVs (High Yielding [Seed] Varieties), through formal institutional channels has always been problematic. Also because of the ecological diversity, many varieties are needed (not all of which are maintained and stored by every farmer all of the time), whereas in contrast, the range of HYVs is limited.

Farmer-to-farmer transactions operate at the individual community level, between households within one community, although lines of supply may extend over a relatively wide geographical area especially if kinship networks are involved. Farmer seed diffusion makes a new variety accessible to a broader range of socio-economic groups than if cash was required for its purchase. In addition small farmers do not have enough cash to be able to buy seed in advance and store it. Instead they need to be able to get it at short notice, typically from their wealthier neighbours. On the negative side however this system also depends on the receiver having sufficient quantities to be able to swap varieties.

Simpson (1994) in his survey of Mali farmers who were located in communities with established Training and Visit extension groups, found that even amongst those farmers who were receiving the highest extension contact, they still indicated that they were over five times as likely to get information on agricultural innovations through informal channels rather than from formal research and extension systems. Another study conducted in Kenya (Cromwell, 1990), showed that although the extension service was a useful initial source of information about new varieties, the service had not been successful in achieving the widespread distribution of seed, largely because of the limited number of farmers with whom it was in regular contact. Informal seed diffusion mechanisms have been under-researched at the field level and there is very little documented information concerning their mode of operation. Therefore their potential contribution is often overlooked in national seed projects and programmes.

Finally the information and seeds passed to farmers by extensionists is geared more towards marketable crops rather than local foodstuffs. Conversely a whole range of seed varieties are needed to fulfil specific socio-economic as well as

agro-ecological needs in the small farm system (particularly in mountainous regions) - no single crop variety is likely to fulfil all households' requirements even within a homogeneous agro-ecological zone. Hence reliance on the extension service for rural development poses particular problems for subsistence farmers. Problems of Green Revolution HYV seeds have been outlined by de Boef *et al.* (1993).

### **3.9.1. Effectiveness of the Indigenous Communication System**

Much is being researched into indigenous knowledge yet comparatively little is known about indigenous communication systems. Indigenous communication has greater significance for rural development than has indigenous knowledge on its own because it accommodates both farmers' indigenous knowledge and the dissemination of new technologies as initiated by both the farmers themselves and the extensionists. The extension system is mostly a top-down approach with the extensionists rarely discussing or exploring indigenous practices with farmers. For example research in Kenya (Goldman, 1991) into traditional fumigation practices revealed that there is little or no diffusion of farmers' knowledge through official channels. Although indigenous communication is only a recent area of research, it is increasingly being recognised as an important channel for development given the limitations of the extension service. Much research (including that conducted in Phulbari, Nepal) has shown that most farmers, both men and women, do not learn about new technologies through the media or extensionists, but instead from their neighbours, friends and relatives, or through their own experiments. In a country like Nepal, characterised by its isolated communities, the effective utilisation of indigenous communication channels therefore has high significance for rural development. Farmers should themselves be active in bringing about rural development. There are a number of reasons why farmers should not rely totally on external support (the extension system) to improve their livelihood. Firstly, the extension system is largely a top-down approach making farmers dependent on outside help. This, in addition, may encourage the break down of the indigenous mechanism of knowledge flow from farmer-to-farmer, or community. The formal, organised institutional structure used to disseminate agricultural information to small farmers remains highly centralised, costly and relatively ineffective in

reaching them.

The advantage of utilising the indigenous communication system is that it becomes easier to reach the farmers who traditionally tend to be isolated from contact with extensionists. Also it acknowledges the reality that most farmers do rely more on receiving information from each other about innovations than from extensionists: "despite the strengthening of the formal seed production and distribution system, informal farmer-to-farmer seed transfer clearly remains a major means of diffusing seed" (Heissey, 1990:63). In fact, a definition given by Korsching and Hoban (1992:2) of the diffusion of innovation process inadvertently illustrates that it is very much a farmer-to-farmer affair: "The diffusion process is the process by which a new technology is communicated from one individual to another, and thus its use spreads throughout the community." Krikelas (1983) in his study on people's information-seeking behaviour also found that traditionally, people seeking information have placed the greatest trust and reliance on personal primary sources of information - sources with which they were personally acquainted and could interact on a face to face basis. This is true for most situations in developing countries.

Birkel and Reppucci (1983 cited in Korsching and Hoban, 1992) refer to recent studies which indicate that accessibility and speed factors seem to exert greater influence on an individual's choice than the amount or quality of information available. This again reinforces the argument that farmer-to-farmer communication, being both more accessible and faster than the extension service, has much to complement the diffusion of innovation by the extension system. Local associations are embedded in local social structures and are characterised by voluntary, personalistic, face to face transaction. In contrast to the extension system, they tend to be highly participatory and coincide well with their members' interests.

In developing countries women generally rarely have access to the extension service due to social reasons. Typically technical information and skills are communicated to women and amongst them using informal channels so that their

preservation is often dependent on informal means of information sharing and training. Yet many of the informal communication systems which maintain the teaching of traditional skills are beginning to break down so that valuable traditional information is also being lost with each succeeding generation of women.

Many studies have revealed that information of new seed varieties obtained from other farmers is the most common way by which the majority of farmers get their information (Rajasekaran, 1994; Antholt, 1992; Nayman, 1988 cited in Rajasekaran, 1994; Green, 1987). Richards (1985) found from his survey of rice farmers in Sierra Leone, that new rice varieties were mostly either begged or bought from friends, strangers and visitors or whilst travelling elsewhere. No mention was made of extensionists. Similarly Longley and Richards (1993) noted that in Ethiopia, farmers typically watch the fields of neighbours and may request seeds they are interested in planting. Simpson (1994) found that in Mali, any farmer who travels becomes an important local source of new information and experience.

### **3.9.2. Limitations of Indigenous Knowledge and Indigenous Communication Systems for Rural Development**

Not only is the extension system characterised by its inequitable flow of information but so too are informal systems, albeit to a lesser extent. Amongst informal farmer-to-farmer innovation diffusion channels, it has been shown that it is once again the better-off farmers who are best served by farmer-to-farmer distribution channels. Green's (1987) study of the diffusion of new seed varieties in Nepal found that there was little passing on of information from the larger to the smaller farmers. Once wealthy farmers get a new variety they can multiply it on a relatively large scale and can more actively participate in exchange and semi-commercial transactions. The poor, in contrast, are seen as unequal and often undesired partners in indigenous seed networks - they have less of interest to offer for sale or exchange (Sperling and Ruzindana, 1988). The very poor may further be handicapped by having to eat their seed during lean months.

Although farmer-to-farmer distribution is widely thought to be effective in diffusing new varieties, yet a study carried out on a new bean variety's distribution amongst small farmers in Rwanda (Sperling and Loevinsohn, 1993) revealed that the majority of farmers did not distribute any seeds. Most of those who did distribute, distributed only to one or two farmers. It was suggested that the reason for this low exchange rate was due to a lack of surplus seeds by the farmers. On the other hand, a minority of 'key distributors' were found - six per cent of the farmers surveyed were responsible for almost half of the distributions.

This case can be explained by the fact that Rwandan households are independent production units and the circle of diffusion is socially narrow. Best friends, close family and important neighbours may get seed - but certainly not all who ask. This suggests that a cultivar may saturate demand locally, while farmers on nearby hills may receive it only after a considerable time lag. Other studies in Rwanda (Sperling and Ruzindana, 1988; CIAT, 1991 cited in Sperling and Loevinsohn, 1993) have further shown that it is the better off farmers who are best served by farmer-to-farmer distribution channels. Once they get a new variety they can multiply it on a relatively large scale and can more actively participate in exchange and semi-commercial transactions. The poor, in contrast, are seen as unequal and often undesired partners in indigenous seed networks - they have less of interest to offer for sale or exchange. They are often obliged to eat their seed, a constraint that makes it difficult to retain even appreciated varieties.

Indigenous technological knowledge is not distributed evenly among members of a society and it is likely to be controlled and manipulated by certain groups and classes in the pursuit of their own interests, with particular types of knowledge being the preserve of 'caste-like' groups. Longley and Richards, (1993:56) believe that "some discoveries are treated as private possessions and closely guarded secrets". A study carried out in Meghalaya, north-east India (Maikhuri and Gangwar, 1993) also revealed that IK was not known by everyone equally with certain knowledge being deliberately withheld by certain members of a



community.

### 3.10. Conclusion

Rajasekaran (1994) believes that technologies should be disseminated to farmers using equally two mechanisms - informal farmer-to-farmer communication as well as the extension system. This is because together both systems will complement each other and are more likely to encourage rural development than either system on its own. There are basically two reasons for this. First, despite the limitations of new technologies, it is misleading to assume that farmers are not interested in them. The opposite is mostly true with farmers being very eager to get information about them despite the fact that not all farmers can have regular contact or even any contact with extensionists. Farmers know that their environment is not static, new diseases break out, people's needs change and production levels usually need to be increased. Thrupp (1989:15) says that "sometimes knowledge that was once well adapted and effective for securing the people's livelihoods several centuries ago becomes inappropriate when confronted by rapid socio-economic changes and interventions".

One of the conclusions drawn from a study carried out in Peru (Cromwell, 1990) is that the small farmer seed diffusion mechanism is very efficient and that large numbers of farmers can be reached with very little 'organised' effort through tapping into this mechanism. Yet even this system is not without its limitations due to the small amount of seed available. For instance, large-scale and commercial farmers cannot be served quickly and adequately by this mechanism. This is because the individual quantities of seed thus exchanged are often very small compared to the amounts formal sector organisations typically deal in. Yet at the same time it is clear that each has a complementary role to play in the diffusion of different types of seed: although the informal mechanisms are a valuable means of diffusing new varieties *widely, especially to smaller farmers*, the organised sector is still required to ensure the availability of initial sources of these varieties.

Recommendations made by Sperling and Loevinsohn (1993) for seed diffusion

from farmer-to-farmer are to make the initial distribution of seed as wide as possible to maximise the number of communities within the region that obtains the new variety. The rate of spread can also be increased by identifying the 'key distributors'. Yet because key distributors do not reach the poor farmers, seeds should also be diffused through local markets and stores as the poor have been found to rely on these sources to a greater extent than their better off neighbours, even for local varieties. The advantage of local variety seeds is that they are always available and available for everyone. Rajasekaran (1994) similarly recommends that village extension workers should be encouraged to use delivery points other than farms, such as market days, village temple days, village-level women's groups and co-operative marketing points. These places are familiar to the whole community and at such informal gathering places the diffusion of information occurs naturally.

Indigenous channels are important conduits of change. Much research has shown that most farmers, both men and women, do not learn about new technologies through the media or extension services, but rather from their friends and neighbours or through their own experiments. These channels are crucial for the exchange of information with those people who are out of reach of the extension system. McCorckle (1989:7) gives the following recommendation about the significance of indigenous communication:

"As an alternative or complement to continued investment in expensive and often inequitable channels and organisations for disseminating agricultural information, extension services should consider strengthening 'natural' communication networks and inputting information into them. One advantage is that local channels and groups typically enjoy more credibility than governmental ones in the Third World. Also using local communication systems increases local participation."

## **Chapter Four**

### **Methodology**

#### **4.1. Introduction**

This is an account of the research techniques used to gather information from the three different groups - researchers, extensionists and farmers. In brief, two different sets of questionnaires were given to both the researchers and extensionists. In the case of the farmers, both in the Kumpur and Phulbari research sites, it was considered inappropriate to issue them with questionnaires but instead to personally interview them using techniques common to Rapid Rural Appraisal (RRA) as a more appropriate research method.

#### **4.2. Farmers' Surveys**

Two separate qualitative surveys were conducted with farmers using the techniques employed in Rapid Rural Appraisal in two different locations of the Mid-Hills - Phulbari, in Kabhre Palanchok District, and Kumpur, in Dhading District.

##### **4.2.1. Preliminary Activities**

###### **4.2.1.1. Language and Culture**

Prior to commencing the field work it was necessary to acquire an understanding of Nepalese culture, and in particular, the lifestyles of the people living in the Mid-Hills especially so as to be able to effectively carry out field work with the farmers. This was done by living in Kathmandu, Nepal, prior to the fieldwork with a local family. Living with this household had two advantages - it became possible to acquire a better insight into local customs and culture and at the same time have an opportunity to learn Nepali (formal Nepali language classes had also been attended). At this stage, it was more useful to stay in Kathmandu, the capital, rather than with farmers because of the location of libraries, research organisations and the offices of international development agencies in Kathmandu.

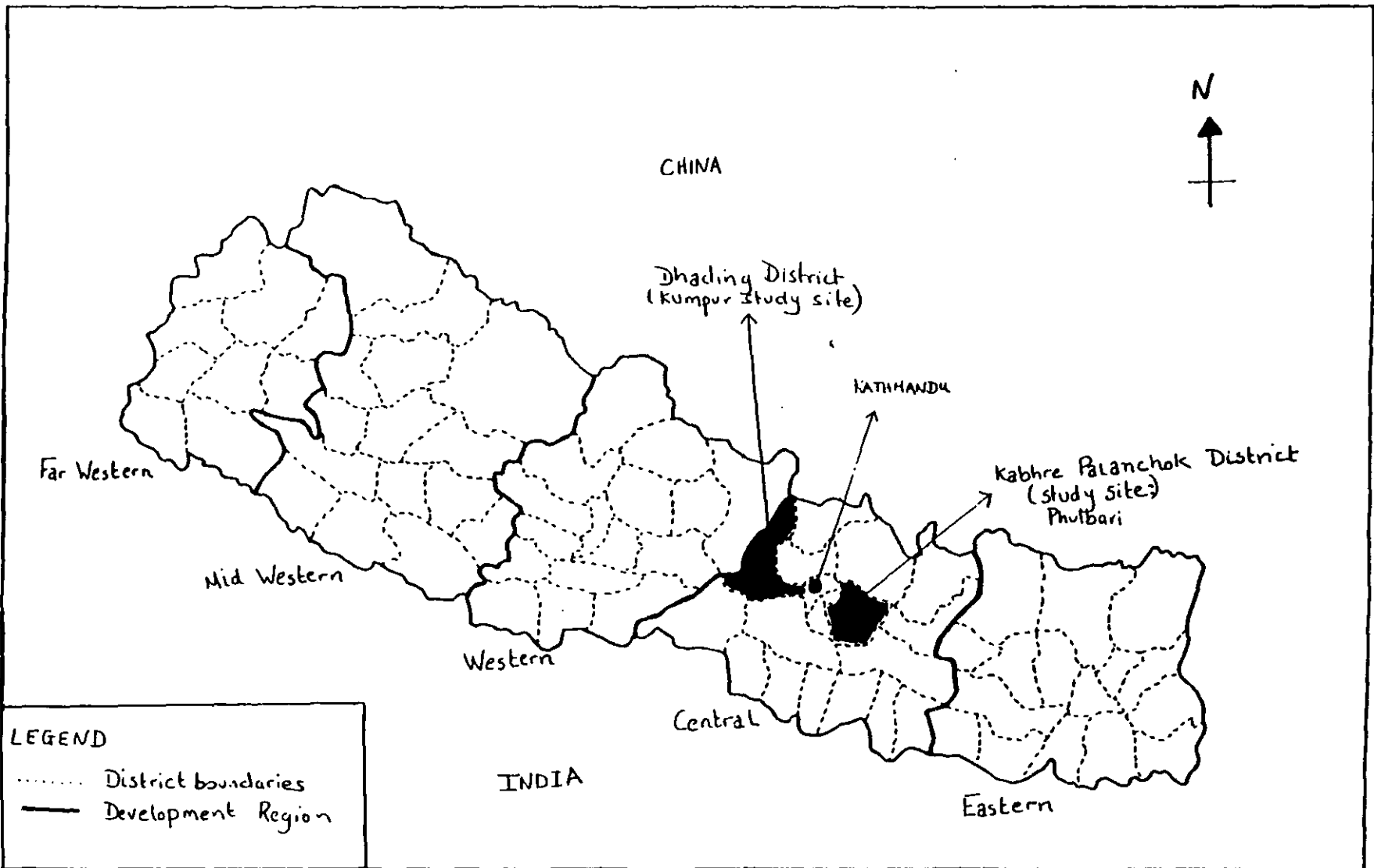


Figure 4.1.

Administrative divisions of Nepal showing the locations of the research sites

#### **4.2.1.2. Secondary Material**

Preliminary activities had also been spent gathering information about Nepal, both in written form and verbally. It was necessary to consult various professional people in order to be able to select study sites appropriate to the aims of the research. It was also necessary to become familiar with farming-related research work being carried out in Nepal and extension techniques. This preliminary work enabled a rough check-list of questions for the farmers' interviews in Phulbari to be drawn up.

Relevant secondary material was mostly obtained from the libraries within the following government and non-governmental organisations: Department of Agriculture, National Agricultural Research Council (NARC), Agricultural Project Service Centre, Nepal-UK Forestry Research Project (FRP), Food and Agricultural Organisation of the United Nations, Tribhuvan University, International Centre for Integrated Mountain Development, New Era, United Mission to Nepal, and Nepal-Australia Community Forestry Project (NACFP). Professional staff of these establishments were also consulted for information, advice and comments.

#### **4.3. Practical and Theoretical Considerations of the Survey Method Selected**

There are numerous methods for collecting data for socio-economic research studies - from simple case studies, exploratory pilot interviews or pre-test surveys, and lengthy surveys, to impersonal mailed questionnaires. Although questionnaires are the basic methodology in much of social science, for this survey it was considered an inappropriate method to use for the following reasons.

(i) Most Nepalese farmers are illiterate or semi-literate therefore they would be unable to fill in the questionnaire unaided. Giving them personal help with the questionnaire would lengthen the research time considerably.

(ii) Farmers could not be expected to respect the importance of accuracy in the gathering of data for the study, hence the occasional lie, exaggeration or misleading answer would all have to be coped with. Some social scientists working in Nepal have commented that they sense that farmers want to please the

researchers by saying the correct comment or by giving ready-made answers with the result being that the information gathered can be very misleading (Campbell, *et al.*, 1979; and Fisher, 1987).

(iii) The farming communities in the Mid-Hills are typically not homogeneous socio-economically nor by farming system in which case the same questionnaire distributed to them would not be so appropriate. Roling, *et al.* (1981 cited in Roling, 1984) advocate dividing the rural population into homogeneous groups for the purpose of study. Such a segmentation of a rural population is a logical step when trying to reach the hard to reach sectors. In fact there is evidence to show that they are not reached by development programmes which are based on diffusion theories. Barker (1979) discusses the cross-cultural limitations of the questionnaire. Some question structures are bound to be inappropriate as a result of cultural or professional differences (for example a pastoralist's concept of a tree will be quite different from that of a forester). This distorts the understanding recorded and so constrains the validity of the representation of local knowledge. In addition, in orally based cultures such as rural Nepal, questionnaires limit the direction and clarity of communication.

In-depth interviews and participant observation allow researchers to investigate complex issues and to develop connected understanding. Communication that encourages intimacy and conveys personal meaning is necessarily a two-way process that takes considerable time and is possible only in unstructured or semi-structured settings. With enough time to get to know the respondents, it is possible to clarify points, be sure of meanings and to ask the same question in different ways.

With in-depth interviews the researcher cannot effectively question a large number of people because of the time required. This is where group interviewing becomes effective.

As the research progresses, one begins to hear the same things from respondents. It is this repetition that forms the basis of the findings.

#### **4.3.1. Applicability of using RRA as a research method for the farmers' survey.**

Rapid Rural Appraisal is the collective term for techniques used to produce quicker and more accurate analyses of the complexities of farming systems than the classical techniques of farmer survey and field experimentation. RRA evolved mainly in the 1970s.

According to Chambers (1992) there are three major reasons for the development of RRA. The first reason was due to the dissatisfaction with the biased information collection process. These biases include: spatial (neglect of peripheries); project (neglect of non-project areas); person (meeting only elites, men and users of services); and seasonal (visiting only in the favourable season). All too often the isolated, powerless and silent have their priorities and needs low on the agenda if on it at all.

The second reason was disappointment with the normal process of questionnaire surveys and their results. All too often the social information obtained has been useless or misleading, and late or even out-of-date.

The third reason was the search for more cost-effective methods of learning by outsiders. This was helped by the growing recognition by development professionals of the obvious fact that rural people were themselves knowledgeable on many subjects which have touched their lives. In the search for techniques to tap this indigenous knowledge more effectively, RRA techniques were evolved.

Rural development is viewed as a 'learning process' which must respond to the specific needs of rural people in an appropriate way. It must take into consideration the social and cultural context in which the local people live (Korten, 1980) so as to provide a base for either research hypotheses which will orient a research programme, or a working hypothesis which will guide development action.

Table 4.1 reveals the contrasting techniques employed in the conventional approach on the one hand, with those in RRA on the other hand.

**Table 4.1.**

**Comparison of Conventional and RRA Research Approaches**

<b>Techniques Employed</b>	<b>Conventional Method</b>	<b>RRA</b>
<b>Statistical analysis</b>	Often a major part	Little or none; use of triangulation* instead.
<b>Formal questionnaires</b>	Often included	Avoided
<b>Interviews with local farmers and key informants</b>	Through <i>formal</i> questionnaire, if at all.	A major component using semi-structured interviewing.
<b>Qualitative descriptions and diagrams.</b>	Not as important as the 'hard data'	Considered equally important.
<b>Sampling</b>	Statistically acceptable sample sizes regarded as necessary. Often random sampling.	Often small sample size, selecting 'key' areas, or farms, households etc. Statistical requirements not always adhered to.
<b>Consulting secondary data sources.</b>	Yes	Yes
<b>Measurements</b>	Detailed, accurate	Qualitative or indicators used.
<b>Group discussion</b>	Informal unstructured sessions	Via semi-structured workshops and brainstorming

\* Triangulation = cross-checking information from as many different sources as possible

Source: Conway and McCracken, in press, cited in McCracken, *et al.*(1988) p.11.

RRA has proved to be a powerful approach for focusing on local realities. Among the strengths of this approach are the combination of research structure and flexibility, the diversity of methods used to collect information and the direct interaction with local populations.

Schoonmaker Freudenberg (1994) believes that local knowledge systems,



almost by definition, arise from unfamiliar experiences and situations, which we can only understand by becoming more receptive to different ways of thinking. She goes on to say that the more research is bound by close-ended questions and close-ended expectations, the less likely it will produce insights about the multiple construction of local knowledge and the more likely it will generate data to fit into our old, familiar patterns of thinking. Participatory research on the other hand, such as RRA, demands that investigators be exploratory and open-minded if they are to understand these multiple forms of knowledge and perspectives. Another critical element of RRAs is the direct interaction between outsiders and local people. RRAs create the context for structured, systematic and probing interactions with local people.

There is now a substantial literature on Rapid Appraisals. "The Art of the Informal Agricultural Survey" by Rhoades (1982) is a key element in this literature. What had formerly been regarded as something anyone can do is now seen as a set of skills which can be and should be learnt. Similarly Norem (1986) presents a discussion of the skills necessary for successful researcher/farmer interaction: techniques for establishing rapport, 'attending' behaviour, question structure, observation, providing positive feedback, sharing experiences and focusing the discussions.

Due to RRA's emphasis on 'learning from the people', a different form of questioning had to be employed. Semi-structured interviewing was the preferred technique whereby the interviewer assumes almost the role of a pupil amongst the rural people who 'teach' him about their lifestyles and their problems (Chambers, 1985).

According to McCracken, *et al.* (1988) two themes are central to the philosophy of RRA. The first is the pursuit of 'optimal ignorance'. This means that the aim of the researcher should be to arrive at an agreed sufficiency of knowledge of the key processes and properties relevant to the objectives of the RRA and not to exceed this by investigating irrelevant aspects or being concerned with unnecessary detail. The second theme is that of diversity of analysis. This is

pursued through the process of 'triangulation' ie. the use of several different sources and means of gathering information so that data gathered can be certified as reliable. Such methods include secondary data, direct observation in the field, semi-structured interviews and the preparation of diagrams.

McCracken *et al.* (1988) list five key features necessary for a successful RRA:-

1. The researchers should develop their hypotheses as they conduct their research and new information is revealed to them.
2. The methodology required is not fixed but depends on the situation and the skills of the researchers.
3. The presence of an effectively interacting multi-disciplinary team.
4. Emphasis on semi-structured informal interviewing.
5. Interviews are held in informal, natural surroundings.

Apart from the third point, all these features were fulfilled in my research. The reason why it was not possible to work with a multi-disciplinary team of researchers was because of the budgeting problems of hiring skilled professionals. However this deficiency was not considered to have impaired the quality of the data collected.

#### **4.3.2. RRA techniques used for this study**

The RRA techniques employed for both farmers' studies (Kumpur and Phulbari) were as follows:-

##### **4.3.2.1. Secondary data review**

A review of published and unpublished sources of materials, and maps to obtain a quick overview of the study area and discover what data has been gathered already.

##### **4.3.2.2. Direct observations**

This involves personal visits and participant observations which allows insight and

prompts the volunteering of information that would otherwise not be accessible about rural social conditions and change, particularly when suggested by rural people themselves.

#### **4.3.2.3. Semi-structured interviews**

Informal interviews with key informants (local people with useful specialist knowledge) and individual informants, using checklists but without questionnaires, which permit probing and following up on the unexpected, without the requirement that all the checklist points must be covered in any one interview.

#### **4.3.2.4. Group interview/focused group discussion**

Interviews and discussions with groups, whether casually encountered or formally as focused groups of homogenous people to represent different points of view, capabilities, or knowledge, and community groups. Significantly Horn (1994) found that an interviewee would volunteer information more readily in the presence of one or more of his/her colleagues.

#### **4.3.3. Disadvantages of RRA**

In order not to overlook the fact that every research method has its limitations and failings, it is necessary here to briefly note down the disadvantages of RRA as a research method. There are two main disadvantages to RRA. These are firstly, a degree of uncertainty regarding the reliability of the data due to the lack of random sampling, and secondly the difficulty in analysing objectively the qualitative data generated. There is also a third drawback to this method (but to a lesser extent) which is the researcher's own bias whilst recording the data.

##### **4.3.3.1. Reliability of Sampling**

In RRA, probability sampling is not used for the selection of individuals or groups. Researchers rely mostly on access to and availability of the individuals, or the activities to be observed. As a result, it is possible that the sample interviewed is not representative of the whole population. For instance, researchers are more likely to select communities which are easily accessible by

road. Also poorer groups and other low status groups are less likely to be interviewed. During the course of this particular research in both Phulbari and Kumpur, conscious attempts were made to try to avoid bias.

#### **4.3.3.2. Analysis of Data**

Qualitative data, by its very nature, is difficult to record, code and analyze objectively. It can only give a relatively accurate picture of the prevalence of a phenomenon, attitude, perception or behaviour pattern, but not of its extent or pervasiveness.

#### **4.3.3.3. Researcher's Bias.**

Care must be taken by the researcher so as not to be biased whilst listening to the comments of the respondents as it is very easy to let one's individual preferences, judgements and views significantly impinge on the conduct of the inquiry. The researcher has much flexibility in framing and asking questions, observing events and recording answers and comments. This leads to an increased likelihood of individual bias and distortion of facts (Kumar, 1991) This can be minimised by using more than one rapid appraisal method, so that the data generated by one source can be cross-checked with that produced from another source. In addition the use of a multi-disciplinary team of researchers helps to reduce an individual's bias in the collection and interpretation of data.

Despite these limitations, RRA was considered to be the best research methodology applicable to the circumstances of the field.

#### **4.3.4. Phulbari case study**

##### **4.3.4.1. Rapid Rural Appraisal Training**

Intermittently between the months of September and November 1991, time had been spent accompanying a Rapid Rural Appraisal research team in Nepal as an observer. This research was run by the United States Agency for International Development (USAID) and was studying the effectiveness of Forest Users' Groups (i.e. micro-level forestry projects where the users are the managers of

projects). Being with the team enabled me to see the techniques of RRA being put into practice, especially the art of questioning. Questioning is a crucial art for extracting accurate information, especially where the respondent and interviewer come from different cultures and environments (Shah, 1991). In addition to acquiring practical skills for carrying out a RRA survey this period also provided me with the opportunity of becoming more familiar with the culture and village life in Nepal.

#### **4.3.4.2. Criteria for the Selection of a Study Site**

The main research question for the Phulbari study was whether a farmer's socio-economic differences together with accessibility, influence their ability to benefit from the extension service compared to farmer to farmer innovation flow. In order to study this a an appropriate study area had to be found. Being not very familiar with the geography of Nepal, it was necessary to enlist the advice of professional staff working in farming-related institutions in Nepal for the selection of a study area.

The criteria for the site selection was as follows:-

1. The population must be of mixed ethnic/caste groups.
2. Varying economic condition of the farmers.
3. Accessibility variation (from road, elevation and ease of access).
4. Outside the direct sphere of influence of Kathmandu, or nearest town.
5. The area must have some degree of extension contact (ie. as there are some areas in Nepal which are not covered by extensionists).

#### **4.3.4.3. The Research Site**

There were many places in Nepal which fitted these criteria, but it was finally decided to select a village area called Phulbari which lay at a distance of approximately 75 kilometres east of Kathmandu. This area falls within the jurisdiction of the Nepal-Australia Community Forestry Project extensionist and research activity as well as being administered by the Department of Agriculture and Livestock and Forest Department extension staff.

Phulbari is an area within Kabhre Palanchok District comprised of a collection of scattered hamlets. Phulbari is reached by travelling along an all-season road to the small market town of Banepa then along a seasonal dirt-road which terminates at Phulbari. An average of three vehicles per week was the expected norm along this road, at least in 1992 during the time of the study period. This indicates its isolation from the influences of Kathmandu or neighbouring Banepa.

Within Phulbari's administrative boundary (Phulbari Village Development Committee (VDC)), four small settlements were studied: *Timilsina Gaun*<sup>1</sup>, *Chapa Gaun*, *Chap Gaun* and *Buchakot*. These hamlets were inhabited predominately by one particular caste. Brahman caste people lived in Timilsina Gaun, Tamang people lived in both Chapa Gaun and Chap Gaun and in Buchakot members of two of the low castes lived - the Kami and Damai. The hamlets were further distinguished from each other by their different degrees of accessibility and their different economic conditions.

#### **4.3.4.4. The Use of Assistants**

The use of an assistant to help conduct the survey was necessary in order to get an unbiased, multi-angled approach to the farmers' interviews. "A single researcher, even if she or he is able to perform multiple and varied participant roles, fundamentally is limited in terms of the perspectives on the insider's world that may be assumed" (Jorgensen, 1989:65). Also because my own knowledge of the Nepalese language was limited, it was necessary to be accompanied by a translator for any interview that took place. This was necessary because in rural areas of Nepal, few if any, of the farmers could be expected to understand and speak any English (in fact during the course of the research it turned out that the only farmers in Phulbari who spoke any English were the schoolteachers and social worker as well as a few of the school children).

Farming-related institutions were approached with the outcome being that a Nepalese assistant was acquired who would provide interpretation/translation services whilst in the field and who had a sound knowledge of Nepalese farming

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<sup>1</sup> *Gaun* is the Nepalese word for settlement.

systems and forestry. By sharing this knowledge in the field it was easier to acquire a better understanding of the rural situation, which consequently meant that during the interviews a better understanding of the farmers' comments could be achieved. In addition a guide was hired from a local village who also helped to integrate me into the local community as his way of living and dialect was the same as that of the villagers being studied.

#### **4.3.4.5. Preliminary Visit to the Study Area**

It was necessary to set aside a day to visit the study area before commencing the research work in order to assess its suitability in the first instance, and secondly to seek the support and goodwill for the research project from influential people of the village. This visit was also necessary from the practical need to secure lodgings in advance. Village elites (wealthier farmers, school teacher, teashop owner and the shop keeper) were approached and an introduction was given about the research project. It was considered important to make our intentions as clear as possible to the villagers at this initial stage so as to avoid suspicion and mistrust, and so that their co-operation and trust could be acquired from the outset. A reconnaissance walking tour of the area was also made so as to become familiar with the area and the hamlets' names and location.

#### **4.3.4.6. Building Rapport with the Villagers**

The first steps towards rapport building were in the form of an introductory meeting at the local teashop and village store. It was also necessary to become established within a Brahman household as a lodger. Staying with such a high caste family immediately gave rise to some degree of respect from the rest of the villagers in addition to lessening their initial suspicion about my intentions. The Brahman family were also to serve as key informers as they would be able to give background information at their leisure during the course of the field work. In addition this household was considered progressive in its farming practices by its neighbours. They were able to arrange introductions to us with other leading farmers who might also become potential key informers.

Age, ethnicity and gender are grounds for social distancing but they can be

overcome through good rapport building (Wax, 1979). Hence in order to lessen the social distance between myself and the villagers I decided that it would be expedient for me to dress more in the style of the local manner. To blend into the local context as much as possible was obviously a good approach to rapport building.

The long stay within the farming community of Phulbari gave rise to a good understanding of Nepali life. Also as the villagers became more familiar with me and the reason for my stay, the quality of the interviews improved as they became more open and honest in their responses. Such a consequence was also experienced by Mascarenhas *et al.* (1991).

#### **4.3.4.7. The Key Informers**

The initial work was that of an introduction to the leading or key persons of the village. These people would typically have a large share of influence over, and knowledge of, the other people. They would be able to give us introductory information both about local history and the social and farming conditions of the villagers.

The following key persons were identified and later interviewed:

- two school teachers
- two teashop owners
- three local store keepers
- a retired forest watcher/social worker
- six of the oldest people of the village
- the researcher's host family (five adults)

#### **4.3.4.8. Observation**

In addition to interviewing, informal observation of daily farming activities and social interaction were carried out. Indeed much was learned simply by living with a household within the community. Sketch maps were taken of the four hamlets as detailed maps were not available (see Figure 8.2). On the sketch



maps, houses, forests, water resources, and footpaths were depicted. These were drawn from high vantage points in the hamlets.

#### **4.3.4.9. Who to interview?**

The initial task was to identify who to interview. Purposive sampling (reputational sampling) was used in this study. According to Babbie (1989:207) "purposive sampling is a type of non-probability sampling method in which the researcher uses his or her own judgement in the selection of sample members". This method was considered appropriate for this study because it involved an investigation of expert opinion.

Wherever possible, group interviews were conducted. Chambers and Jiggins (1987) mention the following advantages of working through groups. Firstly much more knowledge can be obtained. Also cross-checking of comments can be automatic if members correct each other. Furthermore, with groups, internal discussions occur which enable the farmers to identify and specify their problems thereby giving greater insight to the researchers. Lastly, when farmers are being interviewed in groups, they feel more confident and less intimidated than when they are on their own with an interviewer. The disadvantages of group interviews are: one person may dominate, people may come and go, all may defer to one important person, and sensitive personal information cannot be sought or probed. Farrington and Martin (1987) mention that caution may be necessary with group approaches because there is a tendency for groups to bias their responses according to their perception of the identity and objectives of the researchers or to present a consensus which may arise from the dominance of a particular section of the community. The most important factor however is that as populations are not homogeneous, groups should be arranged so that they are composed of people of similar characteristics, as far as possible.

The disadvantage of using group interviews is that certain people will dominate the interview. It will be they whose voices will be mostly heard. Yet their views and experiences may differ greatly from that of others in the group and may

therefore prejudice the data. Typically, shy people and those of a lower social standing whether by poverty, age, sex or caste, will be psychologically suppressed within a heterogeneous group interview. Hence it was necessary from the outset to divide people into relatively homogeneous groups. This was done initially on a caste basis and further subdivided by wealth and age also.

#### **(i) Caste**

In Phulbari three separate castes were identified on the basis of the majority caste living in the four neighbouring hamlets within Phulbari. These four hamlets were: Timilsina Gaun, Chapa Gaun, Chap Gaun and Buchakot which had majority castes of Brahman, Tamang, Tamang and Kami/Damai respectively.

#### **(ii) Wealth**

One of the aims of the research was to find out whether economic standing had any significant effect on information flow. In Timilsina Gaun there was a large discrepancy in wealth amongst the households. Therefore it was decided to grade them according to their wealth in order to be able to arrange homogeneous rich/poor sub-groups for further interview. No wealth ranking was to be carried out in Chapa Gaun, Chap Gaun nor Buchakot as there was found to be no sharp difference in economic status between the households within these hamlets.

The wealth ranking was done on the basis of house appearance and other external indicators. Appendix 1b gives an account of the wealth ranking criteria which was used in this research. It was decided not to define a poor farmer by the land he owned, cultivated or did not own, nor the net sale or total of farm products, because it was both time consuming, a sensitive issue to the farmers themselves and, as far as produce was concerned, could vary from harvest to harvest. Land holding size is often not a true determinant of wealth, as the quality of the soil may vary. Also some farmers may be sensitive about this and may exaggerate or underestimate. Therefore to get an accurate representation it would be necessary to survey the whole area by foot, asking farmers which fields belong to who.

According to Rhoades and Booth (1982) a general impression of housing, clothes,

nutrition, equipment and technologies used is regarded as practical and expedient in locating areas with a concentration of relatively poor farming families. This approach together with suggestions put forward by McCracken *et al.* (1988) formed the basis for the wealth ranking techniques employed in this study. Wealth ranking criteria (Grandin, 1988) using house type and domestic amenities is a quick and easy way to categorise richness. Bearing in mind that a Nepalese farm house is considered an old house after thirty years (considering that they are not weather resistant for long) houses are therefore a good indicator of present wealth. Hence a rich farmer will be able to live in comparative comfort, in a bigger house, and with modern amenities such as a tin roof, outside toilet, water pump and ornate house decorations.

To cross-check whether the wealth ranking criteria were correct, certain randomly chosen households were asked to arrange in a list, the names of all the heads of households in Timilsina Gaun, according to wealth status. Both sets of results coincided very well.

### (iii) Age

It was also an aim of the research to find out whether age had any effect on information flow. The farmers in Timilsina Gaun were crudely divided into young and old categories. More than half a dozen farmers from each of these two groups were then group interviewed.

In the Phulbari survey, women were not interviewed as a homogeneous group. However, whenever possible, person-to-person interviews were held with women. Many present-day social scientists are concerned that women are a largely ignored element in rural development projects. In this study it had been intended to avoid this pitfall. However in practice it proved unsuccessful to carry out group interviews with women. The reasons for this were:-

(i) The researchers were not sufficiently socially accepted to make it possible to arrange interviews with women who were the most protected category of village

society. Women were both discouraged from talking to us by their husbands and in-laws as well as being themselves distrustful of us.

(ii) The women were assumed to be less effective informants than the men as their world view was constricted by their limited experiences and exposure. Rarely would they ever have had a conversation with an extensionist. Schroeder and Schroeder (1979:191) believe that the main reason for this is that "extension educators are male, and their training neither encourages nor do social norms permit much contact with women.

(iii) It proved difficult to get women to devote time for the surveys because they were busier than the men for the most part.

#### **4.3.4.10. How to interview?**

The interviews were mainly held in the early morning before the farmers went into the fields. They would also be held when it got dark in the evening. The key people in each homogeneous group were approached and asked to spread the message that a meeting was to be held at a certain time and place. With group interviews it was found that the maximum time one could hope to achieve for an interview would be one to one and half hours. After that the people would lose interest and start to drift off.

The interviews were usually held in the open air either in a shady place under a communal tree or in a farmer's court-yard. If it rained it would be held on the veranda or inside the house. It was considered important to select as informal a setting as possible for the interviews. Rhoades (1985) suggests that the approach to the interview should be low profile in that the researchers should be aware of the daily work schedule, seasonal activity and cultural habits of the people. In addition the seating arrangements of the meetings were also considered important. Informal seating such as on the ground in a semi circle with the villagers was considered good for rapport building.

It was decided to use semi-structured interviewing because it would enable the direction of questioning to be appropriately and easily changed as new information emerged (unlike with a questionnaire when questions are firmly set and have to be asked however irrelevant they may actually become in the field setting). A conscious attempt was made to avoid asking leading questions. In order to encourage the free-flow of conversation, and to avoid a yes/no series of answers, six 'helpers' were often used - *Who, What, Where, When, Why, How*.

A conscious attempt was also made to ask as many open-ended questions as possible in order to provide an opportunity for unexpected information to arise during the natural course of conversation which may be significant in the context of a particular farming system. (McCracken *et al.* (1988) have presented a list of approved interview techniques).

Although no formal questionnaire was devised, a framework of questions still had to be drawn-up to prevent the interviews from becoming too vague. It also helped to keep in mind the basic objectives of the research. A check-list (see Appendix 2) was drawn-up, with many of the ideas having been adapted from Collinson (1981). However during the course of the field study, this check-list was continually modified and refined as new information was gathered.

Although most data was gathered using key informants and group discussion, useful data was also gathered by interviewing those people who were accidentally met whilst staying in the study area. Hence conversation with the villagers would occur along trails, in fields, in their homes, where women were washing and collecting water, in nearby forests whilst people were collecting fire-wood and fodder, or even in the teashops in the bazaar (see Figure 8.2). These informal gatherings or single interviews were considered necessary to complement the more formally organised group meetings. It permitted the assembly of community members in a random manner.

#### **4.3.4.11. Debriefing**

As a translator was available for the survey period it was necessary to hold

debriefing sessions as soon as possible after each interview was conducted. This was so that everything could be easily remembered and noted down in full. Translating during the interviews was kept to the minimum required to make sense of the conversation under way. This was done out of courtesy to the farmers present, i.e. speaking in a foreign language (English) might make them suspicious and/or bored. For the same reason, note-taking was also kept to a minimum. In addition, it was thought that note-taking and translating would disturb the free-flow of conversation as well as being time-consuming for them. The interviews were not taped because it would again have to be translated at some later time. Instead the interviews were discussed on the day in order to clarify the direction of the interviewing for the next day. This also had the advantage that any misunderstanding could be sorted out without delay.

#### **4.3.4.12. Problems Faced in the Field.**

One of the biggest problems faced in the field was the regular forced cancellation of meetings due to the failure of farmers to turn up. The time spent in the field was lengthened as many days would be wasted due to this reason. The weather also indirectly hindered the study. The pre-monsoon rains had arrived earlier than expected, resulting in the farmers being busier than ever and so had less time to spare for being interviewed.

#### **4.3.5. Kumpur Case Study**

In this study the techniques employed in the Phulbari survey were also used. Only those techniques *not* used in the Phulbari study are described here.

##### **4.3.5.1. Objectives of the research**

The main objective to the Kumpur study was to study the informal diffusion of innovation process between small farmers remote from any direct extension contact. The innovations studied in this case were new seed varieties. To study local systems of seed exchange is a good way to research indigenous communication channels because seeds have always been exchanged even before the extension service started to operate within Nepal, as well as the need for seed

to be constantly renewed.

#### **4.3.5.2. Criteria for the selection of the study site**

It was decided that the objectives of this second study could be reinforced by selecting an area which fitted the following criteria:

1. Selection of an area not served by an extension service, or NGO project and physically distant from any research organisation.
2. Selection of an area which is well established and is a stable community where traditions and customs are deeply ingrained into its society.

To select an area which fitted such criteria involved a process of elimination of areas already covered by development organisations. Phulbari had to be disregarded because it had an extension service and it was losing its traditional community coherence due to the growing significance of a cash economy.

Authoritative people on rural development in Nepal (in particular Dr A. R. Tuladhar, Tribuvan University, Nepal) were consulted to locate areas which had no development thrust. One of the places suggested was in a district adjacent to Kathmandu - Dhading District. This district also had international non-governmental project involvement in the form of German Technical Assistance (GTZ). GTZ's headquarters in Kathmandu was approached for secondary information as well as the district headquarters offices in Dhading District itself. Together with their assistance a village was located which fitted the site criteria. The actual place was four wards within Kumpur VDC. The whole nine wards of Kumpur VDC could not be used as the research site because the remaining five wards either had in the past extension contact or currently had at least a limited amount of contact.

#### **4.3.5.3. The Sample**

Within the four wards there were altogether nine hamlets all of which were

included as the sample. The approximate sample size was 450 households with a population of roughly 3,000. Each of the four wards were considered as separate entities having a different ethnic representation and different levels of farm wealth and accessibility levels. A description of the four wards is given in the results chapter (chapter ten).

#### **4.3.5.4. Use of Assistants**

A translator/local guide was needed to facilitate the research process. Subsequently the local schoolteachers were very useful in this regard as well as the local village healer who was hired for guiding and organising meetings with various villagers. One forestry extensionist was also available for assisting on an ad hoc basis. Together these people enabled the interviewing process to take place, not only for translation purposes but also for homogeneous group identification and organising interviews. However recognition must also be given to the co-operation and help received from the villagers. In addition I was also hosted by different families during the length of the field work.

#### **4.3.5.5. Interviewing procedure**

Before embarking on the interviews, the research aims and objectives were discussed with the interview assistants together with the checklist of topics to be covered (see Appendix 5). The actual interviews themselves could take from ten minutes to two hours to complete depending on the actual situation, what and how much needed to be known, and the interviewees themselves. An average of four full interviews per day was aimed at. However often rapport building and preliminary explanations as to the purpose of my being in their village would take longer than the actual interview itself.

When a chronological account of anything was needed from the interviewees, eg. the introduction of new seed varieties, the dates were verified by cross-checking them with the dates of special events in their lives as a time scale, which also served as memory triggers. Such information needed constant cross-checking with each group of farmers and therefore was more reliable through group interviews.



Interviews were conducted both with individual villagers as well as with groups of farmers. If a homogeneous group of farmers was needed for interviewing then prior arrangements would be done beforehand to arrange a meeting with them. Non-homogeneous group interviewing was easier to arrange, often only requiring going to where a group of farmers were usually together. However even this usually required the local knowledge of the villagers to find out their whereabouts.

The information gathered through group interviewing gave access to a wider body of knowledge through mutual cross-checking. Community level information such as community resource management, local institutions, the number and ethnic composition of households in the village, community problems, etc. could all be easily generated from such group discussions. In addition, the information may be more accurate than that gathered during individual interviews because respondents are always open to correction by fellow participants. This can identify variability within a community and prevents any atypical situations from being confused with the average. Respondents were also stratified on the basis of variables such as economic status, occupation, ethnicity and age.

The number of interviews needed depended on the information collected from interviewees. If the information from a new interviewee was repetitious and the researcher believed that no more new information could be added then the survey was considered as complete.

#### **4.4. Researchers' and Extensionists' Survey**

Two sets of formal printed questionnaires were created and distributed to extensionists and researchers respectively. The questionnaires were designed to establish the respondents' use of information and how information flowed to them and from them.

#### **4.4.1. Considerations for conducting a questionnaire-based survey**

Questionnaire-based surveys provide a structured and therefore relatively rapid and easy means of gathering knowledge especially amongst homogeneous groups such as researchers and extensionists. The researchers and extensionists were given separate questionnaires (see Appendix 3 and 4 for a copy of the questionnaires).

Extensionists and researchers are literate, and have professional qualifications in their field. Furthermore, they were considered to be familiar with filling in questionnaires and it was expected that questions could be understood by the respondents unaided.

Extensionists are field level staff who are in close contact with farmers and are concerned with farming at a practical level. Because of this they have different information needs from researchers who work at the scientific level or in specialised areas of agriculture, livestock or forestry.

#### **4.4.2. Disadvantages of a questionnaire survey**

Despite the obvious advantages of conducting a questionnaire survey there are still a number of weaknesses with such a survey which needs mentioning. For example, complex communication is impossible in a survey questionnaire. Not only does one have to account for the comprehension of the respondents, but in addition both questions and answers can be interpreted differently from what the researcher originally meant.

Closed questions elicit opinions that respondents may not have held previously. By comparison, open-ended questions may result in shallow and off-the-top-of-the-head type of answers which does not reflect what that person really feels (Babbie, 1989). Open-ended questions may also elicit relatively few answers and are, in addition, difficult to quantify and analyze. Neither type of question can be rephrased or clarified when used in self-administered questionnaires, and nuances of context and qualification cannot be addressed adequately.

However if the researcher is only interested in finding out how individuals within the population are spread across a given range of options, then the results of closed questions will result in valid data. The two questionnaires used in this study included both open-ended and closed questions. The open-ended questions asked respondents to express their own opinions in a qualitative fashion. The closed questions elicited a preference or rating from among a list of answers provided.

Careful wording of questions is vital in a questionnaire survey, the aim being to ensure all respondents can understand the questions unaided. For example Gurung (1993) reported that the majority of his interviewees could not complete his questionnaires for two reasons - lack of understanding of the subject and difficulties in writing answers in English (this is why Nepali was chosen as the medium for the extensionist questionnaire in my case). Also he found that they showed little interest in completing the questionnaires because they did not expect personal benefit from the research and they found the questionnaires too long and complicated.

#### **4.4.3. Trial Field Visit**

Prior to the commencement of the field study, on various occasions visits had been made to Kabhre Palanchok District (the study area) with a forestry extensionist (Ranger). The purpose of these visits was to experience a typical working day of an extensionist in Nepal so as to better understand the nature of the contacts farmers had with extensionists and to understand the conditions under which they have to work.

#### **4.4.4. Pre-test Survey**

Pre-test surveys have been used to gather certain kinds of information relating to farm-forestry programmes in the Indian sub-continent (Nichols, 1991). The aim of such surveys is to test the methodology before launching the complete survey (Ashby *et al.*, 1987). Any difficulty or shortcoming is explained and a course of action is laid out for improving the method.

Initially informal interviews were held with a number of researchers and extensionists enabling draft questionnaires to be composed. Secondly, pilot surveys were conducted to generate ideas about data and for later improving the quality of the questionnaires. In order to do this, questionnaires were distributed to a small sample of researchers and extensionists as a pilot study. From this, several problems became apparent with the questionnaires. The wording of some questions was causing ambiguity which resulted in unanswered questions. Therefore some questions had to be rephrased or even left out altogether. Some questions were designed to yield answers which were quantifiable whilst others were constructed so as to give the respondents plenty of opportunity to expand their views and provide their comments.

#### **4.4.5. Characteristics of the Question Contents**

Questionnaire-based surveys provide a structured and therefore relatively rapid and easy means of gathering knowledge. The difficulty comes in the wording of the questions. There are many pitfalls which have to be avoided in the construction of a questionnaire. The techniques outlined below were employed in the construction of the questionnaires in order to secure qualitative and quantitative data.

##### **4.4.5.1. Factual Questions**

Straightforward factual questions were asked at the beginning of both researcher and extensionist questionnaires. These questions could be quickly answered by the respondents and served to lead on to questions which required more time to answer. These questions were intended to create a positive attitude within the respondents towards the questionnaire. By being easy to answer they also encouraged participant co-operation.

##### **4.4.5.2. Opinion Questions**

As questions which ask for respondents' views or own experiences create more problems for the respondent, so they were left until the end of the questionnaire.

#### **4.4.5.3. Questions Involving Memory Recall**

Recalling information which occurred in the past was expected to present problems to many respondents. To reduce this problem it was decided that only a three-year past work perspective was to be asked of the respondents as they would most probably be able to recall this information either from memory or from their records. In order to make recall easier for the respondents, the Nepali calendar was used rather than the Christian calendar.

#### **4.4.5.4. Use of Pre-Coded Questions**

Many pre-coded questions were used in the questionnaires. These ensured standard replies which in addition are easier to quantify.

#### **4.4.6. Questionnaire distribution**

As with any social survey method involving people, the respondents' co-operation must be won. At first it was decided to mail the questionnaires together with a letter to introduce myself and the nature of the research, to all the proposed respondents. However mailed questionnaires have a customarily low response rate. In addition field based staff would be much more difficult to contact by mail than in person. Therefore it was realised that using a mailing system for extensionists would be a particularly unsuitable method to choose.

Personal visits to the respondents (whenever possible) was therefore decided to be the best approach so as to achieve maximum response. This approach also had the added advantage that any ambiguity the questions might pose the respondents could be explained there and then, again resulting in a better and more accurate response rate. If the respondent turned out to be either not available or not present, then the questionnaire would be handed over to his colleague. In the case of the extensionists' questionnaires, the procedure differed slightly in that respondents would be too scattered to be able to visit them all (given that vehicular transportation was limited). As a result, the help of District Officers was solicited in distributing the questionnaires to their staff. The same procedure was carried out for the collection of the questionnaires.

#### **4.4.7. The Sample**

The initial questions were, who to consult and how. It became apparent from published and unpublished official documents, personal contact and informal visits, that the Ministry of Agriculture, and Ministry of Forest and Environment were the main bodies of His Majesty's Government of Nepal for extension and research in their respective fields. Each ministry has its separate research and extension division. Also non-governmental organisations were identified. From these institutions four research institutions were selected to be issued with researchers' questionnaires and Kabhre Palanchok District (where the farmers' study site was also located) was selected as the area to be issued with extensionists' questionnaires to the field staff.

The research and extensionist respondents were selected using the stratified random sampling technique. This is a commonly used and widely accepted sampling method. The actual sample size is required to be commensurate with the available time and resources for the work involved in selecting the samples and in collecting the required data. The sample sizes and the average sampling intensity vary from survey to survey depending on the type of information required in the survey. Sometimes the sample sizes, although small, are purposely so because they still represent a significant proportion of the population under study (Malla and Fisher, 1987).

The sample size is the number or percentage of population sampled out of the total population (all researchers and extensionists of the above two strata). In theory, the bigger the sample, the greater the accuracy, but it is also necessary to bear in mind how far this is practical. From the point of view of this research, arrangements had to be made to visit the potential respondents which is time consuming as is returning to collect the completed questionnaires. Hence there had to be a balance between the representativeness of the sample size and the number of individuals who could realistically be personally interviewed. An adequate sample must be of sufficient size to allow researchers to have confidence that the characteristics of the sample is a true reflection of the population. The more homogeneous the population is, the smaller the sample can

be and still be adequate and representative (Labovitz and Hagedorn, 1971). Another aim when selecting a sample size, of course, is to obtain as much *varied* information as possible.

In a stratified random sample, the proportions of various groups in a sample should be the same as in the population. This avoids the under-representation of some groups which can occur if a different sampling method is used. To use this method it is first necessary to select the relevant stratifying variable(s) (a stratifying variable being the characteristic which needs to be ensured correct representation in the sample). After selecting the variables, the sampling frame is organised into groups according to the category of the stratifying variable, afterwards systematic sampling is used to select the appropriate proportion of people within each strata (de Vaus, 1986).

#### **4.4.7.1. The Researchers' sample**

On the basis of the work of Stuart (1964), a standard sample size was determined as follows for the research respondents:-

- (a) If the institute consisted of 50 to 75 professional researchers, then 20% would be sent a questionnaire.
- (b) If the institute consisted of 25 or more professional researchers, but less than 50, then 25% would be sent a questionnaire.
- (c) If there were more than 5 professional researchers but less than 25, then 35% would be sent a questionnaire.
- (d) If there were 5 or less professional researchers then 50% would be sent questionnaire.

This procedure of sampling allocation is known as 'optimum allocation' (Avery and Burkhart, 1983).

Within each research institute respondents were sampled randomly. However where there were different subjects within one discipline (eg. within agriculture there are wheat, insect and other specialists) respondents were selected as far as possible so that there was one or more respondent/s from each sub-discipline.

It was decided to chose different types of research organisations to get as much varied opinions as possible rather than just the official opinions of a single research institute. To achieve this four organisations were selected. These were as follows: National Agricultural Research Council (NARC), Royal Nepalese Academy for Science and Technology (RNAST), Forestry Research Division (FRD) and Lumle Agricultural Research Centre (LARC).

**(a) National Agricultural Research Council (NARC)**

Until recently, agricultural research in Nepal was conducted by different departments and programmes within the Ministry of Agriculture, with little co-ordination or co-operation. However in 1985 a major reorganisation occurred with all research activities related to agriculture being placed under a newly created National Agricultural Research Centre. NARC has its main research station in Kathmandu. It has set up regional level research stations in each development region. The regional research stations generate technology for the respective regional as well as following the objectives of the national plan. In addition, as the main research station in Kathmandu, it is also responsible for generating technology for the neighbouring districts<sup>2</sup> of Kathmandu. It also works as a regional level station for those districts. Being a less formidable institution, farmers often visit it informally for farming information.

**(b) Forestry Research Division (FRD).**

It was only natural that this research organisation would be selected as it is responsible for all the government's forestry research activities in Nepal. The Forestry Research Division is the national level research office for the Ministry of Forests. Nepal-UK Research Project (FRP) is a temporary national level research project under FRD. FRP is responsible for generating new technology within forestry. The Forestry Research Division is the only one of its kind in that it has no regional research stations. Due to this reason it has failed to establish information transfer links with extensionists and farmers. Sometimes it conducts research in collaboration with other research institutions within Nepal. It has no

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<sup>2</sup> *Kabhre Palanchok is one of the neighbouring districts of Kathmandu.*



formal links with the Department of Extension and makes its research results public through seminars, workshops and publications. Of the respondents chosen from this organisation, a third were expatriate workers.

**(c) Royal Nepalese Academy for Science and Technology (RNAST)**

The Royal Nepalese Academy for Science and Technology was chosen as a representative of an autonomous academic body for the purpose of understanding its information diffusion mechanism. It also has no regional level branches. It conducts both applied research for farm level technology and pure research. As it is a small organisation only a small sample of respondents was chosen compared to the other organisations.

**(d) Lumle Agricultural Research Centre (LARC).**

To complement these three institutions it was decided to select an International Non-Governmental Organisation as the fourth and last. Of the 300 to 400 foreign-aid projects operating in Nepal, the majority are development orientated (ie. extension programmes). Of the few which are research orientated, it was found that most of them had too few research staff to be able to select them. There are however two institutions which are very prominent in the research field within Nepal whilst at the same time having a large professional workforce. Both are British funded Overseas Development Administration projects - Pakribas Agricultural Centre (PAC) and Lumle Agricultural Research Centre. The latter was chosen because of its closer proximity to Kathmandu.

LARC employs both researchers and extensionists. It acts independently of the public-sector research service in Nepal. Consequently it has abundant resources and is free to deal with external agencies offering promising technologies. Its mandate includes both research and extension activities in support of all farmers within its command area in the Western Development Region of Nepal. It conducts on-farm research and has a farming systems perspective. Despite this, its research is limited by the fact that it only researches into the problems of those farmers who live within its command area. Cross-disciplinary and highly location-specific issues are emerging as high priorities for its research. Its stimulus for

improved research has often come from its extension staff. Its dual research and extension function has meant that its linkages are stronger and that it can respond more effectively to the needs of farmers.

#### **4.4.7.2. The Extensionist Sample**

It was decided to select extension workers operating within the District of the Phulbari study site - Kabhre Palanchok District - so as to be able to make more critical appraisals between the data of the farmers' survey regarding the effectiveness of the extension service in the area, and that of the extensionists.

The District Agricultural Office (DAO) and the District Forest Office (DFO) were the main extension offices in the concerning district. These offices are under the network of their respective HMG/N Ministry and Department. A sample of the total extensionists working under the jurisdiction of Kabhre Palanchok District was selected which included all the various staff levels - District Officers, Rangers/Technicians and Assistant Rangers/Assistant Junior Technicians respectively.

In the case of Extensionist respondents, the District Officers (livestock, forestry and agriculture) of Kabhre Palanchok District were approached and given questionnaires to distribute to their junior staff as well as for themselves. In this case a larger population was issued with questionnaires as it was expected that the rate of return of completed questionnaires would be lower than for the research respondents.

## **Chapter Five**

### **Researchers' Questionnaire**

#### **5.1. Introduction**

The researchers' questionnaires (together with the extensionists' questionnaires) were administered in the spring of 1992. Altogether thirty-five researcher questionnaires were administered and twenty-nine were completed and returned ( $n=29$ ). Hence the percentage response rate was 83%. The questionnaire collected factual information on researchers' relationships with extensionists, their contact with farmers and their contact with other researchers. They were also asked to give their opinions on the effectiveness of extensionists, and the appropriateness of their research work to farmers.

Four national level research organisations were selected. Of these four organisations, twelve of the total respondents were from LARC, nine were from FRD, five were from NARC and three were from RNAS. This cross-section of research establishments was expected to produce more wide ranging responses than if a single establishment had been chosen and so that respondent' replies would not be too much a reflection of the views of their establishment. Attention was to be focused on the differences in institutions rather than the personal characteristics of the respondents.

#### **5.2. Objective**

The objective was to find out how relevant was the research work conducted by the research respondents to the small farmers in the Mid Hills and whether their links with extensionists and farmers were adequate to achieve this end. In particular, indication was sought as to whether there were bottlenecks in the flow of information from research establishment to the farmer.

#### **5.3. Research respondents**

Of all the research respondents only two were female. There was no attempt

beforehand to consciously include women in the research sample as gender was not considered an important influencing factor in the responses of the respondents.

The disciplines of the respondents were as follows: ten were agriculture researchers, ten were forestry researchers, six were extension researchers, two were livestock researchers, and the remaining respondent was a social scientist. The small number of livestock researchers is a reflection of the lower level of research invested in this sector generally within Nepal. When the respondents described their major field of responsibility there appeared to be a division between those who conducted pure research and those who conducted research in addition to maintaining a research-extension link. The latter were more likely to be conducting applied research.

Some respondents had previously been working as extensionists (ie. nine respondents from LARC). It was expected that these respondents would be more sympathetic in their opinions of extensionists as well as having a more positive communication approach with extensionists during the course of their work.

#### **5.4. Researcher-to-Researcher Information Exchange**

##### **5.4.1. Interaction**

Respondents were asked to describe their relationship with the researchers of other institutions, regardless of discipline orientation, in terms of aiding in each other's research work. Some of the respondents (12) had rated their relationship as a co-operative one. However the actual amount of co-operation may not be as much as the researchers would have liked, as two respondents from FRD had the following comments to make: "co-operative - but involved with only limited numbers even though would prefer to be more involved," and, "co-operative information dissemination does exist but actual application is found to be very poor, possibly because the recipient finds it difficult to change the system".

Fewer researchers (8) reported that they carried out collaborative research. It was

mostly respondents from LARC and NARC who said that they did collaborative research work, ie. they conducted research in partnership with researchers from other institutions.

A few respondents said that theirs was a completely 'indifferent relationship' (4) or that it 'varied' (5) according to which institutions they had the most contact with, or at different stages of their research work. When respondents described their relationship with researchers in other institutions but of the same discipline as their own, only one respondent now expressed that he had a completely indifferent relationship. Another difference emerged with some respondents describing their work as collaborative (12) rather than simply co-operative (9). This shows the importance researchers place on maintaining a good relationship with researchers of the same discipline as themselves in other institutions. They are much more likely to have a working (collaborative) relationship with researchers of the same discipline and a casual (co-operative) relationship with researchers of other disciplines in outside institutions. Hence it appears that there is a discipline bias amongst researchers and less concern to set their research work into the holistic farm approach.

#### **5.4.2. Feedback from other Researchers**

Less than half of the respondents (13) indicated that they sometimes heard about *researchable village problems* from other researchers (see Table 5.1). This tended to occur when they came together, such as at seminars, which provided them with the opportunity to exchange news about their research work. However there appeared to be no formal reporting mechanism in existence between them. Less than half of the respondents (13) also indicated that they got *feedback* about the implementation of their technologies in the field from other researchers. NGO researchers were indicated as supplying this feedback rather than researchers from government organisations. This links up well with NGOs' greater tendency to have closer links with the field (and of having a multi-disciplinary team). It is only possible to get feedback at the implementation stage if other researchers visit the field or get information from an extensionist or farmer. In both cases only three respondents said that they *frequently* got information either about

researchable village problems or feedback from field research.

**Table 5.1.**  
**Information on Researchable Village Problems**

	Source of information	
Frequency	Other researchers	Extensionists
Frequently	3 (10%)	13 (45%)
Sometimes	13 (45%)	11 (38%)
Rarely	2 (7%)	3 (10%)
Never	1 (3%)	2 (7%)
No response	10 (35%)	0 (0%)
Total	29 (100%)	29 (100%)

Note: percentages have been rounded to nearest whole number.

Respondents indicated that they more frequently got feedback from extensionists than from other researchers.

### **5.5. Evaluation of the extension service**

The respondents were asked to discuss effective and easy ways to diffuse information from researchers to extensionists. Their comments have been grouped under the following subject areas:

#### **a) Publications.**

A fifth of the respondents (6) recommended the use of publications to disseminate their research results to extensionists. However one respondent disagreed with the use of this method of communicating: "passing on information to extensionists on paper is not successful". Others suggested improvements to this method - "publish easy to understand research findings rather than formal

scientific reports", "use of leaflets in local language" (as opposed to scientific language), "FRD plans to publish leaflets with photos to make field staff more aware of its work" and "the timely publication of research results, making sure that they reach the extensionists on time". The latter comment points to the drawback of publications, namely that it takes a long time - one or two years delay before publishing the results is not uncommon. Another important point within this communication method is that publications do not allow for the two-way flow of communication only a top-down flow. This limitation was not referred to by any of the respondents.

**b) Direct links between farmer and researcher.**

Less than half of all the respondents (13) indicated that researchers should have direct contact with farmers, whereas only one respondent believed that "researchers should not communicate directly with the farmers". A breakdown of the results by institution showed no difference in opinions, with roughly half of each institution's respondents recommending direct links with farmers.

Of those who advocated direct researcher-farmer contact to make the diffusion of innovations more effective, none suggested that this meant doing away with the role of the extensionist. Instead they viewed it as an enhancement to the whole R-E-F linkage system. One respondent from RNASST believed that the researcher could devise more appropriate technology by seeing local farming conditions for himself:

"Farmers should be involved at all stages, beginning from problem identification, to the planning of research and its dissemination. Researchers must appreciate the farmer's knowledge and must be willing to learn from them. Although extensionists are intended to bridge the gap between researcher and farmer, the researchers themselves must establish direct contact with the farmer via on farm trials. This is best done by involving both researchers and extensionists to demonstrate on farms. This would be an ideal model for initiating extension communication".

Many respondents suggested the use of on-farm trials to establish a formal link

between researcher and farmer - as one respondent said, "bring research to farmers' fields via verification plots and demonstration".

### **c) Better links between Researcher and Extensionist**

In practice most researchers have limited direct contact with extensionists. Mostly the research results get disseminated to extensionists (who are usually in another department) by an information officer within the research establishment. The information officer is responsible for the communication of research results in an easy to understand language for the extensionists. In addition the researcher may have direct linkage with extensionists through periodic (usually monthly or two or three times an year) meetings with district level extensionists who then relate back to the field based staff.

The majority of respondents (20) criticised the relationship between researchers and extensionists. Most of this criticism amounted to little more than stating the need for better linkage between them. Some believed that information could be diffused more effectively if extensionists could be made to be more involved in the research work. For example two respondents from LARC believed that researchers should involve an extensionist at some stages of the research, whether in the planning or setting of research agenda or in verification trials (to make the extensionist more informed and confident with new technologies). Other respondents thought the solution lay in researchers and extensionists working within the same organisation so as to create a closer linkage between them.

The majority of respondents had emphasised how to improve the top-down approach. One respondent (FRD) replied that there should be a "prompt feedback from extensionists," another respondent (LARC) said that a formal feedback mechanism should be developed from extensionists to researchers.

The researchers were found to have infrequent contact with extensionists even though they found this situation unacceptable. As a result of this, extensionists found it difficult to properly understand the technology they had to promote, and may even not get to hear of the technology. Similarly because researchers do not



get to hear of village problems through the extensionists, they may design inappropriate technology which the extensionists are then blamed for failing to extend successfully to the farmers.

#### **5.5.1. Problems with the extension service**

More respondents (20) had a negative impression of the extension service than a positive impression only seven respondents thought it was satisfactory and even then they said much depended on the individual institution and the extensionist himself (two respondents had no comment). Respondents replies did not reflect the institution from which they came, instead they were completely individual responses. The respondents' description of the inadequacies of the extension service were grouped into the following categories (Table 5.2).

**Table 5.2.**  
**Problems Associated with the Extension Service**

<b>Reasons for ineffective extension</b>	<b>No of respondents</b>
Insufficient training and knowledge	11 (38%)
Inappropriate technologies	6 (21%)
Lack of logistic support	5 (17%)
Lack of incentives	3 (10%)
No response	4 (14%)
Total	29 (100%)

Note: percentages have been rounded to nearest whole numbers throughout.

The respondents highlighted the extensionists' insufficient training and communication problems between extensionists and researchers resulting in their lack of information about the technologies as being the main cause of their poor performance. They blamed this largely on defects in the top-down dissemination of knowledge from researcher to extensionist. However some respondents were worried that the technologies that extensionists were expected to extend might

also be inappropriate to local conditions. Under the heading 'lack of logistic support', respondents listed lack of inputs, lack of manpower and too many duties.

In addition to criticising the extension service, one or two of the respondents also offered recommendations on how to improve the situation: "select the extensionist from amongst the villagers or if not then an outsider extensionist should be based in the village and not be burdened by other tasks such as administration or policing." Another respondent suggested that, "farmers should be given innovations appropriate to their needs and farm condition."

The majority of respondents (23) criticised the linkage between extensionists and researchers whereas only a small proportion (3) approved of it. (Three respondents gave no comment). The reasons given for the weak relationship between extensionists and researchers lies as much with their respective organisational structure and policies as with their deliberate professional isolation. However the dominant comment to emerge (as given by 20 respondents) was that the nature of their separate work and organisational isolation kept them both apart.

Time constraints was cited as another reason by two respondents for the poor linkage. For example, extensionists were described as being often too involved in administrative work to be able to afford time to attend meetings : "perhaps individuals have too big a workload and the Deputy Director Generals don't order time to be set aside for contacts" (FRD respondent). Isolation was another reason given for the lack of contact between researchers and extensionists. Some respondents admitted that both they and the extensionists were working independently and oblivious of each other's activities even though the final objective of serving the farmer was the same for both parties.

The researchers and extensionists were mostly portrayed as being physically isolated from each other. For example one FRD respondent claimed that " within FRD there are no links between research and extension". In addition they were

also viewed as being professionally isolated. For example a LARC respondent admitted that "often research is done just for research purposes and not for ultimate extension". Another LARC respondent criticised that "researchers don't explain effectively to the extensionists research results which are usable." Yet another LARC respondent admitted that "the technologies are very complicated". This condition, together with the lack of training given to extensionists, means it is not surprising that innovations are not being passed effectively to the farmers. In the words of a LARC respondent, extensionists "lack experience with the very new varieties even though they need to be able to give all the details to the farmer". In total, five respondents believed that extensionists were failing to understand the research results.

Other respondents criticised the extension organisation for not taking the necessary action to establish closer links with research organisations: "the Extension Division, which I think should take the responsibility of such co-ordination is quite inactive and thus needs necessary stimulus" (FRD respondent).

Respondents emphasised their personal acquaintance with extensionists as opposed to their institutional linkages. Nine of the respondents expressed that there either should be, or there was, a personal relationship between researchers and extensionists. These respondents were representative of all the institutions sampled apart from NARC.

One respondent from FRD replied that due to their personal contacts with extensionists there was subsequently no reliability or formal channels for contact. Hence it was found that five of the respondents hoped for the setting up of a formal relationship between them. One FRD respondent replied that "at the moment I only have my own personal contacts but I am trying to establish official contacts". Of the three (all of whom were from NARC) who replied that they had formal contacts (in the form of pre-arranged meetings and seminars) one of them commented that "only an official relationship exists but there is no commitment from them". Hence it is apparent that the relationship between researchers and extensionists needs to be established formally with an inter-

institutional set up being established between the two, rather than relying on individual, personal relationships.

### 5.6. Relevancy of Research Output for Small Farmers

It was considered important to find out to what extent the work of researchers directly helped improve the local farming systems. Farmers are more likely to accept technologies which provide a solution to their problems rather than adopting them simply because of the insistence of an extensionist.

Respondents were asked whether they considered the research they had conducted in the previous three years was applicable to local farming conditions. The results showed that the majority of respondents from all the institutions considered their work as basically relevant to the farmers. The next most common answer was that their work was slightly relevant. However some respondents clarified the situation saying that some of their research was "relevant and others slightly relevant". Only one respondent (from FRD) believed that his research was not relevant to small farmers.

**Table 5.3**  
**Relevancy of research to local farmers.**

Frequency	Own research	Colleagues' research
Relevant	18 (62%)	8 (28%)
Slightly relevant	4 (14%)	5 (17%)
Not relevant	1 (3%)	3 (10%)
Don't know	6 (21%)	6 (21%)
Varies *	0 (0%)	7 (24%)
Total	29 (100%)	29 (100%)

Note: Percentages have been rounded to nearest whole figure throughout.

\* Where respondents had indicated both 'relevant' and 'slightly relevant' categories, their responses have been removed to the 'varies' category.

When the respondents were asked to describe the relevancy of their own and colleagues' research work, basically the same pattern emerged. Yet to find the true test for relevancy, in addition to finding the opinions of researchers, it is also necessary to find the rate of innovation uptake by farmers as well as whether the research is target-orientated or aimed at solving specific farmers' problems.

#### **5.6.1. Target-orientated research.**

The respondents were asked whether the research work they conducted was target-oriented. Such a policy is very much a feature of a top-down planning approach where farmers are expected to accept innovations without their having given any participatory input. Such research work is likely to be more difficult to extend to farmers than if the farmers themselves had had involvement at the research identification stage.

The majority of respondents said either that they mostly conducted target-oriented research (14) or that they occasionally did (11). A minority replied that they rarely conducted their research in this way (4). All apart from one of these respondents were from LARC. Significantly nobody said that they never engaged in target-oriented programmes. A breakdown of responses by institution revealed that FRD and NARC respondents were mostly involved in target-oriented research (over half of all respondents from FRD and all respondents from NARC). In contrast over half of all the respondents from LARC and RNAS described themselves as being only occasionally involved in target-oriented research. Thus it appears that generally, research work is that of a target-oriented programme with government directed, hierarchical institutions such as FRD and NARC being much less likely than the other institutions to carry out non target-oriented work. LARC's Farming Systems Research approach meant that it sought to be more receptive to local farming research needs. Equally RNAS's more academic orientation meant it was more receptive to new ideas in research.

Additional comments made by the respondents further revealed the inherently

top- down approach of their organisations: "HMG/N's Annual Programme is our [ie. FRD] guide but we also help in producing it". One LARC respondent justified his organisation's preoccupation with target-driven research, commenting: "we have to find out about new technology as farmers may not be aware of problems". Despite his concern with helping the farmers' plight, this comment does show that as a researcher he does not believe that a farmer has the ability to understand his farming priorities as well as a researcher can.

#### **5.6.2. Farmer-orientated research**

The respondents were asked whether they ever undertook research on farmers' actual problems. Some respondents (13) replied that they would occasionally carry out research on local farming problems with only a quarter of them (7) saying that they would rarely do so. Surprisingly both the respondents who said they would not, belonged to LARC. Even though LARC professed to be more

farmer-centred than FRD, the responses to this question did not reveal this inclination. In fact FRD respondents showed a more positive approach to farmer-orientated research than did LARC respondents.

Some of the respondents who had said they would occasionally carry out farmer orientated research did however set out conditions under which they would do so. For example : "if time and staff are available", "if it is an urgent problem", "if it is related to my line of research" or "if it is not costly and it needs a slight modification of targeting trials, we modify it to match with research needs even though it is not mentioned in our target as a demonstration work". Such comments makes it clear that farmer orientated work is not a priority area of research concern.

Even though almost half of the respondents had said that they were sometimes willing to undertake farmer-orientated research, in practice this ultimately depends on the amount of awareness the researchers have of local farming problems and whether there is a formal mechanism for this feedback.

### 5.7. Researcher/Farmer Information Exchange

It was intended to find out to what extent and how successfully the research results were reaching the farmers. The majority of the respondents (27) could see many weaknesses in the transfer of their technologies to the farmers, yet very few could offer any improvements to the system. Only one respondent (from LARC) believed that the system was working efficiently, at least within his own organisation - "a strong mechanism based on frequent communication and meetings".

There was a variety of reasons as to why the research results were not reaching the farmers. The reasons given by the researchers were grouped under subject headings as shown in Table 5.4.

**Table 5.4**  
**Reasons for the poor transfer of innovations**

Reason	No of respondents
Weak institutional linkage	12 (41%)
Extension system's fault	7 (24%)
Researchers' fault	7 (24%)
Farmer's fault	3 (10%)
Total	29 (99%)

Note: Percentages have been rounded to nearest whole number throughout.

Of the few respondents who believed that it was the farmer who was the cause for the poor transfer of innovations, their comments basically said that the farmers are not interested in innovations.

Almost a quarter of the respondents (seven) blamed the extension system. Comments varied from the extensionists being unapproachable to the farmers, to the working conditions of extensionists being too unfavourable for them to be able to perform their duties effectively. Training of extensionists was also a cause

of concern as was a lack of inputs and insufficient staff. These comments point to the overriding need for more financial investment to be put into the extension service.

Almost a quarter of the respondents (seven) also said it was their own, ie. researchers', fault. Significantly all apart from one of these respondents were from LARC. In addition it was LARC respondents over all other respondents who had shown the greatest concern for the poor institutional linkage between researchers and extensionists. Respondents criticised that research results were either unavailable to the users or that they were institution-directed technologies, inappropriate to the local farming conditions, having high input costs and being unsustainable by the farmer.

Almost half of all the respondents (twelve) reported problems in the linkage mechanism between researcher - extensionist - farmer. Many of these respondents were worried that they, as researchers, were too isolated from the local farming scene and said there should be direct links between themselves and the farmers rather than their being completely dependent on the extensionists. However one respondent (from NARC) disagreed, saying that researchers should not have to be involved with farmers: "Farmers are coming to NARC for information on new innovations. But they should have contact with extensionists instead of coming to us."

Respondents were also critical of the weak institutional linkage between research establishments and extension establishments. One respondent from LARC said that the poor linkage between them meant that the quality of the research work itself suffered - "research work is done without consulting the knowledge of the extensionist". He proposed that researchers should work as extensionists for a short period and vice versa.

#### **5.7.1. Feedback to Researchers.**

Feedback with farmers was reported to occur in both ways - both when researchers made field visits and when farmers themselves visited either the



research trials or the research institution. This sort of information was reported mostly by researchers from LARC, and the least by FRD respondents. This is a reflection of the closer link LARC, as an NGO, has with the field compared to FRD (a GO). Yet on the whole, the rate of feedback was low, with only eight respondents saying they frequently got feedback and nine saying that they sometimes got feedback. This low rate exposes the limited contact most researchers have with farmers. Despite this only one respondent admitted that he never received information from farmers (see Table 5.5.).

**Table 5.5.**  
**Source and frequency of feedback for researchers**

Frequency	Extensionist	Farmer	Researcher
Frequently	12 (41%)	8 (28%)	3 (10%)
Sometimes	11 (38%)	9 (31%)	13 (45%)
Rarely	4 (14%)	2 (7%)	2 (7%)
No response	-	9 (31%)	10 (34%)
Never	2(7%)	1 (3%)	1 (3%)
Total	29 (100%)	29 (100%)	29 (99%)

Note: Percentages have been rounded to nearest whole number throughout.

Many respondents (19) claimed to receive some degree of feedback from farmers about the implementation of their technologies. Seven respondents said that they did not get any feedback and the remaining three respondents did not respond to the question. Analysis by institution showed that only LARC and NARC respondents mostly got feedback, whereas the majority in FRD and RNASIT did not (see Table 5.6).

**Table 5.6.**  
**Frequency of feedback by institution**

<b>Frequency</b>	<b>FRD</b>	<b>LARC</b>	<b>RNAST</b>	<b>NARC</b>	<b>Total</b>
Regularly	-	11	1	2	14
Occasionally	3	-	-	2	5
Never	4	1	1	-	7
No response	2	-	1	-	3
Total	9	12	3	5	29

#### **5.7.2. Village-level problems**

In response to the question "do you get to hear about researchable problems at the village level?", the majority (26) replied that they did. Yet although it seems that a lot of feedback is occurring, it does not show how frequently such feedback is happening. For example although one respondent from FRD replied positively he added the following illuminating explanation: "Yes - but at second hand and almost certainly not to the extent we should to allocate priorities with any accuracy".

#### **5.7.3. Source of feedback**

When respondents were asked from who did they get feedback, many (16) had indicated that they received feedback both from farmers and extensionists with only two saying that they only got feedback from extensionists and one respondent saying that he only got feedback from farmers. However comments made by some of the respondents showed that their contact with farmers was less than their contact with extensionists, on an ad hoc basis and to select farmers only, eg. forest user groups or progressive farmers.

Nine respondents added that they had other sources, primarily staff of NGOs or field level staff of other institutions. Only two respondents said that they visited the field for themselves to evaluate the performance of their research results. Yet these two respondents were also involved in extension activities for their respective institutions.

It was found that FRD respondents obtained information from farmers the least compared to any other institution, whilst LARC respondents obtained information from them the most. The overall finding however is that of limited regularity of feedback for all institutions and with greater reliance on extensionists than farmers, and finally other researchers.

As so few respondents indicated that they frequently received information from a certain source this implies that there is a lack of a clearly established pathway for them to get their information. It also implies that researchers may not regard feedback as a particularly important component to their work.

## **Chapter Six**

### **Extensionist Questionnaire Results**

#### **6.1. Introduction**

This questionnaire has attempted to evaluate the extension service as it operates in relation to the farmers and the researchers. The sample taken was the HMG extensionists (livestock, forestry, agriculture) working within Kabhre Palanchok District in the Mid-Hills of Nepal (ie. the same district as the farmers' survey in Phulbari). Seventeen completed questionnaires were returned from an original distribution of thirty-two. Hence the percentage response rate was 53%. Three topics were addressed by the questionnaire. These were as follows:

- a) Professional effectiveness of the extensionists
- b) Communication between researchers and extensionists
- c) Communication between extensionists and farmers

The first issue to be addressed by the questionnaire was that of their training and exposure to knowledge of new research results and by which communication method did they receive their information.

The next issue addressed was that of their exposure to current research work and their connection with researchers as well as the appropriateness of the innovations they had to extend to the farmers.

The final issue addressed was that of the interaction between extensionist and farmer. Questions attempted to reveal whether extensionists preferred to visit certain categories of farmers (by caste, economic status, accessibility and progressiveness) and whether they got, or encouraged feedback. Questions were also asked to reveal what encouraged/discouraged extensionists from visiting certain villages.

## **6.2. Background to the respondents**

The sample (a total of seventeen respondents) was divided into agriculture, forestry and livestock extensionists, ie. ten, six and one respondent respectively. This proportion may appear very unequal but in fact it corresponds well with the actual situation in Nepal, that is, a preponderance of agricultural extensionists, less forestry extensionists and few livestock extensionists. All the respondents apart from one were field level staff, the exception being one District Forest Officer. No attempt had been made to select extensionists on the basis of their gender or caste even though this was expected to influence their interaction with the farmers. In fact it was found that only one female extensionist had completed the questionnaire. This correlates well with the low numbers of female extensionists in Nepal and was therefore not considered a defect of the study. Although the respondents had not been asked to which caste they belonged to, an examination of the respondents surnames revealed that the majority were of high caste background - Brahman (seven) and Chetri (five), and the remainder to the Newar caste (five). Both Brahman and Chetri are in general the most socially powerful group in Nepal and amongst the ethnic castes, the Newar is considered the highest. No other caste was represented amongst the respondents. I expected that the respondents' caste would have an influence on which caste of farmers they would interact with mostly.

## **6.3. Extensionists' knowledge of new technology**

The questionnaire was intended to find out how much connection extensionists had with researchers, research-related activities and research organisations. As the extensionists in this district were physically quite close to all the major research establishments in Kathmandu it was expected that this would have a beneficial effect on their exposure to research work, knowledge and understanding of recently released innovations. However as far as passing on this information to the farmers they, in association with all other extensionists working in the Mid-Hills, had equal difficulty in accessing the farmers.

### **6.3.1. Training**

Over half of all the respondents (9) reported that they had no work-related training (in the form of either a workshop, seminar or conference) during the past three years. Of the remainder who had training, most of them had between one and two training sessions during this period. Over a quarter (5) described this training as being of moderate use to them, one had described it as poor and only two described it as very useful .

### **6.3.2. Literature**

The majority (15) reported that they received literature regarding research work, whereas only one respondent said that he did not and another failed to reply. The respondents were also asked whether their office was supplied with periodicals or whether they read them from a different source. As it turned out, respondents stressed that it was mostly from their own office that they received periodicals rather than any other source. A review of these journals revealed that they were mostly bi-monthly issues of Nepalese journals. Very few international journals were mentioned. This fits well with a field worker's needs, ie. material written in Nepalese will make it easier for him to understand the contents and secondly the technologies discussed would have greater likelihood of being relevant to local conditions.

### **6.3.3. Radio**

The frequency of radio listening behaviour was studied amongst the respondents. It was expected that extensionists would at least know about programmes being transmitted relevant to their profession, but whether they actually listened to them would largely depend on their being in the office at the right time. In addition the radio programmes were directed more at the farmers themselves rather than at the extensionists, as they are a mass media extension approach.

All the respondents knew about these programmes on the radio. The highest frequency of radio listening by discipline was for farming related programmes.

This is not so surprising considering that there are more farming related programmes being broadcasted in the first instance than any other discipline and that in addition, there were more extensionists from this discipline than any other in the sample. Despite this, forestry and livestock programmes also had a following but more on an occasional basis.

**Table 6.1.**  
**Frequency of listening to radio programmes**

<b>Frequency</b>	<b>Farming prog.</b>	<b>Forestry prog.</b>	<b>Livestock prog.</b>
<b>Regularly</b>	7 (41%)	2 (12%)	2 (12%)
<b>Occasionally</b>	3 (18%)	6 (35%)	6 (35%)
<b>Rarely</b>	6 (35%)	7 (41%)	6 (35%)
<b>Never</b>	-	1 (6%)	1 (6%)
<b>No response</b>	1 (6%)	1 (6%)	2 (12%)
<b>Total</b>	17 (100%)	17 (100%)	17 (100%)

Note: Percentages have been rounded to nearest whole figure throughout.

#### **6.3.4. Visits to research establishments**

It was found that very few respondents made visits to research establishments. Respondents visited the district level research establishments (ie. local level research such as that conducted in agricultural service centres) more regularly than any other research establishment level. However even at the district level, the frequency of regular visits was low (only three respondents). Less than half of the respondents (seven) claimed that they sometimes visited national level research establishments. This relatively high figure was most likely a reflection

of their geographical proximity to Kathmandu.

#### **6.3.5. Knowledge of research plots at district level**

Over a quarter of the respondents (five) indicated that there were research plots being conducted in their district. The other respondents either did not know or said there were none. The presence of research plots can provide the extensionists with valuable insights into research work being conducted on site. In addition they can present extensionists with the opportunity of taking part in the research process enabling them to have a close working relationship with researchers. However the low number of respondents who had indicated that there were research plots in their area (bearing in mind that some respondents may have been unaware of whether their area contained research plots) signifies the weak links extensionists have with research work.

When the respondents were asked to indicate how many research plots were in the district, those who replied could only answer for their own command area and not for the whole district. The respondents were later asked whether there was any provision to have study visits to the research plots. Over half said yes (eleven respondents).

#### **6.3.6. Comparison of sources of information used by extensionists**

It was considered important to find out which source of information the respondents relied on the most. Respondents were given pre-selected sources to choose from. Over half had indicated more than one source of information with the majority (twelve) indicating that literature was a major source of research information for them.



**Table 6.2.**  
**Source of information for extensionists**

<b>Source (Author's criteria)</b>	<b>Number of respondents</b>
Literature/radio	9 (53%)
Research/demonstration plot visit	5 (29%)
Other *	2 (12%)
Not informed	1 (6%)
Total	17 (100%)

Notes: Percentages have been rounded to the nearest whole number throughout.

\* Under the 'other' category, respondents mentioned training, farmers and conferences.

When the respondents were later asked the same question but this time as a qualitative rather than a quantitative question, differences emerged in their responses, with respondents including another category - meetings and research reports - in their replies.

**Table 6.3.**  
**How extensionists receive research outcomes**

<b>Source (respondents' own criteria)</b>	<b>No of respondents</b>
Literature/radio	6 (35%)
Researchers	4 (24%)
Training, seminars and meetings	5 (29%)
Not informed	2 (12%)
Total	17 (100%)

Notes: Percentages have been rounded to nearest whole number throughout.

Here also none of the respondents had mentioned that they received information from other extensionists, even though they would come into contact with them through training sessions, seminars and meetings.

#### **6.4. Information exchange between extensionists**

It was assumed that there might be communication problems between extensionists - in fact only three of the respondents said that they had good interaction. Many of the respondents tried to give reasons as to why communication between extensionists was problematic yet they could offer only two reasons - a lack of logistical support and hierarchical feeling between the different grades of extensionists. Mostly the respondents blamed higher level staff for not interacting positively with lower level staff resulting in poor coordination between them. Others blamed the hierarchical organisational structure for discouraging feedback from field level staff to their superiors about problems in the field. As in the words of one extensionist, "planning and programmes are not grass-roots oriented".

#### **6.5. Relationship between extension and research establishments.**

When the respondents were asked to describe their establishment's relationship with research establishments, the majority were noncommittal, describing it as a 'moderate' relationship (twelve). Yet as one respondent hastened to add, "there is co-ordination but it is not effective. The research office has no network for a two-way flow of information. Researchers lack co-ordination." This comment exposed the real need for improved contact and communication between the two parties.

It was found that information first passed from the research establishment then down to the district level extension offices. The district officers were then expected to pass this information down to the field based staff to extend to villagers. Yet when questioned, half of all the respondents (nine) believed there were communication problems between district based extensionists and

researchers whereas only two respondents said there was no problem.

Two important points emerged from the replies of the respondents. The first is that some respondents (three) considered the technologies themselves to be inappropriate to the local field conditions. For example one agricultural extensionist replied: "even though research outcomes do arrive in time in the district, they are not orientated to district level problems and farmers' needs" and yet another respondent replied: "the forestry research establishment has not approached different parts of the country's needs". Field based extensionists criticised district officers for not passing information to them ("although research outcomes reach the district office, they don't arrive in the farmers' fields") but they also felt that researchers did not interact sufficiently with extensionists (six of the respondents said there was a lack of interaction between researchers and extensionists). As one agricultural extensionist expressed: "there is no frequent interaction between research offices and the district offices. These two bodies meet only occasionally so that many problems remain unidentified".

One of the main concerns of the respondents was their efficiency at transferring technologies effectively to farmers. The general criticism which respondents expressed was that they had no degree of participation in research work nor were they made exposed to any on-going research work. For example one respondent mentioned that "field staff hardly get a chance to visit a research office once in four or five years". One respondent had this to say about the extension process: "in practice, the work is not carried out following research results".

The other problem highlighted was in the identification of village level problems. Respondents mentioned that it was difficult for the extensionist to gather village level information as well as to pass it on to higher level staff. In the first instance they said that their insufficient contact with the farmers, together with a lack of logistic support and resources to launch their own research projects, inhibited them from identifying farmers' problems: "the field staff are supposed to work as a bridge between villagers and researchers. But they have not visited or diagnosed so many of the villages problems because the majority of the villages

are remote, and there is a lack of physical facilities and a lack of resources to launch the programmes." Respondents suggested that this situation could be improved by the close co-operation between researchers and extensionists. One respondent expressed: "There is an urgent need to have a good co-ordination/relation between researchers and field staff so as to diagnose farmers' technological problems and to introduce new technology."

Over half of the respondents (ten) said that the innovations they were expected to extend were only 'slightly applicable' to local conditions and needs. One respondent described the situation as: "maybe the research outcome will be pragmatic but in practice it is not. Maybe it is limited to certain places only."

#### **6.6. Communication between extensionist and farmer**

Respondents gave many reasons as to why communication was problematic between extensionist and farmer. The majority of respondents (fifteen) gave more than one reason indicating that there were many areas for improvement. These have been grouped under the following topics:

##### **A. Lack of resources for development**

- lack of funding and transport
- inappropriate technologies for local conditions

##### **B. Extensionists' fault**

- lack of manpower
- lack of communication
- insufficient training
- low working morale

##### **C. Farmers' fault**

- unreceptive to innovations

**Table 6.4.****Reasons for poor communication between extensionist and farmer**

<b>Reason</b>	<b>No of respondents</b>
Extensionist's fault	7 (41%)
Lack of resources for development	6 (35%)
Farmers' fault	4 (24%)
Total	17 (100%)

Note: Percentages have been rounded to nearest whole number throughout.

Many more respondents blamed extensionists and their lack of resources for failing to extend technologies rather than the farmers for not accepting them. Therefore it appears that there is a need for fundamental changes within the programme and planning of the extension system as well as better training to equip the extensionists with greater ability to transfer technologies to the farmer. The top-down approach is causing problems to the field level staff who have to deal with the realities of local farming conditions. For example one agricultural extensionist commented, "we have asked several times for pesticides to control crop diseases but people at the top level don't listen to us. Similarly fertilizers are not available in time". Another respondent criticised the programmes that extensionists are required to perform: "the programmes are not a bottom-up approach. Instead they are planned at national level and therefore don't meet the farmers' needs. Therefore village level planning should be done according to the physiographic agro-ecology and socio-economic conditions of the farmers."

Not only was the communication between extensionist and researcher criticised for being distant and often late but also some respondents criticised themselves for not being able to provide a feedback and follow-up service to the farmers due to limited manpower and the large areas they had to supervise. This resulted in farmers' problems being neither known in time nor solved.

### **6.6.1. Selection of farmers/villagers to contact**

It was expected that respondents would visit some villages more than others as there were too many villages for them to visit effectively, hence the need for selection. In fact the results showed that all the respondents admitted this. Not only was there preferences amongst villages but also localities or VDCs. Just under half of all the respondents (eight) said that they visited some of their VDCs much more regularly than other VDCs in their command area.

The reasons given by the respondents as to why they visited some villages more regularly than others depended largely on whether or not there was a development programme present in the VDC. If there was a development programme present then it deterred the extensionist from visiting other villages. Other respondents replied that they would visit villages only when asked to do so at the request of the villagers themselves or by the District Officer.

The factors influencing which villages the extensionists choose to visit are listed in Table 6.5.

**Table 6.5.**  
**Factors influencing which villages extensionists visit.**

<b>Reasons</b>	<b>No of respondents</b>
Area too big	5 (29%)
Remoteness	4 (24%)
Lack of facilities	4 (24%)
Target area approach only	2 (12%)
Others	2 (12%)
Total	17 (101%)

Note: Percentages have been rounded to nearest whole number throughout.

The majority of respondents said that they concentrated their activities in villages located within development areas. This shows that it is advocated by the extension service to concentrate efforts in certain areas particularly to fulfil set targets. Another very strong motivating factor encouraging extensionists to visit certain villages is whether the farmers there are receptive to innovations. Although accessibility and availability of transport to villages also encouraged extensionists to visit, its effect was not so significant as the initial two reasons.

**Table 6.6.**  
**Reasons for the selection of specific villages to visit.**

<b>Positive reasons</b>	<b>No of respondents</b>
Pocket/block development area	7 (41%)
Farmers' development orientated	7 (41%)
Accessibility/transport	3 (18%)
Total	17 (100%)

Note: Percentages have been rounded to nearest whole number throughout.

#### **6.6.1.1. Frequency of visits**

Respondents' visits to villages varied from three times a month, to twice an year, to never, ie. no fixed frequency pattern emerged. This high variability implies that there is no routine schedule of visits adhered to by extensionists. Many respondents commented that they visited some villages more frequently than others particularly according to circumstances at hand. The following comments made by respondents explain this: "according to farmers' need and situation, I visit once a month or two to three times a month," and, "according to necessity.

If there are programmes I visit frequently, if not, I don't". Other respondents said that they were more likely to visit villages closer to their base: "I am based in the service centre. I see/visit farmers in the village of the service centre every day", and, "in certain pocket area where work is concentrated I visit three to four times a month. But in other areas specifically in remote areas, I don't even visit once in one year".

#### **6.6.1.2. Characteristics of farmers selected**

Once the extensionist has identified which villages to visit he then has to decide which farmers or groups of farmers to focus on, given that only a limited number of farmers can be contacted in any case.

The factor of low interest by farmers discouraged over half of the respondents from visiting them. Also the results revealed that there was preference amongst the respondents in choosing farmers from certain socio-economic groups.

##### **(i) Caste**

Respondents were asked to list the names of three villagers from three separate villages with which they interacted with mostly. The list of names were then arranged according to caste. The results are presented in Table 6.7. The results correspond with the caste breakdown of the respondents themselves, ie. a high caste preference. Hence it seems that respondents favoured their own caste people to a large extent. When the respondents were asked why they preferred to contact high caste farmers, they mentioned that it was because they were 'educated', 'co-operative' and 'interested'. Hence it appears that most extensionists prefer to work with those farmers who are the most likely to adopt their innovations with the least resistance.



**Table 6.7.**  
**Caste preferred by extensionists**

<b>Caste</b>	<b>Visits to farmers</b>	<b>Extensionist's caste</b>
High caste	12 (71%)	12 (71%)
Ethnic groups	5 (29%)	5 (29%)
Low caste	-	-
Total	17 (100%)*	17 (100%)

Note: Percentages have been rounded to nearest whole numbers throughout.

The respondents were also asked to list the profession of the villagers they had named. Although the majority described them as just farmers some also had secondary occupations such as teachers, village leaders or local level politicians. The comments of one respondent reveals why such people were chosen:

"These people are the ones who are well familiar with village problems, and they can express the problems, and they are the ones who plan and manage how the other villagers can solve their farming problems. They lead the village and can call people for a gathering, or for community work."

It was found that four of the villagers mentioned had been listed by more than one respondent. This means that those villagers had frequent contact with more than one extensionist. For example, in one instance, one villager had links with two agricultural extensionists and a livestock extensionist. Therefore monopolisation of an extensionist's attention also occurred particularly with the higher status villagers. In addition, over a quarter of the respondents (six) revealed that they had contact with three villagers of the same family within the same village with a further thirteen of them having close contact with at least two members of the same family within the same village.

The extensionists were less interested to visit the low caste farmers and at the same time these farmers were described as the ones who were the least likely to benefit from the extension service. One respondent explained why the high caste villagers were the ones most likely to benefit from the extension service : "the higher castes are relatively cleverer than the lower castes who subsequently are less benefited". However bearing in mind that none of the respondents were of the lower castes it is likely that they were biased in their opinions and visitation patterns.

### **(ii)Economic category**

Only a few respondents (three) stated that the richer farmers benefited the most from their work. Instead most respondents (fourteen) identified the average income farmers as benefiting the most, followed by the poorer farmers (seven). Seven respondents had also indicated more than one economic category.

### **(iii) Progressive farmers**

Almost three quarters (twelve) of the respondents believed it was more profitable for them to concentrate their attention on progressive farmers rather than the more conservative farmers. One such respondent described why this was the case:

"Extensionists will only contact the leading person of a village as he thinks that poor farmers cannot gather community people together - they have no group leading ability and also the poor have no time to devote. That is why the extensionist contacts rich/leaders of a community."

Only a quarter (five) of the respondents did not believe that this was a good policy. The reasons why they disagreed can best be illustrated by the following comment from one respondent:

"Our programmes are mostly limited to the progressive farmers yet the majority of farmers are not progressive and are very poor. Because of the nature of our society and the economic condition of the farmers, these

backward farmers are ignored. This is why we only diagnose problems relevant to the progressive farmers".

Those respondents who disagreed with concentrating on progressive farmers did so because they thought that the non-progressive farmers were in more need of their help to uplift their farming condition to the level of the progressive farmers. Whereas those respondents who believed it more expedient to give most attention to progressive farmers (twelve) did so because it was easier for them to teach them because they were already motivated as well as being 'intelligent' farmers. As one livestock extensionist remarked, "they are interested in new technology and also they can understand the subject matter if someone explains it to them. They will then immediately bring the new technology into practice". Their efforts with such farmers would be more likely to produce positive results and at a faster rate in line with a target policy. In addition, progressive farmers also often act as informal contact farmers thereby helping to promote and extend the technologies further afield. The comment of one respondent illustrated this belief: "it is the trend in villages that the uneducated or poor farmers trust leader farmers. If we create small groups of leader farmers and encourage them, it helps to disseminate and for adoption of new research eventually by other farmers."

A completely different reason was given by one respondent as to why it is better to work with progressive farmers - then the extensionist cannot be accused of favouring a particular caste as a progressive farmer can be of any caste! Only two respondents replied that support should be given to farmers equally, regardless of their level of progressiveness.

### 6.6.2. Feedback from farmers

The majority of respondents (sixteen) said they received at least some feedback from farmers.

**Table 6.8**  
**Method of feedback**

Method	No of respondents.
Extensionist visits farmer	6 (35%)
Farmer visits extensionist	2 (12%)
Equal interaction	3 (19%)
Extensionist rarely visits farmer	3 (19%)
Farmer rarely visits extensionist	3 (19%)
Total	17 (100%)

Note: Percentages have been rounded to nearest whole number throughout.

Table 6.8 shows that the respondents got feedback mostly by visiting the farmers and rarely by a farmer visiting the extensionist. It was found that if a farmer visited the extensionist he would do so mostly to comment on the new technology he was practising.

It was revealed that respondents got feedback mostly when they were casually amongst the villagers. This seems to make villagers more confident to approach the extensionists with their problems than when the extensionists are preoccupied with their extension programmes, ie. "during personal informal contact" as one respondent said.

**Table 6.9.**  
**Extensionists' ability to receive feedback**

<b>Ability</b>	<b>Response</b>
Moderate	8 (47%)
Difficult	6 (35%)
Easy	2 (12%)
Never	1 (6%)
Total	17 (100%)

Note: Percentages have been rounded to nearest whole number throughout.

Few respondents found it easy to get feedback. Respondents tended to find it either moderate or difficult to get feedback. Most could only get feedback by contacting the farmers for themselves. Probably the reason for this poor feedback is that there are no formalised channels for it, the whole extension system relying on a top-down approach with little emphasis being given to farmer participation or the need for the extensionist to get feedback. For example, when the respondents were asked to describe their communication with their senior level staff most replied that there was a reasonable level of communication between them. It appeared that communication between extensionists was easier than it was with farmers.

#### **(i) Feedback by caste**

Respondents were asked to consider which caste of farmer visited them the most, both to give feedback, as well as to receive information. The results (see Table 6.7.) showed that high caste farmers were the most frequent visitors followed by the low castes who only occasionally visited them. The ethnic groups (eg. Tamang and Newar) were the least likely to visit them. This means that although the low castes are generally poor, and are not particularly a progressive group,

they are still eager to get information about new innovations. This is despite the previous finding that they were considered the least likely to benefit from the services of extensionists. Hence it seems likely that it may be the actual innovations themselves that are inappropriate for the poor farming conditions of the low castes rather than the lack of motivation on their part. Also it seems likely that the extensionists have a preconceived idea that low caste groups will not benefit from their services, either because their resources do not allow it or because they are conservative. It was also found that generally ethnic groups rarely visited the researchers.

**(ii) Feedback by farmer's economic condition**

The results showed that farmers of an average economic condition visited the extensionists the most frequently (eleven respondents) followed by the poorest farmers (four respondents). The wealthier farmers rarely visited them, ie. only one respondent said he was frequently visited by them. This finding corresponds with the findings from the Phulbari case study where the farmers said that the progressive/wealthier farmers prefer to visit the research centres rather than ask for advice from field level extensionists.

**6.7. Recommendations**

Many of the respondents offered their suggestions as to how they thought the extension service could be improved. Their comments have been categorised into four topics as shown in Table 6.10. Many respondents gave more than one recommendation. Hence the total number of recommendations (30) exceeds the total number of respondents (17).

**Table 6.10.**  
**Recommendations on how to improve the extension service**

<b>Recommendation</b>	<b>No of Responses</b>	<b>Examples Given</b>
Expose farmers to research	10 (33%)	Study tours, workshops, on-farm trials.
Increase extensionist/farmer contact	9 (30%)	Groups, decrease ratio, meetings, contact farmers, one to one.
Availability of inputs	7 (23%)	Seeds, fertilizers.
Appropriate, timely technology	4 (13%)	
<b>Total<sup>1</sup></b>	<b>30 (99%)</b>	

Note: Percentages have been rounded to nearest whole number throughout.

<sup>1</sup> In some cases respondents' recommendations included more than one category hence the total number of responses (30) is greater than the total number of respondents (17).

Over half of the respondents (ten) believed that farmers would be more motivated to try new technologies if they were exposed to on-going research work thereby increasing their acceptance of them. This also means that they would have direct contact with researchers. An additional remark made by one agricultural respondent recommended that farmers themselves should be involved in seed production activities rather than just the research centres and the Agricultural Input Corporation. This participation would make farmers more willing to adopt new crop varieties. Over half of the respondents also thought that contact between extensionists and farmers should be increased, ie. more meetings with more farmers. Given the lack of manpower, as well as remoteness of localities, this option would involve a greater financial investment by the extension organisations. The recommendation that more inputs should be available is more a matter of planning. That technologies should be appropriate is certainly of concern to the researchers and programme planners and for them to be timely is a reflection of how efficient the communication flow between researchers and

extensionists should be.



## **Chapter Seven**

### **Discussion of Researcher and Extensionist's Results**

#### **7.1. Introduction.**

The researcher and extensionist questionnaires were administered in order to assess the effectiveness of the formal mechanism of the transmission of innovations from research establishments to the extensionists and ultimately to the farmers. This basically involved an analysis of the linkage mechanisms between the three respective parties.

#### **7.2. Communication Linkage between Extensionist and Farmer**

The agricultural extension system in this study was found to be ineffective and inefficient in transferring the technologies to the farmers. Part of the reason for this lay in its level of logistical support it received. In the first instance the extension manpower was insufficient. Secondly the topography of the Mid-Hills made it difficult to reach villages which were in addition situated far apart from each other.

##### **7.2.1. Selection of Farmers for Contact.**

###### **7.2.1.1. Accessibility.**

The ratio of extensionists to farmer was too low necessitating that the extensionists should be selective, both where they visited, as well as who they visited. This, in addition to the difficult terrain, made it hard for an extensionist to reach even a fraction of his clients on a regular basis. The responses of the extensionists indicated that remoteness acted as a 'push' factor inhibiting them from visiting those areas. In contrast the presence of a development project in an area acted as a 'pull' factor encouraging extensionist visits. FAO's (1994) study of extensionists in the Philippines similarly found that even though the area they had to cover was too large, and this problem was exacerbated by a lack of transport and allowances, communication networks could be well developed but

this happened in areas that were relatively more prosperous.

#### **7.2.1.2. Caste and wealth**

Once the extensionist has selected areas to visit he still has to select which farmers to communicate with. A socio-economic breakdown of the type of farmer actually visited showed that the majority chose high caste and average income farmers. Hence whilst high caste was a major factor, greater levels of wealth did not feature significantly in the choice of farmers to visit. It is also significant to point out here that the majority of extension respondents were of high caste. Feedback from the farmers also followed the same socio-economic specifications. This accords with Thapa *et al.*'s (1988:14) study in Nepal which concluded that "if extension focuses on male farmers (as normal) then it is the high caste Brahmin and Chetri who are the main points of contact as they are often the innovators who are interested in 'modern' technologies". Similarly, Van Crowder's (1988) study in Ecuador, clearly demonstrated an extension bias towards larger farmers as well as the most influential ethnic group which was also the wealthiest. Significantly this group belonged to the same ethnic group as the extensionists. Van Crowder's (1988:220) results prompted him to remark: "inequities in agricultural services to farmers from public and private sources are linked to inequities in farmers' productive capacities and to their socio-economic backgrounds."

Seeley (1989a) links together caste and accessibility in her finding that in Nepal the lower caste families tended to live some distance from village centres which acted as an added disincentive for extensionists to visit them. Consequently as the extension service is relatively ineffective in reaching the smallest and most isolated of farmers, farmer-to-farmer transfer of innovations should be recommended as a measure to overcome these constraints.

#### **7.2.1.3. Progressive Farmers**

A further criterion which the majority of extensionist respondents gave in choosing which farmers to work with was that of the progressiveness of individual farmers. Seventy one per cent of the extensionist respondents said that

they contacted progressive farmers rather than non-progressive farmers. This is a long- established policy with the extension service. For example, Sharma and Anderson (1985) reported that LARC's extension philosophy aims to serve farmers who wish to be assisted, ie. the progressive farmers. Although cost effective, this strategy is often criticised by development professionals for its unequal distributional impact - the majority of farmers remain unaffected by the extension service. Similar situations are found elsewhere. A survey done in Pakistan (Sofranko, *et al.*, 1988) revealed that progressive farmers had higher levels of contact with extensionists and also generally exhibited a favourable view towards the advice and information they received. Thapa *et al.* (1988:14) link progressiveness with high caste in the case of Nepal, thus leading to the confirmation of this trend.

Only a minority of the extension respondents of my survey disagreed with the idea that extensionists should concentrate their attention on progressive farmers on the grounds that progressive farmers were less in need of help than the more traditional farmer. Wadsworth (1995) in his Costa Rican study raised the question in his paper of the feasibility of devoting scarce extensionist time to progressive farmers.

Another limitation of the extension service is that unwittingly, by its preference for working with these model farmers, misunderstandings have arisen on the part of both research and extension as to what innovations are appropriate to and can be adopted by the majority of farmers. This limitation has also been reinforced by the researchers who, when they do on the rare occasion, come into contact with farmers, have tended to communicate only with larger farmers who do not share the needs of the smaller farmers (Doorman, 1991).

Wadsworth (1995) recommended that the efficiency of agricultural extension might be improved by the utilisation of a targeting strategy based on some measure of the farmers' ability to adopt innovations. In this way extension resources would be used more efficiently and the traditional bias of extension towards progressive farmers would be reduced.

### **7.3. Institutional Limitations of Research and Extension Organisations.**

The hierarchical transfer of technology model fails to question its own weakness. It does not address the question of whether the technology is relevant to the clientele. Instead the extensionists need to search for groups of farmers who are willing and capable to adopt it. Similarly feedback, if it does happen, only occurs when the recipient group is a well organised and influential farmer lobby. ISNAR (1994:4) believes that only by receiving feedback can researchers design more appropriate technologies:

"Compelling evidence suggests that interaction with and external pressure from farmers, preferably in groups, is essential if research is to generate technology options relevant to farmers' needs and opportunities".

However if the feedback is only from larger farmers, then the needs of the smaller farmers remain uncatered for.

Both the research and extension respondents in my surveys pointed out the need for an improved institutional linkage between both parties. In turn, this would lead to more appropriate technologies being diffused with greater success. Many of the respondents had, between them, suggested two main ways to bring this about. The first is through closer collaboration between researchers and extensionists. One research respondent from RNASST recommended that "there must be research trials on farmers' fields in close collaboration with extensionists". The second suggestion was for institutional reform. Another researcher from RNASST recommended that institutional reform must first be structured around research policies. The institutional set up was criticised for not giving greater flexibility to researchers: "researchers must be allowed flexibility to conduct research on field problems as well as to pass research outputs directly to extensionists". The researchers as individuals have little flexibility to respond to local conditions, given the top-down directive of research planning.

In Nepal on-farm research programmes find it difficult to get the research policy makers to recognise farm-level conditions and problems. With little or no contact

with farmers, researchers in these programmes have not been able to understand the constraints of the farmers who are intended to be their clients.

### **7.3.1. Communication between researchers and extensionists**

Thapa *et al.*, (1988:17) from their survey of HMG research and extension establishments in Nepal, found that despite the clear evidence of the benefits of a close working relationship between extension and research workers, there were still many difficult institutional and personal status problems to overcome. They found that "researchers rarely invite extension staff to attend national research seminars or six-monthly review meetings. Even when they are invited, contributions from extensionists may not get a very sympathetic hearing," giving the example of an incident when "the comments of an extensionist on the reasons for the low acceptance by poor farmers of an improved rice variety were ridiculed". Gebrehiwot's (1988) Ethiopian study also found that the actual contact between researcher and extensionist was of an informal and intermittent nature. He also found that the researchers had a relatively low positive evaluation of the technical competence of the extensionists. Lack of training was given as the main reason for the extensionists' inefficiency in transferring innovations to farmers in my survey - of the total extensionist respondents, over half of them had no training during the past three years and of those who had training only a minority of them considered it very useful. Kaigi (1983:37) similarly describes extensionists in Tanzania as being not well trained, tending to "talk to the farmers very passively, without much persuasion".

Most of the extensionists in the survey largely received technical information via publications. Yet to understand technical innovations simply from publications is very difficult especially given the extensionist's lower level of education. Many of the research respondents were aware of this problem believing that the answer lay in making the publications easier to understand. However according to Shin and Evans (1991:16) "written information is not enough; oral communications and personal contact provide opportunities for discussion, clarification and interaction". Another limitation of passing research results only through

publications to extensionists is pointed out by Doorman (1991:112) in his study of the linkages between research, extension and farmer in the Dominican Republic:

"Even in those instances where manuals for extension agents or leaflets for farmers were published, their contents often did not contain the results of national level research but appeared to be based on internationally available rice production manuals or other sources. As a result, extension agents made recommendations on the basis of a standard technology package that had not systematically been adapted to regional and local agro-ecological or socio-economic conditions".

Many of the research and extensionist respondents had suggested that there should be formal contact between researchers and extensionists in person. Yet few indicated that they did have such contacts. Instead there existed a personal and informal network of communication in many instances. There is therefore a clear need for formal contacts to be established as part of the constitutional policy.

### **7.3.2. Inappropriate Technologies**

In Nepal research advisors have recognised the limitations of the extension/diffusion approach, and have emphasised the need for increased adaptive research efforts and the development of improved agricultural technologies which will be relevant and acceptable under local conditions. In this survey, both the extensionists and the researchers admitted that often the technologies to be extended to the small farmer were inappropriate to the conditions in which they farmed.

LARC has tried to overcome the tendency towards inappropriate research by collecting information from local farmers which is then used to help its researchers to develop more appropriate technologies. Farmer involvement in the research priority setting has been facilitated by researchers going on treks to meet the farmers. This has often led to the redefinition of problems and encouraging

collaborative participation. An analysis of LARC respondents subsequently revealed that its researchers were more likely to carry out research into specific local farming problems than any of the other research institutions surveyed.

When questioned most of the research respondents indicated that most of their technologies were target-driven and that their organisations' research priorities were largely determined by policy makers resulting in little or no farmer participation. The solution to this problem lies in giving greater attention to the farmer's real needs rather than the researcher's perceptions of them.

#### **7.4. Conclusion**

The hypothesis that there was not an effective two-way flow of information between researchers-extensionists-farmers was clearly confirmed. Certainly there was a top-down flow of information (and even that had its constraints) but only a very limited two-way flow of information was revealed.

## **Chapter Eight**

### **The Effectiveness of Extension Coverage in Phulbari VDC: a Village Area in a Semi-Subsistence Level Farming Community.**

#### **8.1. Introduction**

The information within this section was obtained from oral histories given by farmers within the administrative area of Phulbari Village Development Committee, personal observations and the interpretation of information as supplied by the farmers. The main focus is on analysing the effectiveness of the sources from which farmers receive information for improving their farming practices and how extension information flows are mediated by farmers' different socio-economic characteristics and geographical accessibility levels.

#### **8.2. Methodology.**

The fieldwork entailed gathering data from the farmers by conducting informal interviews on pre-set topics (see Farmers' Checklist in Appendix 2). Interviews were mostly conducted with groups of farmers numbering from two to sixteen. However on average most group interviews were composed of six farmers. Women rarely made themselves present due to social reasons. It was possible however to interview some women singly during accidental interviewing. The survey was focused around the ninety-two households residing in the hamlets surveyed. A total of about twenty-five group interviews were held. Altogether more than one hundred and fifty farmers were consulted to provide this data. Not all the farmers present in the group interviews contributed anything apart from their time, whereas on the other hand some farmers contributed a great deal. Group interviews were arranged with the following socio-economic categories of farmers:

- poor farmers of Timilsina Gaun



- progressive farmers<sup>1</sup> of Timilsina Gaun
- farmers from Chapa Gaun
- farmers from Buchakot
- farmers from Chap Gaun
- farmers in general from Timilsina Gaun.

Farmers were also randomly interviewed, whether in groups or alone, whenever the opportunity presented itself.

### **8.3. The Research Area in Context**

#### **8.3.1. Administrative Setting**

Phulbari is an administrative area, its correct title being Phulbari Village Development Committee (Phulbari VDC). Phulbari is the collective name for the scattering of hamlets it encompassed. In general each hamlet was largely or solely composed of a single caste or clan (ie. patrilineal family members). Thus for instance in the hamlet of Timilsina Gaun, all the inhabitants belonged to the Timilsina clan of Brahmans.

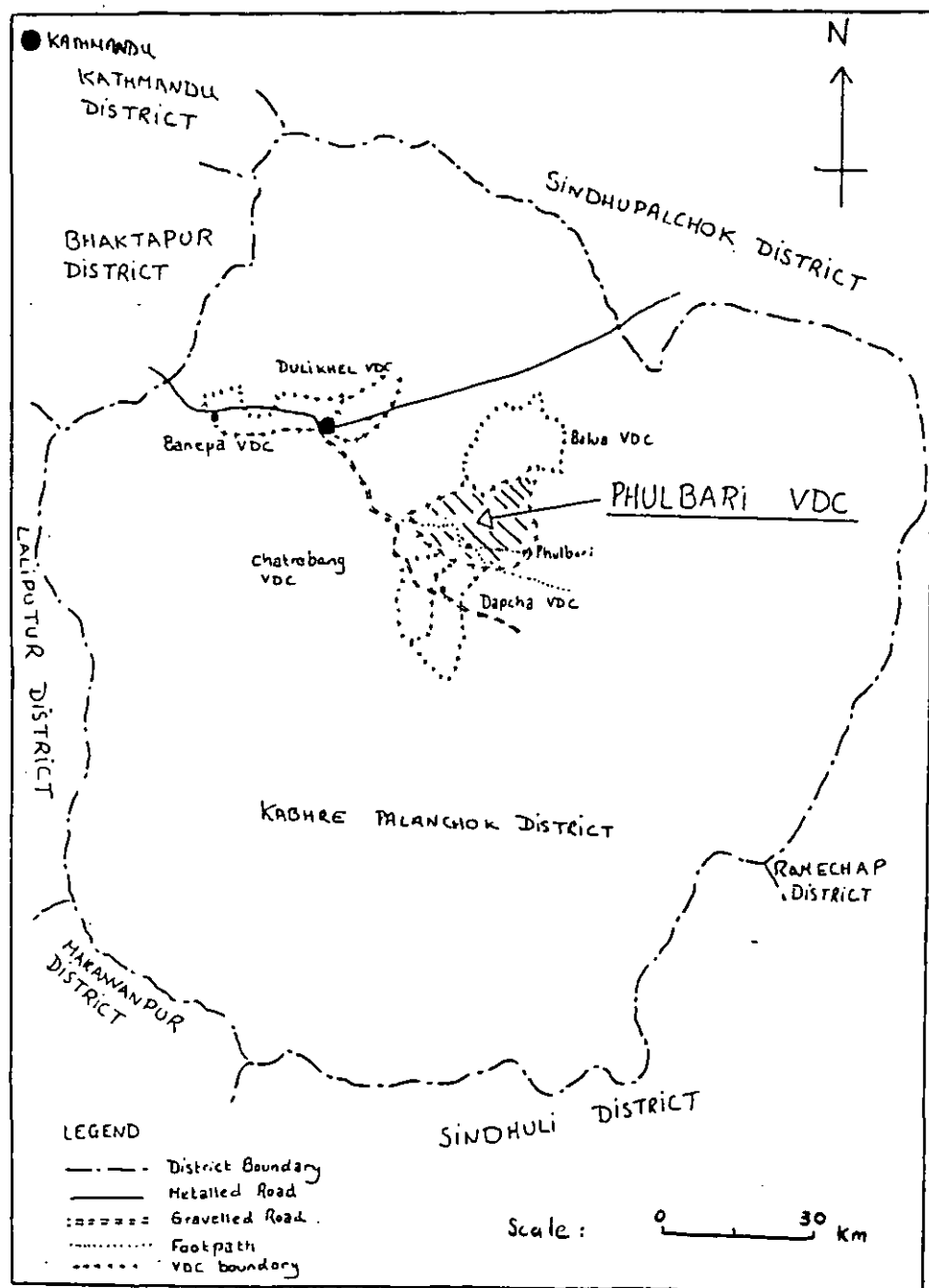
#### **8.3.2. Farming System**

The main characteristics of the farming system in Phulbari were its labour intensity, a susceptibility to soil erosion, a natural nutrition recycling system (despite the increasing reliance on chemical fertilizers), a mixed cropping system and a subsistence level of farming for the most part.

Phulbari had also experienced the introduction of many new varieties (High Yielding Varieties) of its traditional staple crops to its farming system. Also the past few decades had witnessed the intensification of the crops grown due to the use of chemical fertilizer, the introduction of improved crop varieties as well as the introduction of winter wheat. Apart from these changes, farmers generally still farmed in the traditional way, despite being desirous to improve their production levels.

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<sup>1</sup> The term 'rich farmer' is used throughout this account as being synonymous with progressiveness, eliteness and leaders of farming innovations.



**Figure 8.1.**  
**Kabhre Palanchok District showing location**  
**of Phulbari VDC**

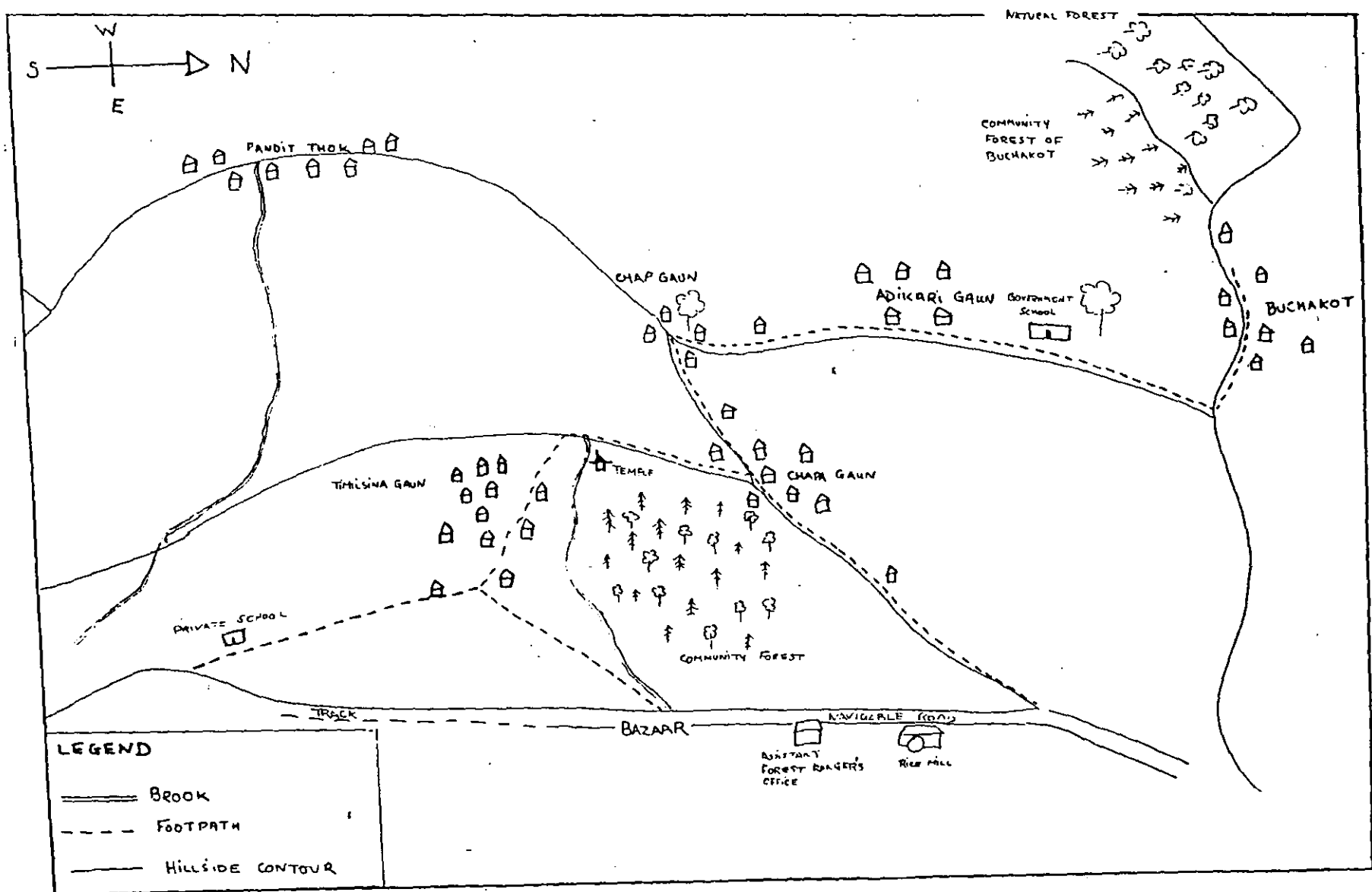


Figure 8.2.

Sketch map of hamlets studied within Phulbari VDC

### 8.3.2.1. Historical Farming Practice

Oral history stated that fifty to a hundred years ago livestock husbandry was a much more dominant part of the farming economy than is the case today. During relatively recent times there has been a move to sedentary agriculture and a steady decline in the importance of livestock husbandry. Mono-cropping had also been practised in the past. This was before the introduction of a new rice variety which had a shorter growth period. Thereafter winter wheat could be grown in what had formerly been the fallow period.

**Table 8.1.**  
**Changes to the farming system through time.**

	Land use/crop harvested	
Season	Past	Present
Winter	Fallow	Fallow
Spring	Fallow	Wheat
Summer	Rice	Rice

### 8.3.2.2. Agricultural Production

Rice, maize and wheat were the staple crops grown. Only a few of the wealthier households managed to produce a modest surplus. This would be sold either to the local markets of Banepa and Dulikhel or in the village bazaar (called Bazaar Gaun). In addition to growing more crops, farmers found that they had to change their crop varieties every three to four years otherwise crop disease attacks would significantly reduce their yield. Thus even to maintain their present production levels the farmers had to adopt and experiment with improved farming techniques. Hence they were all in need of extension services.

### **8.3.3. Extension Services in the Area**

Phulbari was served not only by the government's extension departments (livestock, agriculture and forestry) but also by the extension staff of Nepal-Australia Community Forestry Project (NACFP), an International Non-Governmental Organisation (INGO).

#### **8.3.3.1. Nepal-Australia Community Forestry Project**

This was a non-governmental organisation whose function is to extend forestry research work done by other organisations to its command areas of Kabhre Palanchok District and Sindu Palanchok District in Central Nepal. Its main objective was to increase the forest cover in these areas for the benefit of both the environment and the farmers. It also ran an action research programme within Phulbari. This was a kitchen-garden tree nursery programme which supplied farmers with free tree seeds and plastic grow-bags. However although it was designed to serve the whole of Phulbari, in practice, it was only operational within the hamlet of Timilsina Gaun at least up until the study period of 1992.

#### **8.3.3.2. Extension Services Provided by HMG**

The District Offices for Livestock, Agriculture and Forestry were all located within the small market town of Dulikhel, it being the District Headquarters for Kabhre Palanchok District. These offices were managed by the District Officers of each department. There were two levels of staff underneath their authority. The Agricultural Development Bank (ADB)<sup>2</sup> was also located there.

Located within the vicinity of Phulbari there were a few extension offices. The Forest Ranger's office was located in Banepa. There were three Assistant Forest Rangers under his authority. One of these Assistant Rangers was commissioned to serve Phulbari and as such his house/office was located in the local bazaar. However for much of the time he was absent coming only once or twice a month to his office for one or two hours for consultation with the villagers. At one time he operated a local tree nursery but this activity had ceased over the past few

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<sup>2</sup> The Agricultural Development Bank is run by the government. Its function is to encourage farmers to take out financial loans for farming ventures.

years.

In Dapcha (see Figure 8.10) there was an Agricultural Service Centre (an approximately two and a half hour's walk from Phulbari) which conducted on-site agricultural research and had demonstration plots and trials within its vicinity. It was responsible for nine VDCs including Phulbari VDC and was commissioned to give advice and information on farming matters to the farmers. In the bazaar there was an Agricultural Input Depot. Its function was to provide the villagers with a supply of chemical fertilizers and pesticides, if available. There was also a livestock sub-centre in the bazaar staffed by a Junior Livestock Technical Assistant who provided information mostly on husbandry related topics.

#### **8.3.4. Socio-Economic Conditions of Phulbari**

There was no electricity in the village. Development schemes as well as self-help organisations had brought piped water supply into most of the hamlets. In the forefront of domestic water supply was Timilsina Gaun where many households had their own personal water pump in their courtyard. In general however, most hamlets only possessed one or two water pipes for communal use. In contrast to this was the poorest hamlet - Buchakot - which still had no piped water supply.

##### **8.3.4.1. Economic Condition of the Farming Population**

All the farmers interviewed owned their own land, but the amount of production each household achieved varied. At one end were the households who in addition to being self-sufficient in food throughout the year, had surplus production for sale. At the other end were the households who achieved food self-sufficiency for only some months of the year (the amount of months varying from household to household). To meet their subsistence needs these farmers were obliged to carry out off-farm activities such as waged farm labouring.

Farmers who owned khet land were automatically wealthier than those who only owned bari land. This was because rice could only be grown successfully on khet land, and commanded a much higher market price than any other cereal. In

addition, irrigated land such as khet land, would produce five times as much cereal yield as unirrigated land. Therefore to own even a small amount of khet land would be better than owning large tracts of bari land.

Some farmers carried out part-time, off-farm employment, not because they could not produce enough from their land but because their education level was above the average for their community and so encouraged them to undertake formal employment such as school teaching, government post or any other opportunity that presented itself to them. Others carried out part-time work because they had to buy food during lean months.

#### **8.3.4.2. Education**

The majority of the adult farmers were illiterate but some communities had a higher than average level of literacy and education due to their superior socio-economic condition. This was found more so amongst the wealthy Brahman male farmers.

There was one privately owned primary school in the area and one free government owned primary school. Not all the village children attended these schools, depending on the parents' attitude towards schooling and the importance of their children as a source of family labour.

#### **8.3.5. The Hamlets Studied.**

Four hamlets were selected as the research area. These were Timilsina Gaun, Chapa Gaun, Chap Gaun and Buchakot (see Table 8.2). In addition, further 'incidental' interviews through casual meetings with farmers from the surrounding area took place.

The bazaar<sup>3</sup> was the main activity point for the hamlets within Phulbari VDC. The following facilities were located there: Forestry Assistant Ranger's office, a livestock sub-centre, a milk collection depot, an Agricultural Input Depot, two teashops, three village stores, and a rice de-husking mill.

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<sup>3</sup> The bazaar was a small collection of shops, services and houses serving Phulbari VDC.

**Table 8.2.**  
**Characteristics of the hamlets studied.**

Characteristics of hamlets	Approx walk from road (minutes)	Predominant caste	Economic situation
Hamlet Name			
Timilsina Gaun	25	Brahman (high caste)	surplus food sold
Chapa Gaun	40	Tamang (ethnic group)	self-sufficient all year
Chap Gaun	55	Tamang	self-sufficient for 9 months
Buchakot	100	Kami + Damai (low caste)	self-sufficient for 6 months

#### 8.3.5.1. Timilsina Gaun

Timilsina Gaun was located on the hill-side<sup>4</sup> at a twenty-five minute walk uphill from the bazaar. As such it was the nearest hamlet to the bazaar and prospered from its easy accessibility. It was easily identified as the richest hamlet of the area initially by the wealthier appearance of its houses. Yet it also contained a minority of poor households as well. The presence of toilets in the hamlet was an unusual feature in the rural areas of Nepal, especially as it was not a tourist area.

The farmers of Timilsina Gaun owned the best farmland which included the majority of the vicinity's khet land. Some households grew cash crops on a small scale. The more innovative farmers had started market gardening as an alternative commercial venture. Timilsina Gaun was renowned within Phulbari for its progressive farming.

Timilsina Gaun was composed entirely of Brahman caste people. The majority of

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<sup>4</sup> All hamlets were located on hillsides thus leaving the valuable flat land free for farming.



households were inter-related either by blood or through marriage. Sixty years ago, there were only six houses in Timilsina Gaun but by 1992 this figure had increased to thirty-two.

#### **8.3.5.2. Chapa Gaun**

Chapa Gaun was located above Timilsina Gaun at a higher elevation. It was composed of thirty-two Tamang households<sup>5</sup>. The hamlet, although not particularly poor, had a less wealthy appearance than Timilsina Gaun, with only one water tap present, shared amongst the whole community.

The Tamang farmers owned both khet and bari land but the amount of khet land they owned was much less than their bari land and furthermore was significantly less in area than what the Brahman farmers of Timilsina Gaun owned. They grew winter wheat and rice on the khet land and maize and wheat on the bari land. Their farming system had undergone intensification compared to what it was like thirty years ago. For instance at the time of the research, ninety-five per cent of the whole community were self-sufficient in food throughout the whole year; whereas before introducing chemical fertilizers to their fields, only twenty-five per cent of the households had been self-sufficient in food for the whole year. The use of chemical fertilizers had improved the fertility of their land enabling them to grow two crops per year (see Table 8.3.). Their rice production had increased due to the introduction of better farming practices - the use of draught power for ploughing and the introduction of multi-cropping. These changes had led to an increase in their production levels. Despite this, they still grew no cash crops because of a lack of resources, namely a lack of land surplus to their subsistence needs.

#### **8.3.5.3. Chap Gaun**

Chap Gaun was located on the other side of the ridge from Chapa Gaun. This hamlet was also composed mostly of Tamang people. Chap Gaun houses had a

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<sup>5</sup> In Nepal people of the same caste prefer to live together in the same hamlet/area as there is close social interaction and co-operation between people of the same caste as opposed to people of different castes.

less wealthy appearance than those in neighbouring Chapa Gaun.

Out of the total of eleven Tamang households living in Chap Gaun, eight households (over half) were deficient in food for six months of the year, whilst the remaining three households were deficient for four months of the year. This serves to reveal that their agricultural production was less than that of neighbouring Chapa Gaun. This could be due to a variety of reasons such as smaller land holding size, less fertile land and lack of irrigation facilities. They also had a smaller area of khet land on which they grew rice. They did not grow any cash crops due to a lack of sufficient resources - all their labour and land went into subsistence agriculture.

#### **8.3.5.4. Buchakot**

Of these four hamlets studied, Buchakot was the one located at the furthest distance from the bazaar - alongside a ridge top. It was composed exclusively of the low caste Kami and Damai. Altogether in the hamlet there were four Kami households and eighteen Damai households. Their traditional occupation, apart from farming, was tailoring and musical entertainment (Damai) and blacksmithing (Kami). They also did some labouring work for other farmers. This formed a supplementary income for their farming activities.

According to tradition, Brahmans and Kami and Damai castes have always had a patron-client relationship. So when the Brahman people moved into what is now Timilsina Gaun, the Kami and Damai were soon to follow. They were granted land on which to settle which was out of sight of Timilsina Gaun and therefore an acceptable distance away. This location was known as Buchakot and it was significantly less desirable farm land.

Their low social status played a direct role in their inter-relationships with the castes of neighbouring hamlets. Their ritual impurity in Hindu culture affected their day-to-day life. They had to manually carry water to their hamlet because there was no water source in their own hamlet even for land irrigation. Subsequently they fetched water from a source which was a twenty minute climb

up to their hamlet.

In common with the farmers from the other hamlets of Phulbari, the farmers of Buchakot carried out subsistence-level farming. However even this level of farming was not enough to sustain them throughout the year. Their low level of agricultural production was due to the poor quality of their land. In addition their farm land was composed of red ferrous soil, its high iron content making it difficult to plough and causing it to heat up quickly and become dry. None of the Kami and Damai farmers owned any khet land, only bari land. Consequently they did not grow rice, instead they grew maize and wheat as their staple crops. On their bari land they operated a two-cropping pattern of maize and wheat, and maize and fallow, which enabled them to have two harvests per year. As of 1992 they had not grown any cash crops despite wanting to, because of their lack of irrigation facilities. None of the Buchakot households produced enough food to last them throughout the year.

**Table 8.3**  
**Cropping patterns of the hamlets studied**

**a) Khet land use**

<b>Year</b>	<b>1960s</b>	<b>1970-80</b>	<b>1992</b>
<b>Hamlets</b>	<b>winter:summer</b>	<b>winter:summer</b>	<b>winter:summer</b>
<b>Timilsina Gaun</b>	fallow:rice	wheat:rice(l)	wheat:rice(HYV+l)
<b>Chapa Gaun</b>	"	"	"
<b>Chap Gaun</b>	"	"	"
<b>Buchakot</b>	no khet	no khet	no khet

## b) Bari land use

	1960	1970-80	1992
Hamlets	winter:summer	winter:summer	winter:summer
Timilsina Gaun	fallow:maize	wheat:maize(l)	wheat:maize (l+HYV)
Chapa Gaun	mustard/millet (good soil); buckwheat (poor soil)	wheat:maize (l)	wheat:maize (l+HYV)
Chap Gaun	"	"	"
Buchakot	fallow	maize (l):fallow	wheat:maize (l+HYV)

Abbreviation: l= local seed varieties

Tables 8.3.a and b show how the cropping patterns of the hamlets have changed over the years. It shows that increased cropping has occurred throughout the hamlets with the elimination of the traditional winter fallow period as a result of the introduction of winter wheat. In Buchakot this occurred a decade later than in the other hamlets, perhaps because of the difficulty they had purchasing chemical fertilizer to make it possible to grow crops throughout the year on the same piece of land. They said that the reason was because nobody had encouraged them to grow wheat. They had seen it being grown in the neighbouring village of Banepa and had queried the farmers there for more information so as to be able to grow it themselves. In Chap Gaun and Chapa Gaun the introduction of wheat resulted in a decrease in the varieties of crops grown, notably buckwheat, mustard and finger millet. However in Buchakot the introduction of wheat had led to more crops being grown. In addition to the majority of hamlets reducing the variety of crops grown, the yield of those crops had, by contrast increased, often by double the amount. In Chapa Gaun the farmers said that their yields of rice had doubled from one muri per ropani<sup>6</sup> in the 1960s to two muris per ropani at the time of the research (1992). As there had been no increase in the area being cultivated this increase in agricultural production was probably due to intensification by introducing chemical fertilizers.

<sup>6</sup> *Muri* and *ropani* are Nepalese terms for local measurements. Muri is the measurement for crop production and is equivalent to 2.4 bushels, whereas ropani is a measurement for land and is equivalent to 0.0509 hectares.

#### **8.4. Extension Coverage within Phulbari.**

The following account tries to reveal the reality of the extension service from the farmers' perspective and the extent to which it is initiating changes to the traditional farming system in Phulbari. The theoretical aims of the extension service were themselves never criticised by the farmers. What was criticised however was the extensionists lack of involvement with certain categories/ social groups of farmers. The following account exposes the extensionist's visiting bias as well as revealing other weaknesses within the extension system.

Few farmers in Phulbari had contact with extensionists, principally because the extensionists responsible for Phulbari had areas too large to administer to effectively and equally to all the farmers. The extension service had too little manpower to respond effectively to local needs and so it tended to rely on transmitting information and its services primarily to contact farmers, hoping that some diffusion of innovations to the rest of the farming community would occur.

##### **8.4.1. Lack of Sufficient Technical Information**

The farmers who had contact with extensionists, although they were very interested in the information and advice they gave them about farming and forestry, had on many occasions, been given insufficient technical information to enable them to carry out the extensionists' recommendations. As an example, the Tamang farmers of Chapa Gaun complained that the services provided by the Livestock Sub-Centre in the bazaar were not sufficiently skilled in transferring technical knowledge to the field. These farmers wanted technical advice about animal health and husbandry. Yet the staff were insufficiently informed to be able to give them sufficient technical information. Other farmers were also critical of them because the suggestions they gave were not applicable to their circumstances. For example although the Livestock Sub-Centre staff had encouraged them to increase the size of their cattle herds they had not suggested to them a complementary programme to increase the amount of fodder or grass available. Consequently the services provided by the Livestock Sub-Centre were not so highly esteemed by many of the farmers.

The forestry service had also not escaped from the farmers' criticism. The reason for this was due to a combination of two reasons - extensionists were blamed for not being interested in passing on information to the farmers and/or that they did not possess that information. For example forestry extensionists were found to be failing to perform their duty of providing information and advice for the post-planting period of community forests. Timilsina Gaun Forest Management Committee members complained that they had not been given enough technical information from the extensionists to be able to manage community forests on their own successfully due to the lethargy of the forestry staff.

Agricultural extensionists were also blamed for imparting incomplete technical advice to the farmers. For instance one farmer had a personal visit from a Junior Technical Assistant (JTA) to explain about new varieties of grasses and legumes for cattle feed. Although the farmer (who was from Adhikari Gaun hamlet) was very impressed that the JTA had visited him, he later realised that he had omitted to tell him from where he could get the seeds for the grasses and legumes. Therefore not only had the extensionist's visit been wasted but also the farmer was unable to effectively adopt an improved farming practice despite being willing to try.

These failings on the part of the extensionists are a reflection, in part, of their inadequate training, making it very difficult for them to impart sufficient knowledge about new farming techniques persuasively to farmers. Even if farmers do adopt the recommended technologies, it is unlikely that the knowledge they will receive from the extensionists would be adequate for them to use the technologies effectively.

The Improved Clay Stove Programme<sup>7</sup> was a similar failure due to not supplying the farmers with enough technical details. Improved clay stoves, as opposed to the traditional clay stoves, were cleaner and more efficient in their fuel-wood

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<sup>7</sup> The Clay Stove Programme is part of the aims of the Ministry of Forests' Community Forestry Development Project (CFDP). Its intention is to introduce and popularise improved cooking stoves which reduce fuel-wood consumption as well as being less smoky. The Nepal Australia Community Forestry Project is also involved in this activity.

consumption. They had been distributed free to many households. However none of the extensionists had passed on the information of how to maintain these stoves to the women. Consequently, as the stoves broke through use, nobody knew how to repair them. Hence the household would revert to using their former stove which, seeing as they had designed and built themselves, they also knew how to repair.

#### **8.4.2. Lack of Contact with the Farmers**

The majority of farmers interviewed had primarily criticised the extensionists for not visiting them. Even the progressive farmers of Timilsina Gaun who were singled out as the group who had the most attention from the extension service, were still dissatisfied with the amount of visits they had received. One of these farmers made this comment about the apathy of the staff of the Livestock Service Sub-Centre: "the staff never volunteer to come up to our farms to see our animals, instead we always have to go to them."

The forestry extensionists were also criticised. For example the local farmers on the Community Forestry Management Committee of Timilsina Gaun, were dissatisfied with the forestry extension personnel: "As a whole we are not getting satisfactory services from forestry staff". The forest ranger was criticised for his absenteeism by the farmers. The farmers said he was supposed to reside in his office/house in the bazaar, but in practice he never did. Instead he would make irregular and infrequent visits to his office during the course of the year, sometimes once every two months and at other occasions, once every half year. This meant that there was a greater possibility for mismanagement of the community-owned forests. For example mismanagement had happened once during the distribution of firewood and fodder amongst the farmers of Timilsina Gaun. Another consequence was that once the forest ranger stopped visiting them, both the village-elected forest guard and the forest watcher had slackened in their responsibilities. In addition, even though the Brahman farmers of Acharya Gaun (see Figure 8.2) had started their own forest nursery over six years ago, for the purpose of establishing their own community forest, the authority to manage the forest had still not been handed over to them by the forestry staff. The farmers

blamed this failure on the lethargy of the forestry extensionists in interacting with them and setting aside time for discussions. Similarly many other farmers from other hamlets were frustrated that extensionists rarely visited them and had gone to the District Forest Headquarters in Dulikhel to request that they visit them or in some instances to complain about the lack of visits.

Tables 8.4 a,b,c. show that extensionists were not involved in the introduction of these crop varieties, but that instead it was the farmers themselves. Amongst the farmers it appears that those from Timilsina Gaun were the most active in introducing new varieties hence earning their title of being the most progressive farmers of the area. Yet although the farmers from Timilsina Gaun were usually ahead with regards to introducing new cereal varieties into Phulbari, Tamang farmers from Chap Gaun were more progressive with regards to maize varieties. The Tamang farmers, being poorer had less khet land on which to grow rice than the wealthy farmers in Timilsina Gaun. Similarly the cultivation of maize by Timilsina Gaun farmers was of secondary importance.

**Table 8.4.**  
**Introduction of New Crop Varieties (HYVs) and Wheat into Phulbari.**

**(a) Rice HYVs**

<b>Name of crop variety</b>	<b>Year of Introduction</b>	<b>Introducing Agent</b>	<b>Source</b>
<i>Pokhareli</i>	1972/3	Progressive farmer from Timilsina Gaun	Obtained from the National Agricultural Centre (NARC) in Kathmandu
<i>Khumal 4</i>	unspecified date	Progressive farmers of Timilsina Gaun	This variety was released from NARC in 1987 and was specifically recommended for use in Hill areas
<i>Khumal 2</i>	"	"	"



(b) Maize HYVs

Name of Crop Variety	Year of Introduction	Introducing Agent	Source
<i>Khumal Yellow</i>	1970	Tamang farmers from Chapa Gaun	It was a Tamang farmer who first introduced this variety to Phulbari. He received it directly from NARC.
<i>Khumal Yellow</i>	1972/3	Brahman farmers of Timilsina Gaun	
<i>Khumal Yellow</i>	1987	Brahman farmers of Acharya Gaun	This variety was first released by NARC in 1968 and recommended for the Hill areas.

(c) Wheat

Name of crop variety	Year of Introduction	Introducing Agent	Source
<i>Seto medulo/ Nepali rato</i>	1. 1950 2. 1955 3. 1965	1. Progressive farmers of Timilsina Gaun. 2. Tamang farmers of Chapa Gaun. 3. Poor farmers of Timilsina Gaun	These two varieties are local varieties which were brought to Phulbari from elsewhere.
IR 21	unspecified date	Tamang farmers of Chap Gaun	
<i>Two Eight Six</i>	"	Tamang farmers of Chap Gaun	
<i>RA 21</i>	1982	Timilsina Gaun	Brought from Baktapur, near Kathmandu
<i>Gango jumuna</i>	unspecified date	Tamang farmers of Chap Gaun	Farmers from Chap Gaun try to change their wheat varieties every three years to maintain yield levels and to avoid disease attacks.

#### **8.4.3. Extensionists' Unequal Contact with the Hamlets**

When extensionists arrived in the area they had to pass first through Timilsina Gaun to visit other hamlets and would frequently not trouble to go any further. The Government's and NACFP's extension approach generally used within this area was that of individual farmer contact. This results in a low coverage in terms of the total population as well as a disparity of visits between hamlets geographically adjacent to the bazaar and to those further away. Even for the extensionist to attempt to give an equal service to all hamlets would involve too much time being spent walking to and from hamlets. Hence the reality was that the extension system did not provide an equitable distribution of services to all the hamlets of Phulbari VDC.

It became apparent from the comments of the farmers, that the extensionists had made far fewer visits to other hamlets than to Timilsina Gaun. Also in general, the further away the hamlet was from the bazaar, the less visits it could expect from the extensionists. Tamang farmers from Chapa Gaun had complained to the District Agricultural Office (DAO) in Dulikhel that extensionists never stayed with them but were always staying either in the bazaar or in Timilsina Gaun. The Brahman farmers of Acharya Gaun were also annoyed with this favouritism, and had also complained to the District Agricultural Office. Acharya Gaun was a steep and distant climb away from the bazaar. Hence although it was composed of a Brahman community, its location still discouraged extensionists from making frequent visits.

Timilsina Gaun received more extensionist visits than any of the other hamlets. The results of the research implies that its accessibility had much to do with this, acting as the "gateway to Phulbari". Also as Timilsina Gaun was the home of many of the local elite, it was to be expected that the officials would show respect to these individuals by staying in their homes overnight as their guest. This is a typical custom of Nepalese hierarchical society. In addition, some of the farmers went out of their way to build up a good relationship with the extensionists, encouraging them to stay the night by providing them with modern

facilities such as an outdoor toilet and piped water.

Another incident further revealed the preferential treatment given to farmers of Timilsina Gaun by extensionists. A Home Nursery Programme had been started in Phulbari in 1992, organised by the Nepal-Australia Community Forestry Project (NACFP). The aim of the programme was to encourage farmers to plant more trees on their farms by transferring knowledge to them about seedling raising, seed collection and storage, so as to be eventually self-sufficient as regards their forest needs. However this programme had not been publicised in any of the hamlets apart from Timilsina Gaun and so the whole benefit of having a private woodlot would rest entirely with the farmers of Timilsina Gaun. An analysis of the farmers selected by extensionists for study tours<sup>8</sup> shows a preference for those living close to the roadside, ie. Timilsina Gaun or the bazaar. Farmers from Acharya Gaun had complained that none of them had ever been selected to go on one of these study tours (see Tables 8.4. and 8.5). Some hamlets received virtually no services from the extension system therefore these farmers were self-reliant with regards to finding information about new farming techniques.

Table 8.5. shows that male, high caste farmers are the preferred choice of tour participants. The farmer's accessibility also counts. Therefore amongst the farmers of Phulbari who have been selected for these tours, all were male, all were of the higher castes and all lived in accessible locations.

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<sup>8</sup> Extensionists often organise study tours for selected farmers. These tours, which may last up to ten days, are entirely free for the farmer, including board and food. The farmer will be taken to see new farming practices being carried out in other districts.

**Table: 8.5.**  
**Farmers Selected to Attend Study Tours Since 1985**

Farmer no.	Caste	Sex	Residence	Type of Tour
1.	Brahman	Male	Timilsina Gaun	Forest User Visit
2.	Newar	Male	Bazaar	Agricultural Tour and Livestock Tour
3.	Brahman	Male	Timilsina Gaun	Livestock Tour
4.	Brahman	Male	Timilsina Gaun	Forestry Tour

#### **8.4.4. Type of farmer mostly contacted by extensionists.**

In Phulbari, the farmers chosen as contact agents for the extensionists were the progressive farmers of Timilsina Gaun. No matter how conscientious a contact farmer is, in Nepal the common feeling of *afno manche* (loyalty to one's own circle of people) especially of hamlets of different castes prohibits their effectiveness. There is in addition a strong element of individualism amongst each hamlet in Phulbari with some hamlets having antagonistic, rivalry feelings towards each other. For example village improvement projects had been initiated by the social worker/contact farmer only in Timilsina Gaun, his own hamlet, at the neglect of surrounding hamlets. In order to counteract this bias, each hamlet should have its own contact farmer elected otherwise the use of contact farmers has limited effectiveness as a cross-caste communication link.

Although the progressive farmers of Timilsina Gaun were expected to pass on information to neighbouring farmers yet according to the Brahman farmers of Pandit Thok (a neighbouring hamlet), this information flow was not taking place. The lack of co-operation between the Brahman inhabitants of Pandit Thok and the Brahman farmers of Timilsina Gaun prevented any effective communication between them. In addition, farmers from Pandit Thok suspected that Timilsina Gaun farmers dissuaded the extensionists from visiting them, revealing the tensions between farmers of the wealthy hamlet of Timilsina Gaun and the poorer hamlet of Pandit Thok. This results in important information not being shared by

the farmers who are most in need of information on how to farm using more productive methods. Local factions are not taken into consideration when extensionists choose contact farmers for different areas. This omission affects the effectiveness of the use of contact farmers.

Farmers selected to attend agricultural, livestock or forestry tours were also obliged to pass on the information they had gained to other farmers. But according to Tamang farmers of Chapa Gaun this again never happened. In addition it was mostly male Brahman farmers from Timilsina Gaun who were selected for such tours (see Table 8.5.). Despite this there was a small minority of farmers who were not only knowledgeable about new farming practices but were also active in passing on the information to other farmers. In the forefront regarding this aspect were the two school teachers and Susider Timilsina, the ex-forest nursery chief/local social worker. They were regarded as knowledgeable and approachable farmers who would discuss farming issues with the other farmers regardless of their caste or from which hamlet they come from. These features are essential in the choice of a contact farmer.

#### **8.4.4.1. Accessible Farmers**

Many farmers had pointed out that extensionists and their projects frequently went no further than Timilsina Gaun. This can be readily illustrated by the fact that NACFP's Home Tree Nursery Programme had only been introduced to Timilsina Gaun despite its advocated intention to benefit the whole of Phulbari. Similarly the Improved Clay Stove Programme had its greatest application in Timilsina Gaun where seven stoves had been installed as compared to the three in neighbouring Chapa Gaun and none in the more distant Acharya Gaun and Buchakot. *The implication is that extension staff are progressively less active in hamlets which are further away from a road, ie. less accessible.* This can be further illustrated by the example of the introduction of community forestry into each hamlet. This was introduced in 1976 in both Timilsina Gaun and Chapa Gaun, in 1982 in Chap Gaun and finally ten years later in Acharya Gaun, the most distant of these hamlets. Authorization had still not been handed over to the farmers of Buchakot during the time of the research in 1992, despite the fact that

they had already planted their plantation. These dates show that the more distant a hamlet is located from the bazaar and the road, the later the project was introduced there by the extensionists.

The introduction of chemical fertilizers into the local farming system follows a similar concentric pattern, with their earliest use being recorded in Timilsina Gaun and their use by hamlets progressively distant from the bazaar being introduced at progressively later dates (at approximately two to three years interval).

#### **8.4.4.2. Progressive Farmers**

The progressive farmers of Phulbari were concentrated in the hamlet of Timilsina Gaun. These farmers were also wealthier than most farmers and had the necessary resources to try out new farming ventures. Often they would be engaged in activities in addition to farming such as school teaching or business. Subsequently they were regarded as the village elite. Their ideas and farming techniques were much sought after by other farmers even in other hamlets.

The Brahman farmers of Acharya Gaun said that they regarded Timilsina Gaun as the main source of their information. They placed high value on the information to be had from Timilsina Gaun farmers both because extensionists often visited it and because the farmers were rich enough to readily adopt new farming practices. They viewed its proximity to the bazaar as being one of the major reasons why it received new farming information so soon but they also linked it to many of the farmers being more progressive as compared to farmers in other hamlets.

It was characteristic of the progressive farmer category to have close personal involvement with officials responsible for rural development, with some having family connections with them. Furthermore, most of the officials were of Brahman caste like themselves and similarly educated therefore their social standing was similar. They were also very determined to solve their farming problems and get new seed varieties. If the local extensionists did not have sufficient information for their needs, they were confident enough to go to higher

level staff at the Regional Agricultural Office in Kathmandu and then ultimately if necessary to the National Agricultural Research Council also in Kathmandu. They were undeterred by transport costs and time lost from their farming work principally because they were the resource-rich farmers within their community and they recognised the advantages to be gained from being the first to start new farming practices. This attitude was found to be in marked contrast to that of the majority of farmers interviewed who could not usually spare time even to listen to radio farming programmes.

The progressive farmers were familiar with the extensionists' tools of mini-kits<sup>9</sup>, Farmer's Field Trials (FFT)<sup>10</sup> and Pre-Production Verification Trials (PPVT)<sup>11</sup>. They knew that demonstration plots of FFT and PPVT were located in the vicinity of the Agricultural Service Centre at Dapcha (see Figure 8.1) and that free mini-kits were available there in addition. Much of this knowledge was also attributed to the fact that they had relatives who were JTAs and who even though they were stationed in other areas, they still used to come and visit them occasionally. When these JTAs visited them, they provided them with information on new farming practices as well as distributing free mini-kits to them.

#### **8.4.4.3. Farmers' Economic Condition**

Information tended to gravitate towards the wealthy or influential farmers such as the village elites, leaders and contact farmers. This was because these people tend to monopolise and utilise their contacts with extensionists and at the same time extensionists prefer to visit and pass on information and services to them. They are also typically wealthier than the average farmer so making it easier for them to try out new technologies in their fields as they have less land shortage

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<sup>9</sup> A 'mini-kit' is a composite package of improved cereal seeds (released and/or pre-released varieties), planting instructions, fertilizers and farmer feed-back cards which are distributed free to farmers via the national extension service.

<sup>10</sup> Farmer's Field Trial is the term used by extensionists for collaborative research work done in the farmers' fields by the researcher and the farmer himself.

<sup>11</sup> Pre-Production Verification Trials is an extensionist's term for trials conducted in the farmer's field before releasing the seed variety for widespread extension.

than other farmers. According to the village leaders themselves, it is almost a tradition for extensionists to consult them first before approaching the community as a whole with its extension programmes. Hence local leaders will be the first to know about the activities occurring in their village. *Social contact with the local elites therefore provided the ordinary farmer with a valuable source of information about new innovations.*

Wealth was found to have a positive effect on farmers' decision to adopt innovations. Wealth usually meant that the farmer was less overworked than his poorer neighbours giving him more time to listen and think over information given by other people and to become more active in seeking information for himself. Of greater importance it meant that the farmer had the resources available to adopt the innovations.

In contrast, poverty was found to have a negative effect on farmers' ability to find out information. For example the group of poor farmers in Timilsina Gaun could never spare the time to attend to any of the agricultural demonstration fairs which were regularly held at Dulikhel. Only once had one of these poor farmers attended a fair and that was seven years ago.

The poor farmers of Buchakot made a very perceptive criticism against the development projects which had been in Phulbari. They complained that agricultural research is always directed at what is already comparatively productive land, whereas conversely, *poor, unirrigated land such as theirs (bari land) is never the target for research projects.* HYVs are best suited to fertile, irrigated land as owned by the richer farmers and are not suited to poor, unirrigated land. The farmers of Buchakot had requested government assistance to irrigate their land but this assistance was not forthcoming. They were bitter about this and took it as an indicator of the general disregard of government staff for their economic welfare. Similarly the staff of the Agricultural Development Bank were not forthcoming with the poor farmers of Buchakot when they approached them for information and a loan. They were refused both these services on the grounds that they did not have enough land and did not have



enough resources to be able to repay the loan later on.

#### 8.4.4.4. Caste.

The most apparent feature of Table 8.6 is its predominance of Brahman farmers selected for training and a marked absence of low caste farmers such as Kami and Damai. It also shows a preference for male farmers. A breakdown of the caste composition of the farmers' hamlets revealed that even where there was no high caste majority, higher caste farmers are selected in preference to lower castes. The two Tamang farmers selected were the majority caste of their hamlet and in addition, one was the local forest guard. The results depicted in this table indicate the extensionists' preference for training higher caste farmers. Altogether 61% of the farmers mentioned were Brahman, 23% were Newar and only 15% were Tamang. In addition 38% were women which was quite surprising considering women's generally low involvement with extensionists.

**Table 8.6.**  
**Characteristics of Farmers Selected for Training by Extensionists**

Gender of farmer selected	Caste selected	Majority caste of farmer's hamlet
F	Brahman	mostly B
M	Brahman	mostly B
M	Brahman	mixed
M	Brahman	mostly B+T
F	Brahman	mostly B+T
M	Brahman	missing data
M	Brahman	mixed
M	Brahman	mixed
M	Newar	T+N
M	Newar	T+N
F	Newar	T+N
M	Tamang	mostly T
F	Tamang	mostly T

Abbreviations:- B = Brahman T = Tamang N = Newar

It was found that all the extensionists responsible for Phulbari were Brahman. The Kami and Damai farmers of Buchakot believed that as there was no extensionist of their caste, they could not be adequately represented at official level which was why their needs were regarded as low priority. They believed that they received little attention from extensionists because of their low caste. In addition they also criticised the formal, top-down approach of the extensionists and the fact that they would not come into their homes to talk to them but would instead talk down to them from the pathway overlooking their houses either consciously or unconsciously because of their low status. The extensionists did not encourage a two-way conversation but instead merely issued their message then left. As a result the extensionists never realised the problems faced by these farmers nor whether or not their messages were appropriate to the farmers.

Low caste was not found to be synonymous with lack of innovativeness. For example the poor Buchakot farmers' lack of resources and low status did not deter their eagerness to find out information about new innovations. Hence despite their heavy daily workload, they could still find the time to visit the District Agricultural Office and Livestock Office in Dulikhel as well as the Agricultural Development Bank whenever the need arose. They had also on their own initiative, visited the agricultural demonstration plots in the Agricultural Service Centre at Dapcha. However the staff there ignored them saying they did not have time for them, despite it being part of their duties to give information about their work to any visiting farmer. Therefore they learnt nothing about the new techniques being practised there. This incident suggests that their low social status, with regard both to their poverty and caste, negatively influenced the staffs' behaviour in refusing to give them any information. This is in sharp contrast to their attitude towards the wealthy, high caste and progressive farmers of Timilsina Gaun who regularly obtained information from them.

#### **8.4.4.5. Gender.**

Although it must be admitted that far fewer women than men were interviewed in this survey, the comments that the women made showed that they were as

knowledgeable in most instances about farming matters as men. Like the men, they too were interested in obtaining information about improved farming practices and would obtain new varieties of seeds to try out in their fields. Because of social customs and a busier workload, they had less contact with extensionists than men. Extensionists were less active in passing on their extension messages to women perhaps because they themselves were men and therefore found it easier to talk to members of their own sex or because they believed it would be more effective to talk to the male heads of household who were also the decision makers. Hence almost all the information women received was gathered from neighbours and relatives. Also as women infrequently left their hamlets they would be less exposed to observing new farming practices in other villages. Yet within the hamlets there was little restriction in information transfer across the sexes. The local information 'gatekeepers' were just as informative to female farmers as to male farmers. Because of the greater farming contribution made by women, it was of little surprise to find that they also conducted their own experiments and used trial and error tactics during the phase of introducing a new crop variety to their farms.

#### **8.4.4.6. Associated Factors.**

The results of the study shows that often it is a combination of factors which encourage or discourage extensionists from visiting individual farmers or hamlets rather than a single over-riding factor. For example in the case of Buchakot, not only was it the most isolated hamlet but in addition its inhabitants, being of low caste, were also socially isolated to an extent. These two negative determinants reduced the desire of extensionists to visit them to a significant extent.

*It appeared that accessibility is of greater influence on its own than is caste.* Caste on its own was not a major deciding factor for extension coverage. This could be proved by the fact that Brahman farmers from hamlets other than Timilsina Gaun were not found to have had noticeably any more visits by extensionists than lower caste farmers in other hamlets. One Brahman farmer from Pandit Thok (see Figure 8.2) believed that the reason why he had never been visited by any extensionist was because his hamlet quite far removed from

the bazaar and his house was situated apart from the other houses of Pandit Thok. Hence he believed that residential locality was a major factor influencing extensionist visits. Similarly in Timilsina Gaun the farmers who were frequently visited by extensionists were accessible, high caste, wealthy and progressive. All these factors when combined together provided a stronger pull factor for extensionist coverage than any of these factors taken singly.

### **8.5. Other Formal Information Sources for the Farmers**

The services offered by the Agricultural Development Bank were not well known to the majority of farmers in the area. Even fewer farmers were aware that the Bank chose areas for specific development projects such as buffalo rearing, and would give loans to farmers but only for those specific activities. The fact that the facilities available from the Bank were not familiar to most of the farmers was due largely to its lack of promotional activities. Although the Bank operated a five-year Pocket Area Plan, it was found that it would be typically three years later before it started to inform farmers about the services available to them in that particular area. In addition most of the farmers who knew about the Bank's loan facilities had gathered this information not through its staff but from other farmers or relatives. The Bank was therefore not effective in transferring information itself nor sufficiently active in working through the extensionists to impart knowledge of its services and facilities to the local population. This reflected a serious lack of co-ordination amongst the various organisations concerned with development. In addition the Bank suffered from a lack of co-ordination of its activities.

However despite the general lack of awareness of the Bank's services, it was found that the progressive farmers of Timilsina Gaun were well familiar with its services, with some of them having taken out loans. In addition it was one of these progressive farmers who was the first to take out a loan (which he used for his new venture into commercial poultry rearing). Therefore once again it is the progressive farmers who benefit the most from the services of development organisations, whether the extension service, or as in this case, the Agricultural Development Bank.

## **8.6. Mass Media as an Extension Method.**

Mass media is seen by some theorists to be the practical alternative to the use of extension workers. The benefit of mass media is that it can reach many people at the same time and at much less cost than by using an extensionist and also as it is not biased towards certain categories of farmers. Therefore it is a very equitable method. However the major disadvantage with this form of communication is that it is a monologue from the media to the farmers. The differing information needs of individual farmers are ignored and no farmer feedback is possible which could otherwise serve to improve the contents of subsequent messages.

### **8.6.1. Radio**

The radio was discussed from the point of view of its effectiveness in transmitting farming information. Radio Nepal is the broadcasting company operating in Nepal. It broadcasts daily a ten-minute agricultural programme during the peak listening hour, running from 7.20 am to 7.30 am. In addition it broadcasts a fifteen-minute evening programme during peak listening hours, three days a week. These programmes give information on cereal crops, livestock, horticulture and markets. They also feature interviews of the experiences of successful farmers and agricultural events of major significance.

A survey of Phulbari revealed that few households possessed a radio because they considered it a luxury item. However there was at least one radio in each of the hamlets studied which was accessible to all the inhabitants. As only some households had a radio it seemed possible there might be an information gap between those who had a radio and those who did not, usually the wealthier farmers and the poorer farmers respectively as the ownership of a radio is an indicator of comparative wealth in rural Nepal. The majority of radios were owned by the wealthy farmers from Timilsina Gaun whereas in Buchakot there was only one radio serving the whole hamlet. Therefore to rely exclusively on the use of radio for mass communication would give an unfair advantage to wealthier communities with the risk of promoting an information gap between rich and poor

farmers. But despite this, the use of one radio for each community is not a real concern given the fact that a farmer who owned a radio would never hesitate to let others listen to it if they wanted to. In addition radios were regularly brought outside the house as the household performed its out of doors activities thereby enabling neighbours to listen to it. Therefore most of the farmers in Phulbari had some knowledge about the contents of radio broadcasts. For instance a farmer from Adikhari Gaun said that although his household possessed no radio, he still knew that farming programmes were broadcast two or three times a week.

#### **8.6.1.1. Effectiveness of radio for information transfer**

In addition to finding out how accessible the radio was for each community, it was also necessary to evaluate how effective its information output was. The progressive young farmers of Timilsina Gaun were very positive about the usefulness of the information given by the radio on farming matters. They knew when these programmes were broadcast and would occasionally deliberately listen to them and if the information given was applicable to their needs they would act upon it. One progressive farmer from Timilsina Gaun had very positive views about the use of radio as an extension method: "If people are really interested in improving their farming methods then they will listen to the advice given on the radio in agricultural and forestry programmes". However the comments of this category of farmer should not be taken as being representative of the opinions of the majority of the farmers interviewed, as they were richer, more educated and more familiar with seeking professional advice than were other farmers. Subsequently, when other farmers were interviewed, they expressed a negative opinion about the effectiveness of the use of radio to transfer information. It was from the comments of this majority of farmers that three recurrent themes became apparent.

##### **(i) Interest**

The radio was regarded primarily as a source of entertainment or as 'background noise' for their daily activities rather than as a source of information. This was because they had no time to spare to concentrate on the radio. Some members of the Tamang community interviewed in Chapa Gaun said that they had no interest

in listening to agricultural or forestry programmes on the radio. In general few farmers knew when these programmes were broadcast and would therefore only come across them accidentally. Many farmers were also too busy in the morning to be able to listen to the radio even though it was officially considered to be 'peak listening time'.

## **(ii) Comprehension**

When some farmers tried to concentrate on the message of a farming programme they invariably found it difficult to understand what the presenter was saying. This was because the Nepali spoken on the radio was of a refined accent, grammatically very accurate and with an absence of colloquialism. This was different to their own every day speech. Also as the radio was a monologue, if the farmers could not understand the conversation then the whole radio message would be lost to them. They found that they tended to forget what the presenter was saying very early on, especially the technical details or to misunderstand them. This was a reflection of their lack of familiarity with formal education and their difficulty in concentrating. This again shows that educated farmers will benefit more from the radio messages as they will be able to understand them better. However even a progressive farmer commented *"in general people never remember what is said on the radio"*.

## **(iii) Detail**

The farmers also complained that the information given on these programmes was often incomplete. For example a recent radio programme had advised farmers on the use of new crop varieties. However no mention was made of where to get these seeds. Hence although the interest of the farmers had been initiated, the incomplete information given to them could not be acted upon.

To conclude, the radio in reality was considered by the majority of farmers as a less effective tool for the diffusion of information than that of person to person contact.

### **8.6.2. Posters and Pamphlets**

There were two major disadvantages to the use of posters and pamphlets for communication purposes. Firstly pamphlets were of little use to the overwhelming majority of farmers who were illiterate. Similarly many farmers complained that the posters they had received contained too much script at the expense of illustrations which, being illiterate, confused them. For example the Kami and Damai farmers of Buchakot said that they had occasionally received posters from forestry extensionists. These were mostly about forest fire prevention but as they were completely in script form they could not gather any information from them. Few farmers complimented the clarity of the message intended by the posters apart from the Tamang farmers of Chapa Gaun and the progressive farmers of Timilsina Gaun who said that they had been impressed by the forestry posters they had seen.

The second drawback with this method is that it relies on extensionists visiting the area in the first place to distribute the posters. Hence although in theory it is a faster way to reach a greater amount of farmers, it was found that, again, not all the hamlets were visited by extensionists for this purpose. In fact none of the hamlets interviewed said they had received any posters about agricultural or livestock practices but some hamlets had been found to have been visited by forestry extensionists, namely Buchakot, Chapa Gaun and Timilsina Gaun.

### **8.6.3. Conclusion to mass media as an extension approach.**

The use of mass media, namely radios, posters and pamphlets, as extension tools was found to be of limited use in Phulbari with some farmers, notably the minority of literates, benefiting more from this method than the majority of illiterate farmers.

## **8.7. Farmers' Informal Information Flow**

Due to the factor of the rare and unequal visits by extensionists to farmers as well as the limitations of mass media as an extension approach, farmer-to-farmer communication had a very important role for the diffusion of new farming



practices. It was expected that the farmers who benefited the least from formal sources of information would in turn benefit more from informal sources. This was found to be true to an extent. For example the low caste farmers of Buchakot heavily criticised the extension service for giving them the least attention. It appeared that they acquired more knowledge from other farmers than from the extension service or other official sources. For instance they got to hear about the livestock projects run by the Agricultural Development Bank not through the Bank itself, but indirectly via neighbouring farmers in Adikhari Gaun. When they noticed that the Adikhari farmers had increased their goat herds they asked them how they had been able to buy more goats. They were told that it was due to a loan they had received from the Bank.

In fact many farmers in Phulbari had learned of new farming practices simply by observing the activities of neighbouring farmers. For example a Kami farmer commented on how they usually received information from other hamlets: "They [farmers from other hamlets] come to us to mend and sharpen their tools and Kukris [Nepalese knife] and it is then that we come to hear of the village news when they start chatting to us to pass the time."

The poor farmers' lack of resources meant it was a greater risk for them to adopt new farming practices so they would typically wait and observe the outcome of others' harvests before adopting the new techniques themselves. This effectively served as a trial for them. However one of the main limiting factors for the adoption of new farming practices was the ability to purchase the necessary materials to make the new technology a success. Hence even obtaining new crop variety would involve the initial purchase of the seeds. The farmers of Buchakot - the poorest hamlet within Phulbari - commented that their ability to copy the new farming practices of neighbouring farmers was limited both by their lack of resources and by the high risks it would entail. Theirs was the only community which was still not using chemical fertilizers because they could not afford to buy any.

### **8.7.1. Contact with Outside Communities**

Many innovations had first been introduced into the hamlets by a farmer travelling out of the area and seeing a new farming practice in operation or by being informed of it in some other way. Hence the more active the villagers were in this respect the greater the number of innovations they would be likely to come across. Farmers in Buchakot seemed to be comparatively inactive as for instance they were still growing local wheat varieties through ignorance of how to obtain the improved varieties. Tamang farmers of Chap and Chapa Gaun on the other hand revealed that they obtained new crop varieties largely through the activities of farmers visiting other villages and seeing the new varieties grown there. They would then buy those seeds and plant them in their own fields.

Visiting relatives in other areas appeared to be a very common way for farmers to obtain new seed varieties as well as farming information. One farmer from a neighbouring hamlet learnt about a new wheat variety from farmers already growing it in Timilsina Gaun. Chemical fertilizers were introduced to Timilsina Gaun in a similar fashion. A farmer from Timilsina Gaun was in Banepa when he overheard a group of farmers discussing the merits of chemical fertilizers. He then bought a pack to try out on his own fields. After seeing how successful it proved to be, from then onwards he adopted it as part of his farming practice. Similarly another farmer learnt of a brand of fertilizer called 'Annapurna' by receiving a leaflet about it whilst he was visiting Kathmandu.

From these accounts it seems that not only is accessibility a major factor encouraging information pick-up, but also the farmer's movement from his hamlet is an effective means of coming across new information.

### **8.7.2. Local information 'gatekeepers'**

Two main categories of villagers were found to be acting as the local information 'gatekeepers'. These were the village school teachers and the progressive farmers.

### **(i) Village School Teachers**

The school teachers were regarded as the intellectual people of the village with the adult population relying upon them for much of their information and administrative needs. The school teachers had much contact with the local extension agents, with one of them being a part-time farmer. Extensionists found it easy to communicate with them as they had received the same level of education. Because of this they would be amongst the first to hear of farming information from the extensionists. They also found no difficulty in understanding radio broadcast messages and could therefore explain them to the other farmers.

Farmers revealed how it was often their children who would bring home farming information which they had learnt from school. The low caste farmers of Buchakot also learnt of village activities via their children especially if they attended school. Interested farmers would then approach the school teacher concerned for more information. However a few farmers had commented that they lacked the full technical details about new innovations to enable them to put them into practice. Despite this, many farmers, particularly the poor farmers of Timilsina Gaun, continued to satisfy most of their information needs by approaching the local school teachers who were sometimes able to supply them with mini-kits also.

### **(ii) Village Elites/Leaders and Contact Farmers**

The rich farmers of Timilsina Gaun displayed a degree of responsibility towards their poorer neighbours in Timilsina Gaun. For instance one of the progressive farmers, who was also the village school teacher, would often distribute mini-kits to them. Similarly their relatives would often bring them new seed varieties whenever they came to the village to visit them. Farmers within their own community gave them much information about new farming techniques.

### **8.7.3. Local Centres of Information Exchange**

The bazaar was the centre of social activity for Phulbari where people gathered

new information and swapped ideas about farming. It acted as a natural stopping point for extensionists because farmers from all the surrounding hamlets gathered here as it was where the road ended. Therefore it had developed into a focal point for information exchange. Farmers living closer to the bazaar were able to make more frequent visits there than those living at a greater distance from it and so were able to keep more abreast of activities happening around them.

The bazaar was located at the foot of the hill side and at the termination of the road. The teashops were located here and served as ideal magnets for informal information exchange amongst the farmers and any official who might occasionally be visiting. The teashop keepers were themselves part-time farmers and therefore were also interested in discussing and raising farming issues. Those farmers who had more leisure time to spend in places like these, would benefit from being able to access a wider social circle with the resulting possibility of gaining more farming information.

#### **8.7.4. Limitations**

In general it was found that few farmers were interested to give information to other farmers unless first asked to do so. The Kami and Damai farmers of Buchakot said that nobody had encouraged them to grow wheat, that it was entirely their own achievement. They had questioned farmers from neighbouring hamlets who were already growing it, and had received sufficient information from them to be able to have the skill and confidence to grow it themselves. They wryly commented that farmers do not voluntarily come to them to explain their new technologies, not even farmers of their own caste; instead the farmer himself must be active, going to, and asking other farmers about their farming practices. Only then can he receive the information that he wants.

The only farmers who were interested to pass on information to other farmers were usually those who were concerned about village affairs such as the schoolteachers, the local leaders or others with similar responsible positions. Social contact with such people would provide the ordinary farmer with a

valuable source of information about innovations. *Farmer-to-farmer spread of information relies much on farmers actively searching for information using their social contacts.*

#### **8.7.4.1. Monopoly of information**

Another limitation of farmer-to-farmer information flow is that information can be deliberately withheld from certain farmers. For example, community forests are intended to be managed and used by the local people on an equal basis. However the Community Forestry Management Committee of Timilsina Gaun was run largely by powerful farmers who exerted their influence to gain a greater share of the forest resources. An incident had occurred whereby they had withheld the date for the collection of forest products from the poorer farmers until the actual day so as to have an unfair advantage over them. This account serves to show how the gap between rich and poor farmers is being widened, both through the activities of rich farmers and the partial exclusion of poor farmers by extensionists as well as the research priorities of researchers favouring the irrigated lands of the rich farmers. Therefore there is no one to effectively help alleviate the poverty of the poorer farmers apart from what they can do by their own efforts.

#### **8.7.4.2. Caste interaction**

While there was no animosity between members of different castes within Phulbari, there was little social intermixing between them. In addition, although farmers of the same caste but of a different hamlet would maintain a cordial relationship, loyalty to one's own caste and to one's own hamlet was very obvious. Yet even within this category there were various sub-groups such as the poorer farmers of Timilsina Gaun and the progressive/rich farmers of Timilsina Gaun.

Within Phulbari there were clear cases of bias with regard to who would pass on information and to whom. Farmers preferred to pass on information to farmers of their own caste, in particular to their relatives or friends, at the expense of farmers of different castes. For example there was a local club in existence called *Jan*

*Jagriti Samudaik Samity* [People's Public Awareness Group] which was organised by some of the Timilsina Gaun farmers. It conducted informal education classes on topics which included those related to farming. Its membership was open to inhabitants from any hamlet in the vicinity . Yet Tamang Farmers from Chap Gaun and Chapa Gaun for example had no knowledge of its existence.

#### **8.7.4.3. Lack of detailed knowledge of modern technologies**

One of the main limitations of farmer-to-farmer communication was the difficulty in passing accurate technical information (researcher generated technologies) in an informal way. For example one farmer from Adikhari Gaun noted that although many new crop varieties were being grown by farmers nowadays, their knowledge about their specific requirements were vague, and involved the farmer in a process of trial and error. This process of trial and error was also very much apparent with the use of chemical fertilizers. None of the farmers knew the exact quantities to apply nor the best time to apply it. Some farmers had found through experience that a combination of compost and chemical fertilizers avoided degrading the soil.

The school teachers had also been criticised for supplying the farmers with insufficient technical information on many occasions. For example although the village school teacher knew about new wheat varieties, he lacked information about their correct storage requirements. Such incomplete information posed problems for the successful adoption of technologies by the farming community. This was one of the limitations of using farmer-to-farmer communication methods.

The farmers' methods of dealing with crop diseases revealed that in Phulbari farmer-to-farmer communication on its own, was often not sufficient. Every farmer expects to encounter crop disease during some stage of his crops' growth and to varying degrees of seriousness. With traditional crop varieties the farmer is more familiar with the methods of controlling the diseases to which the crops are prone. However, with introduced new crop varieties the farmer is unfamiliar with the characteristics of the crop variety with regards to disease susceptibility.

He does not know to which disease it is most prone. In addition it has been found that improved crop varieties are less hardy than the traditional varieties, despite having more yield. Therefore if a farmer adopts new crop varieties, crop disease control is even more important. Because of this, farmers in Phulbari were found to be very eager to obtain pesticides, such as from the Agricultural Input Depot at the bazaar. Yet this was rarely possible as the supplies were both irregular and scarce. This situation is typical of the rural and more inaccessible areas of Nepal where demand regularly outnumbers supply. Because of this situation, farmers were therefore in the habit of improvising with whatever chemicals they could get hold of. For example, a crop insecticide called *Metacid* had been introduced by a Timilsina Gaun farmer. But although it is specifically intended for crops, he did not know which insect it was aimed at, nor the exact dosage which was recommended. Therefore he used it indiscriminately, using a dosage which he estimated was correct in line with how much he could spare.

It is unfortunate that the local extension system was unable to supply them with the correct pesticides nor any given information about them such as sources of availability and correct dosage requirements. The farmers' technical knowledge plus input availability was found to be lacking in this aspect. Technical details such as these could not be expected to be passed accurately from farmer to farmer, instead requiring detailed instructions from trained extensionists.

### **8.8. Conclusion**

For the farmers to maintain their production levels, it was necessary for them to constantly adopt and experiment using improved farming practices. To do this they needed all the help and advice they could get whether from extensionists or from other farmers which they could rely on for their good farming advice. All the farmers seemed to wish for greater extension contact, even though a few thought that extensionists needed better training.

It can be seen that there are limitations to both systems. The knowledgeable farmers, as well as the extensionists, were often selective in those to whom they

passed on information. Therefore it is a prerequisite for individual farmers to be active in searching for farming innovations from as many sources as they can so as to improve their farming condition. Poorer or socially inferior farmers have greater ability to prosper from informal farmer to farmer communication than from the extension system or any other formal source. This is because there are unfortunately clear prejudices in whom extensionists generally choose to contact. There are usually a combination of factors which act together either to encourage or to discourage an extensionist from communicating with a farmer. For example no extensionist would refuse to visit a farmer simply on the grounds of his caste or economic condition. Yet when associated with locational isolation it could prove to be a reason not to visit. Similarly if a farmer or group of farmers are renowned for their progressiveness and have the resources to experiment with new farming techniques, as well as being of a social position to not feel intimidated by officials, then they are easily selected by extensionists as their point of contact with the whole farming community.

The extensionist is therefore seen by many farmers as one who is easily discouraged from visiting farmers who are relatively difficult to reach, and who have less resources and who are of a low caste. This view was also given by one of the low caste farmers from Buchakot: "Most of these sorts of activities and information are given to those areas easily accessible to the road, irrigated and fertile soil and to richer villagers who are of high caste".



## **Chapter Nine**

### **Phulbari: Discussion**

#### **9.1. Introduction**

This research uncovered those factors which encouraged information about innovations to pass to farmers in Phulbari, particularly via the formal extension system. For the most part, each of the hamlets studied within Phulbari was revealed as comprising a homogeneous community. Yet in Timilsina Gaun, the hamlet was subdivided into wealthy/educated and poor farmer groups. Each of the four hamlets studied was progressively distant from the bazaar and road (which served as meeting places and hence were the communication nodes in Phulbari). Each of the hamlets was a distinct social group. Consequently the factors of wealth/poverty, education, caste and accessibility were studied in order to find out how, if at all, they affected the farmer's ability to obtain information about farming innovations.

#### **9.2. Farmer-Extensionist Communication**

Only a minority of the farmers were visited by extensionists. Mostly these were the progressive farmers of Timilsina Gaun who were also characterised by the accessibility of their hamlet, their high caste, and comparatively high levels of education and wealth. Significantly an NGO project run by NACFP was operating only in Timilsina Gaun. Yet all farmers of the study area had complained that extensionists visited them too infrequently. Also it was expressed that extensionists often gave too little technical information to enable them to successfully adopt new innovations.

Due to the poor extension coverage many farmers from different socio-economic backgrounds and hamlets felt the need to visit extension and research establishments for themselves. The progressive farmers were the group who made the most visits. It was only the farmers from Buchakot who

did not get satisfactory services even after visiting these establishments.

### **9.2.1. Caste**

Significantly all the extensionists serving Phulbari were Brahman. Farmers selected for training by extensionists were also mostly from the higher castes and none were from the lower castes. This clearly implies favouritism on the part of the extensionists towards those castes. Contact farmers were also found to be favouring their own caste and would often neglect to pass on information to hamlets of a different caste.

What is more, the low caste farmers of Buchakot themselves believed that the extensionists favoured the higher castes at their expense. They also felt that the extensionists were unable to discuss matters with them effectively because of social restrictions. This was one of the reasons why the poor farmers of Buchakot had to rely on getting information from other farmers rather than from the extension service. Seely (1989b) in her study based in Nepal had also noted the limited contact extensionists had with members of different castes. Hartmann *et al.*, (1989) reported similar cases of discrimination against the lower castes in Andhra Pradesh, India, for the issuing of agricultural loans.

Information was found to filter very slowly to the low caste farmers of Buchakot. This was linked to the fact that they were an isolated group of farmers both because of their physical location and remoteness of their hamlet and because they were a minority group in the area which was regarded as socially inferior. This all helped to weaken their communication networks outside of their immediate community. Hence, in this instance, caste cannot be separated from other negative factors influencing their information uptake.

Tamang farmers of Chap Gaun and Chapa Gaun were held in higher esteem than the low caste farmers and were also less isolated being both closer to

the road and having an extensive network of family ties in surrounding villages. This enabled them to procure communication from outside their hamlet.

The wealthy Brahman farmers of Timilsina Gaun had contact with and were respected by the local extensionists. Hence in this instance it is again difficult to separate one factor (in this instance, wealth) from another (in this instance, caste).

Communication networks existed between farmers of the same caste. These networks were stronger for farmers within the same hamlet but they still existed even between hamlets far apart from each other. Similarly it was found that both extensionists and contact farmers preferred passing on information to farmers of the same caste as themselves.

It was also found that the information-seeking behaviour of members of different castes was different. The Brahman farmers, particularly the progressive farmers of Timilsina Gaun, were very familiar, assertive and confident with officials and both they and the Tamang farmers had been known to visit national research centres. In contrast the low caste farmers were intimidated by them and never went further than local level officers for information.

Searle *et al.*, (1993) also commented on the low self-esteem of the lower castes in their study in relation to asking for help from the extension service. Sen (1969) found that lower castes relied more on informal sources viz farmer-to-farmer word of mouth rather than on the extensionists.

To conclude it was found that caste did have an effect on communication flow but more so in association with other influencing factors particularly physical distance. For example, high caste hamlets, distant from the road, received few visits by extensionists, their distance discouraging any visits. Overall, however, the extension system was a less effective mechanism for

the lower castes in this study than it was for the higher castes. There were strong communication links between farmers, contact farmers, extensionists and other officials of the same caste and much weaker links between those of different castes. This finding suggests that ideally extensionists should be recruited from a cross-section of castes so as to be able to give a more equitable service to a heterogeneous population. The same should apply to the selection of contact farmers, if they are to be used to filter innovations into the community.

#### **9.2.2. Wealth/progressiveness and poverty**

From the practical point of view, if a farmer has very limited resources it might seem less likely that he will be eager to obtain information about new farming technologies because of the expense likely to be incurred in adoption. Furthermore most farming innovations are directed at irrigated land (as owned by wealthier farmers) rather than at unirrigated land (as owned by poorer farmers). Yet despite this assumption it was found that poor farmers were generally just as eager as rich farmers to acquire information about technologies which would fit into their farming systems and which might increase their production levels.

Wealth on the other hand does increase the farmer's ability to adopt innovations as he has more access to resources (resources being usually a prerequisite for the adoption of innovations). In Phulbari the wealthy farmers were also the village elite or leaders. As such they were accorded special respect within the community as well as by outsiders visiting the village. For instance whenever an official entered the village he was expected to first meet with the local elites before approaching the rest of the community. As a result the wealthier/elite farmers were always the first to know about any new information related to the village and were also typically selected as contact farmers. Furthermore, after having met the elite farmers, many of the extensionists would be disinclined to trouble themselves by repeating their message to other farmers.

Wealthy farmers were found to be maintaining their elite position within the community through their access to agricultural information. They were prone to try to conceal certain information from the other farmers if it was to their benefit. Sivayoganathan (1985) also found from his study of Sri Lankan farming communities that farmers deliberately withheld information about innovations from other farmers which was critical for their adoption of the innovation. Many studies have revealed that development campaigns often benefit the comparatively advantaged sections of the community rather than the poorest, thereby strengthening the position of elites. Local power relationships can also serve as a constraint to participation by economically and socially disadvantaged groups such as the poor and the lower castes. Dasgupta (1977) also found that village elites in Indian villages were able to use their position to monopolise information. The same findings were revealed in Carter's (1991) and Searle *et al.*'s (1993) studies, both of which were carried out in Nepal.

The other farmers were aware of the unfair advantage that the wealthy farmers had over them, resulting in factional divisions within the village. The presence of these factions within the community further prevented effective communication between farmers of different castes and of different economic status within the same caste. This resulted in a lack of community solidarity.

If wealthy farmers are selected as contact farmers they tend not to search out poor farmers to pass on information. Hence the intended trickle down effect may not in fact occur amongst such groups. Carter (1991) in her study points to a high caste family which had benefited considerably from various training and promotion schemes but had shown little inclination to pass on any of what they had learnt to other farmers.

The wealthy farmers in Phulbari were found to have more leisure time than the poorer farmers. This was partly because wealthy male farmers in Nepal typically do little farming themselves. As a result of their greater leisure

time they were able to devote more time to collecting information to improve their farm's productivity and to attend any meetings and training programmes organised by the extension service. In addition they were known to visit the research centres in Kathmandu for new seed varieties. Doorman (1991) also found that the large farmers in the Dominican Republic would visit research institutes concerning their farming problems and at the same time establish informal contacts with them. This same pattern is also apparent in developed countries - Haverkort (1976 cited in Jones and Rolls, 1976) found that in Holland the propensity of farmers to ask for advice rose with farm size. In contrast poor male farmers were completely tied to their farms and could not participate in organised extension activities. Hartmann *et al.* (1989) similarly found that less busy farmers tended to spend a longer time talking to people than busier farmers, who may not stop to talk at all.

Wealthy farmers also benefited much more from mass media facilities in the same way. For example it is easier for wealthy farmers to purchase a radio than it is for poor farmers, also they will have more time to listen to it and may even understand its message better especially if they have had more education than the poorer farmers. Sen (1969) also found that education helps farmers understand radio messages.

To conclude, it was found that wealth did have a positive effect on a farmer's ability to obtain information, particularly from the extension service.

### **9.2.3. Gender**

Women were found to receive information mostly from informal channels rather than from the extension service. Also they were not active in approaching extension or research establishments. Despite this a minority of women (excluding those of lower caste) had been selected for training by extensionists.

#### 9.2.4. Education

Within Phulbari there was an unequal level of literacy and education amongst the farmers in favour of the richer communities. Extensionists found it easier to communicate with the educated farmers as they could understand the information about innovations more readily than the non-educated farmers.

This conforms well to the findings of Saha (1987) who suggested that literate farmers had greater expectations from the extension service due to their exposure to the outside world. Literacy and education makes it easier to find out what is happening outside the farmer's immediate community. Education also guides farmers on how to find relevant information and which source to pursue. School children are also a source of information for their households in rural areas. Their schooling serves as a keyhole to the activities of the wider world. This is how the poor farmers of Buchakot got to hear of farming innovations indirectly through the schoolteachers. Sen (1992) recommends that school children are a good medium through which to transfer information on new agricultural practices to their parents, and in this respect they have an important role to play in the transfer of technology.

Uneducated farmers in Phulbari complained that it was difficult for them to communicate with extensionists as they were unfamiliar with their extension terminology. Posters, as an extension media, were also largely uninformative to them due to the use of script. Radio broadcasts were not seriously listened to, and in any case, were quickly forgotten.

Searle *et al.* (1993) commented that the educated farmers of their study were generally more satisfied with extensionists than uneducated farmers who also complained that extensionists never visited them. They found a distinctive difference in attitude between educated villagers and the uneducated villagers. In Phulbari also, educated farmers had close personal contacts with extensionists and were less critical of their services to them than the other

farmers.

Related to education was formal part-time work in which some farmers, notably members of the elite groups, were involved. This work was of a prestigious nature, as opposed to the manual work in which the poorer farmers were often involved. It included activities such as teaching, forest nursery work and social work. This exposed them to other information sources, by bringing them into contact with officials.

#### **9.2.5. Accessibility and isolation**

Geographically, accessibility had a positive effect on an area's ability to obtain information as indicated by the earlier adoption of innovations. Extensionists were found to be less likely to visit hamlets the more remotely they were situated. Farmers themselves believed that their location in terms of accessibility had a lot to do with whether extensionists visited their hamlets or not. Similarly Hossain *et al.* (1993) found that the remoteness of their study area in Bangladesh from any extension centre, together with an unreliable road transport system, resulted in insignificant contacts with the official service system. Hughes's (1985) report on an agricultural research and extension organisation in Nepal revealed that the extension approach they used (that of individual contact) not only resulted in low coverage in terms of the total population, but also in a disparity between wards geographically adjacent to field staff and those further away. His study showed a direct correlation between the number and location of contacts and the nearness to the field staff's base. In Phulbari, Timilsina Gaun, being the most accessible hamlet, received the most attention from extensionists, thereby encouraging unequal rural development. Also farmers were only selected from the bazaar and Timilsina Gaun for extensionist-organised study tours.

If accessibility on its own is seen as a major contributing factor to the ability to get information and hence adopt innovations, then all farmers in Timilsina Gaun should be equally innovative. As this was not the case it suggests that



a combination of factors encourages a farmer to get information and hence adopt innovations.

Another factor closely related to accessibility is that of a farmer's 'cosmopolitanism'. A few of the farmers in Phulbari, in particular Timilsina Gaun, had connections to officials in Kathmandu and elsewhere. These were the farmers who, more often than the rest of the community, would visit Kathmandu. Whenever a farmer leaves his hamlet he has more chance to come across innovations as illustrated by the introduction of new seed varieties to Phulbari by the progressive farmers of Timilsina Gaun and those of Chapa Gaun. Rogers (1983) noted that this increased awareness will lead a farmer to be more innovative. Carter (1991) made the same observation about a travelling farmer in Nepal who noticed a new farming practice being carried out and thereby adopted it as part of his farming system.

It is usually beneficial if a hamlet is easily accessible and has good communication links with other hamlets and if its farmers regularly travel in and out of the village. This exposes the farmers to the knowledge of new farming practices. Its accessibility also makes it more likely for it to be visited by an extensionist.

### **9.3. Conclusion**

The hypothesis that extension information does not flow equally to farmers, but is conditioned by their different socio-economic characteristics and accessibility level, was confirmed. It was found that high caste, education, wealth, accessibility and mobility are all positive factors encouraging the likelihood of a farmer receiving information about innovations, particularly through the extension system. All these factors were present in the progressive farmers of Timilsina Gaun and their hamlet had achieved greater rural development than the surrounding hamlets. Farmers who did not have these characteristics were less likely to receive extension information. With regard to the other farmers of Phulbari, these positive

factors were not all present, and the other hamlets had varying degrees of disadvantage. These hindered any search for knowledge about new farming techniques and discouraged extensionists from visiting them.

This study did not reveal that any of these factors was strikingly more important than the others. The impression the evidence produced was that all these factors had an active and inter-related part to play. Taken together as a group of positive factors provided any given farmer with a very strong base which he could use to his advantage to obtain information. The extension service by communicating mostly with the progressive farmers accentuates the rift between the wealthier farmer and the poorer farmer.

#### **9.4. Recommendations**

Certain conclusions lend themselves to the formulation of recommendations as follows:-

**(i) More farmers should be recruited to act as village-level extensionists.**

Most of the farmers of Phulbari relied on other farmers to satisfy their information needs because they rarely, if ever, had visits from extension workers. Formalisation of this would recognise that information derived from personal sources is more likely to be presented in an easy to understand manner and be specific to farmers' situation and needs. Formal village-level extensionists would have the obligation to pass on information, in contrast to the present assumption that it will happen naturally.

**(ii) Each homogeneous group of farmers should have a representative contact farmer.**

This is necessary because unless each group has its own contact farmer, experience shows that information is unlikely to reach all sections of the community. In particular, efforts should be made to recruit from among poor farmers, as rich farmers are unlikely to be committed to training poor farmers. This group approach would seek to counter the present problem of contact farmers favouring certain farmers.

**(iii) Extensionists should be recruited from all castes.**

Presently most of the extensionists employed are of higher caste. Employing a selection of all castes would reduce the current bias which extensionists have towards farmers of their own caste.

## **Chapter Ten**

### **Kumpur Research Results: Informal Innovation Sources and Channels**

#### **10.1. Introduction**

The results of both the extensionist and researcher questionnaires as well as the farmers' survey in Phulbari led to the realisation that what was lacking in the extension service to farmers might be achieved through informal farmer-to-farmer communication. Therefore the objective of the final study was to evaluate both the effectiveness of this form of informal technology transfer and study how it functions. Consequently the research area had to be one which had no extension or rural development contact.

It was decided to study seed diffusion mechanisms in particular. The small farmer seed diffusion mechanism is part of the indigenous communication system as it involves no extension contact. In Nepal most seed transactions involve transfers of seed from richer to poorer households in the form of gifts, seed exchange, in-kind seed loans, or exchanges for labour. Few farmers have the resources to pay cash.

#### **10.2. Background Information to the Research Site**

The study was conducted within four of the nine wards of Kumpur Village Development Committee (VDC) in Dhading District, Nepal. They were the only wards adjacent to each other which had never had any extension contact.

##### **10.2.1. Dhading District**

Dhading is one of Nepal's 75 districts and lies directly west of Kathmandu. Despite its proximity to Kathmandu, development has been slow to come to Dhading. The people are amongst the poorest in the hill districts of Nepal and it is one of Nepal's least developed districts.

#### **10.2.1.1. Road Network**

Travel in Dhading is difficult. The Kathmandu-Pokhara highway passes from east to west through the Trisuli Valley in the southern part of the district. The only road is the fair-weather road from the district headquarters at Dhading Besi linking with the highway 20 kms away. It carries an irregular supply of buses and tractors and government vehicles to the district headquarters. The absence of feeder roads, an adequate number of suspension bridges, and well distributed markets and service institutions has been a physical bottleneck hindering both the exchange of goods and services in the district, as well as social contact and the exchange of ideas.

An adequate infrastructure would provide for the increased mobility of people, opening of markets, opening of new opportunities and a linking of the scattered villages for economic and social interaction on a larger scale.

#### **10.2.1.2. Economic Situation**

Dhading is a food deficit area. Only about 38% of the population is self-sufficient in food for the whole year. In Dhading a total of 9% of the total population (mostly men) leave the villages for up to six months to get outside employment.

#### **10.2.1.3. Mass media**

As in most hill districts, there are no local papers. The only official newspaper is limited to a few offices in the district headquarters. Most information passes orally, if it is of any interest. In the evenings many local school teachers operate an adult literacy campaign. It was assumed that only a few households if any, owned radios, and in any case much fewer than those possessed by Phulbari. This was concluded as no radios had actually been heard during the field study and no innovation was said to have been initiated as a result of radio information.

#### **10.2.1.4. Agriculture**

Ninety-five per cent of Dhading's population are small farmers, the majority of whom own marginal farms. Most of the available inputs and resources are

concentrated along the highway and in the central parts of the districts. In contrast farmers in remote areas have not benefited from the agricultural development effort. Farm inputs such as fertilizer or improved seed varieties are not readily available.

The cropping patterns of this district depend on the availability of irrigation water. Usually irrigated khet lands have a rice-based cropping pattern with two to three crops an year. The rain-fed khet lands often have a rice crop during the monsoon, and wheat in winter. Maize-rice-fallow cropping sequences are also found. Pulses are often grown as a second crop after upland rice. The rain-fed uplands have a maize-millet cropping system predominating over other cropping sequences. The cultivation intensity of the levelled and sloping fields is a function of water availability, soil conditions and exposition.

#### **10.2.2. Kumpur VDC - Description**

Kumpur VDC is a close-knit community of hamlets. Most of the households within each hamlet are linked together by patriarchal ties. A few of the males regularly migrate from the area in search of seasonal work. Generally the only newcomers are the newly married women coming to live to their husbands' household.

Kumpur VDC is one of fifty VDC's located within this district. It lies at 1,000 - 2,000 m asl. The landscape is characterised by its ridges. Slopes on these ridges are usually steep to very steep. Even the valleys have moderately to steeply sloping terrain. Intensive farming is practised on these ridges apart from the very steep south-facing slopes of the ridges which are forested. Quite large areas of forests are under scrubland adjacent to the agricultural lands. They are used as grazing grounds for livestock and for the collection of firewood and fodder.

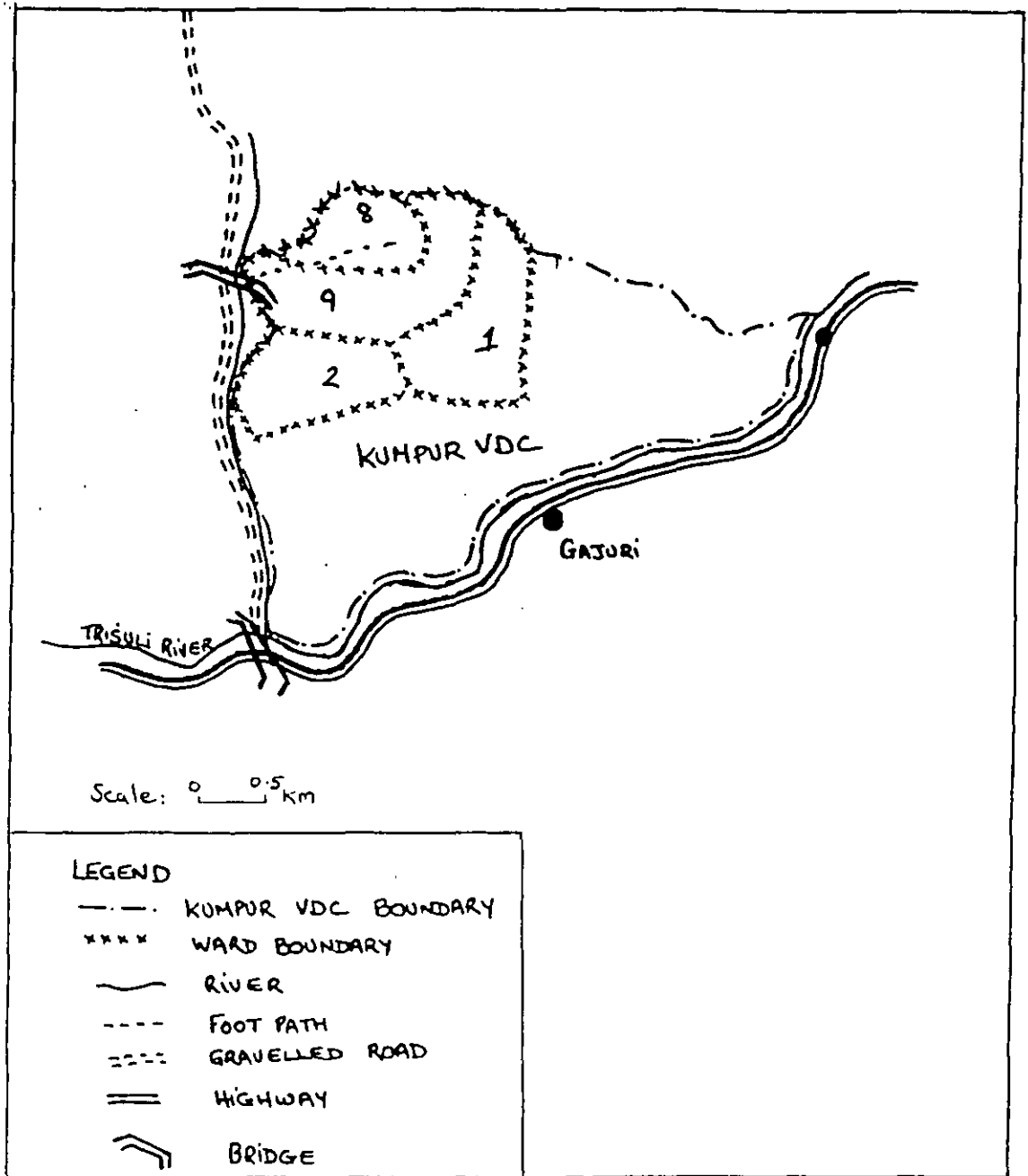


Figure 10.1.

Location of study area within Kumpur VDC

#### **10.2.2.1. Economy**

Semi-subsistence level farming is carried out with a local market orientation if at all. Thirty-seven per cent of the families are sustained by farming throughout the year and nineteen per cent for less than six months. A farmer with one hectare of land is considered a wealthy farmer. Such farmers amount to thirty per cent of all the farming households.

#### **10.2.2.2. Ethnological Information**

The population of Kumpur, as of the Mid-Hills, is composed of different castes and ethnic groups. The majority groups found in the four wards studied were the Newar, Gurung and Ghale ethnic groups and three low castes (Kami, Damai, and Sarki).

#### **10.2.2.3. Agriculture**

Farming communities often farm agricultural land over a vertical range of more than 1,500m asl. and use pasture and forest products from a still greater altitudinal range. Therefore many farmers own both bari and khet land. The richer the farmer the greater his percentage of khet land.

Farmers know that the location of fields relative to slope gradients affects productivity and therefore they distribute their labour inputs and fertilizers across scattered land parcels. Fertilizers are generally in short supply and are applied first to the best fields. Fields on steep slopes receive manure direct from livestock deposits - composted materials are only rarely applied to these marginal field sites.

Chemical fertilizers were first used in Kumpur between 20-30 years ago. They are mostly associated with modern varieties and especially with crops grown on khola khet. Few farmers applied it to paka khet. It is basically essential for wheat growing. Many farmers only started using chemical fertilizers after they first started growing wheat. Chemical fertilizers are also preferred for rice cultivation. It was the richer farmers who applied it first and by now even the poorer farmers have used it. However it is difficult to maintain supplies both because of its cost



and due to the irregularity of the supply source.

The staple crops grown are rice, maize or millet depending mostly on the fertility of the land. In Nepal the majority of crop varieties are indigenous. However modern hybrids (HYVs) are increasingly being grown, especially at lower altitudes and where there are stronger links with urban markets. This is particularly true for maize and rice crops. Farmers regularly change the varieties they grow so that some of the older indigenous varieties are no longer in existence. The main cereals grown are described in detail below:

#### **(i) Rice**

Rice is principally grown on khet land but is also grown on bari land (dry land variety) but to a lesser extent. This is because of the higher labour involved to grow it on bari land and the lower value and poorer taste of rice grown on this land type. Yields tend to be low on bari land compared to those achieved on khet where two harvests per year are obtained. Using new rice varieties, fertilizers and irrigation, very high yields can be obtained from khet land. On khola khet, because of the all year availability of water, two rice crops are grown - summer rice and winter rice. This is not possible on any other land.

The nature of rice farming means that at certain peak periods, especially at transplanting and harvesting, more labour is required than can be provided by any one household. As a result reciprocal labour exchange is a practised system.

There are many more modern varieties of wetland rice (khola khet) grown in Kumpur than of dry land (bari) rice. The majority of dry land rice varieties are old indigenous ones. HYVs are best adapted to khola khet conditions. Despite this no farmer relies completely on modern HYVs - they reserve a proportion of their land to local varieties due in part to their resistivity as well as superior taste, despite their lower yields.

#### **(ii) Maize**

Maize is planted both on paka khet and bari land. It is not planted on khola khet.

Often maize and millet are intercropped - maize being planted in March/April and relay cropped with millet in June.

Maize is widely grown in the district yet it is considered an inferior staple compared to rice. Both hybrids and local varieties are grown. With this crop also, all farmers still plant old varieties alongside the new.

#### **(iii) Millet**

Amongst many farmers in Kumpur, particularly the non-Brahmans, millet is the preferred crop after maize as it is a socially important product because it is brewed into alcohol as well as being the poorer farmer's staple food. Another use for millet is its straw because it is highly valued as fodder for livestock. Millet grows well on poor soils and is never given any fertilizer. It is usually grown on bari land as a relay crop with maize. No High Yielding Varieties of millet have been introduced, with only the traditional varieties being grown. In one of the hamlets a variety from another locality has been introduced but this also is not a HYV, in addition, its widespread diffusion has not occurred.

#### **(iv) Wheat**

Wheat is a new crop to Kumpur, having only been introduced in the past twenty years or so. It has certain requirements to ensure its success in that it needs to be grown on khola khet (ie. it must have irrigation) and it needs heavy applications of fertilizers. It is usually grown as a winter crop after the final rice harvest. Initially when it was first introduced many farmers were eager to plant it yet a few years later its popularity decreased when farmers found that land formerly planted with wheat was no longer so fertile for the next rice crop. Generally it was only the richer farmers who planted it.

### **10.2.3. Description of the four wards studied**

**Ward Eight** extended from an altitude of 910 - 1,680 m asl. It contained two hamlets called Chamkhola and Chekbang. The major ethnic group in this ward was Newar (70%) followed by Gurung (20%). The remainder of the population

were Brahman and Chetri (5%), Sarki (3%) and Damai (2%). The oldest settlers were the Newar who came to the area eleven generations ago from Kathmandu Valley.

**Ward Nine** was composed of three hamlets - Chepe, Raiker and Bungdanda. Each hamlet was separated by a thirty minute walk from each other. It had a small community than the other wards but the area it covered was larger. Its altitudinal range was the same as for Ward Eight. Newar and Gurung were the dominant groups with a Kami, Damai and Ghale minority.

**Ward Two** contained the hamlets Islang, Kamrang and Kumpur Kark. It had a strong Ghale majority and a minority of Kami, Damai and Newar households. Its altitude was the same as for the previous two wards. Yet its location was close to the road (the road led to the district's headquarters - Dhading Besi and to Gajuri the local market town) hence it had greater accessibility than the other wards.

In this ward the Ghale farmers were economically better off than farmers in the other three wards and all of them owned khet land. In total more crop varieties were grown in this ward, with some of the modern varieties being exclusive to this ward.

**Ward One** was the smallest ward and was composed of only two hamlets - Huli and Chuwakharka. It had a main Ghale community but also a sizeable Newar population. There were also a few Sarki, Damai and Brahman households.

It was the poorest of the wards with only four of its richest farmers (Ghale) owning rain-fed (paka) khet. None of the farmers here owned irrigated khet. Therefore wetland rice varieties were not grown here neither was wheat. It was located at a higher altitude on a ridge between 1,350 - 1,830 m asl. It was the most isolated ward in terms of accessibility - the furthest from the nearest road and the steepest climb away. As an indicator of this ward's relative agricultural productivity, its paka khet land could only produce eight units of rice each year

whereas even a poor farmer owning khet land in Ward Eight could manage to produce twenty units of rice per year, with the richest farmers producing up to a hundred units of rice.

### **10.3. How location affects information exchange**

The research area was a geographically and physically isolated area with no road access. Any outsider contact had to be by foot. This was one of the reasons why the area had never had any extension visits or any rural development projects. Because of this, farmers had to be self-reliant with regard to seeking information about new farming innovations. Its isolation had also served to maintain the traditional system of close interaction between farmers especially for resource exchange, including labour. In fact, as the farming system was all manual as well as being labour intensive, particularly during critical farming operations, reciprocal labour exchange was practised. Also the rice farming system as practised here, being labour intensive at peak periods had given rise to voluntary labour gangs. Therefore each community was very interdependent on its members. For example farmers' homes were located within the hamlets with their fields being usually fragmented and scattered. Therefore a farmer in such a situation was not isolated from the rest of the community. Most of the male farmers had lived all their lives in the village where they were born. Despite this almost all had relatives in other areas thereby ensuring at least an indirect exposure to activities outside of their area.

### **10.4. How Information Flowed into Kumpur without any Extension Effort**

A ward's ability to get information or new crop varieties from the outside depended on the amount of contact its members had with the outside world. Therefore the more often farmers left their wards, whether to visit relatives, in search of casual work or for any other reason, the greater was their potential exposure to new seed varieties as well as other farming innovations. Some farmers, more so than others, had greater opportunity as well as ability and interest to get agricultural information from different sources.

#### **10.4.1. Innovators**

Innovators play the main role in bringing in new farming techniques to their area. Together they have their own social network over a wide geographical area which helps them pick up new ideas both within wards and further afield. Innovators are prominent farmers within their ward and even within their VDC. For example farmers in Ward Eight knew which new seed varieties were introduced by a prominently innovative farmer from Ward Nine.

#### **10.4.2. Hired Labourers**

Labourers also act as vital transmitters of information. They often have access to different farming practices on various farms, and sometimes in different localities. For example each year in Ward Nine some farmers went to Patan near Kathmandu to work as rice harvesting labourers. As most of the new HYV seeds are released here first, it is a rich area in terms of its variety of HYV seeds. Consequently these labourers come across new seed varieties which they try out in their own ward. This is how *Taichune*, *Gheu Mansara* and *Americane* rice varieties were introduced to Ward Nine. The labourers gave them to a rich farmer to plant first rather than risk an uncertain harvest themselves, being relatively poor farmers.

#### **10.4.3. Contact with Extensionists**

Some of the farmers were found to have either visited extensionists themselves or had indirect contact with them through other people. Yet it appeared that only in Ward Two did any farmer say that they had visited an extensionist directly - the rich Ghale farmers obtained new maize varieties in this way. One or two farmers had indirect contact with extensionists through their relatives living in Gajuri where the Agricultural Office was located. Through this contact they had obtained one or two new seed varieties.

#### **10.4.4. Visits to Relatives**

Farmers often obtained new seed varieties when they visited their relatives in other areas. The further afield the relative lived or their closeness to some form of extension contact or proximity to a market town, all added to the likelihood

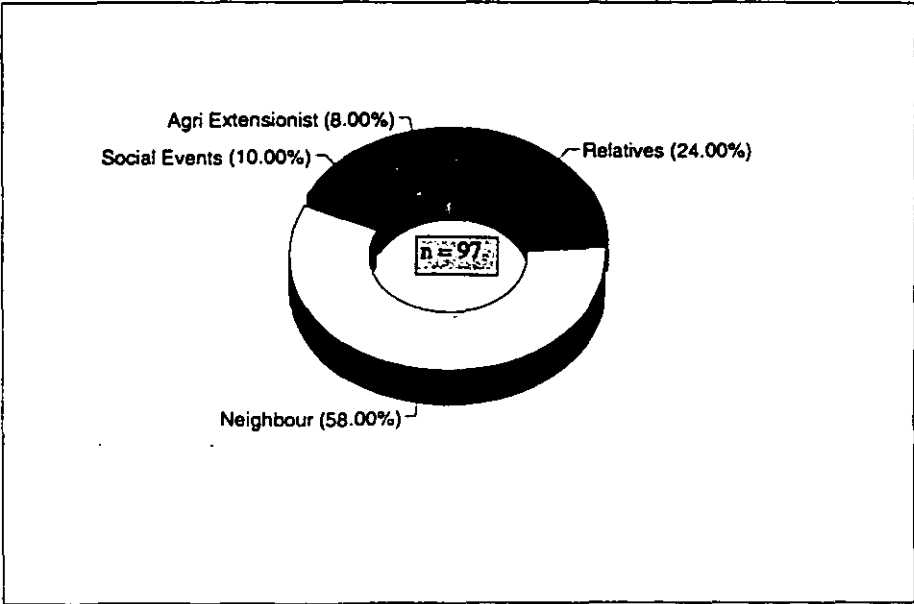
of their having different seed varieties to what the farmer had.

No farmer mentioned that he obtained new seed varieties or a new farming technique by a relative visiting him. Instead the farmer always had to be actively on the lookout for new varieties. Therefore the more active a farmer was in this respect the greater was his likelihood of coming across new varieties and other farming technologies.

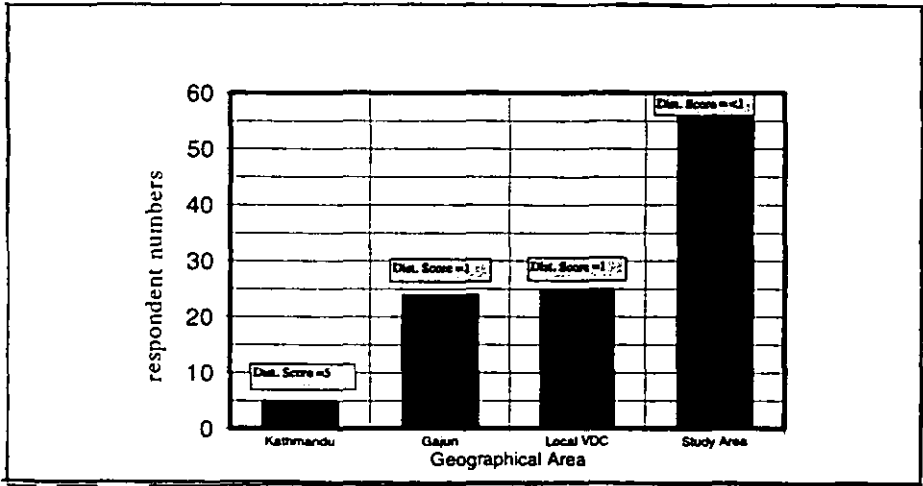
#### **10.4.5. Social Gatherings**

Farmers' labour routines affected the time they had available for knowledge exchange. Farmers involved in rice and secondary crop farming, as well as a variety of non-farm activities had less time to engage in conversations, except on social occasions such as religious festivals (*pujas*) or weddings or during peak seasons in the fields. These occasions brought farmers together from distant areas. Many farmers reported that they got information from pujas or weddings. Most of these they attended involved their relatives in other areas. One farmer commented that "particularly during puja time much information is exchanged".

Farmers from one ward would often attend pujas in other neighbouring wards. This was how farmers who usually never met could meet each other and exchange farming information. Hence the social network created by a puja could be very wide. Pujas were open to any farmer from any ward and whatever his or her caste. For example it was considered normal when a Newar farmer from Ward Eight attended a puja performed by Ghale farmers in Ward Two. During a puja farmers would, according to local custom, bring along with them a dish of cooked rice as an offering. This exposed other farmers to different varieties of rice, incidentally serving as a further significance of pujas for information transfer.



**Figure 10.2.**  
**Source of information and new seed variety by social interaction**



abbreviation: Dist. = distance

**Figure 10.3.**  
**Source of information and seed by geographical area**

### **10.5. Geographical Extent of Information Flow**

If a farmer had acquaintances or relatives further afield who he on occasion visited, he would be more likely to get information faster than those who did not update these links. Figure 10.3. shows the range of places where farmers reported they got their new seed varieties. Most of the innovations came from surrounding VDCs and Gajuri and its vicinity. Few innovations came from further afield. Most of the innovations coming in from outside would come from visits the farmers would periodically make to their relatives. Few had the opportunity to obtain new seed varieties in any other way. No farmer mentioned that he had bought seed on a commercial transaction. Generally only the most innovative farmers searched for new seed outside of Kumpur and through sources other than their relatives.

It was found that Gajuri, more so than any other area, acted as a local seed source for many farmers. This was because it had a wide catchment area as a market town and also it had a few rural development type offices including the Agricultural Office where sometimes new seed would be available. Seeds coming from other VDCs within Dhading District basically depended on where the farmers' relatives lived and their possession of a seed variety different to their own. Farmers would generally attempt to visit relatives living very far away less often than those living close-by.

### **10.6. Differences in innovation flow between wards**

The four wards studied were not equal with regard to accessibility and wealth. Therefore these two factors are considered as influencing factors for differences in the frequency of innovation flow amongst the wards. Information and seed came mostly from those wards which were the most accessible which explains why Ward One was never mentioned as a source of innovation nor seed. It can be seen from Figure 10.4 that Wards Eight, Nine, and Two were much more active in exchanging seed varieties than was Ward One.

Ward Two was the richest ward with the majority of farmers owning irrigated



khet land. In addition it was the most accessible from the roadside. Interestingly however the farmers' caste was not high, belonging to the Ghale ethnic group. Hence in this case at least, innovativeness bore little, if any, relation to the farmer's caste. The farmers in Ward Two were active in searching for new seed varieties which included visiting Gajuri Agricultural Office. As a result of this exposure, Ward Two had a greater number of new varieties than any of the other wards. Subsequently other farmers would visit them from surrounding wards to obtain new seed varieties. In addition many farmers would pass through Ward Two simply to reach the road at the bottom of the hill side. Therefore there was greater opportunity for farmers from other wards to come into contact with them.

As a contrast to Ward Two, Ward One was the poorest in that the majority of its farmers owned only upland, and of the four farmers who owned khet land, even that was unirrigated and small in area. They had the least number of new varieties compared to the other wards. This ward did not frequently get new seed from neighbouring wards even though its neighbours in Ward Two were of the same caste as themselves (Ghale). This once again implies that caste is not a prominent factor for the informal flow of innovations. Farmers in this ward relied mostly on obtaining new seed varieties from visits made to relatives in other areas.

The reason why Ward One was cut off from its neighbours was that it was situated in a physically remote area of Kumpur VDC and was difficult to access being on top of the mountain side. Also the farmers' activities were more confined to their own ward in that they did not own or rent land in any of the other wards, and did not perform any communal work with farmers in any of the other wards. In addition as it was found that poorer farmers generally got information last, it follows that a poorer ward will also get information or new seed varieties at a later date, if at all.

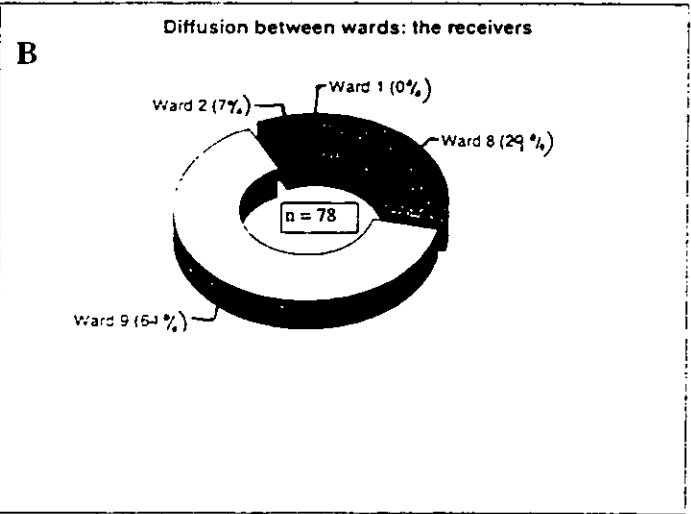
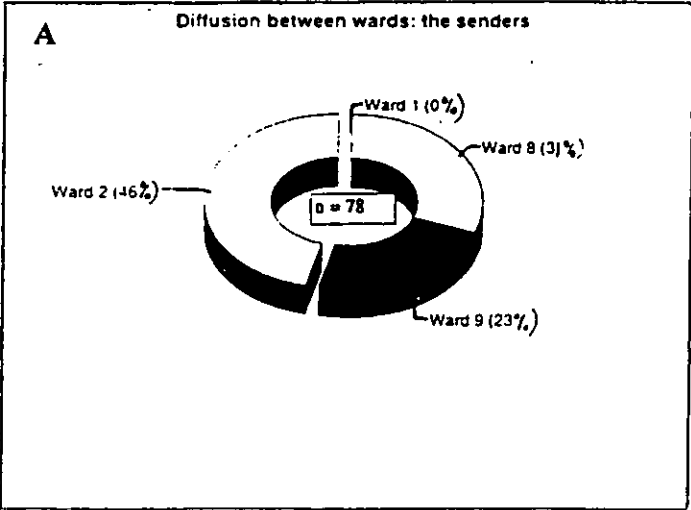


Figure 10.4

Diffusion between wards

Due to their lack of irrigated khet land and limited number of farmers with unirrigated khet land, many of the new seed varieties arriving in the other wards were not suitable for their farming system. Also they used very little chemical fertilizers which is a prerequisite for many of the new varieties. There are fewer new crop varieties suitable for dry land farming available. Yet conversely this is what most of the farmers in Ward One needed. This was another reason for their greater reliance on local varieties and their slower rate of adoption of new varieties.

Considering the four wards as a whole, it was found that different crop varieties were introduced to the wards at different times. One ward would adopt one crop variety at an earlier date than other wards but for another crop variety that same ward would be late to adopt it. No ward was significantly more progressive than another ward in every aspect. However Ward One was disadvantaged by its remoteness and harsh farming conditions, hence negatively affecting its rate of adoption.

Within the study area, Ward Two farmers were the major diffusers followed by Ward Eight farmers. Ward Nine farmers received the most new seed varieties. Its central location as well as its access to the road encouraged this. Ward One was the least likely to receive innovations. The most likely reasons for this were its isolated position and poor quality land making its farmers less interested in new seed varieties.

#### **10.7. Communication Flow within Wards**

Once a new farming innovation such as a new seed variety enters a ward how does it diffuse within the community and is there differential access to this information by different groups of farmers? Farmers differ in progressiveness or innovativeness due to their differential access to land, water, labour, inputs, markets, capital and information. In addition all farmers have different opportunity levels as well as different farming needs. Hence to understand how new knowledge spreads, it is first necessary to study the social dynamics and networks of different kinds of farmers

- rich and poor, socially powerful or socially insignificant and so on. The research done at Kumpur has attempted to reveal to what extent, if at all, these factors influence the diffusion process and to what extent homophilous links between farmers encourage information flow.

It was found that many farmers were active in introducing new seed varieties to their wards rather than only one or two prominent farmers. Yet innovative farmers were differentiated from other farmers by the larger number of new seed varieties they had introduced. In each of the wards, initial ie. first stage, diffusion accounted for the most transactions. Second step diffusion was usually significantly less and third step diffusion, if present, was the least occurring within the ward. Therefore the greater the number of initial innovators to a ward the greater will be the second or more stage diffusion resulting in a greater spread of new seed varieties within that ward. If a ward has a limited amount of sources of new seed varieties the greater the likelihood that diffusion within that ward will be limited also.

#### **10.7.1. Traditional Local Institutions which Aided Information Transfer**

In Kumpur the villagers themselves felt responsible for village development. For example they had a strong traditional management system for forests and employed their own forest guard. There were additional traditional systems operating in this area such as the presence of a village crier (*kurwal*), the *Jhara* system and *Dhikuti* and village *puja*.

##### **10.7.1.1. *Dhikuti***

This is primarily limited to Gurung and Newar people. Basically it is a money-raising system - a type of 'indigenous lending bank'. Members can raise money and start a business easily and quickly by relying on people they know. Yet such a system is easily eroded when rural development projects introduce money-lending schemes through agricultural banks (eg. the Agricultural Development Bank).

##### **10.7.1.2. *Jhara* System**

This is a system of free labour for community work. Yet according to farmers

in Ward Eight for the past thirty-five years or so this system had been declining in the area.

#### **10.7.1.3. *Puja***

The village *puja* (religious service) in Kumpur is an important part of village life even though it only happens a few times an year. It helps to keep a sense of unity within the community as well as serving as an occasion for the whole village to get together, regardless of caste or economic differences. It is a very old tradition but this is also being eroded in areas which have had more outside contact. In Ward Eight, two main pujas were held annually - *Jal Dhara* (which is to pray for no drought), and *Saxama* (which is to pray for protection from epidemics in the village).

#### **10.7.1.4. Village Crier (*Kutwal*)**

A village crier is an unique phenomena in certain rural areas of Nepal undisturbed by any outside rural development. He is employed by the village to shout out any important news affecting the community. This includes informing about meetings, pujas, temple restorations, landslides, the date that farmers must plant rice, illegal forest cutting, etc. In Ward Two, the village crier had the additional responsibility of distributing letters from the postman.

The village crier is always employed from the Sarki caste and is always a man. The position is usually passed from father to son. There is one village crier for every ward. However in Ward Two there were two village criers partly because that ward was very large and partly because it was rich enough to be able to pay for two. In contrast, in Ward Nine there was no longer any village crier. The last village crier migrated from the area and there were no more Sarkis in the ward to fill in the position.

This system operates by the village chairman and other socially important villagers informing the village crier what message to pass. It only happens if there is something important to say, ie. it does not necessarily happen daily. Typically a village crier will shout his message early in the morning before the farmers leave their homes

or after they have returned in the evenings. *This system is a form of indigenous mass media approach, and as with mass media it attempts to reach all farmers regardless of socio-economic differences.* The village crier is paid in kind by all the villagers on an yearly basis. In Ward Two he was paid extra as he was also the forest guard.

Although the village crier system is an indigenous form of mass media, it has not always been in existence in the same form as it is today. It was an approximately forty-year old phenomenon in this area, varying by a few years between the wards. It came into existence within Nepal with the ossification of Rana administration in Nepal in the mid-nineteenth century. Two types of village level officials were designated, both of whom were referred to by the general name of *mukhiya*. The power of the *mukhiya* emanated from relations with central authority. The *mukhiya* had to collect land tax for a given area which was usually paid in kind, typically rice or wheat. The *mukhiya* would in turn employ a village crier to work on his behalf who was given a salary from his funds. He had to take the land tax to the governor of the district and bring back message to the *mukhiya*. Therefore in those days the village crier was responsible to the *mukhiya* and to the local governor, and not to his local community as is the case today. With the abolition of Rana rule in the 1950s the *mukhiya* system and land tax came to an end. However ward members still used the village crier as a messenger and his role flourished. Yet the sustainability of this system depends to a great extent on the subsistence and self-sufficiency of the community. Where community relations are strong, market forces are weak and the migration of villagers to other areas is insignificant then the village crier system is sustainable and an important contribution to the diffusion mechanism.

#### **10.7.1.5. Village Meetings**

Forty years ago meetings would be held on platforms constructed around a communally owned tree called a *chautari*. Chautari is a Nepali term for a common resting place, generally under a Pipal (*Ficus religiosa*) or Bar (*Ficus bangalensis*) tree. Both trees have a religious value in Nepalese society. It is believed that nobody

will tell a lie under such a tree. Sometimes a cemented or clay platform is erected around it for people to sit and talk. Community judicial decisions used to be made here. Nowadays with the construction of government primary schools, they were held there instead. Meetings were held to discuss information passed by the village crier in depth also to come to a decision about village concerns such as animal diseases, crops and irrigation. For example, meetings were held in one ward to decide whether to use chemical fertilizer on paka khet land. If a farmer at the bottom of the hill applied chemical fertilizers but not those 'higher up', then that farmer's crops would grow faster and absorb nutrients from the slower growing crops higher up. This decision was publically announced by the village crier so that everybody got informed.

#### **10.8. Farmer Seed Exchange Process**

As improved seed can make a substantial contribution to productivity, independent of other inputs, it is considered an important source of innovation. The individual quantities of seed exchanged along the informal farmer seed diffusion mechanism is often very small compared to the amounts in which formal sector organisations typically deal. But because the direct purchase of seed is very much in the minority, farmers rely more on seed exchange. Similarly seed are rarely bought by cash from other farmers. There are three ways by which seed are dispersed in a subsistence based farming economy. Either they are exchanged for old varieties or some other produce is given for them, or they are given free especially if it is a small amount or from relatives, or given in exchange for labour. Relatives will always give seed free.

New seed varieties come to the wards from a variety of sources and by more than one farmer. Usually even the same seed variety would enter a ward via three or four farmers for the first few years before the diffusion process begins to work within the ward. The greater the number of farmers who introduced the same variety from outside the ward, the quicker that variety would begin to diffuse within the community. If a new variety had a restricted source outside of the area (eg. Agricultural Office in Gajuri only) then it would take a longer time for it to diffuse.

This happened in the case of a rice variety called *Americane* which, being obtained from the Agricultural Office by one farmer, had diffused to only a handful of farmers in Ward Two a few years later.

Once a new seed variety entered a ward it would typically diffuse to only a handful of farmers if at all. This depended a lot on that farmer's social network in his ward. Other farmers often brought in the same seed variety from another external source without knowing that it was already being grown in their ward. Consequently the fact that ten years was not unusual for new seeds to be still unknown to other farmers in the same ward indicates that farmer seed exchange is a slow diffusion method. In addition when a new variety first comes to a ward it is in short supply therefore it is less likely to be distributed until two to three years later after the supplies have increased. Similarly most farmers would usually only approach another farmer for a new variety after having observed its performance in the field for two or three harvests. This was found to be the common length of time amongst early adopters to realise that another farmer is growing a new variety and to be able to appreciate its characteristics. The more varied the sources for new seed varieties, the better they will diffuse within an area. This is because the diffusion process is very much a dilution process. Within a ward, if the farmers are mostly of the same caste this helps to diffuse the seed faster amongst them.

#### **10.9. Diffusive versus innovative Farmers**

In order to find out which farmers stood out as passing on innovations to others, the spread of new seed varieties between farmers was studied. The research revealed that three or four farmers in each ward stood out as being the main diffusers of new seed varieties. Other farmers would approach them for seed after having observed the new seed variety's performance in the farmer's field. One farmer expressed clearly the opinion of the majority of other farmers when he said that "no farmer will plant a new variety without first having seen its performance in another's field". This need to observe seemed to fulfil some of the usual functions of a small-scale trial on their own farms.



A diffuser farmer was considered a reliable source of information with good farming practices as well as being socially respected. Also the diffuser farmer had to have sufficient quantities of the new seed to distribute to any other farmer wanting it. Therefore his farm size should be above average and productive. One such diffuser farmer came from Ward Eight. He was a wealthy farmer in that he owned two houses, much cattle and rented out some of his land to other farmers. The other farmers all considered him as a reliable informant. Also he was interested to promote new seed varieties, for as he himself said: "I pass messages of any new variety I come across."

Most of the innovators however were found to be not very good at diffusing the innovations. Only rarely was an innovator active in this respect. Similarly diffusers were rarely the original innovators and usually got to hear of the innovations a few years after it was first introduced to the area but thereafter they were the ones who largely popularised the new varieties.

#### **10.10. Influence of socio-economic factors on informal technology transfer**

The influential farmers could be categorised as being either the actual innovators or the early adopters. In either case they had certain characteristics in common. These included social standing, whether in the form of being ward members or wealth, physical mobility and accessibility. Farmers who had an influential position within the community, such as landlords, schoolteachers, and ward members, had an important role to play in the diffusion process. Such villagers had a patriarchal role to play in their community and were typically enthusiastic about increasing the agricultural productivity of the area and bringing about rural development. As in the words of one landlord in Ward Eight: "Since the landslide happened in our ward a few years back, from then onwards I became motivated to promote better farming practices in our ward and to increasing its agricultural productivity." Such farmers were important in popularising and familiarizing new seed varieties for the rest of their community. There was no farmer exclusive to a ward who was influential in introducing all the new varieties to his ward. Rather there were numerous different farmers who contributed towards increasing the number of new

varieties in their respective wards.

#### **10.10.1. Caste**

Initially it had been expected that the research results would reveal that the higher the caste, the more innovative the farmer and the more knowledgeable about new seed varieties. It was also expected that there would be limited information exchanged between farmers of different castes. However the research results did not show that this was true. Farmers of different caste, were found to be very co-operative with each other, readily passing information and exchanging seeds. In fact the rich Ghale farmers of Ward Two were recorded to have passed much more new seed varieties to farmers of other castes and other wards than to the poor Ghale farmers of neighbouring Ward One. Hence it was revealed that in Kumpur, economic standing was a more influencing factor than a farmer's caste. The castes represented were mostly limited to middle level and lower level. Furthermore the Ghale, Gurung and Newar ethnic groups are more closely related to each other than they are to the high castes or the low castes. This may be the reason why they had little inhibition in communicating with each other compared to their more restrained interaction with the low castes. This also explains why the lowest caste, ie. the Damai, were always the last to get information. Significantly it was found that the lowest castes (Kami, Damai and Sarki) did not pass information or seed varieties to castes higher than themselves partly because other castes were not inclined to ask for information or seeds from them as they were not role models for other farmers to imitate.

Yet many of the low castes were of the same economic status as the higher castes and some were even richer, particularly the Sarkis. As Sarkis were employed as village criers within the wards (except for Ward Nine), they had developed a close association with influential members of the community. In addition, as they were paid for their services in kind by all members of the community, they were in a much better position to become exposed to new seed varieties. Also being in possession of irrigated khet land they benefited from planting HYV seeds. As village criers however, they were only found to pass on seeds to their own relatives and therefore had no significance for the diffusion process outside of their own narrow circle of relatives.

The Damai, who were considered the lowest in the social order, tended to be the poorest as a group and the least aware of new seed varieties or any other new farming technique because they were the most socially isolated group.

#### **10.10.2. Wealth and Poverty**

Wealth was measured in the local terms of how much khet land a farmer owned or at least rented, and next, whether it was irrigated or rain-fed. Wealth appeared to be a more influential factor in the diffusion process as well as the innovation process than was caste. Wealthier farmers, rather than poorer farmers, were mostly influential in distributing new seed varieties. For example in Ward One it was the rich farmers with khet land who were the only farmers who were introducing new varieties into the ward. On the other hand, the majority of new seed varieties introduced to Kumpur were suited to irrigated khet land. This is a disincentive for their adoption by those farmers who did not farm khet land, ie. the poorer farmers. Also if a farmer owns khet land, it is a greater motivation for him to search for better varieties than if he only farms unirrigated upland as the rate of return for the effort spent over productivity is high. Farming the latter land is equivalent to farming marginal land where the advantage of expending effort to improving the productivity of such land compared to the actual net returns is low. For example farmers in Ward One did not grow the new rice variety called *CS45* because that variety was best suited to irrigated khet land which they did not have.

Poorer farmers may also be less inclined to plant new varieties because of the latter's requirements for chemical fertilizers for optimal performance. Also farmers never put chemical fertilizers on unirrigated upland because it would leach downhill and requires rainfall (which is unpredictable) to be absorbed by the soil, otherwise it would simply blow away. Poorer farmers' requirement to buy food over their lean months is greater than their requirement for chemical fertilizer. Another drawback for these farmers is that they have less livestock per head than richer farmers and consequently less farmyard manure. So altogether their land will be less productive and less cost effective to farm. Hence their need for new varieties is less important.

As poorer farmers have less land available they need a greater awareness of how the new varieties will fare and of their specific requirements. Thus the poorer farmer may be more inclined towards concentrating his efforts on fewer species. This is why he may be less knowledgeable about new varieties. Also he does not have enough surplus land to experiment with and not enough surplus seeds to exchange with other farmers' new varieties. His smaller seed store means that his level of risk with new varieties is higher.

Generally it was found that the poorer farmers got to hear about the new varieties much later (around ten years later) than the other farmers - they were the least well informed farmers. Their labour routine affected the time they had available for knowledge exchange through casual conversations. The information obtained from them during the study tended to be very vague or unreliable regarding when new varieties had come to their ward. The comment made by a poor Damai farmer illustrates this point: "I plant whatever other farmers plant. I don't know their names." However on the rare occasion, a poor farmer would sometimes be the first to introduce a new variety into his ward. For example a poor farmer in Ward One, was the pioneer of *Khumultar*, a maize variety, into his ward. He had obtained the seed from his relative's farm in another area. This reveals that there were exceptions to the generalisations of which type of farmers were the diffusers, the innovators and the late adopters.

#### 10.10.3. Old Age

Old age was taken as being roughly sixty years and over for the purpose of this study. *Old age was found to only become a disadvantage for the innovation mechanism when it reduced a person's mobility. In the study, old farmers were amongst the most innovative within their community as well as acting as sources of information for other farmers.* Farmers in their fifties were also active in this respect. This finding correlates with Hossain *et al.*'s (1993) study in rural villages of Bangladesh which revealed that influentials were much older than followers. Even some of the very old farmers still managed to get hold of new varieties first within their ward. Old age did not prevent a farmer from experimenting. For example one seventy-two year-old farmer from Ward Eight had introduced a new variety

to his farm only two years previously.

Older farmers were generally not found to be traditionalist with regard to their farming if the opportunity presented itself to them. Also many of them travelled relatively frequently out of their villages and thus had greater opportunity to become exposed to new technologies. In fact they often had greater leisure time because their age meant they were less involved in farming activities than the rest of their household. This gave them greater opportunity to come across new farming techniques.

#### **10.10.4. Women**

Although single and group interviews were held with women farmers the information they had about new technologies was not reliable. Their recollections of the dates of introduction of new varieties to their ward was inaccurate and they did not know who the innovators were.

Women farmers were found to have extensive local pragmatic knowledge but limited awareness of information coming from outside their ward. In this respect they resembled the poorest male farmers in a ward who also generally failed to hear about new technologies until the majority of their community had adapted them. An eighty-nine year old man added to this representation saying that "generally women are not involved in seed exchange because they fail to get sufficient information for others to be motivated to plant it." In addition because of the similarity between women and the poor this could also be one reason why information rarely passed upwards from poorer farmers to wealthier farmers.

#### **10.10.5. Education**

Basically, the only educated farmers were the schoolteachers. The school teachers were not however mentioned by other farmers as sources of information, also they had not brought in any new technologies to the area. This was in contrast to the situation in Phulbari, the site of the earlier study. There, the school teachers were

considered to be progressive farmers and were regarded as an important source of information. This shows that each area has its own unique situation.

#### **10.10.6. Opportunity and Need**

The adoption of innovations is a question of suitability, opportunity and need with a combination of conditions such as wealth, mobility and accessibility acting as additional positive factors. Wealth, on its own, did not guarantee that a farmer would be an early adopter, particularly of all the new varieties. A case in point is that a certain wealthy farmer was amongst the first to introduce *CS45* rice variety to his ward. Yet with regard to *Ekle* rice he was amongst the last to adopt it, as well as the last to know about it.

It is not only poverty that makes a farmer not use a new technology but also lack of suitability to the conditions at hand. For example a poor farmer from Ward Eight had been using chemical fertilizer for two years but stopped after realising that it made his soil hard. He then reverted to organic manure. Another example is illustrated by a farmer who did not introduce any new maize varieties to his farming system because when a neighbour gave him a sack of it he found he could not grind the grains in his stone grinder because the grains were too large. Also it had post harvest storage problems in the form of severe insect attacks. Furthermore it had a poorer taste than the local maize varieties. The farmer believed that these varieties were unsuitable for the subsistence needs of poor farmers. However for the wealthy farmers who had enough to sell, did not grind and eat it themselves and did not need to store it for next year, these factors would not concern them.

Individual factors such as age, wealth and caste, only have a partial effect on a farmer's ability to introduce new crop varieties to his farming system. What is more important is a combination of the above factors coupled with the farmer's own needs and opportunity levels. The ability to obtain new seed varieties is not homogeneous even within a small community, instead it varies between individuals and groups of individuals. However eager a farmer is to get new varieties, even a progressive farmer may not be aware of all the new varieties coming into his

area until many years after their first introduction.

## **Chapter Eleven**

### **Kumpur Discussion**

#### **11.1. Background**

The Kumpur study attempted to reveal the effectiveness of indigenous communication mechanisms and the circumstances under which they were effective. Kumpur was chosen as the research location because it was isolated from any extension support and other such external influences and its farming was not market-led but was at a subsistence-level with a strong degree of farmer co-operation. It was hypothesised that for indigenous communication systems to be functioning well these factors needed to be present.

#### **11.2. Farmer characteristics encouraging the spread of information via indigenous communication systems.**

Any understanding of how new technology spreads must be situated within a comprehension of the social dynamics and networks of different kinds of farmers. Therefore a socio-economic analysis of the farmers was conducted.

##### **11.2.1. Mobility and social interaction**

In Kumpur (as well as in Phulbari), innovative farmers were found to be those who had significant contact with farmers from different areas or whose location in the most accessible areas encouraged strong communication flows. Falcon (1981) similarly found that farmers who had less interaction with farmers other than their extended families and very limited variety of information sources, were very slow to apply innovations to their farming systems. In Kumpur it was found that farmers who had greater opportunities to obtain agricultural information from different sources were the innovators. Therefore it appears that one of the main differences between innovators and non-innovators is the difference in opportunity levels they have. Roling (1988:1) believes that "the difference between developed and underdeveloped is a question of opportunity". This theory



can explain why those farmers who practised seasonal work migration from Kumpur introduced new seed varieties to the community on their return home, despite the fact that they were poor. Their movement provided them with the opportunity to gain knowledge from well beyond their local farming area. Similarly farmers who visited relatives and friends in other areas had opportunities to acquire information through observations and conversations. Falcon (1981) found from his study of a group of Mexican farmers that their delayed transition to more modern agricultural methods was partly attributed to their lack of social participation outside their family, and the very limited numbers of sources of information used by them.

#### **11.2.2. Age**

In Kumpur it was found that the older farmers were both the innovators and the diffusers. Originally I had assumed that younger farmers would be more active in this regard. In Nepal the older farmer is more socially respected and if he promotes a new seed variety, other farmers are motivated to also plant it. Winarto (1994) came across a similar attitude in the villages of West Java, Indonesia, where the agricultural experts were considered to be those who had the most years of farming experience and good strategies in farming practices. Hence knowledge transfer from extensionist-trained younger farmers to their parents and older relatives was often rejected. Many older farmers considered themselves to have more mature judgment and farming experience than their juniors. Hossain *et al.*, (1993:53) also found that in rural areas of Bangladesh "influentials are much older than followers. Time is the key factor in acquiring knowledge and experience, . . . because age is the key factor, farmers are likely to turn to more experienced farmers, even in other villages".

#### **11.2.3. Wealth, knowledge and social standing.**

In Kumpur wealth was defined as how much irrigated rice land a farmer possessed. Such farmers were regarded as good sources of information by their neighbours and were also typically amongst the innovative.

In Kumpur it was found that wealth, in the form of land quality and size, was a general characteristic of innovative farmers. Rarely were the poorer farmers the first to adopt an innovation although it did happen occasionally. Furthermore it was the wealthier farmers who were active in the diffusion of innovations. It was found that poorer farmers were not in a position to pass innovations to neighbours who were wealthier than themselves. Other studies support this conclusion. For example Cromwell and Wiggins (1993) found that in Nepal most seed transactions involve transfers of seed from richer to poorer households and not vice versa. Perhaps the reason for this can be linked to what Winarto (1994:153) found that in villages in West Java - farmers who "did not belong to any powerful social group [such as wealthy farmers] often faced constraints when trying to share their knowledge with those of higher social standing". Biggelaar and Gold's (1995:270) study also found that the most knowledgeable farmers were also the richest, being "actively engaged in searching for and obtaining planting materials". One reason for this was that they had enough land to support their newly found species.

Individuals who succeed in getting new seed varieties to their locality may later be approached by other farmers if they succeed in getting a good stand of crops growing. In addition there are other farmers who actively rather than passively, as in the former case, promote their new seed varieties to other farmers. These individuals usually have some kind of traditional status within the community or have a personal commitment and interest in promoting development within their community. Castillo (1979:40 cited in Hossain *et al.*, 1993) says that such individuals, who he calls 'opinion leaders', "earn and maintain their position by their ready social accessibility, adherence to appropriate social norms and a relatively high degree of technical competence".

#### **11.2.4. Strong community interaction**

In Kumpur it was observed that there was strong community coherence and good inter-caste interaction. This helped to maintain the traditional institutions thereby promoting the indigenous communication mechanism, despite the occurrence of

seasonal migration in search of work by some of the men. However in Ward Nine in Kumpur, no new village crier had replaced the last one, indicating a breakdown of community self-help mechanisms, which may threaten the processes seen in action in Kumpur. Similarly Sherpa (1996) reported that the function of the local village crier in the remote Phu village of Manang District, Nepal, was losing its significance because village level co-operation was on the decline.

#### **11.2.5. Farmer characteristics not influencing the spread of information via indigenous communication systems**

##### **11.2.5.1. Education**

In Kumpur the most educated farmers were the schoolteachers (who were also part-time farmers). Yet they were neither innovators nor leading farmers amongst their community. Therefore it appears that in this case formal education does not have any obvious advantage in receiving information via the indigenous communication system.

##### **11.2.5.2. Caste**

In Kumpur no caste bias appeared to influence the farmers as to whom they would pass on information or new varieties. Similarly Green (1987), in his study set in the Mid-Hills in the eastern part of Nepal, found that there was no correlation between involvement by ethnic group. However he did find that inter-ethnic seed exchange was restricted compared to farmers of the same caste. It can be concluded that the degree of inter-caste information exchange is strongly influenced by the degree of social interaction between farmers and that it will vary according to local conditions.

The ability to obtain information is not homogeneous even within a small community, instead it varies between individuals and groups of individuals. "Different individuals are recognised as 'specialists' in particular fields and are key in the transmission and interpretation of knowledge within a community or family" (Scoones and Thompson, 1994:27). According to Green (1987) farmers

who are active in diffusing information and seeds do not conform to a common social criteria.

### **11.3. Indigenous method of communication transfer.**

In Kumpur there was a well established channel for information transfer which was accessible to all farmers regardless of socio-economic standing. The primary social institutions promoting information exchange were pujas (community level worshipping functions), community meetings, the village crier and reciprocal labour exchange. In addition to this, farmers made their own efforts to obtain farming information based on their ability, social contacts and casual opportunities. Farmers differed in their propensity and aptitude towards experimentation and innovation, and therefore did not take up the opportunities offered by these information transfer channels to an equal extent.

The hypothesis that in a community with no research or extension contact there will be a well developed indigenous communication system in operation, was proven. Indigenous communication systems thrive in areas like Kumpur, which have a high degree of farmer contact and interaction, especially in areas where community co-operation is strong, and where the area remains largely inaccessible to extension services. This is why Phulbari, with its ready access to small markets, a growing money economy, and relatively high expectations of the research and extension services, did not have a good indigenous communication mechanism.

Smaller, poorer farmers rely more on informal farmer-to-farmer diffusion mechanisms than on the extension system, the former being a more equitable process of information transfer than the extension system. Larger farmers have usually better contacts with extensionists in any case. The indigenous communication system is an effective mechanism for indigenous knowledge transfer. Potentially it could also be used for the transfer of research information. To do this however, the limitations of the indigenous communication system would have to be offset by new forms of association with

the extension system.

## **Chapter Twelve**

### **Overall Conclusion**

#### **12.1. Introduction**

This research examined the limitations of the formal transfer of technology to farmers, by which technologies are developed at research level, passed to the extension service, and then ostensibly transferred to farmers. It found that farming research is determined by policy makers and researchers with no extensionist or farmer participation. The research system consequently fails to address the question of whether the technology is relevant to the clientele. Many of the extensionists in the study indicated their awareness that research generated technologies were only partially applicable to local farming conditions. Knowing this, extensionists with their clear directive for achieving target levels of adoption, preferred to work with farmers who showed the most willing and ability to adopt their innovations.

Technology can only be made relevant to different socio-economic categories of farmers, particularly in relation to their differing needs and opportunity levels, if researchers contact farmers (of all types) and if extensionists pass feedback from farmers (of all types) to the research level. In fact the transfer of technology from researcher to extensionist was characterised by its dependency on the physical passing on of print materials rather than through face-to-face contact at organised meetings. This mechanism quite simply did not contain opportunities for significant feedback, even if extensionists were geared to collect and pass back farmers' opinions and reactions.

Given the low ratio of extensionists per farmer, as well as the poor accessibility of many farming communities in the Mid-Hills, extensionists selected both the areas and the farmers they visited. It was found that extensionists generally developed closer working relationships with the influential and most accessible farmers. This category of farmers in turn was more likely to seek the advice of

extensionists concerning their farming problems. In contrast, the needs of the poorest farmers are not recognised and they fail to get adequate or satisfactory services from both extension and research. The socio-economic analysis of farmers visited by extensionists revealed that the majority were high caste, economically average, but progressive farmers. This tends to contradict the study by Sen (1992) which indicated that a farmer's opportunity level for adoption is more significant than is his caste. In Sen's (1992) model, given the same opportunity levels, the rate of adoption for each caste would be the same. The extensionists studied here preferred to deal with contact farmers, who they variously described as 'educated', 'co-operative' and 'progressive.' They were at the same time overwhelmingly of the same caste as the extensionists.

The technologies promoted by extensionists are often mostly appropriate to the resource-rich (wealthy) farmers rather than the resource-poor farmers. Educated farmers are also more likely to enlist services of researchers and extensionists and be market, rather than subsistence, orientated. Therefore for the farmers who are left behind, traditional farmer-to-farmer communication remains central to the satisfaction of their farming information needs.

The research reveals that farmer-to-farmer communication is still strong and effective - particularly so in remote communities like Kumpur. Because the extension service can only reach a fraction of the farming community, even in those areas where it functions most strongly, an alternative system must be made available. Given that the extension service is relatively ineffective in reaching the smallest and most isolated of farmers, an emphasis on farmer-to-farmer transfer of innovations has been seen as a means to overcome these constraints. As farmers always rely to some extent on each other to obtain different seed varieties and for farming information, this indigenous system must be given greater recognition and be incorporated into the formal researcher-extension-farmer linkage mechanism. Hossain *et al.* (1993:54) believe that farmers in remote locations who experience limited contact with extension services develop "strong interpersonal linkage systems". In addition most farmers prefer to see new crop varieties growing in other's fields before having the confidence in the

variety to grow it for themselves. Neighbours are always available if a farmer needs seed to plant or information, whereas the frequency and timeliness of extension visits are unreliable. Even if a farmer does visit an extensionist's office or research establishment there is always the possibility that they may be out of stock of the seed variety. Finally the demand for locally generated technologies or local varieties can be as strong as for research generated technologies.

The effectiveness of farmer-to-farmer communication is dependent on social interaction as well as a flow of innovations into the area. In the case of Phulbari, despite the availability of extension services, the spread of new seed varieties was due largely to farmer-to-farmer communication. According to Hossain *et al.* (1993:39) this process "produces greater effects than any other medium in terms of knowledge gains, attitude formation and changes and overt behavioural change". Compared to extension services, including mass media, farmer-to-farmer communication is effective for a wider cross-section of farmer categories. Similarly Simpson (1994) found that even amongst those farmers who were receiving the highest extension contact, they still indicated that they were over five times as likely to get information on agricultural innovations through informal channels, rather than from formal research and extension systems.

Farmer-to-farmer communication, although more heavily relied upon by the poorest farmers, in fact worked more effectively for wealthier farmers because they had greater social contacts and more time to receive and search for farming information than the poorer farmers. In Phulbari, it was found that the wealthier farmers were less interested to pass on information to poorer farmers. Also there were low levels of social interaction between poor and rich and between different castes in Phulbari compared to Kumpur.

Phulbari and Kumpur had different social settings which affected farmer-to-farmer communication. Consequently there were some differences as well as similarities between the two areas. For example, in Kumpur, caste was no real barrier to information flow, but in Phulbari it did have a marked effect. On the other hand, poverty had a negative effect in both areas, whereas conversely,



geographical accessibility had a positive effect in both areas. The indigenous communication system was stronger in Kumpur than it was in Phulbari. This was due to differences in farmer interaction. For example, in Phulbari there was little sense of togetherness amongst the separate hamlets. The area was more recently settled than Kumpur. Therefore traditional institutions were not strong and were further weakened by lengthy migration and the beginning of a market economy bringing about increasing individualism for personal benefit. The extension service was active in the area. Therefore farmers relied much less on each other for their social welfare, and traditional practices and customs were declining. The hamlets of Kumpur, in contrast, were close knit communities with little difference in status amongst villagers, regardless of caste. Money was not a primary method of exchange and hiring labour was not commonplace compared to co-operative labour exchange and communal decision-making was considered more important than self-interest.

### **12.2 Influence of socio-economic factors on indigenous communication system and the extension service: a comparison.**

Poverty was the most significant factor disabling farmers from acquiring innovations, both via the indigenous communication system and the extension system. Whereas wealthy farmers can benefit from both systems and tend to monopolise information.

Farmers with high social standing both attracted extensionists to visit them, and prospered from their visits. It also gave them greater access to information via the indigenous communication system but to a lesser extent.

Education improved a farmer's ability to utilise extension services. They had more confidence and ability to communicate with extensionists than did the uneducated farmers. Education had no effect on the indigenous communication system.

Women relied mostly on the indigenous communication system for their

information needs. They were under-represented in farmer-extension visits. Old age served as a positive asset for the indigenous communication system but was not significant for benefiting from the extension system.

### **12.3 Recommendations**

This study identified two main areas for improvement:

*(i) Improve communication within the formal transfer of technology mechanism.*

This study revealed communication weaknesses in the formal transfer of technology mechanism. Extensionists should be given training to enable them to communicate more effectively with all categories of farmers rather than just the influential farmers. Furthermore to reduce the current bias which extensionists have towards visiting farmers of their own caste, extensionists should be recruited from a wider selection of the caste and ethnic groups of Nepal (as presently most of the extensionists are of higher caste). Researchers also, if they visit farmers they will mostly visit the influential farmers. Therefore a misunderstanding develops of what the majority of small farmers need and want. This can only be rectified by consciously selecting all categories of farmers and learning about their constraints and needs. This implies better communication skills and feedback in order to develop more appropriate technologies and to distribute them to a wider cross-section of the farming community.

Feedback between researcher, extensionist and farmer should be made to feature more in the transfer of technology mechanism. A formal investigation should be conducted to find out how feedback can be installed into the communication system. The present informal and intermittent contact between researcher, extensionist and farmer is a cause of concern. Hence it is not surprising that extensionists are sometimes criticised for possessing incomplete knowledge of new technologies. In order to improve the performance of the extension service it is recommended that a new training curriculum be designed with a strong focus on communication. Developing better communication skills will improve their links with both farmers and researchers.

*(ii) Formally utilise farmer-to-farmer communication.*

The clear implication of this picture of communication in the Nepalese communities studied is that farmers' needs, knowledge and information exchange system should all be utilised both by research and extension sectors - in order to promote rural development, as many channels of communication as possible should be used. Extensionists need to identify communication networks within communities and use them to diffuse their technologies. Similarly by tapping into the indigenous farmer seed exchange mechanism a large number of farmers can be reached with less effort on the part of the extensionists. This would be an innovative approach to seed acquisition through the local collection by farmers and schoolchildren, supported by seed exchange between areas and projects.

Farmers who are the local diffusers or innovators of new technologies within their communities should be located and recruited by extensionists as village-level extensionists. Wherever possible each homogeneous group of farmers should have a representative village-level extensionist. Local school teachers can also be used to pass on extension messages to farmers formally via adult education classes and extension messages should be developed into the school curriculum. New seed varieties could also be dispersed widely using local fairs and markets. The advantage of using this approach is that markets have a large catchment area with good opportunities for a broad diffusion of the seed.

The extension service must actively encourage farmer-to-farmer information exchange, and should seriously consider using the indigenous communication system for its extension messages, as without this help, the formal transfer of technology is unlikely to be able to bring about rural development everywhere and to everyone. This is because instead of relying on the thinly spread extensionists, farmers rely more upon a wide range of informal communication mechanisms. It was found that few farmers in this study had adopted an innovation based solely upon information derived from either mass media or extensionists. Instead they relied heavily on indigenous communication channels which managed to reach more farmers especially those out of touch with formal information channels. It is obvious that the formal acceptance of farmer-to-farmer

transfer of technology calls for a significant policy shift at the Ministry level and considerable retraining of personnel, but if really effective rural development is to be achieved such changes are essential. At present, the dislocation between formal and informal systems is wasteful and tends to distort the development process. As outlined above, there are ways to reconcile the two, but they need to be based on a detailed understanding of the ways in which the two systems work. The present research is offered as a contribution to this understanding.

## References

- Amanor, K.S. (1993) Farmer experimentation and changing fallow ecology in the HKrobo district of Ghana. In de Boef *et al.* Cultivating knowledge: genetic diversity, farmer experimentation and crop research. Intermediate Technology Publications Limited, London. pp. 35-43.
- Antholt, C. (1992) Agricultural extension in the Twenty First Century: lessons from South Asia. In: Rivera, W.M. and Gustafson, D.J. (eds.) Agricultural extension: worldwide institutional evolution and forces for change. Elsevier Science Publishing Company, New York. pp.30-45.
- Ashby, J.A. *et al.* (1987) Farmer participation in On-Farm Trials. Agricultural Administration (Research and Extension). Network Discussion Paper 22. ODI, London.
- Ashcroft, J. *et al.* (1973) Extension and the forgotten farmer. First report of a field experiment. Bulletin 37. Wageningen Agricultural University, The Netherlands.
- Avery, T.E. and Burkhardt, H.E. (1983) Forest measurements. McGraw-Hill Book Company, USA.
- Babbie, E. (1989) The practice of social research. Wadsworth Publishing Co., California.
- Barker, D. (1979) Appropriate methodology: an example using a traditional African board-game to measure farmers' attitudes and environmental images. IDS Bulletin 10(2): 37-40.
- Beets, W.C. (1981) Towards a strategy for Hill agricultural development in Nepal. In: Ministry of Forests and Agriculture, HMG Nepal (ed.). Nepal's experience in Hill agricultural development. HMG, Nepal. pp. 209-215.

- Bellaart, M.L. (1988) Planning with the poor: involving rural people in problem identification. University of Amsterdam, The Netherlands.
- Bienen, H. *et al.* (1990) Decentralization in Nepal. World Development, 18(1):61-75.
- Biggelaar, C.D. and Gold, M.A. (1995) The use and value of multiple methods to capture the diversity of endogenous agroforestry knowledge: an example from Rwanda. Agroforestry Systems 30(1-2):263-275.
- Biggs, S. (1980) Informal R and D. Ceres, 13(4):23-26.
- Biggs, S.D. and Clay, E.J. (1981) Sources of innovation in agricultural technology. World Development, 9(4):321-336.
- Biggs, S.D. and Farrington, J. (1991) Agricultural research and the rural poor: a review of social science analysis. IDRC, Ottawa.
- Bistra, D.B. (1991) Fatalism and development. Nepal's struggle for modernization. Orient Longman, India.
- Blaikie, P. and Brookfield, H. (1987) Land degradation and society. Methuen, London.
- Bowen, R. (1992) Personal communication. Research advisor, Nepal-UK Forestry Research Project, Forestry Research Division, Ministry of Forests, Kathmandu, Nepal.
- Brokensha, D. *et al.* (1980) Indigenous knowledge systems and development. University Press of America, USA.
- Brown, E.J. and Deekens, A. (1958) Roles of the extension subject-matter specialist. Rural Sociology 28(3):263-276.

- Brown, L. (1981) Innovation diffusion: a new perspective. Methuen, London.
- Burch, W.R. (1988) The uses of social science in the training of professional social foresters. Journal of World Forest Resource Management. 3(2):73-109.
- Byers, E. and Sainju, M. (1994) Mountain ecosystems and women: opportunities for sustainable development and conservation. Mountain Research and Development 14(3):213-228.
- CAB International (1992) Appraisal of country needs for CABI Services, kingdom of Nepal. CAB International, Wallingford, Oxon.
- Campbell, J.G. *et al.* (1979) The use and misuse of social sciences research in Nepal. CNAS, Tribhuvan University, Nepal.
- Caplan, A.P. (1972) Priests and cobblers: a study of social change in a Hindu village in western Nepal. Intertext Books, London.
- Carson, B. *et al.* (1986) Present land use and the potential for improvement. Land Resource Mapping Project: Agriculture, Forestry Report, Kathmandu, Nepal.
- Carter, E.J. (1991) Tree cultivation on private land in the Middle Hills of Nepal: a village perspective. PhD Thesis, University of Oxford, UK.
- Chamala, S. *et al.* (1980) A new look at adopter categories and alternative proposal for target grouping of farming community. Indian Journal of Extension Education. 16(1,2):1-18.
- Chambers, R. (1985) Shortcut methods of gathering social information for rural development projects. In: Cernea, M.M.(ed.) Putting people first: social variables in rural development. Oxford University Press, UK. pp.399-415.

Chambers, R. (1992) Rural appraisal: rapid, relaxed and participatory. IDS Discussion Papers 311. IDS Publications, Brighton, England.

Chambers, R. and Ghildyal, B.P. (1985) Agricultural research for resource poor farmers: the farmer-first and last model. IDS Discussion Papers 203. IDS Publications, Brighton, England.

Chambers, R. and Jiggins, J. (1987) Agricultural research for resource-poor farmers.. Part 11: a parsimonious paradigm. Agricultural Administration and Extension. 27(2):109-128.

Chambers, R. *et al.* (eds.) (1989) Farmer first: farmer innovation and agricultural research. Intermediate Technology Publications Limited, London.

Chaudhry, A.A. (1991) Information for the mountain farmer. Quarterly Bulletin of the IAALD 36(1-2):24-28.

Chaudhry, M.A. (1984) Resistance to change: fact or fiction? A study in selected areas of Punjab Province in Pakistan. Agricultural Administration. 16:131-143.

Chitrakar, P.L. (1990) Planning, agriculture and farmers: strategy for Nepal. Ganesh Devi Chitrakar, P.O.Box 5548, Kathmandu, Nepal.

Clay, E.J. (1980) The economics of the bamboo tubewell: dispelling some myths about appropriate research. Ceres. 13(3):443-47.

Collinson, M. (1981) A low cost approach to understanding small farmers. Agricultural Administration 8:433-450.

Collinson, M. (1984) Farming systems research: diagnosing the problems. In: Annual Agricultural Symposium. The World Bank, Washington, Jan. 9-13, 1984. The World Bank, Washington D.C., USA.



Cristovao, A.F.A.C. (1989) Research in extension: popular participation as a major issue. Paper presented to the Ninth European Seminar on Extension Education, Stockholm, Sweden.

Cromwell, E.(ed.) (1990) Seed diffusion mechanisms in small farmer communities: lessons from Asia, Africa and Latin America. Agricultural Administration (R and E) Network Paper, 21, ODI, London.

Cromwell, E.A. and Wiggins, S. (1993) Sowing beyond the state: NGOs and seed supply in Developing Countries, ODI, London.

Crouch, B.R. and Chamala, S.(eds.) (1981) Extension education and rural development. Volume 1. John Wiley and Sons, Chichester.

Dasgupta, B. (1977) Agrarian change and the new technology in India, Institute for Social Development, Geneva, Switzerland.

Day, J. (1977) Information needs of staff of agricultural extension services, Extension and Rural Development Centre, University of Reading, UK.

de Boef, W. *et al.*, (eds.)(1993) Cultivating knowledge. Genetic diversity, farmer experimentation and crop research, Intermediate Technology Publications Limited, London.

Denhlom, J. (1991) Agroforestry in mountain areas of the Hindu Kush Himalayan region. ICIMOD Occasional Paper 17. ICIMOD, Kathmandu, Nepal.

de Vaus, D.A. (1986) Surveys in social research (Contemporary Social Research Series: 11). George Allen and Unwin Ltd., London.

Dey, J. (1981) Gambian women: unequal partners in rice development projects. Journal of Development Studies 17:109-122.

Dillon, J. and Hardaker, J.B. (1980) Farm management research for small farmer development. FAO Agricultural Services Bulletin 41, FAO, Rome.

Dixon-Mueller, R.(1985) Women's work in Third World agriculture. Women, Work and Development 9. Geneva.

Doherty, V.S. (1974) The organizing principles of Gurung kinship. Kailash 2(4):273-301.

Doorman, F. (1991) Linkages between researchers, extensionists and farmers: the case of rice in the Dominican Republic. Agricultural Systems 37:107-118.

Dunsmore, J.R. (1988) Mountain environmental management in the Arun Basin of Nepal. ICIMOD Occasional Paper 9, Kathmandu, Nepal.

✱ Elliott, J.A. (1994). An introduction to sustainable development: the developing world. Routledge, London.

Ewell, P.T. (1989) Linkages between on-farm research and extension in nine countries. OFCOR Comparative Study Paper 4. ISNAR, The Hague.

Falcon, G. (1981). In: Crouch, B.R. and Chamala, S. (eds.) Extension, education and rural development. Sixth edition. John Wiley and Sons, Chichester.

FAO (ed.) (1992) FAO Yearbook. Production. FAO Statistics Series 99. FAO, Rome.

FAO (1994) Participatory rapid appraisal of farmers' agricultural knowledge and communication systems. Report of the PHI/92/TO1 Technical Support Services Project. FAO, Rome.

Farrington, J. (1988) Research methods for difficult areas. Experimental Agriculture. 24:269-279.

Farrington, J. and Martin, A. (1987) Farmer Participatory Research: a review of concepts and practices. ODI Discussion Paper 19. ODI, London.

Fisher, R.J. (1987) Confusing numbers with facts: a note of caution about the results of quantitative survey questionnaires. Paper presented for a working group on forest, fodder and leaf litter. Forest Research Information Centre, Kathmandu, Nepal.

Fisher, R.J. (1989) Indigenous systems of common property forestry management in Nepal. Working Paper 18. East-West Centre, Hawaii.

Francis, P. and Rawlins-Branan, M.J. (1987) The extension system and small-scale farmers: a case study from northern Zambia. Agricultural Administration and Extension. 26(4):185-196.

Gebrehiwot, A. (1988) Agricultural research and extension linkages in the central province of Ethiopia: an inter-organisational analysis. PhD Thesis, University of Reading, UK.

Gibbon, D. and Schultz, M. (1992) Farming systems research in remote areas of Nepal: the need for a new approach to on-farm research and extension. Experimental Agriculture. 28(2):203-209.

Gogoi, D.K. and Singh, R. (1986) Communication of agricultural information within a village social system: a model of farm information flow. Interaction. 4(3):33-42.

Goldman, A. (1991) Tradition and change in post harvest pest management in Kenya. Agriculture and Human Values 8(1+2):99-113.

Grandin, B.E. (1988) Wealth ranking in smallholder communities: a field manual. Intermediate Technology Publications Limited, London.

Green, T. (1987) Farmer to farmer seed exchange in the Eastern Hills of Nepal: the case of Pokhereli Masino rice. Working Paper 05/87 Pakhribas Agriculture Centre, Dhankuta, Nepal.

Green, V. (1980) Index of regional variation for Nepal. USAID, Nepal.

Gupta, A. (1992) Honey bee. Indian Institute of Management, Ahmedabad, Vastrapura, India.

Gurung, G.S. (1993) The roles of tourist guides and their training needs: a case study in Nepal. MA Thesis, Lincoln University, New Zealand.

Guyer, J.I. (1980) Female farming and the evolution of food production patterns among the Beti of south central Cameroon. Africa 50:341-356.

Hartmann, P. *et al.* (1989) The mass media and village life. An Indian study. Sage Publications, London.

Heissey, P. (ed.) (1990) Accelerating the transfer of wheat breeding gains to farmers: a study of the dynamics of varietal replacement in Pakistan. CIMMYT, Mexico.

Hobley, J.M.A. (1990) Social reality, social forestry: the case of two Nepalese Panchayats. PhD Thesis. Australian National University, Canberra, Australia.

Hofer, A. (1972) A settlement and smithy of the blacksmiths (Kami) in Nepal. Kailash 4(4):349-396.

Holmberg, D.H. (1989) Order in paradox. Myth, ritual and exchange among Nepal's Tamang. Cornell University Press, Ithaca, USA.

Horn, C. (1994) Conflict in recreation: the case of mountain-bikers and trampers. MA Thesis, Lincoln University, New Zealand.

Hossain, S.M.A. *et al.* (1993) Informal agricultural communication patterns in a remote area of Bangladesh. Journal for Farming Systems Research-Extension 3(2):39-58.

Hughes, D.T. (1985) Extension evaluation and planning in the hills of Nepal (with special reference to the Overseas Development Administration's Project based at Lumle). Agricultural Administration 18:89-105.

ISNAR (1994) Farmers' organizations offer research institutes prospective for partnership. ISNAR Newsletter 24. INSAR, The Netherlands.

Ives, J.D. and Messerli, B. (1989) The Himalayan dilemma: reconciling development and conservation. Routledge, London.

Jiggins, J. (1977) Extension planning and the poor. Agricultural Administration Unit, Occasional Paper 2. ODI, London.

Jones, G.E. and Rolls, M.J. (eds.) (1976) Progress in rural extension and community development. vol 1. John Wiley and Sons, Chichester.

Jones, G.E. *et al.* (1987) Information management in agriculture. British Library R and D Report No 5931. Agricultural Extension and Rural Development Centre, University of Reading.

Jones, G.E. (1992) La Diffusione delle innovazioni e i processi decisionali in agricoltura. (Innovation diffusion and decision-making in agriculture) Rivista di Economia Agraria. 47(3):353-369.

Jorgensen, D.L. (1989) Participant observation: a methodology for human studies. Applied Social Research Methods Series.15. Sage Publications, London. pp.65.

Kaigi, N.M. (1983) Current awareness service for agricultural information. Users in Kenya with special reference to the Ministry of Agriculture. MLib. Thesis, Loughborough University of Technology, UK.

Kidd, C.V. and Pimentel, D. (eds.) (1992) Integrated resource management. Agroforestry for development. Academic Press, London.

Kilic, H. (1991) The information needs of Turkish farmers. MSc Thesis. University of Reading, UK.

Kirsch, O.C. *et al.* (1980) The role of self-help groups in rural development projects. Breitenbach, Saarbrücken, Germany.

Korsching, P.F. and Hoban, T.J. (1990) Relationships between information sources and farmers' conservation perceptions and behaviour. Society and Natural Resources 3(1):1-10

Korten, D.C. (1980) Community organization and rural development: a learning process approach. Public Administration Review. September/October 1980. 40(5):480-511.

Krikelas, J. (1983) Information-seeking behaviour: patterns and concepts. Drexel Library Quarterly 19(2):5-20.

Kumar, K. (1991) Rapid appraisal methods in development settings: an overview. In: Kumar, K. and Carter, D. (eds.) Rapid appraisal data collection methods: international case studies. The World Bank, Washington D.C., USA. pp 1-19.

Labovitz, S. and Hagedorn, R. (1971) Introduction to social research. McGraw-Hill, New York.

✓Lele, U. (1975) The design of rural development: lessons from Africa. The John Hopkins University Press, Baltimore, USA.

Lightfoot, C. (1987) Indigenous research and on-farm trials. Agricultural Administration and Extension 24:79-89.

Lightfoot, C. *et al.* (1988) A participatory method for systems problem research: rehabilitating marginal uplands in the Philippines. Experimental Agriculture 24:301-309.

Lisk, F. (1985) Popular participation in planning for basic needs: concepts, methods and practices. Gower, Aldershot, UK.

Longley, C. and Richards, P. (1993) Selection strategies of rice farmers in Sierra Leone. In: de Boef *et al.* (eds.) (1993) Cultivating knowledge. Genetic diversity, farmer experimentation and crop research. Intermediate Technology Publications Limited, London. pp 51-57.

Longo, R.M.J. (1985) The role of information transfer in the adoption of agricultural innovations: the case of the Federal District of Brazil. PhD Thesis. University of Sheffield, UK.

Macfarlane, A. (1976) Resources and population. A study of the Gurungs of Nepal. Cambridge University Press, Cambridge.

Maikhuri, R.K. and Gangwar, A.K. (1993) Ethnobiological notes on the Khasi and Garo tribes of Meghalaya, north east India. Economic Botany 47(4):345-355.

Malla, Y.B. (1982) Extension forestry. MSc Thesis, University of Reading, UK.

Malla, Y.B. and Fisher, R.J. (1987) Planting trees on private farmland in Nepal: the equity aspect. Nepal-Australia Forestry Project, Nepal.

Mamponya, C.R. (1982) Agricultural libraries and information in Malawi. MPhil. Thesis. Loughborough University of Technology, UK.

Mascarenhas, J. *et al.* (eds.) (1991) Participatory rural appraisal. Proceedings of the February 1991 Bangalore PRA Trainers Workshop. RRA Notes. 13. IIED, London.

Mathema, P. (1988) Community forestry in Nepal: a review. MSc Thesis. University of Wales, Bangor, UK.

Maurya, D.M. *et al.*, (1988) Improved livelihoods, genetic diversity and farmer participation: a strategy for rice breeding in rain-fed areas of India. Experimental Agriculture. 24:311-320.

McCorckle, C.M. (1989) Towards a knowledge of local knowledge and its importance for agricultural RD and E. Agriculture and Human Values. 6(3):4-12.

McCracken, J.A. *et al.* (1988) An introduction to Rapid Rural Appraisal for agricultural development. IIED, London.

McDermott, J.K. (1984) The U.S. Land-Grant college experience in research and extension linkage. Paper presented at a conference on research and extension linkage. Eldoret, Kenya. June 11-14, 1984. Ministry of Agriculture and Livestock Development, Nairobi, Kenya.

McNeely, J.A. and Pitt, D. (eds.) (1985) Culture and conservation: the human dimension in environmental planning. Croom Helm, London.

Melnyk, M. (1993) The effects of sedentarization on agriculture and forest resources in southern Venezuela. ODI Rural Development Forestry Network. Network Paper 16b. ODI, London.

Moore, M.P. (1984). Institutional development, the World Bank, and India's new agricultural extension programme. Journal of Development Studies. 20:305-317.



Nichols, P. (1991) Social survey methods. A field guide for development workers. Development Guidelines 6. 274 Banbury Road, Oxford, UK.

Norem, R.H. (1986) Basic interviewing and note-taking skills for the informal survey in FSR and extension. In: Flora, C.B. and Tomecek, M.(eds.) Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium. ODI, London. pp.56-57.

Oakley, P. and Garforth, C. (1985) Guide to extension training. Agricultural Extension and Rural Development Centre, University of Reading, UK.

O'Brien, W.E. and Flora, C.B. (1992) Selling appropriate development versus selling out: rural empowerment and control in indigenous knowledge discourse. Agriculture and Human Values 1(2):95-103.

Pachico, D. and Ashby, J. (1983) Stages in technology diffusion among small farmers: biological and management screening of a new rice variety in Nepal. Agricultural Administration. 13:23-37.

Pathack, S. and Majumdar, A.K. (1986) A paradigm of attributes of elements of communication process to communication fidelity. Interaction, 4(3):43-46.

Penlinck, E. *et al.* (1983) Training and extension for community forestry. Nepal Community Forestry Development Project, HMG Department of Forests, Nepal.

Pitt, D.C. (1988) Poverty, women and young people. In: Ives, J. and Pitt, D.C. (eds.) Deforestation: social dynamics in watersheds and mountain ecosystems. Routledge, London. pp.191-223.

Potts, M.J. *et al.* (1992) Farmer experimentation as a basis for cropping systems research: a case study involving true potato seed. Experimental Agriculture. 28(1):19-29.

Raintree, J.B. and Hoskins, M.W. (1988) Appropriate R and D support for forestry extension. In: FAO (ed.) Planning forestry extension programmes. FAO, Rome. pp24-48.

Rajasekaran, B. (1994) A framework for incorporating IK systems into agricultural research and extension organisations for sustainable agricultural development. Technology and Social Change Series 22. Technology and Social Change Program, Iowa State University, Ames, Iowa, USA.

Rhoades, R.E. (1982) The art of the informal agricultural survey. Social Science Department Training Doc. 1982:2. International Potato Centre, Lima, Peru.

Rhoades, R.E. (1985) Basic field techniques for RRA. In: Khon Kaen University (ed.) Proceedings of the 1985 International Conference on Rapid Rural Appraisal. Rural Systems Research and Farming Systems Research Project. Khon Kaen University, Thailand. pp.114-128.

Rhoades, R.E. and Booth, T.H. (1982) Farmer-back-to-farmer. Agricultural Administration. 11(2): 127-137.

Richards, P. (1975) Alternative strategies for the African environment: folk ecology as a basis for community orientated agricultural development. In: Richards, P. (ed.) African Environment: problems and perspectives. African Environment Special Report no 1. International African Institute, London.

Richards, P. (1985) Indigenous agricultural revolution: ecology and food production in West Africa. Westview, London.

Rocheleau, D.E. (1987) Women, trees and tenure: implications for agroforestry research and development. In: Raintree, J.B.(ed.) Land, trees and tenure: proceedings of an international workshop on tenure issues in agroforestry. ICRAF and the Land Tenure Centre, Madison, USA. pp. 79-120.

Rogers, E.M. (1983) Diffusion of innovations. Third Edition. The Free Press, New York.

Rogers, E.M. and Shoemaker, F.F. (1971) Communication of innovation: a cross-cultural approach. Second edition. The Free Press, New York.

Rogers, E.M. (1977) Network analysis of the diffusion of innovations: family planning in Korean villages. In: Lerner, D. and Nelson, L.M.(eds.) Communication research - a half century appraisal. East-West Center, The University Press of Hawaii, Honolulu. pp.117-147.

Roling, N. (1982) Alternative approaches in extension. In: Jones, G.E. and Rolls, M.J.(eds.) Extension and relative advantages in rural development. John Wiley, Chichester. pp.87-115.

Roling, N. (1988) Extension science - information systems in agricultural development. Cambridge University Press, Cambridge.

Roling, N. *et al.* (1976) The diffusion of innovations and the issue of equity in rural development. In: Rogers, E.M. (ed.) Communication and development: critical perspectives. Sage Publications, London. pp.63-78.

Roling, N. (1984) Appropriate opportunities as well as appropriate technology. Ceres 17(1):15-19.

Saha, D.K. *et al.* (1987) Patterns of communication and constraints in disseminating modern agricultural technologies in arid villages. Annals of Arid Zone. 26(4):235-240.

Saravia, G. (1992) A breath of life. Revitalizing farmers' knowledge. Forests, Trees and People Newsletter. 18:36-39.

Schoonmaker Freudenberger, K. (1994) Challenges in the collection and use of information on livelihood strategies and natural resource management. In: Scoones, I. and Thompson, J. (eds.) Beyond farmer first: rural people's knowledge, agricultural research and extension practice. Intermediate Technology Publications Limited, London. pp. 124-133.

Schroeder, R. and Schroeder, E. (1979) Women in Nepali agriculture: all work and no power. The Journal of Development and Administrative Studies 1(2): 178-192.

Schroeder, R.F. (1985) Himalayan subsistence systems: indigenous agriculture in Nepal. Mountain Research and Development, 5(1):31-44.

Schultz, T.W. (1984) The economics of agricultural research. In: Eicher, C.K. and Staatz, J.M. (1984) Agricultural development in the Third World. The John Hopkins University Press, London. p335-347.

Scoones, I. and Thompson, J. (eds.) (1994) Beyond farmer first: rural people's knowledge, agricultural research and extension practice. Intermediate Technology Publications Limited, London.

Searle, R. *et al.* (1993) Communication and rural development in Nepal: planning a national communication policy. Department of Communication, University of Amsterdam, The Netherlands.

Seeley, J. (1989a) Wealth ranking in Magar communities: examples from Lumle Agricultural Centre Extension Command Area. Working Paper 89/2. Lumle Agricultural Centre, Nepal.

Seeley, J. (1989b) Women and extension services in Lumle Agricultural Centre, Research and Extension Command Areas. Technical Paper 16. Lumle Agricultural Centre, Nepal.

Sen, C.K. (1992) An effective approach to technology transfer in the Western Hills of Nepal. PhD Thesis, University of Reading, UK.

Sen, M.L.A. (1969) Mass communication in a desert village. Annals of Arid Zone. 8(1):135-142.

Shah, A.C. (1991) Shoulder tapping: a technique of training in participatory rural appraisal. Forests, Trees and People Newsletter, 14: 14-15.

Sharma, R.P. and Anderson, J.F. (1985) Nepal and the CGIAR Centres: a study of their collaboration in agricultural research. CGIAR, Washington DC., USA.

Sherpa, A.P. (1996) Participatory Rural Appraisal (PRA) in Community Tourism Planning: a case study in the Nyishang and Nar-phu regions of the Manang District, Nepal. MA Thesis. Lincoln University, New Zealand.

Shin, W.Y and Evans, J.F. (1991) Where field staff get information from: approaching the electronic times. Journal of Extension. Fall:16-19.

Simpson, B.M. (1994) The lifeblood of agricultural change. ILEIA Newsletter 10(1):1-16.

Singh, I. (1979) Small farmers and the landless in South Asia. World Bank Staff Working Paper 320. World Bank, Washington D.C., USA.

Sivayoganathan, C. (1985) Training and Visit system in Sri Lanka: the relative importance of contact farmer as a source of rice production information. Agricultural Administration 18:127-135.

Smith, D.B. (1989) Farmers and indigenous agricultural knowledge in Nepalese agricultural research. PhD Thesis. University of Wisconsin, Madison, USA.

Sofranko, A.J. *et al.* (1988) Insights into farmers' extension contacts: evidence from Pakistan. Agricultural Administration and Extension, 30:293-307.

Sperling, L. and Loevinsohn, M.E. (1993) The dynamics of adoption, distribution and mortality of bean varieties among small farmers in Rwanda. Agricultural Systems 41:441-453.

Stavis, B. (1979) Agricultural extension for small farmers. Rural Development Paper 3. Michigan State University, East Lansing, USA.

Sthapit, B.R. *et al.* (1989) Development of biofertilizer technology in the hills of Nepal - the experience of Lumle Agricultural Centre. LAC Technical Paper 22. Lumle Agricultural Centre, Nepal.

Stuart, A. (1964) Basic ideas of scientific sampling. Charles Griffin and Company Ltd., London.

Stuart, A. (1984) The ideas of sampling. Charles Griffin and Company Ltd., High Wycombe, UK.

Subedi, A. (1988) An analysis of farmers' decision-making processes and their implications for extension services with particular reference to Nepal. MSc Thesis, University of Reading, UK.

Subedi, A. *et al.* (1989) Traditional methods of maintaining soil fertility in the Mid and High Hills (1,200 -2,100 m asl) of the Western Development Region of Nepal (Kaski and Lamjung districts): problems and potentials. LAC Working Paper 3. Lumle Agricultural Centre, Nepal.

Sumberg, J. and Okali, C. (1988) Farmers, on-farm research and the development of new technology. Experimental Agriculture, 24:333-342.

Sutherland, A.J. (1987). Sociology in farming systems research. ODI Occasional Paper 6. ODI, London.

Thapa, B. (1987) The potential of agroforestry in the Middle Hills of Nepal. MSc Thesis. University College of North Wales, Bangor, UK.

Thapa, H.B. *et al.*, (1988) Agricultural extension in the Hills of Nepal: ten years of experience from PAC. Agricultural Administration (Research and Extension) Network. Network Paper 4. ODI, London.

Thrupp, L.A.(1989) Legitimizing local knowledge: from displacement to empowerment for Third World people. Agriculture and Human Values 6(3):13-24

Tuladhar, J.M. *et al.* (1977) The population of Nepal: structure and change. University of California, Berkeley, USA.

Upadhyay, H. C. (1990) Harijans of Himalaya with special reference to the Harijans of Kumaun Hills. Gyanodaya Prakashan, Nainital, India.

Van Crowder, Z. (1988) Agricultural technology transfer in Ecuador. Agricultural Administration and Extension (30):215-220.

Van den Ban, A.W. (1963) Boer en Landbouwvoorlichting. Van Gorcum, Assen, The Netherlands.

Van den Ban, A.W. and Hawkins, H.S. (1988) Agricultural extension. Longman Scientific and Technical, London.

Van Spengen, W.V.(1987) The Nyishangba of Manang: geographical perspective on the rise of a Nepalese trading community. Kailash 13(3-4):131-278.

Van Wijk, C. (1985) Participation of women in water supply and sanitation. Roles and realities. IRC, The Hague, The Netherlands.

Wadsworth, J. (1995) Adoption of innovations by Costa Rican livestock producers under different levels of extension intensity: predicted versus observed behaviour. Agricultural Systems 49(1):69-100.

Wax, R.H. (1979) Gender and age in fieldwork and fieldwork education. Social Problems. 26: 509-522.

Wiggins, S. (1986) Agricultural policy and agricultural extension: the African experience. In: Jones, G.E.(ed.) Investing in rural extension: strategies and goals. Elsevier Applied Science Publishers, London. p.89-105.

Williams, S.K.T. (1974) Rural poverty to rural prosperity: a strategy for development in Nigeria. Text of an inaugural lecture delivered at the University of Ife, Nigeria. University Press, Nigeria.

Winarto, Y.T. (1994) Encouraging knowledge exchange: integrated pest management in Indonesia. In: Scoones, I. and Thompson, J. (eds.) Beyond farmer first: rural people's knowledge, agricultural research and extension practice. Intermediate Technology Publications Limited, London. pp. 150-154.

World Bank (1979) The Nepal agriculture sector review. Report 2205-NEP. Document of the World Bank. South Asia Project Department. World Bank, Washington D.C., USA.

World Commission on Environment and Development (1987) Our common future. Report of the World Commission on Environment and Development. Oxford University Press, Oxford.

Zimmerer, K. (1992) Land-use modification and labour shortage impacts on the loss of native crop diversity in the Andean Highlands. In: Jodha, N.S. *et al.* Sustainable mountain agriculture. Intermediate Technology Publications Limited, London. pp.413-414.



## Appendix 1a.

### Wealth Ranking: theories and application

Social scientists use social techniques for wealth ranking which is different from the techniques used by economists. Grandin (1988) suggests a "card sorting" method for wealth ranking for social research. The card sorting method requires much skill and its result are based on the theory of probability of statistics. Other social scientists recommend "direct observation" techniques for wealth ranking.

The following procedure was used while doing wealth ranking in the hamlet of Timilsina Gaun, Phulbari:-

First of all a list of all the householders in Timilsina Gaun was obtained from the local people. Secondly, for the "direct observation technique", local parameters were used for the reflection of wealth after making observations of the community. The degree of wealth was considered a sensitive issue for the community. Therefore during informal talks with the villagers, issues about richness were raised in an indirect way, such as, " *how many people will be able to afford to buy an electric powered irrigation pump when electricity comes to the village?*". In this way the initial ranking of the households could be further cross-checked. In addition people were asked to categorise the households of Timilsina Gaun as 'rich', 'medium' or 'poor'. The following parameters for the reflection of wealth was noted within the community:-

(i) **House Age:-** A new house is a symbol of status. Only rich people can generally afford to build a new house. Generally houses are built out of unbaked mud 'bricks', therefore they usually do not last for more than 30 years. If a house is more than 30 years old and the owner has not reconstructed a new house it implies that he cannot afford to build a new house.

**(ii) Roof types:-** Up until twenty years ago, baked clay roof tiles were a status symbol in rural Nepal. Their manufacture was very time consuming hence they were expensive. In addition much firewood is needed to bake these roof tiles and timber is needed as roof rafters to support them because of their weight. Therefore only the rich could afford to use them for roofing. Conversely, poor households have always used thatch roofs because it is the cheapest roofing material available. Even today poor people still use rice straw for thatching. Nowadays timber is scarce and therefore expensive, and the cost of labour has increased so rich people have begun to use corrugated iron sheets for roofing instead of the traditional baked clay tiles. Average-income people can also afford to use corrugated iron sheets as a roofing material.

**(iii) Window type:-** Generally it is not common to have proper 'windows' in most rural Nepalese houses. Instead small holes of about six inches square were made in the walls of the house for ventilation purposes. Gradually people started making more decorative windows in their houses with wooden shutters. The traditional Nepalese windows of the rich households are intricately carved and are subsequently expensive because of the amount of wood and labour required. Later on people started to build plain, uncarved windows which were cheaper. Medium level households could now afford to have windows. Poor households still only used ventilation holes.

**(iv) Toilet:-** Most Nepalese houses do not have toilets in rural areas. Even these days in rural areas, to make a toilet is not considered a priority whilst building a house. Therefore to find a toilet on the property of a household is an indication of a wealthy household. Some households in Timilsina Gaun did possess a toilet but most farmers considered them an extravagance. For example none of the other hamlets had them.

**(v) Water taps:-** Obtaining drinking water is always a problem in most rural areas of Nepal. Phulbari was no exception. In the hills of Nepal water is usually collected

from natural springs, burns, wells or ditches. To collect one *gagro*<sup>1</sup> of water can easily take one and half hours because of water scarcity or remoteness of the source of water from the home.

Drinking water schemes are on-going programmes in rural Nepal. Where villages have water, the pipes do not connect water to peoples homes. Instead a tap is fixed in a common place for community use. However it was observed that in some houses in Timilsina Gaun, there were private taps for the household's own use. This was the product of their own expense and labour. Some of them had constructed a cemented platform all around the tap whereas others were more simply constructed and shared between three or four households. Households with no private tap had to collect water from a common tap.

**(vi) House size:-** Rich households would live in bigger houses, often three-storied high, whereas a house with only one room or single storied, would be considered small.

**(vii) Cattle shed:-** The size of the household's cattle shed (if owned) reflects the number of cattle or livestock owned by them. The bigger the shed the greater the number of livestock stalled, hence the richer the owner.

**(viii) House Walls:-** A rich household would build its house from large, well shaped stones and clay mortar; whereas a poor household would use only clay or clay with small unshapen stones. The reasoning behind this is that more labour is needed to collect large stones and to shape them, than is required to simply collect small stones.

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<sup>1</sup> A 'gagro' is a traditional water collecting vessel. A medium-sized gagro holds about two buckets of water.

## Appendix 1b.

### Physical indicators of household wealth, Phulbari.

This is the chart used to determine the physical indicators of household wealth:

Indicators	Rich	Average	Poor
House Size	Large; three storied.	Two storied.	Single storied, one or two rooms only
Roof Type	Clay slates or corrugated iron	Corrugated iron	Thatch
House Walls	Large, well shaped stones with clay. Plastered and painted.	Shaped stones with clay. Sometimes plastered and painted.	Unbaked mud 'bricks'. Not plastered nor painted.
Windows	Many ornate windows.	Sufficient windows but not so ornate.	Smoke holes rather than windows.
Cattle Shed	Separate from house with sound wall and roof	Attached as a lean-to; in a moderate condition	Cattle kept inside the house at night - no separate cattle shed.
Toilet	Occasionally	Never	Never
Water Tap	Personal water tap	Shared water tap	No water tap

## **Appendix 2.**

### **Farmers' Checklist, Phulbari**

The following is the check-list of topics covered by Rapid Rural

Appraisal interviewing technique: Phulbari case study

#### **Introduction:-**

- researcher
- respondents
- research objective

#### **Land-use System:-**

- past history
- agriculture
- forestry
- agroforestry
- others

#### **Farming System:-**

- crops:-
  - past history
  - pattern
  - variety
  - productivity
  - time introduced
  - information media

#### **fertilizer:-**

- type
- history
- information media

#### **livestock:-**

- past history
- breed
- purpose
- management
- information media

#### **Forestry:-**

- history

- plantation
- species
- nursery
- management
- improved clay stove programme
- others

**Indigenous System of Information Dissemination:-**

- local teachers
- local politicians
- social workers
- priest or respected person
- relatives and in-laws
- neighbouring villagers
- shop keepers
- local clubs
- festivals (funerals, weddings and other religious ceremonies).

**External System of Information Dissemination:-**

- different levels and professions of extensionists
- agricultural suppliers
- Agricultural Development Banks
- researchers

**information diffusion media:-**

- radio:-
  - time, frequencies, understandability,
  - owner, others.

- pamphlet, poster, leaflets

- film

- exhibition, agri-fairs:-

- where, how frequent, organisers

- excursion or study visit, and outsider visitors:-

- organiser, frequency, selection method

- campaign, meetings, talks

- non-formal education

- demonstration or research trials

**Satisfaction and Effectiveness of Information Flow:-**

- problems in flow

- solution to the problem

## Appendix 3

### Extensionist Questionnaire

1. What is your name?
2. What is your rank?
3. Which institution do you work for?
4. How long have you been in your post?
5. How long have you been in your institution?
6. What was your previous post?
7. What was your previous workplace?
8. Have you had training in the last three years?
9. How many times?
10. How useful was it?  
Good/moderate/poor
11. Do you receive journals?
12. Which journals do you read mostly?
13. How frequently do you receive them:  
Regularly/occasionally/rarely/never
  - a. at your workplace?
  - b. at your own expenditure?
  - c. from your library?
  - d. other source?
14. Are there agriculture/forestry/livestock programmes on the radio?  
Yes/no
15. How often are farming programmes broadcast?
16. How often are forestry programmes broadcast?
17. How often are livestock programmes broadcast?

18. How often do you listen to them:  
Regularly/occasionally/rarely/never
- a. farming programmes?
  - b. forestry programmes?
  - c. livestock programmes?
19. Are there farming programmes on television  
Yes/no/don't know
20. Are there research plots in your command area?  
Yes/no/don't know
21. How many are there?
22. Where are they located?
23. Is there a research plot in your district?  
Yes/no
24. How many are there?
25. What are their objectives?
26. How do you get information about technologies ?  
Research plot visit/demonstration plot visit/literature/other/no
27. Is there a district level research office of your discipline?
28. Where is it?
29. Is there a regional level research office of your discipline?
30. Where is it?
31. Is there a national level research office of your discipline?
32. Where is it located?
33. Is there provision for study visits to the research plots?
34. How frequently do you visit them?  
Frequently/sometimes/rarely/never
35. How often do you visit the following:
- a. District level research office
  - b. Regional level research office



c. National level research office

Regularly/sometimes/never

36. How many VDCs are you in charge of?

37. How often do you visit a VDC?  
fortnightly/monthly/bimonthly/quarterly/other

38. Do you have enough time to visit each village within a VDC?  
Yes/no

39. If not, why:  
Too big/target areas only/lack of facilities/other

40. Do you visit some villages more than others?  
Yes/no

41. If yes, why:  
Farmers' enthusiasm/block development area/accessibility/other

42. Name three farmers from three villages with whom you diffuse technologies to mostly.

43. Who benefits mostly from your services:  
Rich/average/poor

44. Who benefits the least:  
High caste/ethnic groups/low caste/others

45. Is it more profitable to concentrate on progressive farmers?  
Yes/no

46. Do some villagers suffer from a lack of information?  
Yes/no

47. How do you contact villagers mostly?  
Personally/meetings/other

48. Do you get feedback from the villagers?  
Yes/no

49. To obtain feedback,  
you go to them/they come to you/equal interaction/rarely you go to them/rarely they come to you/other

50. How often do these farmers visit you?  
a. High caste

- b. Low caste
- c. Ethnic groups
- d. Others

Rarely/sometimes/often

51. How often do these farmers visit you?

- a. Rich
- b. Average
- c. Poor

Rarely/sometimes/often

52. Is it easy to get feedback?

Easy/moderate/difficult/very difficult/never

53. How good is communication between your office and researchers?

Very good/moderate/poor/none/don't know

54. How many innovations solve local farming problems

Most/some/few/varies

55. What, if any, are the barriers to the diffusion of new technology from Extensionist to farmer? Give your opinion/experiences.

56. What is an effective way to pass information from Extensionist to farmer? Give your opinions/experiences.

57. What are the reasons why some farmers do not receive information about new technologies?

58. What are the problems for the exchange of information between district level officers and field level staff?

59. What are the problems for the exchange of information between district level staff and researchers?

60. What are the problems for the exchange of information between researchers and field level extensionists?

61. How do you hear about the outcome of research from research personnel/institutions?

## Appendix 4

### Questionnaire for Researchers

1. Name of respondent.
2. Name of your organisation and job.
3. How long have you been in this institution?
4. How long have you been in your current post?
5. What was your previous post and institution?
6. What is your major field of responsibility in your present post? (underline):
  - a. crop science
  - b. horticulture
  - c. livestock
  - d. other
7. Within your major field of responsibility what is your research subject?
8. Do you get to know about research orientated problems at the village level?  
yes/no
9. How many research trials have you conducted since the following years?

Year	No of trials	Type of research
1991-2		
1990-1		
1998-90		

10. In 1991-2 how did you get to hear about the research orientated problems at village level?

Source of information	Frequently	Sometimes	Rarely	Never
Extensionist				
Farmers				
Researchers				
Other				

11. In 1990-1 how did you get to hear about the research orientated problems at village level?

Source of information	Frequently	Sometimes	Rarely	Never
Extensionist				
Farmers				
Researchers				
Other				

12. In 1989-90 how did you get to hear about the research orientated problems at village level?

Source of information	Frequently	Sometimes	Rarely	Never
Extensionist				
Farmers				
Researchers				
Other				

13. To what extent were the trials which you conducted during the following years relevant to the farmers' situation?

Year	Type of research	no of trials			
		relevant	slightly rel.	not rel.	don't know
1991-2					
1990-1					
1989-90					

14. In your knowledge, to what extent are the research trials which your colleagues conduct, relevant to the farmers' needs?

relevant/slightly relevant/not relevant/don't know

15. Do you get feedback about the outcome of your research at the

implementation stage? yes/no

a. If yes, how frequently:

regularly/occasionally/rarely

b. From who do you get this feedback?

Extensionists/farmers/other

16. Do you conduct research trials as a target-oriented programme?

mostly/occasionally/rarely/never

17. If you know about a specific problem in the field which needs to be researched but is not in your programme, how often will you involve it in your trial programme?

frequently/occasionally/rarely/never

18. Which of the following would best describe your relationships with other research institutions in your field?

co-operative/collaborative/indifferent/negative/varies

19. Which of the following would best describe your relationships with the information disseminators of other institutions?

co-operative/collaborative/indifferent/negative/varies

20. What is your impression about the work of extensionists on disseminating knowledge to the farmers.

21. What is an effective way to pass information from a researcher/institution to extensionists and vice versa.

22. What are the barriers to the flow of information between researcher/institution to the extensionist and vice versa.

23. What hinders and what helps the flow of information from research institution to the farmers.

24. What is the basis of your relationship with extensionists.

## **Appendix 5**

### **Farmers' Checklist: Kumpur**

This is the detailed checklist of topics covered by the Rapid Rural Appraisal survey in Kumpur.

#### **1. Socio-Economic Factors**

Identify farmers' socio-economic group and agro-ecological farming system

Decision making within the community

Travel in and out of the area - frequency, to where, purpose

Social interaction within community

Social changes within community - migration, developments

#### **2. Agro-Ecological Factors**

What crops and crop varieties are grown?

Are they local or HYV?

Where did you get them from?

How often do you replace your seeds?

How far do you travel to obtain seed?

Who do you obtain seeds with?

Do you receive HYV seeds from sources different to those used for local varieties?

#### **3. Farmer-to-Farmer Contact**

Describe community organisations

Describe social interaction patterns within the community

When and where do you discuss farming issues?

How much contact do you and other villagers have outside of the ward?

How frequently do you travel out of your ward?

How frequently do people visit your ward?