

Agricultural Research and Extension Network

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Contents

1. From the AgREN Coordinator	2
Rural Livelihood Diversity and its Implications for Pro-Poor Agricultural Research and Extension	2
2. Contributions from members	4
Animal Traction in West and Central Africa: How to proceed after the disengagement of the State?	4
Public-Private Partnerships for Agricultural Innovation: A useful tool for development?	5
Socially Responsible Rural Mechanisation Processes and Policies in Nepal	7
Trade-off in perspectives between farmers and researchers – IVLP experience in India	8
A community-university-GIS partnership for weed mapping	9
Cardamom cultivation and forest biodiversity in northwest Vietnam	10
Using Participatory Varietal Selection of Rice to alleviate poverty	11
Diversifying rural livelihood options in Bangladesh	12
4. Announcements	13

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From the AgREN Coordinator

The current issue of AgREN includes papers on a wide range of topics that should be of interest to network members. Please remember to consider AgREN for publishing results of your own work so that we can provide the detailed analysis of pro-poor agricultural development that people expect from AgREN.

AgREN is currently assessing possible future strategies. All network members should have received a set of questions (by post and e-mail) related to priorities for AgREN. We are interested in hearing your ideas for strengthening AgREN, and we are particularly interested in suggestions that will help AgREN provide a growing range of papers. AgREN papers are

distinguished by their in-depth analysis, and this implies a considerable time investment from authors. AgREN provides editorial assistance and we would be interested in considering other forms of assistance to authors, or suggestions for appropriate topics. We are also interested in hearing your suggestions for the type of items for the newsletter.

In addition, we would welcome network members' suggestions for the annual e-mail discussion. We held a useful discussion in March on the subject of rural livelihood diversity and its implications for pro-poor agricultural development. The results of the discussion are summarised in this issue of the newsletter.

Rural livelihood diversity and its implications for pro-poor agricultural research and extension

This note summarises the AgREN e-mail discussion held March 22 – April 2 on the implications of rural livelihood diversity for the conduct of agricultural research and extension. (See www.rimisp.org/agren04/ for full discussion).

There is universal acknowledgement that livelihood diversity is a major factor affecting the success and relevance of many agricultural programmes. Although it may be argued that such diversity is nothing new, there is considerable evidence that it is assuming an ever greater role. The logic is clear: as economies develop, agriculture represents a decreasing proportion of economic activity; as economies expand and globalise, there are increasing opportunities to access a range of income sources. Despite these opportunities, many rural people suffer because of inadequate agricultural production, but the phenomenon of income diversity presents increasing challenges to those who seek to develop agricultural innovations.

The pull of an expanding economy and the push of unprofitable farming mean that rural household income diversity is a growing reality. In addition, farming activities are conditioned by the labour demands of off-farm and non-farm opportunities. Those may include local wage and self-employment, short-term or seasonal migration, or long-term migration where remittance income may be the most important factor in household survival. The patterns are complex and varied and defy easy classification. Not all households are on an inevitable pathway out of agriculture, but there are many more choices available which agriculturalists must be aware of.

Discussions about diversity should be familiar to agriculturalists, as small-scale farming has always exploited a range of seasonal and spatial opportunities to develop complex farming systems and deploy scarce labour. Formal interventions are often oversimplified and hence fail to meet the needs of these systems. Dealing with 'pure' farming system diversity is an

important issue, but not the main focus of the present discussion.

Most proposals for agricultural interventions made during the discussion involved linking farmers to markets. These include improved marketing of traditional produce, the development of specialised markets (e.g. organic produce), an increase in post-harvest value adding, and the exploitation of natural resource niches (such as producing and selling biological fertilisers). The caveat is that developing or entering such markets is not necessarily easy, and evidence from several countries indicated that many of the rural poor simply do not have the resources to pursue such opportunities. There are also questions about whether current market demand can accommodate the proposed production increases. On the other hand, there are certainly many cases where agricultural market participation has made an important difference (the case of India's dairy cooperatives was discussed). It should be noted that in at least some of these cases, significant participation in such markets may lower diversity in other parts of the farming system (e.g., shifting from farm-produced to purchased feedstuffs for commercial dairy).

Finding the highest priority areas for intervention is not easy. Decisions regarding the potential of any agricultural intervention must be made in the context of complex resource flows, complementarities and conflicts that determine economic opportunities. Boundaries are also shifting, as significant non-farm activities appear in rural areas, but agricultural opportunities may be a feature of peri-urban and even urban programmes.

There are many instances in which rural households with a significant off-farm income component are better off than those that depend solely on agriculture. There are many exceptions, of course, and studies show a variety of relationships. In areas where farming is remunerative, those households with adequate land

may earn an acceptable income. But where farming cannot fully support household needs, non-farm activities become an increasingly attractive target. In many studies, diversification (into non-farm activity) is a positive strategy. A study in Chile showed most rural households escaping poverty did so through a non-agricultural route. In Kenya, even among cash croppers, the better-off are those diversifying into non-farm activities. In a four-country African study, the wealthier households have a higher proportion of off-farm income.

There were a number of observations about the relative importance of agriculture for getting out of poverty. The traditional conception has been that profits and skills gained in farming can help households (and rural economies) move into other activities. Some examples were discussed (e.g. small-scale commercial seed production in Nepal leading to other enterprises). But the reverse may also be true: in Uganda, off-farm income is necessary to fund entry into cash cropping, and a larger African study showed that households with more income diversity have higher agricultural productivity. When the non-farm economy offers better opportunities agriculture may be only a temporary strategy. In a case in Chile, investment in micro-irrigation led to increased income that financed a shift out of farming. In Bangladesh, farm land is mortgaged to fund migration.

The possibilities are so complex that the simple term 'diversification' may be inadequate to provide guidance. The central meaning in this discussion has been the fact that households formerly (or supposedly) highly dependent on agricultural income in fact dedicate an increasing proportion of their time to non-farm activities and hence are diversified (farm and non-farm). But diversification is not simply measured by counting the number of different income streams. At the lower end of the ladder, households are in a coping mode ('hanging in') and their diverse (and often temporary) activities do not offer a way out of poverty. Such households produce some of their own food and would welcome the opportunity to produce more, but their limited assets mean they are unable to invest much in new technology, and their other activities mean that they are looking for ways to further reduce labour investment in agriculture. These limitations make improving their production and conserving their resource base particularly challenging.

Other households may be in a process of 'stepping up' to improve current assets, further investing in agricultural or non-farm activities. Yet others may be 'stepping out' and accumulating resources to enter new enterprises. There are probably two competing processes here. On the one hand, diversification is important, especially in allowing households to enter new realms; access to credit in Bangladesh enables households to experiment with a wider range of activities. But concentration may also occur, and once the appropriate enterprises are identified, households may need to specialise in particular activities to compete effectively. The discussion focused on accommodating the diversity in the rural economy, rather than

discussing whether successful individual households might manage diverse bundles of activities (for risk reduction and complementarities) or specialise (in order to compete more effectively in particular markets).

The new trajectories in household livelihood strategies may take some time to emerge; for instance, it takes considerable time to accumulate earnings from migratory work and then decide how to invest. In the meantime, major shifts in household organisation are underway. The increasing absence of men from the farm household places increased burdens on the women who remain behind. Women also have new (although usually more limited) opportunities in the emerging non-farm economy, and these affect the nature of the household as well. Evidence from Africa points to the problem of youth who are largely disenchanted with agriculture, but their future success in alternative opportunities is not assured.

The overwhelming consensus of the discussion was that the rural economy is so different from the image of the 'small family farm' motivating most current agricultural research and extension that very significant changes in organisation, skills and strategies are going to be necessary. Those interested in pro-poor agricultural growth must face the fact that (1) agriculture is an important way out of poverty for only certain rural households (thus implying careful targeting) and (2) agricultural interventions will be increasingly focused on new skills and techniques that link producers to markets (thus requiring new strategies for agriculturalists).

The implications for agricultural research and extension are potentially very great, and the discussion only hinted at the types of adjustments that will have to be made. Part of the challenge is dealing with the diversity of individual household priorities and strategies. The top-down delivery of messages is certainly inappropriate, but we have few examples of successfully managed participatory approaches that are able to prioritise and respond to a diversity of requests. Besides doing a better job of understanding household priorities and potential, programmes will increasingly have to help form links between the field and the market. Skills in facilitation and group formation are important areas for attention. Although it may be argued that the facilitation role (linking diversifying households to a growing economy) is of key importance, particular technical skills (e.g. to help develop those markets or improve the quality or efficiency of production) will also be required, and such skills are not widely encountered in current agricultural agencies. In addition, agencies require access to much better information about local and regional trends, to help identify relevant areas for future interventions.

Perhaps the most difficult challenge of all is understanding how various organisations (research and extension agencies, civil society organisations, NGO or donor projects, private entities) can upgrade their skills (in assessment, facilitation, and the provision of specific technical advice); and how they can co-ordinate among themselves, to best serve the needs of rural households in a diversifying economy.

Contributions from members

Animal Traction in West and Central Africa: How to proceed after the disengagement of the State?

Introduction

In the Savannah regions of West and Central Africa, animal traction technology remains a promising option for the sustainable development of family-based agriculture. However, during the last 20 years, the policies followed by the majority of states that disengage direct interventions in favour of agricultural production, have gradually weakened essential support services for animal traction. While access to government-supported credit for equipment and working animals has declined, new service providers have appeared or strengthened their positions, particularly blacksmiths and farmers' organisations. In this new setting it is in the interest of all stakeholders to agree upon coordinated frameworks for action in favour of support systems for animal traction development.

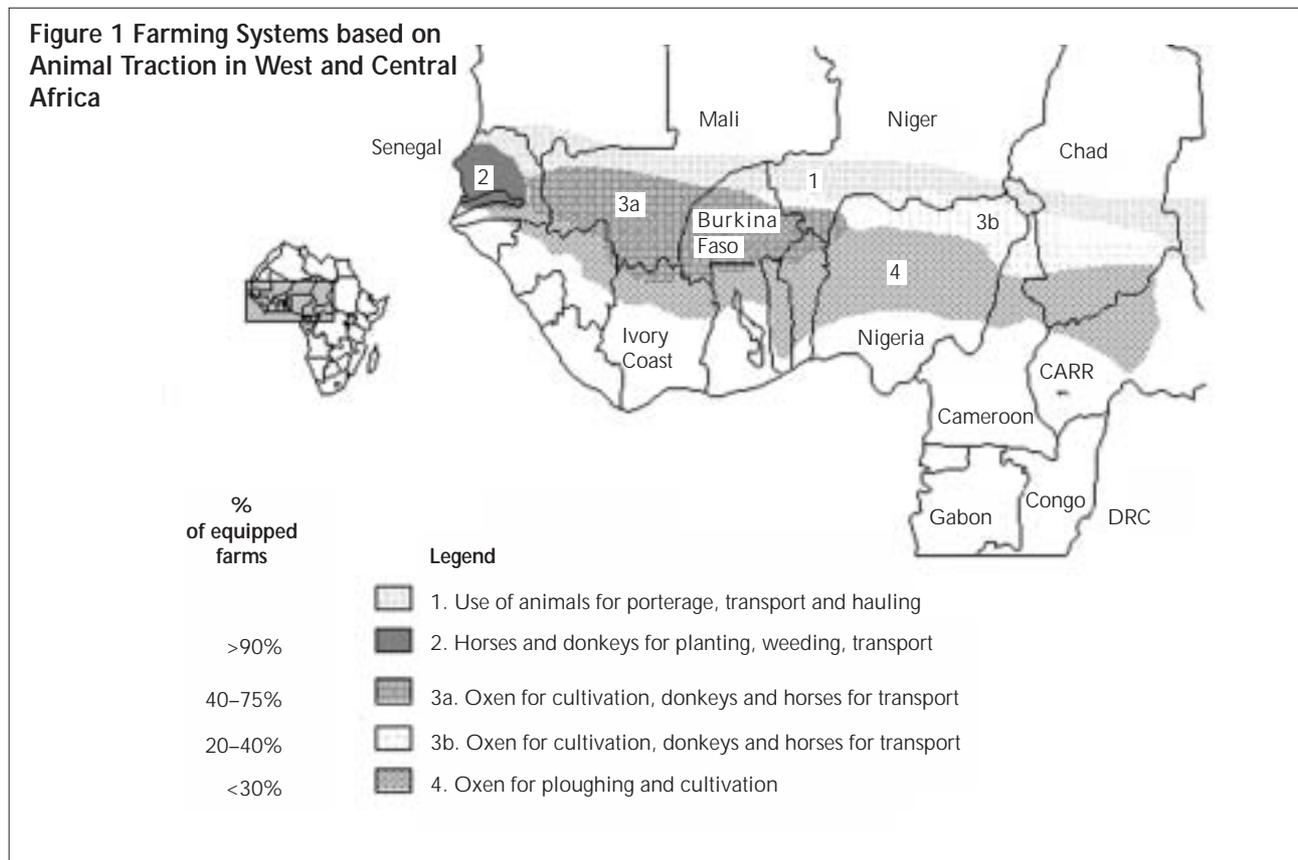
Collaborative Research Programme

Over four years (2000–2003) a collaborative research programme was conducted by a group of researchers from CIRAD and their partner organisations, Institut de la Recherche Agricole pour le Développement (IRAD) in Northern Cameroon, Institut Sénégalais de

la Recherche Agronomique (ISRA) in Senegal, and Association Tin Tua (NGO/FO) (ATT) in Eastern Burkina Faso. These three areas have been chosen because of their contrasting situations, enabling a more complete picture of the actual challenges and constraints. Emphasis has been given to R&D activities in Northern Cameroon, where a great diversity of animal traction technologies is developing within a relatively small area. The average equipment use by farms (almost all relying on family labour) is intermediate. Senegal represents a situation where animal traction was introduced a long time ago. Adoption rates are high, almost all farms are equipped, but there is little on-going technological change, because of persisting agricultural crises. In contrast, in Eastern Burkina Faso, the average equipment rate is low (less than 20%), but there is a strong demand for animal traction, in an area with relatively low population densities and an increasing integration into the market economy.

The main questions addressed were as:

- Which have been the consequences of the break



up, or change in the provision of the support services as regards the agricultural practises and the production strategies of the farmers? How will farmers be able in future to obtain equipment and working animals and ensure their maintenance?

- Under which conditions could new service providers, private, associative or (para-)public, emerge and how will they be able to deliver these in a sustainable way?
- Which should be today's priorities for Research and Development concerning animal traction?

Findings

The main lessons learnt through the research programme were communicated and discussed at an international workshop held in November 2003 in Bobo-Dioulasso (Burkina Faso), with 60 participants from 10 different countries. In addition, 50% of the communications were provided by participants external to the collaborative programme, putting the findings into a much larger setting.

The great disparities of adoption rates that still exist between countries, fully justify strong support measures for animal traction for the benefit of less equipped regions and categories of farmers (figure 1). In sub-Saharan Africa, animal traction technology plays a major role in lessening the burden of human labour in agriculture and greatly contributes to increasing the economic productivity of farming systems. Therefore, it is a major instrument for alleviating rural poverty.

If, in future, private operators and farmers' organisations will become the main providers of support services, their delivery should be economically feasible. The nature of the services offered should respond to the needs of the users (farmers, blacksmiths, etc.), including advice, credit provision and veterinary services. Ways should be found to ensure economic and social sustainability of services: contractual arrangements between providers and beneficiaries, agreements on cost-sharing, quota for subsidies (from

tax-payments and levies), management rules, quality control, etc. The setting up of more formalised frameworks for joint action on animal traction support, between different stakeholders, will be necessary.

Much will depend on an appropriate political strategy for rural development, with due recognition of the importance of animal traction.

R&D recommendations

1. Innovative participatory research on agricultural practises and equipment, in collaboration with farmers and blacksmiths: improved planting and weeding equipment, harnessing, carts, etc.).
2. Improved management of working animals: nutrition, production and use of manure, housing, use of female animals, timely replacement.
3. Appropriate practises as regards natural resources management, making use of the opportunities animal traction offers for mixed farming, erosion control, forage production, soil and water management, agro-forestry, etc.
4. Promoting special devices for addressing young male and female farmers, improving access to equipment and training facilities.
5. Introduction of alternative ways of rural savings, as regards investment in cattle and their extensive husbandry.

Before closing the workshop, the participants decided to join efforts for the creation of a Network for Animal Traction and Mixed Farming in West and Central Africa.

Further information

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Public-Private Partnerships for Agricultural Innovation: A useful tool for development?

Public-private partnerships as a tool for innovation development have gained increasing attention from local governments, public service providers and private companies because they enable partners to draw from complementary resources and profit from synergy and joint learning effects. Governments have supported such partnerships where positive social benefits are expected, for example the development of a sector to reduce unemployment. However, governments usually avoid subsidising innovations that can be legally protected and allow firms to restrict their use.

In developing countries partnerships for innovation development commonly include public research organisations such as government research institutes

and universities. The reason is that the innovative capacity of private companies is often weak. Such public-private partnerships for innovation development are different from efforts to increase efficiency and quality in the delivery of public services such as healthcare, road infrastructure, or education through outsourcing to private companies. Rather, here the aim is to sustain the autonomy of public research organisations by rendering their work more relevant, demand-oriented and efficient.

But partnerships are not easy to build and many do not pass the initial stage where partners provide goodwill statements to each other. Many also break apart in the phase of implementation when commitments have

to be made and benefits redistributed. In addition the public sector is challenged to justify how the partnerships it supports contribute to public economic, social and environmental development.

For this background the International Service for National Agricultural Research, which lately became a division of the International Food Policy Research Institute (IFPRI) launched a study on the institutional opportunities and limitations of partnerships for innovation development in agriculture in Latin America. The main aim of the project is to make partnerships for innovation development a more appropriate tool for development, poverty alleviation and improved livelihoods of the rural poor in Latin America.

The project's first contribution was to conceptualise the building of public-private partnerships. Viable innovation partnerships can be seen as cooperative arrangements between institutions of the public and private sectors that require shared ownership and responsibility, joint investment, shared risk taking and mutual benefit. What drives public and private agents to enter partnerships is usually their interest and their expectations in profiting from innovation rents derived through collaborative work. Here it is important to distinguish between benefits resulting from the innovation itself and the intermediary benefits from the partnership arrangement such as improved access to knowledge and involvement in innovation processes. In the context of interests and expectations partners make a series of considerations that determine if, in the end, they enter a partnership. Partnerships make sense when no partner can do it alone, when partners gain more than they invest and when there are positive synergy effects from joint learning and complementary use of resources. Partners may also consider that no partner makes disproportional gains from the others.

For analysing the building of partnerships and in order to identify appropriate interventions the project further developed an analytical framework for the process of partnership building involving five steps (see Figure 1): (1) identification of the common interest space, (2) negotiation and design of the partnership contract, including legal, funding and organisational design issues, (3) implementation and (4) evaluation of achievements. In a last step (5), partners make a decision to continue or discontinue depending on whether the objectives were achieved and if there is more to gain from the partnership. Over the years the partnership can profit from gradually improving working relationships and become strategic.

The public planner can support the 'partnering process' through different intervention tools. For

example, the project's efforts to support building of partnerships included participatory pre-definition of objectives, mapping of agri-chains to identify where partnerships make sense, classification of potential partners and analysis of technological options in round-table meetings.

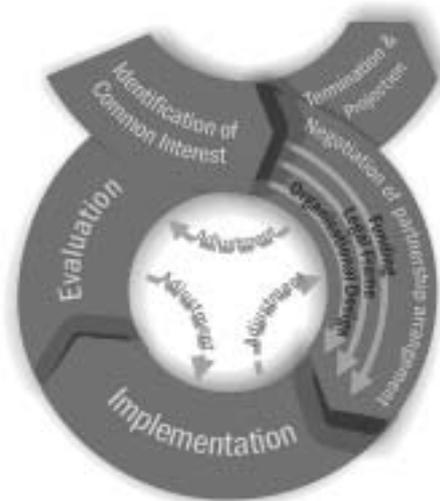
Preliminary results of the project in Latin America show that many partnerships for innovations exist and often they are endowed with substantial funds. The partner's perception vis-a-vis the results and benefits generated through partnerships was extremely positive. This indicates that partnerships 'serve the purpose', that is they provide some small trade off to one of the partners and the other partners, at least do not lose. This, however, does not mean that the real potential

of public-private partnerships for innovation development has been fully utilised. On the contrary, there is empirical evidence that public research entities and private firms involved in the production, processing and marketing of agricultural products have not been able to form viable partnerships that respond to concrete demands and generate the expected synergy effects from use of complementary resources, co-innovation and joint learning.

Innovation partnerships are a complex institutional arrangement and may not be the right tool for agricultural development when public priorities are not clearly set,

when the private sector is not sufficiently committed, or when the organisational cultures of partners are too diverse. Public policymakers may look into options for improving public planning and monitoring more carefully to understand when it makes sense for public agencies to become involved in public-private partnerships.

Figure 1 The Partnership-Building Cycle



Further information

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BMZ funded Project on Public-private partnerships for
Agroindustrial Research in Latin America

Socially responsible rural mechanisation processes and policies in Nepal

In Nepal for the last 14 years, CIMMYT and its partners in the National Agricultural Research System and other local and international actors have been collaborating in a range of projects with multiple sources of funding to promote Research and Development and Extension (RD&E) activities on a variety of resource conservation technologies (RCTs) in tillage and crop establishment. This coalition of projects and partners is bringing about a change in the way Nepalese farmers prepare their land, sow their seeds, transport their goods, thresh their crops, pump their irrigation water, etc. The coalition is also bringing about changes in the way researchers and development agencies perceive and address agronomy and rural mechanisation issues. The basic power source for most of these RCTs are Chinese 12 HP two-wheel tractors. The price of the Chinese two-wheel tractor (2WT) is 50% cheaper than Indian, Korean or Japanese products, which puts the machine into the affordability range for many rural entrepreneurs and smaller farmers in south Asia. The participatory technology development (PTD) portion of earlier projects was to promote the reduced till drill attachment and to develop other RCT attachments such as strip till drills, zero till drills, and bed planters which could be made in local workshops in south Asia.

The original project began in 1989/90 and utilised a farming systems transfer of technology orientation. It was expected that by simply taking the machinery to the fields of small farmers and demonstrating it to them that this would create demand. Over the years and with different partners things have changed. One partner in particular, the CG's System-Wide Participatory Research and Gender Analysis, helped move the project towards changes at three levels: 1) from a farming systems TOT to an interactive PTD approach; 2) more focus on poverty reduction and gender equity issues; and 3) The 'project' has become a 'coalition project', with many linkages to other projects and government programmes. Often to try and keep projects as separate 'stand alone projects' with their own 'inputs and outputs' with their own M&E systems is not useful or feasible.

The goals of two of the current projects under CIMMYT are to strengthen equity of access, poverty reduction, and gender orientations in the current rural mechanization processes in Nepal and South Asia. These projects came in response to a renewed interest in processes of rural mechanisation, which for decades had received little attention in international development.

The coalition project has the following features: 1) it takes an interactive approach to R&D and diffusion; 2) it is concerned with strengthening local pro-poor rural mechanisation processes and innovation systems; 3) all members of the coalition continuously search for potential new partners projects/line agencies/NGOs/private sector who have similar common interests and want to join the coalition; 4) developing new mechanisms for managing multiple partners in this new type of coalition project.

To develop ways to manage the multiple partners in the coalition project a number actor oriented tools

are being used such as, Actor Linkage Map, Actor Linkage Matrix, Actor Time Lines, Actor Learning and Action Tables, to manage and monitor changes in relationships, and activities as the coalition project proceeds.

Current activities in the coalition projects include: 1) surveying and monitoring of small scale mechanisation processes within Nepal; 2) assessment of small group ownership of the RCTs especially power tillers and their attachments; 3) assessing changes in gender roles and social and gender relations that are arising as a result of mechanisation; 4) PTD of new attachments and new agronomies (zero till, bed planting, surface seeding, etc); 5) pursuing credit facilities targeting resource poor service providers, farmers/rural entrepreneurs; 6) establishing a rural mechanisation information network, 7) bringing attention to the major rural mechanisation processes taking place in Nepal via papers and workshops to contribute to policy making process and the intervention activities of development agencies.

What project partners have remarked as being most useful in this coalition project is openness about the overlapping nature between many of the formal 'projects' they are working on, and with other work they are doing. They also like the learning and change approach, which this coalition project has adopted. In regular biyearly meetings the project team reviews what they have learnt, what is currently successful and what is not, and then making very specific six monthly action plans for changes/modifications to project activities and approaches to fit new circumstances. Project members have now come to realise that they must also monitor and learn from other rural mechanisation innovation systems around them, not only within Nepal, but also in the region, especially Bangladesh, where currently 25,000 two-wheel tractors are imported each year.

One of the outcomes of the project in Nepal has been its contribution to an increase in two-wheel tractor sales, which have drastically restarted after six years of no imports. Estimates of this current calendar year are that up to 1300 pieces will be sold. In the Terai, where past projects in this coalition have been concentrated, we have found that many buyers are in the small farmer category (less than 2 ha) and that these rural entrepreneurs have become local service providers. They are selling a range of tillage, haulage and other services. The growth in two-wheel tractor services market is opening up access for the two-wheel tractor services to poorer agricultural and other rural households. The actual poverty and equity outcomes are being monitored as the project progresses.

Further information

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Trade-off in perspectives between farmers and researchers – IVLP experience in India

Identification and characterization of location-specific farming problems and intervention through appropriate technology is necessary for the overall improvement of productivity and sustainability of agriculture in Andaman and Nicobar Islands. A research project on Technology Assessment and Refinement through Institution Village Linkage Programme (IVLP) was launched at the Central Agricultural Research Institute, Port Blair under the Production System Research mode of NATP (National Agricultural Technology Project). The objective was to identify the various farming environments and their production constraints as well as to assess the potential of available technologies. In Andaman and Nicobar Islands, about half of the farmers are small and marginal. Farming is concentrated on two micro-farming situations – the sloping hills, prone to soil erosion, and flat, low lying valley, prone to water logging in monsoon showers. Crop production is entirely rainfed. Thus risk aversion is one of the most important selection parameters for crop technology. In addition, tolerance to biotic and abiotic stress was considered as important as higher yield *per se*.

During four years of participatory research 16 technologies encompassing cereals, pulses, oilseeds, vegetables, and plantation crops were assessed through on farm testing and verification trials in the farmers' fields. Technologies were assessed quantitatively on the basis of growth, yield and economic return. But real evaluation was done with the help of the farmers through participatory matrix ranking. The four years of participation clearly revealed the trade-off in perspectives and priorities between the farmers and scientists in different crops and enterprises.

Paddy

To solve the problem of low productivity of paddy with the traditional variety, research scientists recommended the cultivation of medium duration high-yielding varieties. Accordingly, performance of five high-yielding, medium duration paddy varieties was evaluated in the field with the participation of farmers. Though all these high-yielding paddy varieties recorded 40–45% higher grain yield and net return compared to the local variety, farmers only preferred one of them and rejected the others. Grain size (preferably medium to fine), tolerance to lodging (preferably short stature plant), better palatability, good germination in the nursery, tolerance to prevalent insect pest and diseases were the varietal selection criteria of the farmers, which were in contrast to the scientists' recommendations.

Pulses and Oilseeds

Pulses such as green gram and black gram and oilseeds such as sesame have ample scope for cultivation on the low lying paddy fallow areas. But they are grown on a very small scale by the farmers. Thus to improve the production and yield of these crops, several

recommended high-yielding varieties were evaluated in the farmers' fields for two seasons. The growth and yield performance of these crops were highly satisfactory. But ultimately the crops were severely damaged due to heavy showers at flowering and fruiting, implying heavy losses to the farmers. Therefore, instead of the long duration high-yielding variety, farmers preferred short duration (60–75 days) varieties that could be harvested safely before the onset of the rain. Thus risk aversion criteria were given more preference than yield by the farmers in selecting varieties of pulses and oilseeds.

Vegetables

The lack of correspondence between scientists and farmers over priorities for crop and variety selection was even more evident in the case of vegetable crops. Several recommended varieties of vegetables (including tomato, brinjal, chilli, okra, cowpea, bittergourd, cucumber, pumpkin bottlegourd) were evaluated in the farmers' fields in different farming situations over three years. Better growth, higher yield and higher net returns were the satisfying evaluation criteria for the performances of these varieties by the researchers. However, considering the consumer preferences in the local market and transportation problems, skin colour, lustre, fruit size, average fruit weight, taste, post-harvest loss, shelf life and tolerance to diseases and pests were more important criteria for the farmers in adopting vegetable varieties. In okra, for example, taller plant height was preferred by the farmers because it made harvesting easier. Similarly, in spite of relatively higher yield, a recommended variety of chilli was less preferred than a local one because of problems in harvesting. For vegetables, the farmers' perspectives and priorities in varietal selection depended more on market demand than on yield alone.

Even though there have been significant changes in market and infrastructure facilities, farmers still considered yield stability and sustainability important selection criteria of their crops and varieties. Our study clearly revealed that social and cultural milieu have a profound influence on farming practices of the small and marginal farmers under rainfed CDR (Complex, Diverse and Risk-Prone) systems. Thus the non-alignment of perspectives and priorities between the farmers with the researchers was found to be an important constraint in improving the acceptability of new technology by the small and marginal farmers under low external input rainfed farming on CDR farming systems in these islands.

Further information

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A community-university-GIS partnership for weed mapping

Community-based natural resource planning and management has become increasingly common in Australia, driven by environmental concerns, decentralisation and the concept that decisions on resources are often best made by people with local knowledge. However, local communities often lack the skills and resources to gain funding and other support to achieve their management objectives. Following the declaration in 2002 of the Wombat State Forest in Victoria as Australia's first 'community managed forest', various issue-based working groups were formed to deal with particular aspects of forest management. In late 2003, the Weed and Pest Animal Working Group (WPAWG) selected Blackwood as a priority area affected by weeds and pest animals that pose serious threats to biodiversity and to fire safety. The Blackwood community has been seeking assistance to eradicate major weeds for a decade, but has lacked an accurate and credible means of presenting this issue to authorities – so very little funding has been allocated by local or state government agencies. Hence, the WPAWG developed a joint project between the community and a university department, to develop accurate maps of weed distribution for use in a submission for funding for a weed management programme. The main weeds are gorse, broom and various thistles, all of European origin.

A process for collecting weed information and mapping was developed at community meetings in 2003 (see Box 1). After preliminary discussions and visits, a postgraduate student produced A3-size paper maps of the areas, showing topography, rivers and property boundaries. Community groups with good local knowledge used these maps to mark weed infestations, using a standard set of symbols and colours for different weed species and densities. Their hand-drawn weed maps (Figure 1a) were then converted to

digital format, and feedback sought from community members on accuracy and improvements needed. The final maps were overlaid on air-photography (Figure 1b). The process followed a simple participatory action research cycle, in that activities were planned, action taken (mapping) and then the group reflected on the results before taking further action.

The final maps produced were used by the community and WPAWG as hard evidence of the urgent need for weed eradication, in a submission for government funding for a Blackwood Weed management Strategy in 2004.

The community members, who spent considerable time learning weed names, walking the bush and mapping in difficult terrain and weather, seem very satisfied with the outcomes of the project and have requested future involvement of students and staff in similar projects. If many weed species are involved, sets of correctly identified plant specimens would be an essential requirement of this participatory process. The work could not have been achieved without the local knowledge of weed identification and locations, or without the involvement of students with sound skills in GIS and related technologies, particularly GPS.

The university-community partnership has helped to develop awareness among local communities of GIS technology, and among students and forest professionals about local knowledge and the extent of weed invasions. This study provides a practical example of the high potential to integrate GIS, local knowledge and participatory methods in community-based resource management, in both industrial and less developed regions.

Box 1 Steps in community-based weed mapping

Step 1. Meetings and walks with community members (discussion and observation of weed types and infested areas).

Step 2. Preparation of paper maps of each part of Blackwood /Barry's Reef area (using 1:8000 topographic maps showing property boundaries to guide users in locating points).

Step 3. Paper maps distributed to members in each area and symbols explained.

Step 4. Community members standardize on species identifications and on mapping symbols (community delegates different areas to different individuals).

Step 5. Community members map weeds in their areas and submit hand-drawn drafts to the researcher (assistance given with use of GPS to locate weeds in certain difficult areas).

Step 6. Weed information on hand-drawn maps digitized using ArcView GIS 3.2 to produce digital maps.

Step 7. GPS data downloaded to PC, converted to ArcView shape file and imported to ArcView GIS 3.2.

Step 8. Digital maps printed in appropriate sizes and scales and returned to community for checking.

Step 9. Maps of different areas were merged to produce combined database using Geo-processing tool available in ArcView GIS 3.2.



Figure 1 (a) Hand-drawn weed map prepared by community members. (b) GIS-based weed map overlaid on air photograph.

Further information

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Cardamom cultivation and forest biodiversity in northwest Vietnam

The recovery of the cardamom market in northwest Vietnam during the mid-1980s has seen many new groups of small farmers engage in the cultivation of this crop. This specific type of cardamom (*Amomum tsao-ko*) has a long history of cultivation in the Hoang Lien Mountains. The spice is in demand for both its aromatic and medicinal properties. Cardamom is providing a key source of income for poor farmers living at higher altitudes, people typically isolated from many other markets.

The high prices for cardamom have led to over 90% of households in villages with access to suitable forest engaging in cardamom cultivation. Not all villages have access to such forest. Where topography and soils are suitable, there seems to be potential for existing farmer knowledge to be applied in testing new agroforestry systems involving shade from plantations or natural regeneration to support cardamom production.

The perennial crop requires partial shade and cool temperatures and for these reasons farmers utilise montane forest for its cultivation. These forests are largely under government management for water catchment protection, but are also important for their biological diversity that is unique and supports a significant proportion of the endemism found in Vietnam.

The University of Melbourne in cooperation with Fauna and Flora International (an NGO implementing community-based conservation projects) undertook a study to identify the implications that cardamom cultivation had for biodiversity and small farmer livelihoods.

Farmers were interviewed during forest walks and asked to explain their views on suitability of different sites for cardamom. Cards showing various degrees of tree cover were used to identify farmer's preferences in site selection. Replicate plots (20 by 50 m) were established in cardamom fields and adjacent montane forest to compare forest structure and species composition.

Tree cover in montane forest was closed (70 per cent), while in the cardamom fields it was considerably more open (20 to 50%). Interviews revealed that the significant variability in tree cover in cardamom fields was related to farmers' differing opinions on how to optimize the yield of the crop (and therefore how much tree felling was required)

An examination of tree species composition within plots indicated that for the purposes of cardamom production, no particular species was targeted for tree felling. Interviews with farmers supported this idea. But the changes to forest structure observed do raise questions that some plant and animal populations may not be favoured under current conditions in terms of regeneration potential, or animal feeding or movement.

Observations on forest walks with farmers indicated cardamom fields were concentrated along streams and slope depressions. Farmers used the following main criteria for selecting and establishing cardamom fields:

- Tree cover over 10 m high to avoid excessive shading in particular parts of the field throughout the day (no preferred aspect was evident)
- Altitude over 1000 m above sea level
- A layer of 'black' soil or humus, approximately 5 cm thick, free draining, permanently moist but never saturated
- Located within 300 m of running water.

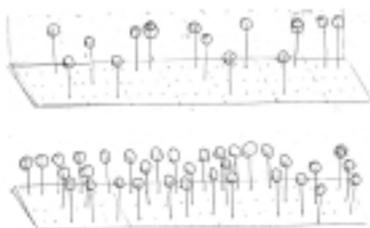
Where forest with optimum conditions had become scarce in the Hoang Lien Mountains, farmers were experimenting with less optimal sites. This included young regenerating forest with thin humus soils. These sites were formerly used for annual crops such as upland rice and maize. This experimentation

raises the possibility that similar sites could be used for cultivation of the spice elsewhere.

As a significant proportion of the world's biodiversity exists in areas where farmers live and work, more research is required to understand how farming affects biodiversity and how farmers could incorporate biological diversity within farming systems.



Cardamom field with very low tree cover; trees damaged by wind, midground



Examples of cards used to assess farmer opinions of ideal tree cover

Further Information

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Using Participatory Varietal Selection of Rice to alleviate poverty

Though Laos has been identified as a hub of rice diversity (second only to India), many local farmers in Hin Huep district of Vientiane province are still eager to gain new varieties. These were the results that were obtained from a small-scale pilot programme on Participatory Varietal Selection (PVS) of rice. Surprisingly all newly introduced varieties outperformed traditional or older varieties. With an average of 10% more production, PVS is an important instrument in addressing poverty. Moreover, the acquisition of new varieties by farmers was received enthusiastically. For the project, it was found to be a very financially efficient activity. When proven worthy, varieties find their way into farmer-to-farmer seed exchange systems which, despite increasing commercialisation, still accounts for over 90% of the seed sourcing of open pollinated cereal crops in the developing world.

The Upland Agriculture Development Centre (UADC) has been working with local farmers for over 10 years. Since the centre was established it was clear that the key component in local agricultural improvement was rice production. The initial years were spent focussing on medium scale irrigation projects, mainly assisting farmers who were already producing sufficient rice to meet their family demands. After international funding terminated, some progress was made by setting up village rice banks. With the assistance of a revolving fund, villages set up a rice store from which they lend rice and repay in kind after harvest. This instrument is very popular as inflation cannot affect the bank, it is community driven and the profits gained from lending rice (interest paid in kind) remain within the village community. Depending on the village, these rice banks have, over time, been used to finance school repairs, and set up village enterprise and emergency funds. However, in the end, low rice productivity was not addressed.

The UDAC is surrounded by undulating, hilly landscape. In the shallow valleys, lowland rice is cultivated during the monsoon. Paddy productivity depends on the lie of the land and the intensity of the monsoon. During this period, upland rice is cultivated on the slash-and-burned hillier areas. Outside of the monsoon few agricultural activities take place with the exception of some vegetable growing along rivers with year round flows.

The area is inhabited by immigrant farmers who came to settle there after the end of the Vietnam-US War. Mostly they originated from mountainous areas to the northwest. Very often they were not in the position to bring with them the rice varieties they traditionally cultivated and/or the varieties were inappropriate to the different natural surroundings.

As part of the new UADC initiatives, started in 2002, attention was paid to improving the productivity of rice. Initially, much was expected of the System of Rice Intensification (SRI) but after two years of

experimentation SRI seems to be less promising than initially thought. Soil fertility is low, and though incorporating legumes may seem promising, the lack of control over grazing animals and the labour extensive system currently used, have meant that this has little potential. In 2003 a small programme with PVS in rice was started. The programme was meant to assess the grade of success, the method and perhaps to gain some insight on which varieties could be used in scaling-up of the programme. By initiating a PVS rice programme, it was anticipated that the outcome would strengthen the case for the introduction of new varieties, and especially indicate which varieties could be used for scaling-up in the future of the programme.

In three villages, 10 farmers received two different rice varieties each. In all, 60 seed packets of four distinct varieties were distributed. The seed was acquired directly from the national seed programme, thus it was above average in quality, as well as being of considerable purity. After production, data were gathered via the District's Agricultural and Forestry Office (DAFO), the frontline extension office. Questionnaires were filled out and the data analysed.

One of the significant findings was that in all cases the introduced varieties produced more than the local rice variety. The gain in production ranged from 2% to 25%. The differences are due to the fact that the rice fields are widely scattered and of variable productivity. Farmers with the highest productivity fields improved their yields less than those with less productive fields.

Despite substantial questioning, little was learned about specific traits of the new varieties and although there were some concerns about tillering and maturity, most respondents valued all the traits of the new varieties positively. Despite some mention of negative tillering or unusual maturity, most respondents (more than 90%) said that they would grow the varieties again next year.

Some question marks have to be raised by the overall positive outcome. But in spite of this it is clear that introducing new varieties can contribute considerably to enhancing the productivity of rice and thus food security and poverty alleviation.

Further information

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Diversifying rural livelihood options in Bangladesh

Agriculture and rural non-agricultural employment

In the developing world, farming's capacity to provide the major means of survival for rural populations is diminishing fast. Declining crop prices, competition for land and access to markets, and declining productivity, have led smallholder farmers to diversify into rural non-agricultural work (defined as work that excludes primary production) or to migrate to the urban areas.

Rural Non-Agricultural Employment (RNAE), in agro-processing, manufacturing and transport sectors, is re-emerging as a critical issue in sustaining viable rural economies and reducing rural poverty. RNAE enables resource-poor farmers to increase total income as well as offset the effects of fluctuations in income flows during the year. The mix of agricultural and non-agricultural work is, therefore, a strategy to reduce vulnerability, enabling farmers to substitute between opportunities that are in decline and those that are expanding.

Strengthening the rural non-agricultural enterprise sector is one way to achieve both value addition in the rural economy and poverty reduction. This sector, however, faces a variety of problems that must be resolved before these aims can be achieved. These include: identification of market opportunities; greater inclusion and empowerment of women; better access to appropriate processing technologies; implementation of effective business organisation practices; more efficient farm-to-market channels; and the timely access to affordable financial and business services.

Economic benefits are unlikely to reach the poorest if the enterprises they work in, the value-chains they belong to, and the business environments within which they operate, lack the quality, reliability, market sensitivity and innovative capabilities needed to compete in a globalising world. These limitations to pro-poor economic growth can be mitigated through the development of skills, services and alliances between local and external actors and agencies.

In Bangladesh, ITDG, a development NGO, is exploring how to establish these alliances and ensure that the resource-poor in rural areas have the skills and capability to participate in the RNAE sector.

Development of rural enterprises in Bangladesh

ITDG Bangladesh has been researching and promoting services for rural non-agricultural enterprises since 1996. Through its Small Enterprise Unit, ITDG is supporting six large local development NGOs and around 120 small village-level organisations that they work with, to deliver business services to thousands of their members, mainly women. These services include training in technical and business skills, brokering of market linkages, coordination of input procurement and new product development.

ITDG Bangladesh has sought to promote access to business services for rural enterprises through this network of Bangladeshi NGOs, for three reasons:

- Village-level NGOs in Bangladesh have established a key role in the delivery of services related to health, nutrition, education and social empowerment of women. They therefore have unparalleled access to those most affected by poverty and in some cases a highly motivated 'socially responsible' workforce of staff and volunteers.
- Many village-level NGOs have active group-based savings and credit schemes. There are many advantages to delivering business services in conjunction with these schemes.
- The absence of any significant commercial market for business services in remote and poorly connected rural areas, means that village-level NGOs are often the sole agencies capable of reaching the poorest rural entrepreneurs.

ITDG's approach is to promote sustainable and market-orientated service delivery for RNAE. It does this by encouraging NGOs at district and village level to test the value of their services through fee-recovery; by promoting the use of private trainers to deliver business services; and by brokering links among NGOs, local authorities and private companies in each region.

ITDG's practical support to the partner NGOs takes the form of:

- Publishing a series of highly popular income-generating activity profiles that provide information in Bangla, the local language, on the technicalities, skills, equipment and investment required for a wide range of different types of enterprises.
- Business skills training and orientation for NGO staff, including advice on establishing revenue-generating activities in areas such as agro-processing, batik-making and small-scale manufacturing.
- Technical skills training for NGO field officers and volunteers.
- Training in organisational planning and administration and market analysis, including sub-sector studies.

The way forward

Experience from rural Bangladesh suggests that improvements in agricultural production *per se* do not offer a sufficient solution for improving the quality of life for the rural poor, especially women. Efforts to bolster RNAE are essential to sustain the local economy and reduce the pressure on the rural farming population to migrate to urban areas. Policies that encourage investment in support services for RNAE could benefit resource-poor farmers in two ways: by strengthening the markets for local agricultural production, and by providing farmers with the vulnerability-reducing opportunity to diversify their livelihoods.

Further information

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Announcements

AgREN future

Thank you to everyone who has responded to our request for comments on the future of AgREN. AgREN receives the generous support of the UK's Department for International Development (DFID) and the current grant will come to an end in less than a year. It is thus a good opportunity to take stock of our position and to consider what AgREN might do in the future. We would welcome your suggestions particularly relating to the following themes:

- The nature/focus of AgREN
- AgREN Papers
- AgREN Newsletter
- E-Mail Discussions
- AgREN website

Other suggestions

Any other ideas you have for the future of AgREN would be most welcome. AgREN is only relevant if it serves the needs of its members. In making suggestions, please bear in mind that AgREN is basically a network for the dissemination of information. We have a modest budget and there is little likelihood that this would be significantly increased in the future. Therefore we are most interested in those ideas that are relevant to an information-sharing network. All comments should be sent via the contact details on the back cover of this newsletter.

AgREN Register of Members

A new edition of the AgREN Register of Members will be published later this year, and we therefore ask members to confirm their details to ensure that the information contained in the new Register is useful to those who receive it. If you have not received a reminder, either by post or email, please contact us to confirm that you are still interested in receiving mailings from AgREN. In addition please indicate your four main areas of interest from the list below:

- Farming systems
- Agroforestry
- Institutional strengthening
- Farmer participation
- Agricultural extension
- Community based organisations and farmers' groups
- Agricultural research policy
- Project management, monitoring and evaluation
- Seed supply and biodiversity
- Livestock and animal traction
- Conservation and environmental management
- Gender issues
- Agricultural marketing
- Rural livelihoods

Members with access to the internet can now update their membership details online at www.odi.org.uk/agren. Alternatively details may be sent by email to

agren@odi.org.uk, or to the mailing address given on the cover of this newsletter.

Re-vitalisation of International Farming Systems Association (IFSA)

After three decades of support to farming systems research and extension across most regions of the world, the Association now has new mandate: *'To move beyond doing good research to making a difference to the lives of small farmers' and the rural poor'*. For some time, IFSA members have been applying their skills and experience to supporting R&D which goes far beyond the farm gate, for example, to facilitate the development of Good Agricultural Practices and food quality and safety measures, to include chains and markets, to support effective rural business development services, micro-finance and rural credit schemes, and to scale up beyond 'experimenting farmer groups' to larger agro-ecological areas. Furthermore, IFSA members have encouraged 'partnerships' between rural producers, processors, transporters and urban consumers, as well as supporting local learning and institutional development initiatives.

You can access the IFSA website at www.fao.org/farmingsystems/ifsa_en.htm, which lists contact addresses for regional farming systems associations. Submit articles and opinion to the Farming Systems electronic facility and e-journal at www.fao.org/agrippa/ in English, French or Spanish, and receive the electronic Farming Systems Update.

To subscribe to the Farming Systems Update listserv and become a member of the International Farming Systems Association (free), please send an email addressed to mailserv@mailserv.fao.org, leave the subject line blank and write, as the first line of the message, `Subscribe Farming-Systems-Update-L`

Relaunch of ACT Info newsletter:

Relaunching the African Conservation Tillage (ACT) electronic newsletter 'ACT Info'. This is a monthly forum to share and learn about experiences and new developments in the promotion/adoption of conservation agriculture with special focus on Africa. Currently subscription is free. To subscribe send an email to actnetwork@africaonline.co.zw with a one-line text message as follows: `SUBSCRIBE ACT Info`. You can also view/download the Newsletter from the ACT Website at: www.act.org.zw

Communication for Rural Innovation - Rethinking Agricultural Extension. 3rd Edition. C Leeuwis & AW Van den Ban

This new edition of a very well received book, asks us to take a fresh look at agricultural extension and rethink our ideas about its role and meaning in today's industry. Agricultural extension is a very important tool for rural development in educating farmers to produce better crops and more productive animals at lower cost.

Communication for Rural Innovation invites all involved in agricultural extension (staff of extension organisations and students of agricultural extension) to face the challenges of today's industry by presenting thinking building blocks to work from. By ending each chapter with a set of questions, this text inspires the reader to investigate how their organisation currently works and how it could improve through communication.

June 2004, 424 Pages, Illustrated Paperback, £24.99 (special AgREN price = £21.25) ISBN 0-6320-5249-X. To order please add P&P costs: Postage and Packing is £2.75 in the UK, £3.00 mainland Europe, £5.00 rest of the world. To order the book send a cheque made payable to Marston Book Services to MBS, PO Box 269, Abingdon, Oxfordshire, OX14YN. Or email direct.order@marston.co.uk or telephone +44 (0) 1235 465500.

Agriculture in the Commonwealth

Launched in March 2004 as the official working document of the 21st Commonwealth Agricultural Conference – New South Wales, Australia, this book looks at specific issues at the cutting edge of debate to promote sustainable agriculture throughout the Commonwealth. *Agriculture in the Commonwealth* draws on experience from both public and private sector organisations and highlights detailed case studies and innovative approaches demonstrating solutions for sustainability in agriculture. Further information on the Commonwealth Secretariat is available at www.thecommonwealth.org, and the entire publication is available at www.cbcbelink.com.

Ploughing up the Farm: Neoliberalism, Modern Technology and the State of the World's Farmers. Jerry Buckland

Farmer livelihoods and food security are intimately related and critically important for the well-being of us all. Yet farm erosion in the form of excessive depopulation, poverty and environmental degradation threaten these goals. The book examines how farm output prices have not increased, international trade in agriculture has not significantly benefited Southern nations and modern technology often by-passes small farmers. These results call into question the neoliberal ideology that drives farm policy. The book concludes with a call for a revisioning of the importance of farmer livelihoods and food and the reform of state, private and international actors to support farmers and their communities. This book is Published by Fernwood Publishing, Halifax, Canada and Zed Books, London. ISBN: 1 84277 367 4 (pb).

Developing Smallholder Agriculture: A Global Perspective. R.L. Tinsley

This is a practical book examining the socio-economic, political and technical environment of smallholders. It synthesises 30 years of working with smallholders by advancing the hypotheses that smallholders' failure to exploit their physical environment results from limited labour and other resources to manage their land. It suggests the best means of assisting smallholders is improving the supporting services by enhancing village based, private micro-enterprises. This book is published by AgBe Publishing, Brussels, Belgium, agbe@skynet.be, price \$49.

Guidelines for contributions to AgREN publications

AgREN members and others are encouraged to submit material for publication in both the Newsletter and as Network Papers. The type of material that is most suitable for submission is described below. Articles submitted as potential Network Papers will be assessed by an Editorial Committee and, where necessary, guidance will be given to authors in revising their papers for publication.

a) Newsletter Contributions: AgREN welcomes news from members that describes their work relating to the development of small-scale agriculture and sustainable rural livelihoods. AgREN would particularly like to hear about specific, on-going projects which are particularly innovative or other activities of interest to AgREN members. Contributions to the newsletter should be no more than 800 words, and may include photographs or illustrations. Shorter contributions are also appropriate. Please note that articles may be edited prior to publication.

b) Network Papers: AgREN Papers are broadly concerned with the design and promotion of appropriate agricultural technologies, with specific attention focused on the methods, processes, institutions and policies that promote pro-poor technical change and support equitable improvements in agriculture for developing countries. The principal focus of AgREN Papers should be adaptive research, extension or supporting mechanisms such as credit, marketing and producer organisations. Network Papers should seek to explore and promote the role of increasing agricultural productivity, resource conservation and farmer empowerment in the context of diversified rural livelihoods.

Content:

- Papers should focus on practical experience in research and extension methods as well as innovations in the public or private provision of other agricultural services.
- Papers may make reference to current theoretical issues in the field of rural development, but their principal focus should be on the provision of well-written descriptions of practical and innovative experience that will be of use to other practitioners.
- Although AgREN has an interest in novel diagnostic and evaluation methods that help practitioners understand farmers' priorities and contexts, papers that follow through on such diagnosis and illustrate applications and outcomes are particularly welcome.
- Papers may be based on a broad range of sectors relating to agriculture, e.g. crop and livestock production, aquaculture, agroforestry, extension, natural resource use, environmental management, credit supply and marketing.
- Most AgREN papers describe an experience from a particular time and location, but they are written in such a way that practitioners on other areas can draw useful implications.

Word length and referencing:

Network Papers should be between 6,000 and 12,000 words long, and include an abstract of 500–750 words highlighting research findings and policy implications. References should follow the examples below.

Books:

Carney, D. (1998) *Sustainable rural livelihoods: What contribution can we make?* London: DFID.

Journal articles:

Sanchez, P.A. (1995) 'Science in agroforestry'. *Agroforestry Systems*, No. 30, pp. 5–55.

Other information:

- Material submitted to the Network will be considered for publication on the understanding that it has not been submitted elsewhere.
- Material published by AgREN may, with acknowledgement to ODI, subsequently be published elsewhere.
- Contributors will be asked to sign a form transferring copyright for published material to ODI. This enables us to give others permission to photocopy Network material.
- Newsletter items may be submitted to the Network at any time. If it is not possible to include an item in the next newsletter it may be held over for use in a subsequent edition.
- Photographs may be submitted to accompany newsletter items. These should have a minimum resolution of 200 dpi.
- Papers should be submitted both in hard copy and on 3½" disk or by email, in one of the widely used word-processing packages.
- All material should be submitted to the Network Coordinator at the address given below:

Agricultural Research and Extension Network, ODI,
111 Westminster Bridge Road, London SE1 7JD, UK. Email: agren@odi.org.uk

Papers with this issue

136. **Communication strategies in the age of decentralisation and privatisation of rural services: lessons from two African experiences.** Ricardo Ramírez and Wendy Quarry
137. **Implementing land reform in South Africa's Northern Cape Province.** Alastair Bradstock
138. **Cinderella's slipper: *Sondeo* surveys and technology fairs for gauging demand.** Jeffery Bentley, Graham Thiele, Rolando Oros and Claudio Velasco.
139. **Evaluating training projects on low external input agriculture: lessons from Guatemala.** Jos Vaessen and Jan de Groot
140. **Farmers' experiences in the management and utilisation of *Calliandra calothyrsus*, a fodder shrub, in Uganda.** Philip Nyeko, Janet Stewart, Steven Franzel and Pia Barklund