odi
Agricultural Research & Extension Network

AgREN

Network Paper No. 114

July 2001

PARTNERSHIP IN AGRICULTURAL EXTENSION: LESSONS FROM CHITWAN (NEPAL)

Gana Pati Ojha and Stephen R. Morin

Abstract

Efforts to transfer agricultural technologies to farmers are more effective when the state (GO), non-governmental (NGO), and private (PO) sectors work in partnership. This conclusion is based on information obtained from 123 farmers and 17 agency personnel during a 21-month field study in east Chitwan, Nepal.

The partner agencies maintained a dialogue while they selected research sites, drew up the research agenda, chose appropriate technologies and decided upon a range of partnership patterns. They assigned responsibility for the tasks required for effective technology transfer to each partner in the various patterns and documented their agreement through a memorandum of understanding (MOU).

Guided by these needs, availability of technology, and the interests of the individual agencies, technologies relating to farmer-preferred rice varieties (developed through a participatory plant breeding process), plus hybrid maize and sunflower were selected for extension. To compare the effectiveness of the various extension patterns, the research was conducted with a quasi-experimental design and information was collected using both qualitative and quantitative methods.

The study revealed differences in the results obtained by the various agencies and patterns of collaboration. The most effective partnerships proved to be GO+PO and GO+NGO.

This study provides lessons on how to promote partnerships and argues that establishing the right partnerships and strengthening them through information obtained from in-depth periodical reviews greatly enhances small farmers' access to improved and relevant sustainable agricultural technologies. Such access is necessary to increase productivity, ensure food security, and reduce poverty.

Research findings

A study of extension partnerships in one area of Nepal revealed strengths and weaknesses of various strategies:

- *When GO, NGO or PO agencies engage in partnerships, their effectiveness is generally increased.*
- *Various partners exhibit different strength. NGOs are particularly effective at reaching resource-poor farmers, while GOs usually have greater technical capacity.*
- *Different partnerships are appropriate for particular goals. GO and PO partnerships are better for high-cost technologies with larger farmers, while GO and NGO partnerships are better at reaching smaller farmers.*
- *The partnership programmes must be mutually beneficial to each other.*

Policy implications

- *Partnerships are a useful way of increasing extension effectiveness, but only when partners fulfil their obligations.*
- *The formation of partnerships must be based on an understanding of the comparative advantages of each agency.*
- *Continuous dialogue between partners is necessary.*

Contact details

Gana Pati Ojha may be contacted at the Capital College and Research Center, G.P.O. Box 2704, Kalimati, Kathmandu, NEPAL. *Tel*: 977 1 272511 (office) 977 1 476404 (residential) *Fax*: 977 1 272725 *Email*: ojhasirkutane@hotmail.com
Stephen R. Morin may be contacted at the International Rice Research Institute, MCPO Box 3127, Makati City 1271, PHILIPPINES. Fax: 00632 891 1292 *Email*: s.morin@cgiar.org

The Agricultural Research and Extension Network is sponsored by the UK Department for International Development (DFID)
The opinions expressed in this paper do not necessarily reflect those of DFID.

ISBN 085003 541 4

Acknowledgements

This research is an output of inputs from various persons and institutions. Though we cannot name them all here, we express our heartfelt thanks to them. Among them, the following have contributed significantly to the preparation and completion of this research. Therefore, we express our earnest gratitude, especially to the International Rice Research Institute (IRRI) for providing funds to carry out this research; the University of the Philippines Los Banos (UPLB) for allowing us to undertake this research; District Agriculture Development Office, Chitwan, Local Initiative for Biodiversity Research and Development, Rural Reconstruction Nepal, Inter Nepal Agrovet, Kisan Agrovet, Narayani Agrovet, and Beera Agrovet for their participation in this research in Nepal. We would also like to express our sincere thanks to Robert T. Raab and V. Subramanian (IRRI); Virginia R. Cardenas, Blanda R. Sumayao and Melinda F. Lumanta (UPLB) for their technical guidance. Our warm appreciation goes to the farmers who participated in this research.

CONTENTS

Tables

Acronyms

NASDA	National Association of State Departments of Agriculture
ASC	Agricultural Service Centre
DADO	District Agriculture Development Office
DNCC	District NGO Coordination Committee
FPR	Farmer-preferred rice
GO	Government organisation
INA	Inter Nepal Agrovet (P) Limited
IRRI	International Rice Research Institute
LI-BIRD	Local Initiatives for Bio-diversity Research and Development
MOU	Memorandum of Understanding
NGO	Non-governmental organisation
PO	Private sector organisation
PRA	Participatory rural appraisal
R&D	Research and development
RRA	Rapid rural appraisal
RRN	Rural Reconstruction, Nepal
VDC	Village Development Committees

PARTNERSHIP IN AGRICULTURAL EXTENSION: LESSONS FROM CHITWAN (NEPAL)

Gana Pati Ojha and Stephen R. Morin

1 INTRODUCTION

We have entered a new millennium and poverty, in association with food insecurity and environmental depletion, remains the number one problem (Shah and Strong, 1999). These three interdependent problems can be solved only through access to sustainable improved agricultural technologies for small farmers, who constitute a large proportion of the population and live under a variety of conditions. This calls not only for technologies relevant to the varied socio-economic and environmental conditions of small farmers, but also for the technologies to be made readily available to them. Even where some technologies are relevant (Fliegel, 1993), small farmers have no access to them. Our focus in this paper is therefore on extension.

Extension is seen as a public enterprise and is guided by the overall development paradigm, which is still top-down in nature. A general weakness of top-down development is provision of services by the state, bypassing resource-poor people and their organisations. Agricultural extension constantly neglects the issues and concerns of resource-poor farmers (Ashby et al., 1995; Howell, 1986; Rivera, 1996). It is only recently that development efforts have targeted this group. New entrants to extension, such as non-governmental organisations (NGOs), are credited with this (World Bank, 1997), but their efforts are limited to a small number of resource-poor farmers. Similarly, the private-for-profit sector has recently provided agricultural technologies to farmers more efficiently than traditional extension agencies (IFAD, 1995), although in this case to resource-rich farmers (Ojha, 1999). A new view of partnership between and among these sectors, which recognises their various strengths and weaknesses, is now emerging (Ashby et al., 1995; World Bank, 1997; CGIAR, 1997).

Partnerships in development

The partnership model is now emerging as a possible solution to the problem of effective technology transfer. This is in response to the failure of the supply-driven, top-down approach with excessive state intervention to attain equity with growth; the shortcomings of the private sector in distributing societal resources and improving the conditions of poor people; and the inability of the 'third sector' (NGOs) to reach the widely spread disadvantaged sector. Academics, development professionals and practitioners are all now considering how partnerships between and among the state, the market, and NGOs can better tackle the problem than any of these agencies acting individually (World Bank, 1997). Additional impetus has been provided by the current demand for additional services because of population increase, the complexity of the problems involved, diversification in consumer demand, and increasing resource constraints (National Association of State Departments of Agriculture (NASDA), 1998). The donor community now seems ready to invest in 'development through their partnership' in almost all areas (World Bank, 1999). In agriculture, the Consultative Group on International Agricultural Research (CGIAR) feels the need for stronger and more effective partnership to deal with a range of multi-faceted problems (CGIAR, 1999).

The logic behind the partnership approach to development is that multi-faceted, complex problems require more expertise and resources than can be provided by a single sector (World Bank, 1999). It follows that such problems can be addressed more comprehensively when the sectors concerned form partnerships, pool resources, and complement their distinct comparative advantage to each other (Khan et al., 1991; Mungate and Mvududu, 1991; Shah, 1995). This way, each of the partner organisations can attain its objectives more profitably than when it works individually (Nugent, 1995; Gomez, 1998). The expectation is that this approach will bring effectiveness and responsiveness from the NGO sector, efficiency from the market or private sector and judicious use of widespread infrastructure from the government or public sector (World Bank, 1997). It is hoped that this will lead to increased productivity, reduced poverty, and an improved quality of life. It is especially because of this mutual advantage that partnership between and among the state, the private sector, and the civil society has become a subject of development discourse these days (Morse, 1996; World Bank, 1997).

Despite its attractions, partnership has not received much emphasis as a variable in discussions of programme/project accomplishment. First, the literature is scant, and what is available is of the 'advocacy genre' (White and Wehlage 1995 cited in Morse, 1996). More is known about what partnership should do than what it actually does (Morse, 1996). Sometimes literature cites partnership as a means of implementing projects. However, owing to the projects' disciplinary orientation discussion of results is dominated by technical aspects and ignores any contribution made by its having been implemented through partnership. In fact, research and evaluation explicitly focusing on partnership are limited (White and Wehlage, 1995 in Karasoff, 1998; Carney, 1998; Ojha, 1999) mainly because the field is still new. Second, despite foreseeable mutual benefits, the state, private sector and NGOs still prefer to work independently of each other. Even government

organisations and NGOs, which have the same development goals, suspect each other and fear close contact (Farrington et al., 1993; Put, 1998). Private organisations, which have a distinctly different agenda, definitely prefer to keep their distance from both GO and NGO. Although some reasons for their reluctance are provided (Farrington et al., 1993), partnership itself is a new area of research and development (Shah, 1995) and therefore needs to be better understood, which calls for more research and evaluation.

To meet the need for more information about partnerships and find out if farmers' access to agricultural technologies can be improved through partnerships of GO, NGO and PO, a study was conducted in Chitwan, Nepal.

The study intended to assess the effectiveness of three individual extension agents (GO, NGO and PO) and four inter-sectoral collaborative extension patterns (GO+NGO, GO+PO, NGO+PO, GO+NGO+PO). Specifically, this study had the following objectives: (1) to describe the extension process employed by various extension patterns; (2) to identify effective extension patterns; and (3) to explain the factors that promote effectiveness of these patterns in extending agricultural technologies to farmers.

In this paper, we shall deal mainly with two aspects of the partnerships, the process of forming and maintaining them and their product. Under partnership process, we shall focus on partnership building and strengthening mechanisms. Under the partnership product theme, we shall examine how well the institutions implemented their tasks, how effective the agents were in transferring technology to farmers and the factors associated with effectiveness. We will also draw conclusions and implications and provide lessons learned from this study.

2 THE PARTNERS AND THE RESEARCH AREA

This section deals with how the partners were selected, describes them and discusses their strengths and weaknesses; recounts the technology, how it was selected and identifies the tasks involved in extending it; and describes the general research area and the individual sites.

Partner selection

To help in finding suitable partners for this project the researcher had letters from the International Rice Research Institute (IRRI), Philippines addressed to various institutions which seemed likely to provide support, either by supplying information or participating in the research. These letters were presented to the Department of Agriculture which then wrote an introductory letter to the District Agriculture Development Office (DADO), Chitwan.

Since DADO is the only government office extending agricultural technology to farmers, GO selection was automatic. The cooperation of this office was ensured by the Department's letter, assisted by the fact that the researcher already had a large number of colleagues there. This also helped in identifying other partners, and DADO provided official letters requesting their assistance.

Chitwan has a District NGO Coordination Committee (DNCC) which keeps records of NGOs registered or working in the District. Armed with an introductory letter from DADO, the researcher contacted the DNCC for information about NGOs. It turned out that although there were 152 NGOs in the district only two were directly involved in agricultural development. These were Local Initiatives for Bio-Diversity Research and Development (LI-BIRD) and Rural Reconstruction, Nepal (RRN) whose district-level staff were interested in participating in the research but needed permission from their headquarters.

The private organisations involved in agricultural development are fertiliser dealers and rice millers, neither of which had staff trained in agricultural technology, and Agrovets which did. The latter were therefore considered appropriate private partners for this research. Chitwan has a large number of Agrovets, which deal mostly in veterinary medicines, hybrid vegetable seeds, insecticides and pesticides, and sometimes cereal seeds. It was noted that many of them had links with each other. Of the nine initially contacted four were chosen to participate, namely Inter Nepal, Kisan, Narayani and Beera Agrovets.

Government Organisation (GO)

The District Agriculture Development Office (DADO), Chitwan is the only agency providing government extension services to farmers. It has 14 Agricultural Service/Sub Centres and during the survey it had 46 technical and 21 support staff (DADO, 1997). DADO covers the whole of Chitwan District where it extends technologies relating to cereal crops, vegetables, fruits, apiculture, fisheries and sericulture to farmers' groups rather than to individual farmers. For example they may provide a group with demonstration materials and tell them how they should be used. The group will then decide which of its members should demonstrate the use of the materials. One of DADO's main functions is to maintain linkages with research, input suppliers and NGOs and POs. The linkage mechanisms, especially with NGO and PO, were not clear except when extension personnel participated in research outreach sites.

Non-Governmental Organisations (NGOs)

The Social Welfare Council (1994) records showed that Chitwan District had the largest number of NGOs among the rice-growing Tarai districts. The District NGO Coordination Committee recorded 152 NGOs in 1997 when this research survey was carried out, only two of which dealt directly with cereals. These were the Local Initiatives for Bio-Diversity Research and Development (LI-BIRD) and Rural Reconstruction, Nepal (RRN). Both were working in east Chitwan and became partners in this study.

Local Initiatives for Bio-Diversity Research and Development (LI-BIRD) was established in 1995. Its main focus is sustainable development through interdisciplinary and participatory approaches. Its main

thematic areas include action-research and methodological development of extension services. LI-BIRD worked through the Participatory Crop Improvement Project in Chitwan to provide crop variety options during this fieldwork. It had an observation nursery, coordinated varietal trials, ran introductory trials and carried out seed multiplication. In addition, 108 farmers in three locations were given packages of F_4 or 'pipeline' crop varieties. The crops included in LI-BIRD programmes were rice, wheat, maize, sunflower, and off-season vegetables. The farmers evaluate LI-BIRD's crop varieties and indicate their preferences. LI-BIRD agreed to participate in this experiment as a resource centre for rice technology and supplier of farmer-preferred varieties of rice seeds.

Rural Reconstruction, Nepal (RRN) was established in 1990 as a multi-disciplinary national NGO. It had about 200 staff and projects in nine districts including Chitwan where it had been working since 1990. During this study, RRN was working in nine Village Development Committees in Chitwan (VDCs), focusing mainly on livelihood programmes in the communities. It followed a farming systems approach covering crops, livestock, green manure, micro-credit and other programmes. It had 27 staff including three technicians when this study was started. RRN agreed to become a partner in extension activities for this research.

Private Organisations (POs)

It was noted that Inter Nepal Agrovet (P) Limited (INA) was very popular and well respected by the others because of its resources and contacts with national and international companies. It operated both as a retailer and as wholesaler to the other Agrovets. Because of its leading position, and because the company was interested in participating, INA was selected as a collaborating private partner. However it was not within easy reach of all the research sites, so another three location-specific Agrovets which had also shown an interest in the project were chosen at a meeting of the other partners. These were Kisan Agrovet Sewa, Narayani Agrovet, and Beera Agrovet.

Inter Nepal Agrovet is a pioneer in Nepal with headquarters in Narayangarh, Chitwan. It deals with veterinary medicines, hybrid vegetable and cereal seeds, insecticides and pesticides. The agency has direct links with Indian and other international companies from whom it buys inputs which it sells wholesale to other Agrovets in Nepal. It also operates as a retailer. There were four staff at its headquarters in a large rented house. The manager of this agency was an agricultural graduate.

Kisan Agrovet Sewa was located in Tandi Bazaar and was also run by an agricultural graduate. It had two staff. Its customers were mainly from the Bachhauli area, which was one of the research sites. It dealt with veterinary medicines, hybrid vegetable seeds and insecticides. This Agrovet ceased trading after one crop season when the owner left for the USA.

Narayani Agrovet is also located in Tandi Bazaar and run by an agricultural graduate. It is a family-run shop. Its stock included veterinary medicines, hybrid vegetable seeds and insecticides. Its customers were drawn from the Bachhauli and Ratnanagar areas, both of which were research sites.

Beera Agrovet is located in Bhandara. This is also a family business, run in this case by a local farm household. Its proprietor had had two short courses, one in agriculture and the other in veterinary medicine. Its customers were farmers from Bhandara, Birendranagar and part of Piple VDC, all of which were in the research area.

Assessing the strengths and weaknesses of the partners

Bearing in mind the problems which the farmers had identified, and the technologies they planned to use, the partners set out jointly to analyse each other's strengths and weaknesses.

Everyone acknowledged that a GO was present in every VDC and was committed to technical services for all the farmers in the district. The GO had plenty of technical staff and good infrastructure such as offices and staff quarters, plus demonstration materials. It also had links with other research establishments throughout the country. However, the GO had to follow government regulations, which sometimes slowed down decision-making. Nor could it be innovative, since it had to stay in line with the policies of the national agricultural research system of which it is a part. Their efforts, especially with small and poor farmers, had not been effective in the past.

It was also agreed that POs were well known as suppliers of agricultural inputs. They had links with private companies both in Nepal and abroad, especially those dealing with seeds and chemicals. They provided information about the inputs they sold and were generally less bureaucratic than the government agencies. However they gave information only to their customers, and they did not have very much manpower, their businesses being largely family-run. They also had little to do with the national agricultural research system.

The NGOs' special relationship with poor and small farmers was also accepted. Their staff was skilled in motivating and organising small and poor farmers, they ran comprehensive livelihood programmes, and they were considered more flexible and thus responsive to their clients' demands. However, they could only cover small areas, most of their manpower was without agricultural training, and they depended on external funding. They had problems sustaining and scaling up their achievements.

Many of the three sectors' strengths and weaknesses identified here are very similar to those identified previously by various researchers (Farrington et al., 1993; Turton and Farrington, 1998; Partnering and Procurement Incorporation, nd.).

Selection of technology

Prior to technology selection, Participatory Rural Appraisals (PRAs) and Rapid Rural Appraisals (RRAs) were conducted with 200 farmers in 38 villages. This was to give us a general idea of the problems experienced by farmers throughout the area and assess their interest in participating in the research. We later

narrowed down our choice of research sites. The appraisals provided a lot of information about socio-economic and technological problems, and gave us an insight into the farmers' wants and needs. They also gave the farmers an opportunity to make suggestions about suitable crops for research. It emerged that the majority wanted rice varieties similar to *Masuli*, only higher-yielding. (*Masuli* is well established on the research site and fetches a good market price. It has a medium length of straw, middling yield (4 t/ha), is non-lodging and its grain is neither too fine nor too coarse.) The farmers were also looking for high-yielding rapeseed/mustard or other high-yielding oil crops. Further, they wanted hybrid maize seed to respond to the emerging demands of feed industries in the district.

The researcher, and an IRRI scientist who was assisting him, contacted five government agricultural research centres in an attempt to source technologies which would address the above problems. Unfortunately none of the centres had suitable technologies available. However, LI-BIRD, one of the partner NGOs, had rice varieties developed through a participatory process, which went some way to meeting the demands of the farmers.

A meeting of three partners – DADO, RRN and INA – discussed the issue and came up with a proposal to carry out research with hybrid maize, sunflower and farmer-preferred rice seed. INA showed an interest in supplying hybrid maize and sunflower seed and in marketing the latter.

The researcher, supported by DADO and RRN staff, visited the selected research sites to find out the farmers' reactions to these crops. The reactions were positive.

At the second joint meeting, attended by the district heads of DADO, RRN, and INA, it was finally decided to use the hybrid maize, sunflower and farmer-preferred rice varieties in the partnership research. The partners developed a Memorandum of Understanding (MOU) to carry out the research.

Task identification

Having looked at the nature of the technology available, their own capabilities, and the farmers' needs, the partners decided on the following major tasks to accomplish the research:

- the supply of inputs such as recommended seed, fertiliser and chemicals for the experimental crops, in line with the farmers' demands;
- providing the participating farmers with marketing information on the crops;
- working with existing farmers' groups or forming new ones;
- motivating the farmers to adopt the recommended technologies;
- training them in the use of the technologies;
- participation by the extension agents in farmers' meetings;
- field visits by the extension agents to the experimental plots;
- holding field days to allow participating farmers to pass on information to others;
- providing information about drying and storing rice, hybrid maize and sunflower;
- on-farm demonstrations of the recommended technologies;
- record-keeping by the extension agents of activities undertaken and results obtained in the experiments.

Memorandum of Understanding (MOU)

The partners developed an MOU based on the various matters they had discussed. These included the sites for specific patterns, technology to be extended, activities, division of responsibilities, and duration of partnership. The MOU also specified that none of the agencies would duplicate the others' efforts in an area assigned to a particular pattern. The heads of the institutions concerned signed the MOU.

The research area

The research area was on a plain in the eastern part of Chitwan District at an altitude of about 500m. The climate is sub-tropical, with hot, humid summers and cold, dry winters. Annual rainfall is 2000mm. The farmers on the research sites, most of whom are owner-cultivators, are a mix of hill migrants and indigenous people. Farm sizes vary from .05 to 4 ha. The area has a crop-livestock farming systems. The dominant cropping patterns are rice-maize/wheat/oilseed-vegetable/maize/rice/fallow (DADO, 1996).

Individual research sites

Eleven villages in seven Village Development Committees (VDC) were selected for this research through a series of formal and informal meetings with potential partners and farmers. The villages are described below.

Piple VDC: Nayabasti and Simara villages, comprising 287 farm households, were selected for extension of new technology related to hybrid maize, sunflower and farmer-preferred rice varieties. Nayabasti and Simara have canals for year-round irrigation. These are small farmers, dominated by relatively new migrants from the hills of Nepal. Both villages are located within two kilometres of the East-West highway. The community is a mix of Brahmin-Chhetri and Gurung-Magar. Before the partnership research and development programme started these villages had two NGO-sponsored micro-credit groups which held meetings every week.

Bhandara VDC: Beluwa and Daduwa villages, consisting of 311 farm households. The villages are located along the East-West highway and are mostly inhabited by Brahmin-Chhetris. The area is irrigated by canals although many well-to-do farmers have also installed tubewells. There is an Agricultural Service Centre (ASC) and an Agrovet shop near the villages. There was a group of mixed gender through which GO extension activities were carried out before this research began. The group meetings were held every month.

Birendranagar VDC: Five-Group village with 198 farm households located within a kilometre of the East-West highway. The dominant ethnic group is Magar-Gurung. Many of the inhabitants are retired army people and are small and marginal farmers. Irrigation is mainly

by canal. There was an NGO-sponsored micro-credit group which held meetings every week.

Kathar VDC: Samanpur village, consisting of 198 farm households, is dominated by Brahmin-Chhetris. Most of the farms, which are irrigated by canals, are relatively small. This village is within a kilometre of the East-West highway. Government extension was carried out through the nearby Khaireni Agricultural Service Centre. A GO-sponsored mixed-gender farmers' group already operated in the area. Group meetings were held every month.

Khaireni VDC: Simaltari and Pipra villages, consisting of 271 farm households. The people here are a mix of indigenous Tharu and hill-migrant Brahmin-Chhetris with many small, marginal farms. Both villages are within a kilometre of the East-West highway. There were two NGO-sponsored micro-credit women's groups operating in the area before research activities started. Group meetings were held weekly. Irrigation is mainly by canal. A government Agricultural Service Centre is located in this VDC.

Bachhauli VDC: Bachhauli village with 209 farm households. The dominant groups are Tharu and Brahmin-Chhetris. Irrigation is by canal. The area is located about five kilometres from the East-West highway but is along the two roads leading to Chitwan National Park. Farm sizes are mixed, ranging from small to large.

Ratnanagar Municipality: Jayamangala and Ghegauli villages, consisting of 326 farm households. The inhabitants are a mix of hill-migrant Brahmin-Chhetri, Magar-Gurung, and indigenous Tharu. Irrigation is by tubewell. There was a GO-sponsored women farmers' group through which government activities were extended. The villages are located within two kilometres of the East-West highway, lying along a metalled road leading to Jutpani. The municipality has an Agricultural Service Centre and there are many Agrovets along the East-West highway.

3 STRENGTHENING THE PARTNERSHIPS

Once the partnerships had been set up various mechanisms were used to strengthen them, including staff training and the establishment of joint monthly meetings.

Staff training

In September 1997 a five-day orientation course on sunflower, hybrid maize and rice farming was given to 15 of the participating agencies' field staff. The course was funded by IRRI and conducted by experts from the local training centre of one of the partner NGOs. Additional expertise was provided by representatives of the other partner institutions. The training had two purposes: to provide technical information about the recommendations and to give details of the projected study.

Joint monthly meetings

The monthly meetings were attended by the heads of the local GO, NGO and PO units as well as the DADO extension officer, to enhance coordination among the partners. Specifically they were used to review what crop activities had been carried out plus what had been done to strengthen and maintain the partnership during the previous month, and to plan what should be done in both these areas over the coming month. To help matters further, the partners chose from among themselves a coordinator for the joint monthly meetings and four for on-site meetings.

Eleven meetings were held from April to December 1998. This included those held at project level to resolve research-related problems. Altogether, 40 decisions were made. There was a high level of participation by GO and NGO (Table 1). A closer look shows 100% participation by RRN and 45.5% participation by LI-BIRD. It is true that the latter's presence was not important except when farmer-preferred rice (FPR) was on the agenda, but in some cases the staff did not participate because they were preoccupied with their own activities. In the case of the POs, although they took part in the meetings, they really preferred less time-consuming ways of exchanging information. Discussions at the meetings centred on research-related problems and solution seeking.

The decisions made at the monthly meetings were passed on to staff at the partners' local offices and from there to the farmers, either at meetings of farmers' groups or to individuals where such groups were either non-existent or not functioning. Similarly, the extension agents collected feedback from the farmers, either when they were on field visits or at farmers' meetings. Information collected this way was discussed at the offices of the local units and subsequently brought to the joint meetings. There were also many telephone conversations and informal meetings between the partners, so that in various ways a two-way flow of information was maintained, which helped keep the partnerships alive and active.

4 RESEARCH DESIGN AND DATA COLLECTION

The experiment

To implement the 11 activities described under Task Identification it was decided that the three sectors would work individually at three sites and that partnerships would be formed at four sites. The three individual sites were:

Table 1 Participation in joint meetings by partner GO, NGOs, and POs

Agency	Expected attendance (no.)	Actual Attendance (no.)	Actual Attendance (%)	Remarks
GO	44	38	86	High
NGO**	22	18	82	High
(RRN)	(22)	(22)	(100)	Full
(LI-BIRD)	(22)	(10)	(46)	Medium
PO	22	11	50	Medium
ALL	88	67	76	High

** Figures for NGOs are weighted averages of the corresponding figures for RRN and LI-BIRD (shown in parentheses)

- Kathar, GO
- Piple, NGO
- Bachhauli, PO

The partnership arrangements were as follows:

- Khaireni, GO+NGO
  GO: (1) demonstration (2) farmers' training (3) participation in farmers' meetings (4) field visits (5) post-harvest information and (6) record keeping (RK).
  NGO: (1) participation in farmers' meetings (2) field visits (3) motivating farmers (4) organising farmers (5) input supply (6) market information and (7) RK.
- Bhandara, GO+PO
  GO: (1) demonstration (2) farmers' training (3) participation in farmers' meetings (4) field visits (5) farmers' field days (6) motivating farmers (7) organising farmers and (8) RK.
  PO: (1) input supply (2) post-harvest information (3) participation in farmers' meetings (4) field visits (5) market information and (6) RK.
- Birendranagar, NGO+PO
  NGO: (1) farmers' training (2) participation in farmers' meetings (3) field visits (4) motivating farmers (5) organising farmers and (6) RK.
  PO: (1) input supply (2) post-harvest information (3) participation in farmers' meetings (4) field visits (5) market information and (6) RK.
- Ratnanagar, GO+NGO+PO
  GO: (1) demonstration (2) farmers' training (3) participation in farmers' meetings (4) field visits and (5) RK.
  NGO: (1) participation in farmers' meetings (2) field visits (3) motivating farmers (4) organising farmers and (5) RK.
  PO: (1) participation in farmers' meetings (2) field visits (3) input supply (4) post-harvest information (5) market information (6) RK

The activities suited to each partner's resources had been identified at previous meetings and the tasks assigned accordingly.

In addition to the experiments, the study also included surveys and observation. Four surveys were done, the first of which was carried out from April to June 1997. This took place in the general area from which the research sites were eventually chosen. The researcher, assisted by an IRRI scientist, conducted PRAs and RRAs with 200 farmers in 38 villages, involving 58 personnel of 20 organisations. The other three surveys were confined to the research sites. The first of these was carried out with farmers during June and July 1998 after the maize harvest. The second took place during October and November 1998 following the rice harvest and the final survey was done in December 1998 for the overall evaluation.

The researcher was interested in observing the dynamics of the relationships between the partners themselves and between the institutions and the farmers. He did this from April to December 1998 while participating in 36 farmers' group meetings, 11 institutional meetings and several informal discussions.

This experiment had a new, uniform technology on all its sites, controlled by the researcher to avoid intervention from other agencies. Other means of avoiding intervention were through the MOU and the action-reflection process.

The technology recommended to the farmers had 11 components applied to farmer-preferred rice, hybrid maize, and sunflower under a rice-based farming system. The 11 components were (1) seed variety (2) seed rate (3) fertiliser (4) insect control (5) disease control (6) weed control (7) irrigation (8) storage (9) spacing (10) drying and (11) market information (see Table 2).

Only variety is evaluated in this paper, first because the focus of the paper is on partnership rather than technology, second because variety usually determines the other components in the technology, and third, because the other components of the technologies were recorded only from those farmers who used the recommended varieties. Analysis was carried out only on variety except in the case of high- and low-cost technologies (see Table 5) where the cost of fertiliser was taken into consideration.

Information was collected from all 123 adopter farmers through interviews, direct observation, tape recordings and photographs, personal experience, and informal discussions. Seventeen agency personnel were also interviewed. Fieldwork started in April 1997 and ended in December 1998.

5 PRODUCTS OF THE PARTNERSHIPS

Under this theme, we discuss three main aspects: (1) performance of institutional patterns in terms of implementing assigned responsibilities, (2) effectiveness of institutional patterns in terms of farmers adopting the technologies, and (3) factors contributing to the effectiveness of the institutional patterns.

The performance of institutional patterns on assigned responsibilities

This section deals with how successful the various partnerships were in implementing the responsibilities assigned to them. Included is a summary of the extension processes used by the various partnerships.

We begin by analysing to what extent the partners in each pattern fulfilled the responsibilities assigned to them when the partnerships were formed. Table 3 indicates that none fully achieved their goal. The Table also shows that the GO+PO and GO+NGO patterns did better than the others, mainly because of their complementarity. Other partnership patterns had their own specific reasons for succeeding or failing. These conclusions were drawn from several observations and validated during a joint GO, NGO, PO meeting.

The GO+PO pattern did well mainly because of the high level of interaction between the partners and between them and the farmers. A major contributory factor was that the partners' premises were close to each other and to the research site. The PO in this case was a local dealer who used the recommended technology on his own farm which encouraged other farmers to try it.

The GO+NGO partnership achieved 64% of its targeted tasks, again exhibiting a high level of interaction.

Table 2 Components of recommended technology

Components	Rice	Maize	Sunflower
Variety: Hybrid	-	Bioseed, Shanker, Shriram Pioneer	Vikie, Mahyco
Variety: Open pollinated (OPV)	Sworna, Pant-10, PNR-381, PR-106, Radha-11, Radha-12	-	Modern dwarf
Seed rate (kg/ha)	60	20	6
Fertiliser (NPK/ha)	90:40:30	130:70:50 (Hybrid)	75:55:36 for hybrid; 55:40:20 for OPV
Insect control	Borer: Furadan Hispa, string bug: Malathion Moth: Malathion, light trap	Cut worm, mole cricket, white ant: Malathion Army worm: Thiodan Borer: Furadan	Caterpillar: Thiodan Borer: Furadan Leaf eater: Nuvan Cut worm: Malathion
Disease control	Blast: Hinosan Bacterial leaf blight: Low dose of fertiliser, seed treatment Brown spot: Dithane M-45 (DM-45)	Stem rot: Balanced use of fertiliser Cob rot: use of healthy seed Downy mildew: Kerathane Blight: seed treatment with thiram	Blight: DM-45 or Blitox Root rot: Drainage Seed rot: DM-45
Weed control	Pull out	Pull out	Pull out
Irrigation stage	Always when land is dry Drain excess water	When 3-4 leaves emerge Knee high Tasselling Grain formation	At planting and 25 days afterwards Growing Fruiting
Storage loss control	Moth: Neem dust	Weevil: dry well, Malathion, or Celphus Rat: Mechanical killing or rodenticide Fungi: Dry well and keep in dry place	Rat: Mechanical killing or rodenticide
Planting distance (cm)	Not specified	Not specified	60 x 30 x 5
Drying	Dry well in sun	Dry well in sun	Dry well in sun
Marketing	Price information in local and Narayangarh bazaar	Price information in local and Narayangarh bazaar	Price information in local and Narayangarh bazaar

Although both agencies were staffed with outsiders, they had a good rapport with the local farmers whom they organised into groups. Weekly group meetings were held to reinforce the exchange of information.

In the case of the GO+NGO+PO partnership, the government agency performed well while its partners did poorly. Part of the problem was that the NGO had a project phase-out which reduced its number of staff so that it was difficult for them to devote resources to the research site. In the case of the PO, there was little demand for its inputs so it was unprofitable for them to remain involved. The GO was responsible for coordination at this site but was not dynamic enough to keep its partners involved, largely because their staff did not feel very positive towards either their partners or the programme.

The reason the PO pattern performed badly was lack of contact with the farmers at the assigned site resulting in their receiving little information about technology and management. The farmers were not organised and no training or demonstrations were given.

Summary of extension process

Each agency had its own way of disseminating technology. The GO and NGOs both passed on a given technology to groups of farmers through their field staff, although they differed as to frequency of contact and their target groups. The GO included all categories of farmers and contacted the groups once a month, whereas the NGO worked with groups of poor and small farmers and contacted them once a week. The GO had a high proportion of male, literate farmers as clients, while the NGOs' clients tended mostly to be illiterate women farmers. The PO worked on an entirely individual basis, passing on information to farmers who shopped for inputs with them.

When the agencies formed partnerships, their ways of passing on information changed. The GO, NGO (RRN), PO and resource centre (LI-BIRD) representatives took part in joint monthly meetings. They reviewed their performance over the previous month, planned the next month's programmes, then disseminated their decisions collaboratively.

In the GO+NGO partnership, the NGO motivated and organised small farmers through women's groups, supplied them with inputs and let the GO know whenever technical information was needed. The GO generally provided the information at the next group meeting day, through field training and field visits.

In the GO+PO partnership, the GO motivated the farmers and provided them with technical information, while the PO supplied the inputs and helped with the motivation process. They made field visits together to study on-site problems and guide the farmers who were mostly literate males with relatively large farms.

In the case of the NGO+PO partnership, the NGO motivated and mobilised the farmers, while the PO supplied the inputs. Their clients were mostly literate males, with farms sized between those of the GO+PO and GO+NGO clients.

Unfortunately it was not possible to analyse the way the GO+NGO+PO partnership worked, because the NGO and PO did not fulfil the tasks they had been given.

6 EFFECTIVENESS OF INSTITUTIONAL PATTERNS

In this part we compare the effectiveness of partnership and individual patterns and analyse them under various socio-economic headings. The 'effectiveness' of a pattern is measured by the percentage of households adopting the innovation.

Effectiveness of partnership versus individual patterns

The findings revealed that there was a higher rate of adoption of improved agricultural technologies when GO, NGO, and PO formed partnerships to extend these technologies to farmers. Partnerships had a mean of 8.44% adopters compared with just 4.29% for individual agencies.

Four reasons were identified for partnerships being more effective than individual institutions in technology transfer: (1) Institutions working in partnership performed a greater proportion of the tasks they had been assigned (54%) than individuals (44.33%) (see Table 3). The partners complemented each other so that not only did they perform their assigned tasks better but they also brought about changes in farmers' behaviour. (2) More manpower and material resources such as demonstration materials were provided by partnerships than by individuals which also helped to change farmers' behaviour. The agents in a partnership gave 10.7% of their time to the research project compared to 5.5% given by agents acting individually. (3) Peer pressure also contributed to success. Reminders from the active to the inactive partner about tasks to be done improved their implementation rate. (4) Most importantly, the partners saved resources by acting together. These factors encouraged partners to remain in partnership, where synergetic efforts and

Table 3 Performance by institutional pattern

		Institutional Combination						
Task		GO	NGO	PO	GO+ NGO	GO+ PO	NGO+ PO	GO+ NGO+ PO
Demonstrations (number)	Target	3	-	-	4	19	-	9
	Achieved	1	-	-	4	19	-	9
	% Achieved	33	-	-	100	100	-	100
Training (number)	Target	3	3	3	3	3	3	3
	Achieved	1	2	0	4	3	3	2
	% Achieved	33	67	0	100	100	100	67
Participation in meetings (number)	Target	8	32	12	40	11	35	43
	Achieved	8	32	3	38	0	33	15
	% Achieved	100	100	25	95	0	94	35
Farm Visit (number)	Target	8	32	3	35	11	35	43
	Achieved	8	10	3	22	30	15	16
	% Achieved	100	31	100	63	100	43	37
Motivating (number)	Target	25	65	12	70	60	25	50
	Achieved	7	17	5	22	52	14	6
	% Achieved	28	26	42	31	87	56	12
Organising (number)	Target	25	65	-	70	50	25	50
	Achieved	13	65	-	70	25	10	25
	% Achieved	52	100	-	100	50	40	50
Input provision (kg)	Target	39	27	100	40	100	14	50
	Achieved	16	13	5	20	83	11	5
	% Achieved	41	48	5	50	83	79	10
Record keeping (%)	Target	100	100	100	100	100	100	100
	% Achieved	100	100	50	100	100	100	67
Post harvest (%)	Target	100	100	100	100	100	100	100
	Achieved	0	0	0	0	0	0	0
Market NGO (%)	Target	100	100	100	100	100	100	100
	Achieved	0	0	0	0	0	0	0
Farm field days	Target	-	-	-	-	1	-	-
	Achieved	-	-	-	-	1	-	-
	% Achieved	-	-	-	-	100	-	-
Total % achieved		49	52	32	64	65	49	38
Average	% Achieved	Individual 44.3%				Partnership 54.%		

Table 4 Effectiveness of seven institutional patterns

Pattern	Number of Adopter Farmers	Number of Households	Adopters (%)
GO	7	154	4.6
NGO	17	287	5.9
PO	5	209	2.4
GO+NGO	22	271	8.1
GO+PO	52	311	16.7
NGO+PO	14	198	7.1
GO+NGO+PO	6	326	1.8

complementarity seem to have contributed to their effectiveness.

Of the partnership patterns, GO+PO and GO+NGO were more effective than the others. Four factors were associated with this greater effectiveness: (1) The staff of these partnerships stayed on the research sites which helped promote interaction with the farmers. (2) Their premises were located closer to each other than those of the partners in the other two patterns (NGO+PO and GO+NGO+PO). This led to better communication and complementarity. (3) The staff participated more in joint monthly meetings held for planning, review of activities, and re-planning (action-reflection) than the others. (4) They cooperated well together to provide extension services. For example, in Khaireni where the GO+NGO partnership operated, if the GO had been working on its own it would have had to make eight field visits. However they found that after making only six visits they had reached an especially large number of small farmers. They were then able to leave the other two visits, which related to input supply, to the NGO, saving the GO both energy and resources. Similarly, the NGO was able to get free technical advice for its clients from the GO, which it would otherwise have had to pay for.

Under the GO+PO pattern, the GO did not have to spend resources on inputs as the PO had already supplied them. For its part the PO benefited from the partnership through advertisement and increased sales. These mutually perceived benefits strengthened and encouraged the partnership to continue delivering services to the farmers.

It was also noted that the staff of the two more successful partnerships used their time more professionally than the others. In the GO+NGO pattern the NGO was seen to concentrate its efforts on motivation and mobilisation while the GO focused on technical matters. Similarly, in the GO+PO partnership the PO paid close attention to management of inputs allowing the GO to look after the technical aspects of the extension effort. In the GO+NGO+PO and the NGO+PO patterns, this professional use of time did not occur. Nor did the partners perform their tasks well (see Table 3).

A common factor observed among the ineffective patterns was that the partners failed to carry out many of the extension activities assigned to them (see Table 3), resulting in a low demand for inputs from farmers. Participation was perceived to incur higher transaction costs than potential benefits. In essence, it was found that partnerships were effective where the partners saw them as mutually beneficial, otherwise they did not work.

Socio-economic dimensions of effective institutional patterns

An important concern in development is that it should reach the disadvantaged members of society. In agricultural development this means making affordable, suitable technologies accessible to small farmers (IFAD, 1995). To evaluate which pattern served the low-income farmers and what technology type was extended, we first reviewed the types of technology extended by the respective patterns. Second, we analysed the farm size of adopter and non-adopter farmers under all patterns.

Partnership was found to be technology-specific, the technology being classified as either high- or low-cost. Hybrid seed with its associated higher dose of fertiliser was considered high-cost technology. The recommended dose of fertiliser for sunflower was 75:55:36 for hybrid and 55:40:20 (NPK/ha) for open-pollinated varieties (OPV). Similarly the price of hybrid sunflower seed was NRs 400 compared to NRs 135 for OPV seed. In the case of maize, all varieties were hybrid, requiring a high dose of fertiliser, whereas the rice varieties were all OPV, requiring a lower dose.

Table 5 Adopter farmers and technology types, by patterns

Pattern	Adopter farmers (no.)	Low-cost technology (%)	High-cost technology (%)
GO	7	100	0
NGO	17	100	0
PO	5	40	60
GO+NGO	22	91	9
GO+PO	52	12	88
NGO+PO	14	86	14
GO+NGO+PO	6	83	17

Adoption of imported high-cost technologies took place under the GO+PO partnership (Table 5). Under this pattern, use of hybrid seed was encouraged. Farmers planted both hybrid maize and sunflower and used the associated technologies extensively. This was possibly because the PO emphasised such technologies, which was good for business. Although the GO was at first reluctant to go for non-sustainable, costly technologies, it later supported their use, possibly as a result of the influence of PO. The farmers, especially large landholders, used the technologies because they were told by both GO and PO staff that they would derive significantly higher returns from the hybrid technologies.

With the GO+NGO partnership, the NGO's emphasis on low-cost, locally available sustainable technologies led to their successful adoption. The technologies were open-pollinated sunflower, a low dose of chemical fertiliser and mechanical means of plant protection. The NGO did not encourage hybrid maize or sunflower here.

In the case of the NGO+PO partnership, the NGO succeeded in motivating the farmers to adopt low-cost

open-pollinated crop varieties but the GO's absence was felt when it turned out the farmers did not know how to use the technologies.

Institutional patterns were found to be specific to the size of the farmers' land holdings. The PO favoured large farm owners, while the NGOs catered for small farmers. The GO came somewhere between the two, probably because its remit was to reach all farmers.

Table 6 T-test showing differences in farm size between adopter and non-adopter farmers by pattern

Pattern	Mean farm size (hectares) Adopter	Non-adopter	T value
GO	1.17	0.69	0.125
NGO	0.51	0.37	0.1852
PO	2.4	0.77	0.0087**
GO+NGO	0.89	1.04	0.611
GO+PO	1.23	0.76	0.4070*
NGO+PO	1.08	0.58	0.0856
GO+NGO+PO	2.02	0.62	0.0497*
All	1.02	0.69	

** Significant at 0.01 level
* significant at 0.05 level

Table 6 shows that adopters in the PO, GO+PO, and GO+NGO+PO patterns differed significantly in terms of farm size from non-adopters on the various sites, meaning that these patterns served farmers with large holdings. The PO's preference for those with large holdings and the GO's 'any farmer' strategy may have enabled the larger farmers to dominate in accessing technology. The GO+NGO partnership served small farmers, the GO being helped to reach them through the advocacy of the NGO. In this respect the NGO+PO partnership fell somewhere in between (Table 6). Despite the NGO presence, the adopters on this site were not small farmers. This was mainly because the farmers did not strictly belong to the NGO group.

The above findings are recapped in Table 7. This shows that GO+PO and GO+NGO were the most effective patterns, with more farmers adopting their recommended technologies. GO+NGO concentrated on delivering low-cost technology to small farmers while GO+PO delivered high-cost technology to large farmers.

Table 7 Trends in adoption, technology type, and farmer type by patterns

Pattern	Technology Adoption	Technology type	Farmer type
GO	Low	Low-cost	Small
NGO	Low	Low-cost	Small
PO	Low	High-cost	Large
GO+NGO	High	Low-cost	Small
GO+PO	High	High-cost	Large
NGO+PO	Low*	Low-cost	Small
GO+NGO+PO	Low	Low-cost	Large

7 CONCLUSIONS

Partnerships between GO, NGO and PO were more effective than the efforts of individual agencies in extending agricultural technologies to farmers, but only when the partners fulfilled their mutually agreed responsibilities. When any or all of the partners proved to be uncommitted, individual patterns were rather more effective than partnerships.

The key to successful partnerships is complementarity of effort. In order to achieve this complementarity there has to be a mutual understanding of and respect for each other's strengths and weaknesses.

Partnership between GO and PO improves the access of large farmers to high-cost technology. Small farmers, including women from poor families, can be reached through GO+NGO partnerships. Philosophically, the NGOs are committed to bringing development and sustainable agricultural technologies to disadvantaged and poor farmers including women. The GO's agenda is also to reach small farmers. With the NGOs' strength in motivating farmers and the GO's technical competence, this partnership pattern can reach more small and marginal farmers, as both the GO's and NGOs' mandates dictate.

The partner institutions continue to collaborate so long as each of them derives benefits from the partnership. When this is no longer the case, the partnerships fall apart.

Continuous dialogue, resource sharing, local-based partners, support from local leaders, flexibility and active involvement of all partners in all stages of the partnership programme are vital ingredients of success.

The concept of committed partnerships as an effective means of extending agricultural technology is new and should be promoted through a series of R&D projects. Considerable time should be allowed to prepare the individual agencies for this new way of working.

REFERENCES

Ashby, J.A., Gracia, T., Gurrero, M.P., Quiros, C.A., Roa, J.I. and Beltran, J.A. (1995) 'Institutionalizing farmer participation in adaptive technology testing with the 'CIAL'. *Agricultural Research and Extension. Network Paper* No. 57. London: Overseas Development Institute.

Carney, D. (1998) *Changing public and private roles in agricultural service provision.* London: Overseas Development Institute.

Consultative Group on International Agricultural Research (CGIAR) (1997) CGIAR and civil society: Forging collaborative partnerships with NGOs and Farmers' organisations as a key strategy to advance sustainable agriculture in the developing world. Briefing Paper for the CGIAR System Review prepared by the CGIAR NGO Committee.

CGIAR (1999) CGIAR on global issues. http://www.cgiar.org/issues.html

Consortium for Oceanographic Research and Education (CORE) (1996) Ocean 2000: Bridging the millennia. Partnership for stakeholders in the ocean. http://core.cast.msstate.edu/oceans2000.html

District Agricultural Development Office (DADO) (1996) Krishi bikas karyakram ra uplabdhi: Ek jhalak 2052–53, *Agriculture development programme and achievements: a glimpse 1995–96*. Chitwan: District Agriculture Development Office.

District Agricultural Development Office (DADO) (1997) *Krishi Sandesh*. 'Agriculture Information'. Year 3, Issue 2. Chitwan: District Agricultural Development Office.

Emerson, R.M. (1976) 'Social exchange theory'. *Annual Review of Sociology* Vol. 2, pp. 335–362.

Farrington, J., Bebbington, A. Wellard, K. and Lewis D.J. (1993) *Reluctant partners?: Non-governmental organizations, the state and sustainable agricultural development*. London and New York: Routledge.

Fliegel, F. C. (1993) *Diffusion research in rural sociology: The records and prospects for the future*. Westport, Connecticut: Greenwood Press.

Gomez, M.N. (1998) 'On the path of democracy: The role of partnership in American education'. *On common ground*. No. 8, Winter. http://www.yale.edu/unhti/pubs/AZI/gomez.html

Howell, J. (1986) 'Accountability on extension work' in G.E. Jones (ed.) *Investing in rural extension: Strategies and goal*. London: Elsevier Applied Science Publishers.

International Fund for Agricultural Development (IFAD). (1995) 'Technology generation and diffusion. Extracted from Internet'. Page maintained by Roxanne Samii.

Karasoff, P. (1998) 'Collaborative perspective: A review of literature'. http://www.iamaw.org/pdp/textonly/chap_1.txt

Khan, M., Lewis, D. J., Sabri, A.A. and Shahabuddin, M. (1991) 'NGO interaction with the public sector: The experience of Proshika's livestock and social forestry programme'. *Agricultural Administration (Research and Extension) Network Paper* No. 26. London: Overseas Development Institute.

Morse, S.W. (1996) 'Building collaborative communities. Leadership Collaboration Series. Pew Partnership for Civic Change'. http://www.pew-partnership.org/research/ics/collabindex.html

Mungate, D. and Mvududu, S. (1991) 'Government and NGO collaboration in natural resources in Zimbabwe'. *Agricultural Administration (Research and Extension) Network Paper* No. 24. London: Overseas Development Institute.

National Association of State Departments of Agriculture (NASDA) (1998) 'Key principles of cooperative relationship'. *Partnership Agreements*, September 1998. Washington D.C.: The National Association of State Departments of Agriculture.

Nugent, J. B. (1995) 'Between state, market and household' in De Janvry et al. (eds) *State, market and civil organizations: New theories, new practices and their implications for rural development*. London: MacMillan Press.

Ojha, G. P. (1999) 'Partnership between government, non-government and private organizations in agricultural extension in east Chitwan, Nepal.' Unpublished PhD thesis, Laguna, Philippines: University of the Philippines Los Baños.

Partnering and Procurement Incorporation (PPI). (nd.) Public-private partnering. http://www.procurement.on.ca/ppp.html

Put, M. (1998) *Innocent farmers?: A comparative evaluation in a government and an NGO project located in semi-arid Andra Pradesh (India) meant to induce farmers to adopt innovations for dryland agriculture*. Amsterdam: Thela Publishers.

Rivera, W. M. (1996) 'Agriculture extension in transition worldwide: Structural, financial and managerial strategies for improving agricultural extension'. *Public Administration and Development*, Vol.6, No. 868 pp. 1–11.

Shah, A. (1995) 'NGO-GO interaction in watershed development: Experiences from Gujarat (India)'. *Agricultural Research and Extension Network Paper* No. 56. London: Overseas Development Institute

Shah, M. and Strong, M. (1999) 'Food in 21st Century: From Science to Sustainable Agriculture'. http://www.worldbank.org/html/cgiar/press/rel9910.html

Social Welfare Council (SWC). (1994) *List of non-government organizations affiliated with Social Welfare Council*. Lainchaur, Kathmandu: Training and Information Section, Social Welfare Council.

Turton, C. and Farrington, J. (1998) 'Enhancing rural livelihoods through participatory watershed development in India'. *Natural Resource Perspectives*, No. 34., London: Overseas Development Institute.

World Bank (1997) *The state in a changing world: World development report 1997*. New York: Oxford University Press.

World Bank. (1999) 'Comprehensive development framework' http://www.worldbank.org/htm1/exldr/partnerships.htm

AgREN

Network Papers cost £3.00 sterling each (plus postage & packing).
This paper may be downloaded free of charge from the AgREN website at: www.odi.org.uk/agren/publist.html
Please contact the Network Administrator at:
The Overseas Development Institute, 111 Westminster Bridge Road, London SE1 7JD, UK
Telephone: +44 (0)20 7922 0300 Fax: +44 (0)20 7922 0399 Email: agren@odi.org.uk

Information about ODI and its publications can be found on our website at:
http://www.odi.org.uk/