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Mountain Agrarian Systems

Village communication networks and implications for agricultural extension in the northern mountains of *Viet Nam*. A case study in *Ngoc Phai Commune, Cho Don District,* *Bac Kan Province, Viet Nam.*

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Abstract

There has been considerable evidence about the positive impact of social capital on economic development, especially as the determinant for access to information and resources. Social networks are particularly important for the rural poor, who are disadvantaged by geographical isolation and limited access to mass media. Nevertheless, the social make-up of poor communities allows some individuals to benefit from social networks more than others.

The aim of this study was to better understand the different impacts of communication networks on rural households' access to information about farming through a case study of a village in the mountainous province of Bac Kan - one of the poorest provinces in Vietnam with extremely limited access to markets and to opportunities for socio-economic development. This paper highlights the most important factors that influence individual access to information, such as local power relations, socio-economic status and kinship networks. The paper concludes with recommendations for official agro-forestry extension services and development agencies to facilitate participatory processes for improved diffusion of innovations.

Keywords: rice innovation, social network, agricultural extension, participatory approaches, northern Vietnam

1. Introduction

1.1. *Social exclusion and poverty in rural Vietnam*

According to the World Bank survey on poverty in 2000, Vietnam stands out as a very positive exception among the twenty-three countries surveyed with respect to the poor's perception of their countries' recent progress in economic development (Narayan *et al.*, 2000). Groups surveyed across the country say economic opportunities have increased and poverty has declined substantially in the last ten years due to

changes in government economic and social policies. However, in 2002, twenty-nine per cent of the population continued to live below the international poverty line, with the majority in rural areas. UNDP research shows that future progress in the reduction of poverty and the achievement of other Millennium Development Goals in Vietnam will be increasingly difficult to achieve mainly due to the isolation of the remaining poor - 'not just geographic isolation, but also social isolation, linguistic isolation, ethnic isolation and even isolation from useful information' (UNDP, 2003a; World Bank, 2003). Reduction in poverty poses a

special challenge in those rural areas of Vietnam that are isolated or suffer from the scarcity of resources as well as environmental degradation. The northern mountains and central highlands that are inhabited mainly by ethnic minorities are the areas with the highest incidence of poverty, and these areas risk permanent marginalisation. Ethnic minorities, which comprise fourteen per cent of the population, are disproportionately affected by poverty, representing thirty per cent of the poor (UNDP, 2003b).

Apart from the high incidence of poverty, the liberal reforms that have been enforced intensively since 1989 have led to unprecedented disparity in the distribution of income and in the standard of living between urban and rural areas, the delta and the mountainous regions. The mountainous areas, which represent seventy-five per cent of Vietnam and twenty-one per cent of the nation's population, have benefited the least from the recent economic growth. In the northern mountains the poverty rate is expected to rise from twenty-eight per cent to thirty-four per cent between 1998 and 2010 (World Bank, 2001; 2003). Conversely, the poverty rate in the Red River Delta region is predicted to fall from fifteen per cent to four per cent during the same period (NCSSH, 2001).

There are not only inequalities in income and socio-economic opportunities between the delta areas and the mountains but also within rural mountain communities (Le Trong and Rambo, 2001). Successive land reforms in the last few decades have resulted in marked disparities in paddy land ownership (Castella and Dang Dinh, 2002; Sikor, 1999). Unequal power relations in villages allow some groups to access the meagre allocation of resources and investments as well as new economic opportunities. The poorest, limited by their inadequate access to resources, are to a large extent excluded from the social, economic and political life of their community. The disparity between individuals in their access to information within rural communities is often due to geographic isolation, lack of access to media and to social stratification within local communities (Alther *et al.*, 2002; Blaettler, 1999). In this study, social exclusion is seen not only in terms of lack of income but also in terms of limited access to

information about state policies, markets and new technologies. Development actions that are undertaken without an understanding of local social networks risk prolonging this form of exclusion.

1.2. *Decentralisation and participatory approaches to agricultural extension*

At the local level there are two main structures through which people can voice their demands. First, there are mass organisations, mainly the Women's Union, the Farmers' Association and the Youth Union. They are all initiated and directed by the State and claim large membership throughout the country. Because of their mainly social objectives they are the organizations that are most capable of channelling the interests of marginal populations to higher level decision-making authorities and incorporating their concerns in agricultural policies. These organisations are generally representative of the local population as people in the village join almost automatically. Membership fees are low and are not perceived as a barrier to entry (Beckman, 2002). The organisations hold regular group meetings on small-scale savings and credit schemes in the case of the Women's Union, and on the exchange of knowledge on agricultural technologies and innovations in the case of the Farmers' Association. Staff members of the agricultural extension system or other relevant people are invited to attend meetings.

The second channel for the diffusion of extension information is the structure of village, commune and district administrations. Previously, these government-led structures were used mainly for the diffusion of directives, but with the recent reform of public administration they are now increasingly becoming forums for local development planning (Beckman, 2002). The grassroots democracy decree (no 29, 1998) has contributed to the recent process of decentralisation of decision making and information management (Geppert *at al.*, 2002). This decree provides a legal framework for a collaborative model of extension that combines the formal and informal systems. However, the links between government organisations and communities tend to be weaker in the

mountain areas because of geographical isolation, of the particular relationships between authorities and ethnic groups, and the diversity of stakeholders and conflicting interests in highly heterogeneous environments (Slaats, 2002). In short, the political context has the potential to improve coordination between the formal extension system and the village communities but its implementation still poses a number of practical problems specific to mountain environments.

In the current system, extension staffs mainly target the better-off farmers who have a better chance of succeeding in applying new technologies (Slaats, 2002). There is now a consensus about the fact that connecting marginal farmers to the formal extension system requires profound changes in extension methods, especially a shift from technology transfer to participatory approaches (MARD, 1998, Neef *et al.*, 2003). In recent years, participatory approaches have become popular in research and development projects in Vietnam. But recent experience in the application of participatory approaches to extension has shown that the concept of participation is often misinterpreted by extension staff and that its implementation in the field challenges the traditional power relations between trainer and trainees (Castella *et al.*, 2003; Neef, 2004). As a consequence, many extension agents are reluctant to apply participatory methods that they have not themselves mastered and that put their authority at risk in their interactions with local communities. They can easily raise farmers' expectations by using participatory methods; but direct interactions with farmers can also expose them to criticism if solutions to the problems described by local people cannot be found rapidly. Another short-coming of participatory approaches is farmers' tendency to stress issues that are not relevant to them simply because they think these particular issues are of interest to the outside extension agents (Chambers, 1997; Neubert, 2000). This is especially true in the context of mountain ethnic minorities when extension agents from the lowlands try to introduce innovations designed for the lowlands (Jamieson *et al.*, 1998, Rambo *et al.*, 1995). To overcome these problems, it is important that extension staff be trained to support village extension networks, and to empower farmers to make their own

decisions instead of delivering standardized technology packages that tend to remove all sense of responsibility from the receivers. As the poor depend on the community organisations to access extension services, they would benefit more from activities that build up the capacity of local organisations (Beckman, 2002). A prerequisite to such activities is a good understanding of social networks and of the patterns of communication at the village level (Slaats, 2002).

1.3. *Social networks and access to information*

Village communities are not homogenous entities but complex networks of social relationships, with various socio-economic groups and different power relations. Many factors such as ethnicity, gender, socio-economic status and power relations determine access to information and resources. Development projects' inadequate understanding of local social networks, norms and power relations can further the interests of the rich while marginalizing the poor. In this study social capital is understood as the household's position in the village formal and informal social networks and its level of participation in local social life that affect its ability to access information. Information, which can be acquired through social relations maintained for other purposes, is important in providing a basis for action (Coleman, 2000). It is the determinant for individuals' access to other resources. Informal networks within the community are particularly important in rural Vietnam, where community-based institutions are still underdeveloped, if they exist at all.

Social networks are mechanisms that connect individuals to society, providing patterns of social interaction, social cues and social identities (Dalton *et al.*, 2002). Social networks can be divided into formal and informal ones. Informal social networks are 'face-to-face relationships between a limited number of individuals who know each other and are bound together by kinship, friendship, or propinquity' (Rose, 2000). This form of social capital is also referred to as a horizontal social network, which has the most value for the rural poor in developing countries, as it brings together individuals of equivalent status and power. Conversely,

vertical or formal social networks link unequal agents in asymmetric relations of hierarchy and dependence (Putnam, 1993). The formal networks examined in this study are state and organised civil society institutions¹. However, in practice, most social networks are mixtures of horizontal and vertical relationships. They are held together by mutual expectations of benefit and norms of reciprocity.

In the following section we present the research methodology employed in the study. Evidence from household surveys conducted in Phieng Lieng village illustrates our analysis of local social networks, their mechanisms and key players. The case study demonstrates how a household's involvement in formal and informal social networks and local power relationships determines its access to information, and consequently to productive resources and economic welfare. It also reveals how village social networks, influenced by the kinship networks and traditional power relations, can benefit a few at the expense of others. Finally we discuss the main findings of this research and put forward a number of

recommendations for improving participatory approaches to agricultural extension.

2. Research methodology

2.1. Site selection

The research reported in this article was conducted in Bac Kan province in the framework of the Mountain Agrarian Systems Program². Bac Kan, the second poorest province in Vietnam, is located 160 km north east of Hanoi (Figure 1). The province's population is characterised by high ethnic diversity with five main ethnic groups accounting for ninety-nine per cent of the total population: the Tay (fifty-five per cent), the Dao (seventeen per cent), the Kinh or the majority Vietnamese (thirteen per cent), the Nung (nine per cent), and the H'mong (five per cent) (Bac Kan General Department of Statistics, 2001). The majority of province's farmers live on subsistence agriculture based on paddy rice cultivation in the valley-bottoms that cover only three per cent of the province (Castella and Dang Dinh, 2002).

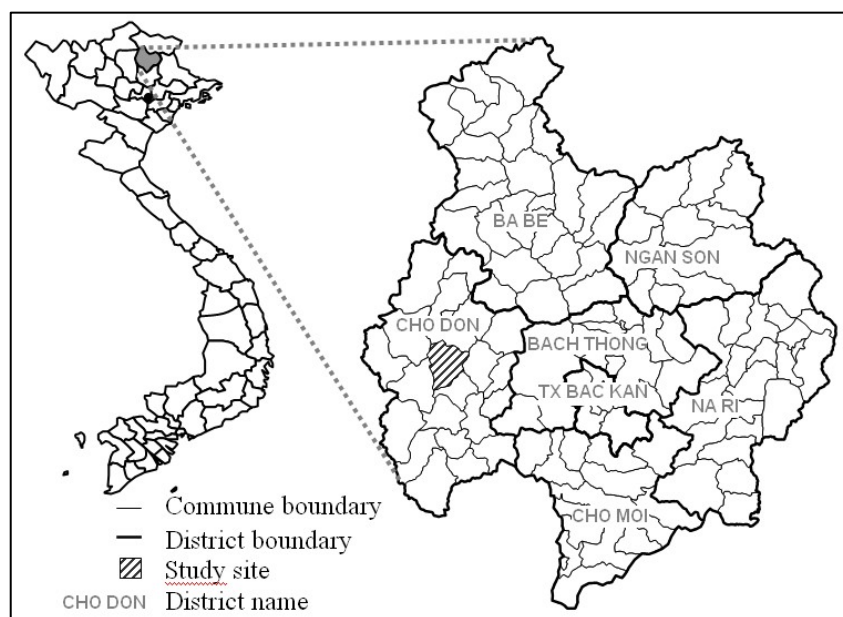


Figure 1: Location of Ngoc Phai commune in Bac Kan province, Vietnam.

¹ Civil society institutions include NGOs; trade unions; community-based organisations; social associations; kinship networks; and the like (Narayan *et al.*, 1999).

² The Mountain Agrarian Systems Program is a joint research project between the Vietnam Agricultural Science Institute (VASI), Institute de Recherche pour le Developpement (IRD), Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement (CIRAD), and the International Rice Research Institute (IRRI).

As our objective was to study disparities in terms of access to information and resources within a community we decided to survey the dominant Tay ethnic group in a village characterized by easy accessibility. Interactions between communities belonging to different ethnic groups or between accessible versus remote villages have been analysed in other studies (Alther *et al.*, 2002; Blaettler, 1999; Castella *et al.*, 2002a). The site selected for this study was Phieng Lieng village, Ngoc Phai commune, Cho Don district. Ngoc Phai commune is representative of the diversity of landscapes and agronomic features of Cho Don (Castella *et al.*, 2002a; 2002b). Phieng Lieng is primarily a Tay village with a total of eighty-two households of which only four do not belong to the Tay ethnic group (three Kinh and one Nung). Phieng Lieng village was split into two in 1998, and are now called Phieng Lieng 1 and Phieng Lieng 2. However, they are still considered a single village by the villagers because of the geographic proximity, a high level of interaction and joint activities between the two villages, and shared common resources such as grazing fields and forests.

Favourable geographic location and proximity to the central town of Cho Don district benefit Phieng Lieng considerably. The commune People's Committee, a medical clinic and a primary school are within walking distance from the village. The village production systems, like all Tay villages in the province, are based on paddy rice production (Castella and Erout, 2002). Off-farm activities in Phieng Lieng include quarrying, petty trading, logging, and working as motorcycle taxi drivers. The village population is characterised by a high level of education for a mountainous area: all respondents in our survey are literate, with eighty-nine per cent having completed at least secondary school. Thanks to its proximity to the district centre, the agricultural development of this site has benefited from many national and international projects over recent years. Local extension staff have been involved in a large number of training activities including participatory approaches by a UNDP program for poverty alleviation (1994-1997), a French NGO involved in agricultural development (Red River Program 1994-2002), a bilateral project on social forestry (Vietnam - Finland coope-

ration 1996-2002), and the Mountain Agrarian Systems Program designing alternatives to slash and burn cropping systems and promoting sustainable upland agriculture (1998-Present). This context favoured our investigations of interactions between the formal and informal extension systems at the grassroots level (Slaats *et al.*, 2002).

2.2. Survey method

An exhaustive survey was carried out of seventy-three households in Phieng Lieng, one respondent per household. The respondent was either the head of the household or his or her spouse. It was difficult to maintain a gender balance in the number of respondents because many women were not available for the interviews due to heavy workloads. As a result, seventy per cent of the respondents were male. However, all villagers holding important positions in the local government and mass organizations, those involved in project activities as well as informal opinion leaders were interviewed. Apart from household surveys, in-depth interviews with key informants in the community and informal discussions with extension workers and project field staff familiar with the site were also carried out to collect information complementary to data from household surveys. Key informants were identified through discussions and interviews with the local government, extension workers and project field staff.

The questionnaire was divided into three main parts: (i) membership in local organisations and position in local government; (ii) informal interpersonal networks and; (iii) individuals' access to information. Many questions in the first and third parts of the questionnaire were closed while the second part was more open-ended, allowing the respondents to do most of the talking. Although analysis of this kind of data is more complex, questions are easy to administer and this socio-metric method has been proven to have the highest validity in measuring opinion leadership and diffusion networks (Rogers, 1983). We explored the respondents' circle of relations from different aspects such as everyday communication, mutual aid and decision-making. Questions covered both communication within the family and outside:

Family communication: “*With whom within your household do you usually discuss farming matters?*”

Three kinds of questions were used to explore a respondent’s circle of relations:

- *Who outside your household do you often discuss agricultural matters with?*
- *Who outside your household do you often ask for advice or help in farming matters?*
- *Whose advice regarding farming matters do you usually follow?*

Another set of questions was used to identify local opinion leaders – both those currently working for local governments and mass organisations and the informal leaders – who have the power to influence collective decisions and information flows. Respondents were asked to put their nominations in order of importance:

- *Who, in your opinion, are the most knowledgeable and influential persons in your village? Why?*
- *Who, in your opinion, are the best farmers in your village? Why?*

Respondents were asked to state their relationships with nominated people in order to understand the role of kinship in the local interpersonal networks. The third part of the questionnaire focused on the respondents’ access to information. Respondents were queried about the number of short training courses and project activities that they had taken part in and about their main sources of information. The rest of the interview explored individual knowledge of development projects underway in the area, of the technical innovations that have been introduced and contacts with the extension worker. It was anticipated that this information would help understand who had better access to information and to benefits from development actions.

2.3. Data analysis

Data on interpersonal communication patterns were entered into 108x108 matrices in Ucinet IV, a social network analysis software package (Borgatti, 1996), and the results were modelled in Krackplot (Krackhardt *et al.*, 1994). Graphic networks were generated for discussion networks, advice networks and influence networks. Every name that was mentioned in the interviews was entered into the matrix in order to display fully the relationships and communication between individuals. As a

consequence there are 108 instead of 73 nodes in the networks. The extra number includes the extension worker, people working in the local government and other villagers who were not interviewed. The analysis of social network data is divided into three levels of behaviour-relevance: (i) discussion networks displaying who-talks-to-whom linkages; (ii) the advice networks showing who-asks-for-whose-advice in farming matters; and (iii) the action networks illustrating who-has-followed-whose-advice in farming matters. Data from the social survey was combined with economic and agricultural data that was already available for the same households (Eguienta *et al.*, 2002) to visualise individuals of different socio-economic status on the networks. For each respondent, the degree of social influence over the village community was categorized according to the number of times he/she was quoted by others as an influential person or as a person good at farming, and according to his/her position in the local administration or organizations (i.e. 0: no membership, 1: member of a mass organization, ... up to 5: village chief and 10: commune leader).

We statistically analyzed farmers’ responses about their access to information and their interactions with the formal extension system. We investigated the relationships between discrete variables through cross-tables and khi2 distance tests. We used factorial correspondence analysis first to create new variables on specific topics (e.g. social status, access to media, and relations to development projects) by combining multiple responses from the questionnaire, then to analyse the relations among the different sets of variables.

3. Farmers’ access to technical information at village level

When asked if the income of the farmers in Phieng Lieng had increased over the past ten years ninety-seven per cent gave positive answers. The adoption of new technologies came in first place (thirty-five per cent) when respondents were asked to explain the improvements in their livelihood. Then thirty per cent of the respondents mentioned access to credit and assistance from development projects, and the third reason given was the introduction of new plant and animal breeds (twenty per cent) and policy

changes (eleven per cent). People's belief in technological change as the main driving force of economic growth is deeply rooted in the collectivisation period and may not reflect the real impact of policy changes on livelihood since the *Doi moi* reforms. However, this result stresses farmers' expectations of their agricultural extension system.

3.1. *The formal agro-forestry extension system*

The official agro-forestry extension system consists of the Agro-Forestry Extension Center (AFEC) at the provincial level, which is administered by the provincial Department of Agriculture and Rural Development (DARD), the Office for Economic and Rural Infrastructures (OREI – former Office for Agriculture and Rural Development) at the district level, and extension workers at the commune level (Slaats *et al.*, 2002). Each extension worker at OREI is assigned to one or two communes. S/he is responsible for organizing training courses, monitoring the adoption of innovation, and epidemic pest control. All these activities are carried out in partnership with the commune's People's Committee (CPC), more specifically with the member of the People's Committee responsible for agriculture. In Ngoc Phai commune, the vice-chairman of the People's Committee is in charge of economic matters, including agriculture and forestry. His main duties are to maintain the links with OREI, to provide agricultural information to villages, and to support the extension worker in conducting extension activities and training courses in the commune. In most cases, the extension workers rarely have direct contact with local farmers. According to a study on the extension network in Bac Kan province in 2002, only eight per cent of the respondents, all of whom are considered as 'contact persons' for extension, stated that the extension worker had come to visit them at home during the past five years (Slaats *et al.*, 2002). In Phieng Lieng village, only twenty-seven out of seventy-three respondents in the survey know or think they know the people in charge of agriculture and forestry in their commune. Very few people know the name of the extension worker and this number is limited to members of the People's Committee, village chiefs, and the head of the village Farmers' Association.

The village chief is the key 'information broker' between the local government, the official extension services and the villagers. His functions are to support extension activities within his village, to provide farmers with agricultural information from official sources, to keep track of production matters and to write short reports or order lists to the People's Committee.

Typically the extension worker informs the person in charge of agriculture at the CPC about a technical innovation. The latter informs the village heads during their regular meetings in the commune. Then the message reaches the farmers during village meetings where those interested are requested to register to attend a training course organized by the extension agent. Once the lists of participants from the different villages are compiled by the commune staff, the training course is held in the meeting room of the CPC. If the list of those interested is larger than the capacity of the meeting room, the village chiefs are requested to shortlist key people to attend the course under the assumption that they will pass the message on to their neighbours and relatives. Our survey showed that often it is the same people who attend the courses. In Phieng Lieng, fifty per cent of the respondents had never attended a training course, twenty-two per cent had attended only once and twenty-eight per cent twice or more. Cross tables showed strong relations between the number of participations in training courses and the three variables: attendance at village meetings ($\chi^2=14.2$, $p=0.007$), direct interaction with extension agent ($\chi^2=9.39$, $p=0.009$), and adoption of innovation ($\chi^2=5.73$, $p=0.055$). These results typify technology transfer mechanisms.

3.2. *The informal extension system*

This section refers to the organisations involved in agricultural extension at the village level without having agricultural extension as an exclusive mandate. As with the formal extension system, the local government bodies such as the commune's People's Committee and the commune's Communist Party play an important role in coordinating the activities of the mass organizations, development projects and mass media, and in regulating information exchange within the commune.

Mass organisations in Ngoc Phai commune like anywhere else in Vietnam have branches down to the village level. There are mass organisations with economic functions and others with non-economic functions that target different groups of people. These organisations are very popular within rural communities in Vietnam although their actual impact on household welfare remains questionable. The World Bank poverty survey in Vietnam in 2000 suggested that the helpfulness of mass organisations depended very much on the personality of the individual leader in each location (Narayan *et al.*, 2000).

Some of the mass organisations in Phieng Lieng village work in close partnership with the official extension services to provide training and assistance in farming matters to their members. The organisations directly involved in economic activities are the Women's Union (WU) and the Farmers' Association (FA). WU is one of the most active organisations in Phieng Lieng, especially in credit programs. All members are eligible for loans from a credit program run by the commune's WU and financed by different national and foreign projects.

FA's main function is to assist farmers in agricultural production through technology transfer, production diversification and obtaining loans. It also helps OREI and development programs to organise training courses to introduce new technologies to the farmers. Every farmer in the village is automatically a FA member. Unlike WU and FA, other mass organisations such as the Fatherland Front, Veterans' Union, and Youth Union are not directly involved in economic matters. However, frequent meetings and the relationships developed between members indirectly benefit them through information sharing and credit assistance.

Development projects and NGOs. There have been nine research and development projects and/or NGOs working in Phieng Lieng village in the last ten years. Some of these organisations are primarily involved in credit schemes while others act as informal extension agencies, introducing new agricultural technologies. These projects and NGOs are important sources of technological information for local farmers. Training courses are often organized jointly

with People's Committee and participants are selected by or with the help of village chiefs. As a consequence, we found a strong correlation between farmers' attendance of official meetings and their knowledge about projects ($\chi^2=17.7$, $p=0.007$). Although not every villager has access to training opportunities and other benefits from projects, a large number of the respondents (thirty per cent) cited 'support from projects' as the main reasons for an increase in income in the last ten years.

Mass media. Phieng Lieng was connected to the national electricity network in late 2001. However, radio remains the major source of information for local farmers, as television and newspapers are still regarded as a luxury. Eighty-four per cent of the respondents stated that they listen to the radio every day or whenever they are at home. Only those who work for the local government or other state institutions and their families (twenty-seven per cent) have access to newspapers. Though farmers said they sometime learned about new technologies from agricultural programs on radio or TV, they never adopted an innovation only as a result of information provided by the mass media. Extension leaflets distributed occasionally by development agencies and the formal extension services seldom reach households other than the local leaders'. Only six respondents in the survey stated that they often had leaflets, and all of them were working in the local government and mass organisations.

4. The key role of village social networks - inclusion and exclusion

4.1. Kinship network

A traditional Southeast Asian agrarian society is normally organized around family relations. Family ties remain the centre of social networks for many individuals and a safety net for the poor. Phieng Lieng village is a very close-knit community partly because of the close interweaving of different kinship networks. Two-thirds of the respondents were born in the village and the majority of them are men. Figure 2 shows the kinship ties of the respondents in Phieng Lieng. It is impossible to distinguish Phieng Lieng 1 and 2 in this kinship network. Most of the people in both villages

are somehow related to one another and belong to a few big lineages. Other isolated groups or individuals either belong to unimportant lineages or recently arrived in Phieng Lieng from lowland areas or neighbouring provinces.

In Phieng Lieng village, kinship networks are particularly significant for access to information and resources. Half of the respondents who had attended at least one training session stated that they discussed what they learnt with their relatives. Most of the people who are in direct contact with the village chiefs have kinship ties with them. The household surveys revealed that close relatives are often the very first choices of the respondents in informal communication. The significance of kinship ties in discussion networks demonstrates that kinship networks serve as one of the main channels of informal communication in the village community. With very limited access to mass media, kinship networks are important sources of information for the local people. Kinship ties do not only serve as an important informal source of information but also play a significant role in household decision-making. The majority of respondents have close relationships with the people they nominated in the action network. If many turn to the village chiefs for advice and information, close relatives such as fathers and brothers are the ones who have the most influence in respondents' decision-making.

4.2. Neighbours

Rogers (1983) highlighted the importance of neighbours' networks in the diffusion of innovations through the mechanism of information sharing. When individuals interact frequently in local networks and in the observance of local norms, they are more likely to exchange information (two-way information sharing) and to observe each other's behaviour (one-way information sharing) (Isham, 2002). In Phieng Lieng village neighbour networks are particularly important in the adoption of technological innovations. For example, the Mountain Agrarian Systems (SAM is the French acronym) project has been carrying out on-farm trials on cover and fodder crops and different soil conservation techniques in Phieng Lieng since 2000. Although only six households in the village work directly with the project in the trials, fifty-four per cent of the respondents have adopted at least one of SAM's innovations though half of these do not know about the SAM project or that the innovations were introduced by the SAM project. They heard about the techniques from neighbours or saw the trials on neighbours' farms themselves. Some techniques quickly became popular in the area because they were seen as solutions for the current problems of erosion and soil degradation on the uplands, as well as to the shortage of paddy land (Husson *et al.*, 2001).

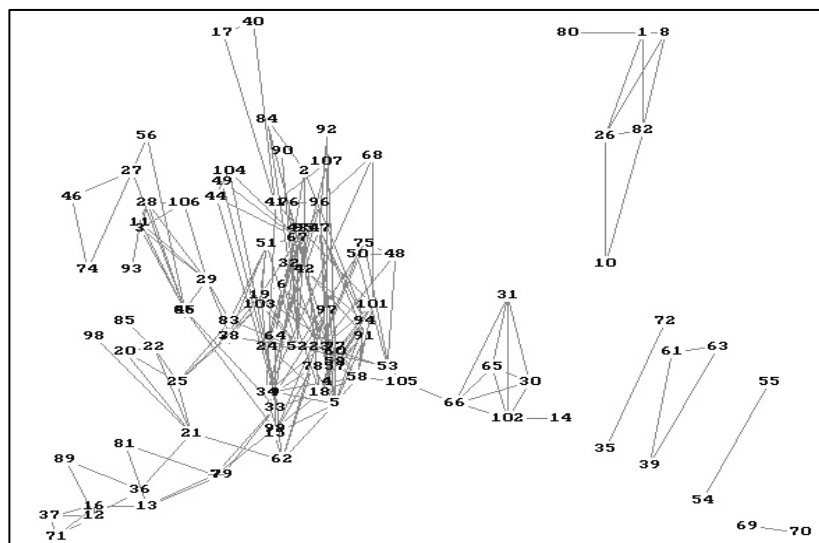


Figure 2: Phieng Lieng village kinship network (N.B. each number represents a household)

Results of the household surveys also demonstrated that neighbours play an important role in the communication networks between individuals in Phieng Lieng village. Close neighbours were often nominated when respondents were asked whom they discussed and exchanged labour with most frequently. Relationships with neighbours are regarded highly by poor households, especially by the recent settlers with few kinship ties in the village. Neighbour networks provide them with the means to integrate in the local community and make up for the benefits that they do not get from kinship networks.

4.3. *Within-village communication*

Despite easy access to the town and frequent contacts with outsiders, informal communication in Phieng Lieng remains village-oriented. Apart from the extension worker, the chairman of the commune's People Committee and the secretary of the commune's Communist Party, all people nominated in the behaviour-relevance networks (discussion, advice, and action networks) are from within the village. Local people tend to exchange information on agricultural matters with, and trust only people in the same village. The strong sense of community in Phieng Lieng can be explained by the extensive kinship ties that are strengthened by a high rate of intermarriage (in forty out of eighty-two households, both the household heads and their spouses were originally from Phieng Lieng village) and the concentration of houses along both sides of the road. Also, according to the respondents, home (for seventy-two per cent of them), fields (sixty-five per cent) and official meetings (fifty-eight per cent) are where they discuss agricultural matters most. The marketplace, the traditional meeting and information-exchanging place for upland people, is no longer an important information-exchanging place in Phieng Lieng. Only eight per cent of the respondents discuss agricultural matters at market places.

The three interpersonal networks of Phieng Lieng village have distinctly different structures. Although the discussion network does not show any clear pattern and choices seem to be random (Figure 3), there is a visible trend in the advice network (Figure 4). Ordinary villagers frequently nominate

village chiefs as advice givers, whereas better-educated or influential respondents tend to ask for advice from only higher-ranking people. The latter include the most important officials in the local government such as the chairman of People's Committee, the secretary of commune's Communist Party or the extension worker. There is no reverse trend in the advice network. However, when it comes to the action network, the two village chiefs no longer occupy the central role they did in the advice network. If villagers frequently ask their chiefs for advice because the latter have direct access to the formal sources of information, they often choose to follow the advice of close relatives and respected people in their village rather than that of formal officials. The following extract from an interview explains why the respondent chose to follow the advice of his elder brother rather than that of the village chief: *"Our village chief is very knowledgeable about state policies, new technologies and new seeds but he is not my kin. My elder brother does not know as much as the village chief but he sincerely cares for my family and me. I know that he just wants good things for us and he always thinks carefully before telling me to do something. My brother also knows our condition better than the village chief. He knows what I can afford to do and what my problems are."*

Information from formal sources reaches villagers mainly through village meetings. With the exception of a few female household heads, most people who attend village meetings are men. However, the frequent inter-spouse communication (eighty-two per cent of the respondents stated that spouses are the people they discuss with most within the family) suggests that information passed on through gender-specific networks at the village level may reach all individuals.

4.4. *Mutual aid groups*

The Tay in the northern mountains of Vietnam have a long tradition of exchanging labour between households for farming, house-building and other household tasks. Members of a group often consist of relatives or close neighbours. The rules of mutual aid groups are based on the norm of reciprocity and, despite their informal nature, are fairly rigid. The return of a

favour is obligatory if the person wants to remain in the network. Every member of a mutual aid group has to return the same number of working days s/he was offered by others. For households with extensive paddy land, this labour exchange is particularly important during transplanting and harvesting periods. Mutual aid is still very popular in Phieng Lieng with approximately ninety per cent of the respondents stating that they often exchanged help with other people in the same village. A few better-off households

now prefer to hire wage labour rather than exchange with other households, because their limited family labour force is not sufficient to reimburse in kind all the workload required for their extensive paddy land. Although landless households do not exchange labour for farm work, they try to remain in the network by participating in other activities such as house building and logging. Membership in a mutual aid group is not only for material interests but also an essential part of peoples' identities, showing that they are a part of the community.

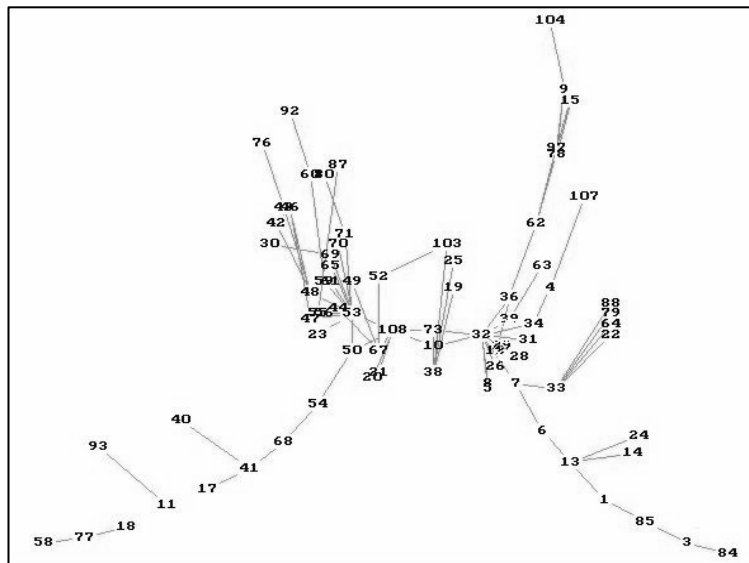


Figure 3: Phieng Lieng village discussion network

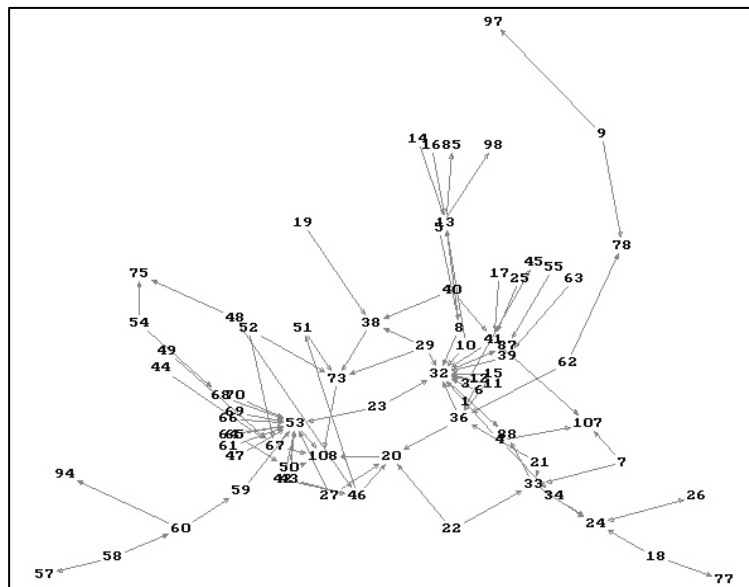


Figure 4: Phieng Lieng village advice network

5. Patterns of influence and power relations within a village community

5.1. *Local opinion leaders and power relations*

Opinion leaders in rural interpersonal networks are often identified as ‘individuals of higher socio-economic status, with more education, greater mass media exposure, greater change agent contact’ (Rogers, 1983). In the case of Phieng Lieng village, all informal opinion leaders either are currently working or used to work for the local government and other state institutions. Not only do they have frequent contact with the officials in the local government and extension workers but they also have a higher education and much better access to newspapers and television than other villagers. There is a positive correlation between the level of education of the villagers and access to newspaper and leaflets ($khi_1=9.55$, $p=0.048$ and $khi_2=11.2$, $p=0.024$ respectively). These facts explain why many respondents choose to seek information and advice from the opinion leaders who are perceived as more technically competent than them.

Local power relations in Phieng Lieng village are a combination of the traditional power structure and the official one. In order to identify the local opinion leaders, we asked respondents to nominate the most influential people in the village and the ones who are considered the best at farming. One man (number 33 in Figures 2 to 4) was singled out as the most influential person in the village with thirty-seven nominations. Mr. 33 is a retired medical doctor, who is well known for his skills and knowledge in farming. He is also one of a few farmers in Phieng Lieng whose fields are frequently visited by the extension worker. Mr 33, though not formally regarded as ‘leader,’ is nevertheless one of the prime movers of events in the village. Other names mentioned by the respondents included retired state workers, people currently working in the local governments and mass organisations and people from big lineages. All formal opinion leaders in the village such as the village chiefs, the head of the Farmers’ Association and the head of the village Women’s Union belong to the two

biggest lineages in the village. This group also owns a considerable area of paddy land. In the advice network most of the nodes concentrate around the two village chiefs: numbers 32 and 53 in Figure 4. The village chiefs are the people many villagers turn to for advice in farming matters because they are the only ones who have direct contact with the formal extension services and the local government. However none of them were considered to be good farmers by the respondents. Below is how one respondent explained why the village chief of Phieng Lieng 2 was elected: “*He is not smart at all. But he has many relatives and friends in the village. One of his brothers is working in the People’s Committee and his father used to be the chairman of the commune’s People’s Committee. His family is very popular here*”. Both current village chiefs in Phieng Lieng are from the two biggest lineages in the villages. Many members of their extended families have held or presently hold important positions in the local government. There is thus a strong link between the scope of social relationships and the local power structure.

This power structure has a strong influence on the distribution of information within the community. If the vertical top-down administrative system determines “how information is transmitted”, the local power relations are predictive indicators for “where information goes”. The privilege of being in contact with the local government and mass organisations through the kinship and friendship networks allows a small group of people to access informational resources and training opportunities. On the other hand, the majority of local farmers are not only excluded from the kinship and social networks but also from the agricultural extension system.

5.2. *Social stratification within interpersonal networks*

In order to understand the link between the socio-economic status of a household, its position in the village social network and its access to information, we combined data from the social network survey with the results of a household typology based on the ability to meet rice needs from paddy land (Castella and Erout, 2002). It is assumed that the average consumption need of each

person is 300 kilograms of paddy each year. Three different groups were identified accordingly. Type A - the better off group - includes households who can attain rice self-sufficiency with a single crop per year. This group has abundant paddy land area, has been living in the area for many generations and often belongs to big lineages. It is commonly observed in many other areas in Bac Kan province that people in type A are the ones with the most power and influence, formally or informally, and with broader circles of relations than the other groups (Castella and Erout, 2002). Households who do not have enough rice for consumption from their summer crop but are able to meet their needs with spring rice belong to type B. Type C consists of farmers who cannot achieve rice self-sufficiency with either one or two crops per year, usually because of insufficient paddy land area, and have to turn to other activities to feed their families.

With available socio-economic data of all households in Phieng Lieng (Eguienta *et al.*, 2002), households were classified according to the area of their paddy land and the number of mouths to feed. Although off-farm opportunities are available in Phieng Lieng, most of them are low-paying and merely serve as supplementary sources of income during the off-season. Consequently, farming is still the major source of livelihood in Phieng Lieng and the area of paddy land is of critical importance to

farming households. Approximately half of the households in the study area belong to type B. This group is made up of young or middle-aged descendants of large lineages who have been in Phieng Lieng for many generations, while type A households are mostly founding families headed by older individuals. Households in these two groups are often related to one another. Many of them work in the local government or have relatives working in state institutions.

Conversely, type C consists of farmers who migrated to Phieng Lieng recently or local people from small and unimportant lineages. Apart from a few individuals who could afford to purchase paddy land from other villagers, most people in this group do not own any paddy land. They have to rely on cultivation of sloping land, work as wage labourers, or do odd jobs. Their disconnection from the major local kinship networks and the lack of time and resources are the main reasons for these households' inability to maintain wide social relations. Figure 5 combines the advice network with the result of the household typology. It is clear from the graphic in Figure 5 that most of the households within the immediate circles around the two village chiefs are type A and B. Village chiefs themselves belong to type B. The arrow indicates individuals who are consulted by others, i.e. the high level of trust and respect they possess as well as their ability to access information.

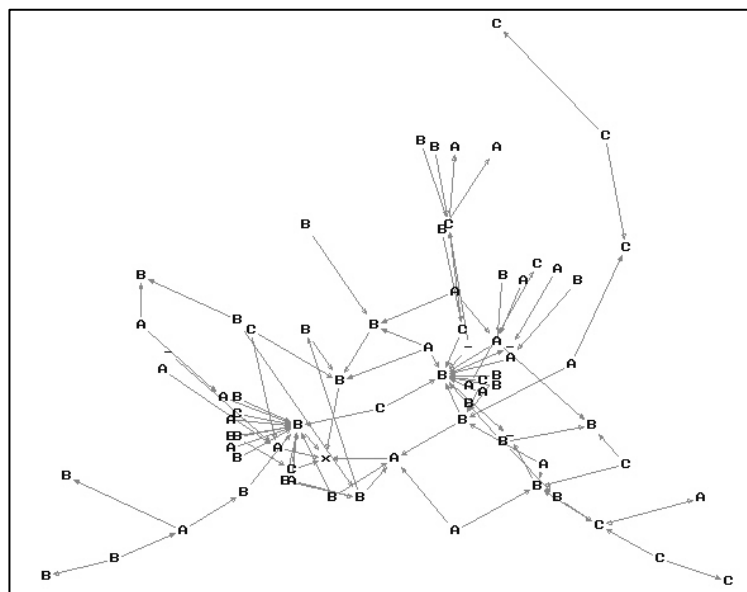


Figure 5: Different household types in the advice network

This group of people also comprises mainly type A and B households. A few exceptions are type C households, who are young educated Kinh families who have reached important positions in the local government such as the head of commune's Farmer Association or a junior member of the People's Committee. The rest of group C is thus not only marginalised in terms of income but also in terms of social relationships and access to information from official sources.

5.3. *Unequal access to technological information*

Training courses provide local farmers with opportunities to access new agricultural technologies and to acquire new skills and knowledge. Development projects, the official extension services and mass organisations in Ngoc Phai frequently organise short training courses at the commune as well as the village level. As we have already mentioned there is a disparity in the share of training between the respondents in our survey, with a majority of local farmers having very little or no access to training courses, while a small group has attended up to seven training sessions relating to agriculture and forestry. They include the two village chiefs, the head of the commune's FA, and a senior member of the People's Committee.

There is a strong correlation between a household's socio-economic status and access to agricultural information from official sources. The first axis of the factorial correspondence analysis in Figure 6 clearly opposes (on the right hand side) middle-aged influential people who have good access to mass media and extension agents, and who attend most of the training courses, against (on the left hand side) people with less influence, with less access to information from mass media, extension agents or training courses, who are less educated, and who often belong to type C households. Most households in type C have never attended a training session, and have benefited the least from development projects currently underway in the area even though they are the ones in greatest need. What limited information they do have about ongoing projects and development activities mainly comes from village meetings. Twenty-one out of twenty-five type C

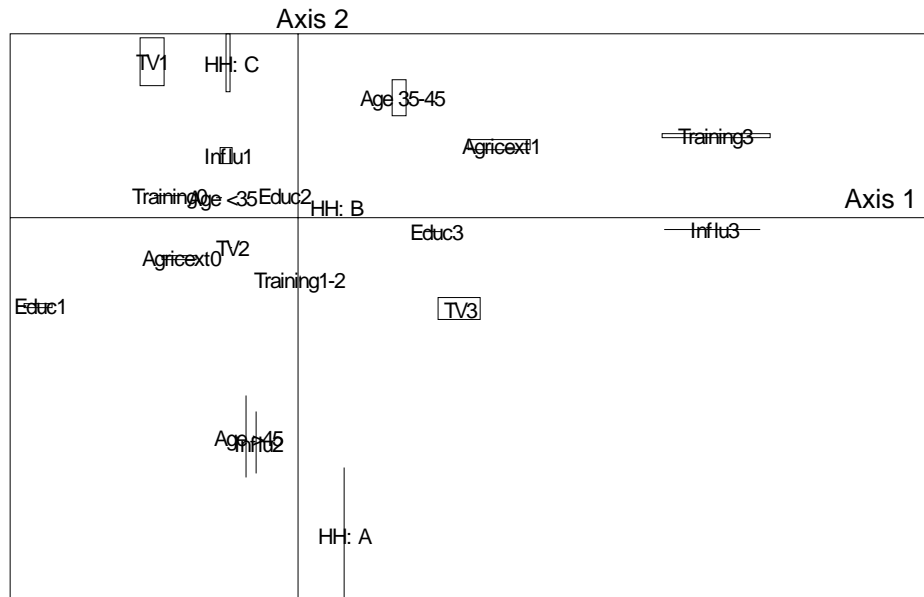
respondents do not know the extension worker in charge of their commune or who is responsible for agricultural matters in the local People's Committee.

On the second axis of Figure 6, type C farmers are opposed to type A farmers who are usually older and somewhat less involved in meetings and trainings, not because they are socially marginalized but because they are too busy managing their large farms. Most of them belong to the village founding families and therefore are from two biggest lineages in the village. This group not only has a higher educational level but also has more assets, higher incomes, and larger farms. It includes non-farming households, i.e. civil servants and petty traders, who are not directly involved in farming and have income from other sources. For instance, a civil engineer, Mr B, with a teacher-wife has attended 3 training courses in agriculture and forestry. He said that he attended the training courses because of the high indemnities paid by the projects organising them, not because he needed the techniques. One of the training courses was on forest tree nurseries although Mr B does not own any forestland, and all his paddy land is rented out to a neighbour. The village chief, who often selects or helps training organisers to identify participants for training courses, is his best friend, and his father used to be the head of the commune's agricultural co-operative.

6. Discussion

6.1. *Connecting formal and informal communication networks for the benefit of poor farmers*

Our analysis of the formal and informal social networks in Phieng Lieng village revealed how local power relations and traditional norms can profoundly influence the diffusion of information and lead to the marginalisation of large groups of people. Both the local government and mass organisations are run by the state in a rigid top-down manner. There is hardly any direct communication between local villagers and the formal networks that does not involve local leaders. The actual aim of mass organisations is to serve as the link between the people and the Communist Party rather than its original mandate, i.e. to accommodate various interests of the people.



Legend:

- Educ: 1 = primary school / 2 = secondary school / 3 = higher degree
- Training: attendance to 0 / 1-2 / 3 and more training courses
- Influ: 1 = low / 2 = medium / 3 = high social influence
- Agricext: 0 = do not know / 1 = know agricultural extensionist
- TV: 1 = rarely / 2 = sometimes / 3 = often watch TV
- Age: < 35 / 35-45 / > 45 years = age of the household head

N.B. The rectangles around the variable modalities represent their relative contribution to axes 1 and 2. The first axis account for 29.6% of the total information while the second axis represents 17.6 % and the third one (not shown) 13.5%.

Figure 6: Factorial correspondence analysis representing the patterns of influence in Phieng Lieng village

The difference in mass organisations is not between members and non-members but between members and leaders, as the latter control the organisations' resources and information flows.

The social networks in Phieng Lieng village are characterised by a high level of interwovenness between the formal and the informal networks. Households' socio-economic status and social connections through kinship, friendship and neighbour networks, rather than their actual needs, are of critical importance in determining the household's access to resources and information from formal sources. Recent settlers in the village and people from unimportant lineages find themselves almost completely excluded from the rest of the community not only in terms of income, assets and social networks but also in terms of access to information and benefits from development activities. The formal

extension services and development agencies very often target village chiefs and other formal local leaders as contact persons for their activities. However, this elite group only represents the views and interests of a minority of the community.

It is clear from our study that the nature and extent of social relationships are particularly significant for the rural poor who are disadvantaged by minimal material assets, lack of formal education, limited access to information and markets, and little institutional support. The level of social capital in the form of social networks possessed by each individual determines his/her access to other kinds of 'capitals' that are essential for well-being. Social participation and frequent interaction within the interpersonal networks also have considerable influence on the early adoption of technological innovations.

The results of this study suggest that in order to avoid furthering the interests of the elite and exacerbating the marginalisation of the excluded groups, development agencies need to identify the right range of stakeholders for all the development actions they support. The conventional practice of external agents is to rely on the support and facilitation of the local elite for their activities at the grassroots level. This practice often helps to reinforce the negative aspects of village social networks. The right stakeholders can be identified by using social institutional analysis, by working closely with local communities and building on existing knowledge on the area. The lack of co-ordination between development agencies working in the same region often results in overlapping activities, waste of time and resources, and most importantly, the incorrect identification of the intended beneficiaries (Castella *et al.*, 2004).

6.2. *Toward participatory extension*

The use of participatory approaches should be promoted in order to foster communication and information exchange, trust and cohesion between stakeholders across different socio-economic groups and between stakeholders and development agencies. The participation of people representing different interest groups in development activities not only strengthens local social capital but also helps development agencies to understand local communities and to identify their needs and wishes in the most efficient way. However, particular attention must be paid to information dissemination in order to ensure effective participation. Participation does not mean only the involvement of farmers in research and development processes but also the involvement of the right farmers. The selection of participants plays a crucial role in determining the success of participatory processes. For instance, participants who belong to type B in this study may consider that lowland intensification is the priority and technologies relating to upland soil conservation and animal husbandry are not necessary. On the other hand, type C farmers, who do not own any paddy land and generate income mainly from upland cultivation and goat husbandry, surely think otherwise. Participatory processes must thus not only include the voices of all the socio-economic groups in the target community

but also make sure that their participation is both active and relevant.

The official extension services in Phiang Lieng and in Vietnam in general have not paid adequate attention to the social aspect of extension work. Rogers (1983) pointed out that the heart of the diffusion process is the modelling and imitation by potential adopters of their near-peers who have previously adopted a new idea. The subjective evaluation of an innovation and the decision of whether or not to adopt an innovation are mainly based on interpersonal networks. The step-by-step communication structure and the disconnection between extension workers and villagers have frequently resulted in the introduction of irrelevant innovations and low adoption rates. Only sixty-three per cent of the respondents in our survey who had attended at least one training session on new technologies claimed that they had partially applied the techniques that were introduced during the session. But it is worth noting that the only training sessions they found useful were related to paddy rice cultivation. Many other short training courses aimed at agricultural diversification such as mushroom production, agro-forestry models, fish cultivation etc. failed to spread across the community. The needs and interests of local farmers were not fully taken into account in this extension work. The extension workers also failed to take advantage of the high level of social capital in the community to facilitate their work. The few villagers who have the privilege of attending one training session after another often belong to the elite group who do not have much connection with the rest of the community and few are aware of the need to share their knowledge and skills with other villagers.

All development actions should be assessed with regard to their impact on social capital. The intended outcomes of projects must increase the level of social capital in the region by enhancing social cohesion and social inclusion rather than aggravating the marginalisation of the poor and excluded groups. Development agencies should promote the ability of local people to work and organise themselves to solve problems together and network with others.

7. Conclusions

In this paper we have highlighted the role of the village social network with regard to access to agricultural technological information. First, we observed that frequent farmer-to-extension contacts influence a farmer's decision to adopt an innovation or to participate in an activity. In addition, through direct contact with local farmers, extension workers were not only able to develop relationships based on trust with them, but were also able to better understand local communities and their needs and wishes. A good understanding of the community will definitely help to identify the most appropriate innovations to introduce, how to introduce them, and which farmers to approach. This is a prerequisite to overcoming the pitfalls of "blind" participatory approaches. Second, official extension systems and research & development projects usually work independently from each other. Co-ordination and information sharing between all stakeholders in the extension system will help promote local agricultural development in a more integrated manner. Research findings in this study will, it is hoped, help development agents to better understand local communities and determine more appropriate approaches that also engage the poor in the development process. These results should also facilitate the interactive processes of co-operation and information exchange between local villagers and external people.

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