Agricultural Administration Unit
Occasional Paper 10

Analytical Abstracts on Farmer Participatory Research

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Contents

Introduction

In recent years agricultural researchers working with low-income farmers in difficult environments in developing countries have been creating new models and methodologies for agricultural research. These environments tend to be highly fragile, characterised by combinations of low and unreliable rainfall, poor and easily degradable soils, hilly topographies, and a lack of economic and social infrastructure. The conditions in which research is carried out on conventional agricultural research stations and experimental farms do not reflect these environments. As a result, technologies generated on research stations have not performed well under farm conditions and have not been widely adopted. Resource-poor environments are also highly diverse. Research strategies are needed which this into account and enable technologies to be adapted and tailored to a variety of farm conditions.

Efforts to overcome these problems have led to the development of methods of collaborating with farmers to understand local level farm conditions and strategies, and the processes through which small-scale cultivators adopt and adapt new agricultural technologies. It is this collaboration which has become known as farmer participatory research or participatory technology development.

Social participation has recently come into vogue in agricultural development. Its roots however go back to the 1960s in Latin America and Francophone Africa, in the context of local community development, where it was also associated with voluntary agencies, and concepts of local empowerment, social justice, and ethical codes. [Whyte 1981; Farrington & Martin 1988]. In this collection of abstracts, the concept of participation is limited to its role in generating agricultural technology. This encompasses the various stages of research - from diagnosis of the constraints and problems in local farming systems, design of tests, testing and evaluating results, and dissemination (extension). It also covers the building of linkages and feedback mechanisms between various agricultural institutions from the farm, to local extension services and national and international agencies. Non-government agencies (NGOs) firmly rooted in the world of community development, such as World Neighbors, have begun to make important innovatory contributions to agricultural research.[1]

The methodology of farmer participatory research has also drawn heavily from farming systems research (FSR). Many innovations in participative technology development have been worked out in FSR programmes, e.g. Khon Kaen University Farming System Project. The heritage of FSR includes the development of interdisciplinary team research, the introduction of social science and survey methods into agricultural research, and a systemic or structural analysis of the farm environment and the institutional context of agricultural research. However, within FSR the local farming environment has tended to be seen as a static traditional environment, and research concentrates on understanding the farmers' perceptions, motivation and constraints, for researchers to then devise and recommend new technologies. In contrast, participatory research tends to view the farm environment as in constant flux, the farmer as a natural experimenter, and involves the farmer in testing, evaluating and designing new technologies [Richards 1989; Waters-Bayer 1989:4-5; Maxwell 1986]. Hence FSR approaches which have not solicited farmers' opinions of new and existing technology and worked with farmers in evaluating or generating new technology have been excluded from this collection.

An underlying principle which characterises the diversity of approaches to developing participatory research is that the long history of farmers' adaptation to and knowledge of these environments, can and should influence research agendas to generate technology specifically tuned to local conditions. One of the aims of this work is to

bring together a wide range of bibliographic materials, documenting a variety of participatory approaches, conceptions and methods developed within different disciplines, types of institutions, agencies and geographical areas. The bibliography makes no claims to be comprehensive, particularly since the literature on participatory research is rapidly expanding.

A wide variety of interpretations of participation are encompassed in this bibliography.[2] At one extreme, the conception of participation does not differ radically from conventional top-down, transfer of technology research strategies. Here the farmers' input into research consists solely in contributing to the evaluation of commodity-oriented packages, in the light of which recommendations are slightly modified. At the other end of the spectrum, research involves the farmer in defining problems, designing a research agenda, testing and evaluation. In the latter method the researcher is often critical of commodity-oriented strategies, adopts a systems approach to farming problems, and acts as a catalyst, guiding and encouraging the farmers to develop their own research agendas [Lightfoot & Ocado 1987, Tan 1986].

Farmer participation has been developed as a tool at various stages of research. In Rapid Rural Appraisal and the concept of the Nepalese group trek or *samuhik bhraman* [Mathema & Galt 1987], farmer participation is used as a diagnostic tool, a technique to gain a rapid overview of the farming system and its constraints, through developing informal interview techniques. Having identified constraints, on-farm trials and technology recommendations can be made by researchers for the target area. Farmer participation has also been developed in extension, in which packages of technology are screened by farmers and recommendations developed in the light of farmer evaluations.

Several types of on-farm trials have been developed using farmer participation in on-farm testing. In some on-farm trials the farmers are presented with clearly defined packages of planting materials and recommendations for application of fertiliser and pesticides. In other trials the farmers are given a wide variety of planting material, no recommendations, and thay are freely allowed to devise their own planting strategies [Chavangi & Ngugi 1987; Kuyper 1987; Kirkby 1981; Lightfoot & Ocado 1987]. Apart from assessing the performance of new technologies, these trials can also help to identify the stock of knowledge, experimental techniques and strategies that farmers utilise in their own informal R & D systems. Some important innovatory research has also involved farmers in a range of trials, contrasting the results achieved from researcher supervised and controlled experiments with loosely structured trials in which farmer are free to devise and modify tests. These show significant differences in the management of contrasting types of trials, reveal the decision-making goals of the farmers, and suggest that the participation of researchers may bias on-farm trials and achieve results which misrepresent the actual conditions under which farmers have to farm [Ashby 1987, Matlon 1982].

Tripp [1989] has argued that farmer participation does not constitute a research methodology or strategy which can solve problems in agricultural research, and is best regarded as a repertoire of techniques which can enrich adaptive research. However participatory methods have developed within the parameters of particular methodological problems, and have contributed towards deepening an understanding of conceptual, methodological and organisational approaches. Several specialised methodological areas of participatory research have emerged including:

rapid rural appraisal (RRA) - the development of rapid survey techniques for diagnosing problems and constraints in the farming system and generating hypothesis for developing research, based on informal interviews and the evaluations of farmers.

indigenous knowledge systems - the study of farmers' stock of agricultural knowledge and methods of utilising this knowledge to strengthening formal research and extension efforts. In extension, Röling and Engels [1988] have developed the concept of the agricultural knowledge and information system (AKIS) which includes the farmers' local

farming knowledge, and addresses the issue of improving the communication interface between farmer and research institutions.

farmer experiments - conceptions of farmers own informal R & D systems [Johnson 1972; Richards 1986], the effects of conventional transfer of technology research strategies on local experimentation [Box 1986; van der Ploeg 1989], and the formulation of organisational solutions for utilising farmers' innovatory skills in generating new technology [Maurya et al 1988; Stoop et al 1982]. Most of the literature on farmer experiments focuses on plant breeding and contributes to building knowledge of the adaptation of plant varieties to resource-poor environments.

farmer-to-farmer extension - the ways in which new innovations are informally extended by farmers and the possibilities of utilising this in research. Methods are being developed for assessing new cropping strategies developed by farmers, targetting potential areas which can benefit from the innovations, and extending the technologies using innovative farmers as trainers [Jintrawet et al 1985; Wilairat 1985; Bunch 1987; Gubbels n.d; Fujisaka 1988].

In each of these areas, an array of participatory methods is being developed within a specific conception of the relationship between technical, social and organisational parameters in the generation of technology. The participatory approach is revealing that the farming systems and farmers' strategies are complex and dynamic. Other methodological problems arising out of participatory research relate to the need for regional perspectives of agricultural systems [Prain & Samaniego 1986; Okali & Sumberg 1986]; and temporal studies of long-term adoption, rejection and transformation of farming practices and technology - including the implications of the process of innovation, adaptation and dissemination of technology at work within local farming systems for the generation of new technology [Rhoades & Bebbington 1988; Lev & Campbell 1987 Okali & Sumberg 1986; Simmaraks & Khammeang 1988].

Several models for participatory research have been and continue to be created, including the farmer-back-to-farmer [Rhoades & Booth 1982], the farmer-first-and-last [Chambers & Ghildyal 1985], and approach development [Scheuemeier 1988]. While these has been useful in highlighting some of the weaknesses of the transfer of technology model and the organisation of research, in some writings a certain rivalry among researchers to develop the most participatory approach has become evident. This carries the danger of fadism, in which participation becomes an aim in itself. In some instances problems of the linkages between researchers and farmers have become confused with questions the empowerment of the local people, but this cannot be adequately addressed within the confines of the generation of agricultural technology and needs methodologies rooted in political economy and history. The development of "more participatory" action research in which local people have more say in field research does not necessarily equate with greater empowerment of local people or the creation of useful technology.

Nevertheless problems of local empowerment and organisation lie at the heart of the development of participatory research. For while researchers in participatory technology development seek a mandate for the resource-poor farmer, these farmers are often marginalised within national political life, receive scant resources and little political representation. As a consequence top-down transfer of technology methods are heavily re-inforced by social attitudes within national agricultural institutions. The problem in farmer participatory research is thus to develop a critique of the failure of the existing top-down institutional structures of agricultural research, and to devise new organisational models which will make research more responsive to local needs. Researchers have increasingly conceptualised participatory research as complementary to existing research, as a method of improving the linkages and feedback mechanisms within the research establishment.

Part of the problem is therefore to conceptualise a structure of agricultural research which will be more responsive to changing and diverse local agricultural needs, and which can be embedded in national agricultural institutions [Biggs 1989; Chambers et al 1989]. This has been addressed through developing training programmes in participatory methods for researchers and extension agents in local programmes [Ashby 1986]; building linkages between NGOs, which frequently work in the more marginal areas and have a commitment to local empowerment, and research institutions [Thiele et al 1988; Farrington 1988]; and building local and regional networks of researchers, development agents and NGOs with an interest in developing participatory methods [Haverkort et al 1989].

The main innovations in participatory research consist in developing a conceptualisation of the total realm of activities which contribute to the development of agricultural technology from the policy maker to the farmer in the field; promoting collaboration and improving feedback mechanisms between farmers and the scientific and research system; recognising the importance of the organisational framework in the generation of technology; and creating models for the development of institutions which are receptive to changing conditions and local diversity. In this, participatory approaches offer the potential of creating a rational and efficient agricultural system in which theory, practice and organisation are integrated into a single framework.

Footnotes

1 Bunch [1985]. The GRAAP approach has also stimulated several agricultural researchers [GRAAP 1987]. Some farmer participatory approaches which are heavily influenced by community development approaches include the EAT appraoch [Galliker 1987] and Approach Development [Scheuemeier 1988].

2 For typologies of participation see Biggs 1989a; Oakley 1987; Steiner 1987; Farrington & Martin 1988..pa

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Part One: CONCEPTS AND MODELS

1 GENERAL METHODOLOGY

1 AGRAWAL, B. D. (1979) **Maize on-farm research project.** 1980 Report; 1982 Report. G.B. Pant University of Agriculture and Technology, Pantnagar. ODI Loc. 1750.
Through surveys and on farm trials (OFT) the project promotes dialogue between researchers and farmers, to better identify problems limiting maize productivity, and to monitor and direct research activities and extension recommendations. Scientists were closely involved with both OFT and station research. The latter was redirected by OFT results and extension recommendations were changed.

2 AHMED, K.; BAILEY, C.; MONDAL, M.; BOTTRALL, A.; ELIAS, S. (1986) **Review report on the progress of project "Strengthening Farming Systems Research",** Bangladesh Agricultural Research Institute, Jodapur. 50p.ODI Loc. 1890.
Farming systems research at Bangladesh Agricultural Research Institute (BARI) is described, and evaluated in the context of farmer-scientist interaction and the needs of the farmer. The on-farm research division at BARI, established in 1983/84 develops scientists' skills in communication and research with farmers by training in FSR methods and principles, while encouraging practical self-reliance. Main features are: gaining local knowledge and problem diagnosis through case studies and discussion with farmers in different economic and ecological categories; attention is given to deviant cases to identify the rationale behind practices; study of homestead production by women scientists; stress on scientists' accountability to farmers; documentation of farmers' hypotheses.

3 ARBAB, F. (1984) **Rural university: Learning about education and development.** International Development Research Centre, Ottawa, Canada. 71p.
Outlines a concept of participation developed by FUNDAEC in Colombia. Technical staff train rural youth without secondary education, to form a cadre of technicians and engineers capable of helping local communities pursue self-reliant development objectives. The project started from a firm belief in the potential of rural youth and people to bring about change. The "rural university" was devised as a catalyst for the development of the region. Skills are taught within the context of a continuous study of rural life, including small farm production, technological support for production, food processing, repair of tools, marketing, etc. The central concern is to incorporate modern knowledge into community life and into the small farmers' systems. Studies involve working with the local community, establishing a "learning process" in which the community looks for alternatives to influence the process of development, and organising community action. Experiments are conducted in collaboration with farmers. Technicians construct trials as subsystems, in which different experiments are conducted on small areas on the farm. It is hoped that farmers will adapt and expand various subsystems, into their farm activities.

4 ASHBY, J.A. (1983) **Participation of small farmers in on-farm testing.** IFDC/CIAT Phosphorus Project, Cali, Colombia. 32p. ODI Loc. 1751.
This paper reports on a project to implement and compare three types of farmer participation in on-farm testing of fertiliser technology in the IFDC/CIAT Phosphorus Project, Colombia, South America.
The first section of the paper discusses the need for participatory research methods in technology assessment for small farm systems and their implications for the organisation of research. Then the objectives, research design and methods of the project are presented. Some basic findings of the research are discussed with reference to their implications for designing on-farm research strategies.

5 ASHBY, J.A. (1986) **Methodology for the participation of small farmers in the design of on-farm trials.** *Agricultural Administration,* 22: pp.1-19. ODI Loc. 1752.

This paper evaluates three approaches to farmer participation differentiated by the extent to which farmers participated in defining criteria for the design of on-farm fertiliser trials. The three methodologies are described, and the resultant experimental designs are compared in terms of their criteria for testing fertilisers under small farm conditions.
The results show that increased scope for farmer participation produced significant changes in the design of on-farm trials due to important insights into how farmers themselves would evaluate fertilisers, and raised basic research questions about improvements in the technology. The paper concludes that farmer participation in experimental design for on-farm trials requires fewer resources and less time than diagnostic survey research while qualitatively improving feedback between scientists and farmers.

6 ASHBY, J. A. (1987) **The effects of different types of farmer participation on the management of on-farm trials.** *Agricultural Administration and Extension,* 25:235-252. ODI Loc. 1740; ODI Journals.
Examines the implications of the use of different types of farmer participation on the results of on-farm trials, in the light of experimentation with on-farm trials in Colombia. Three different types of trials were compared: researcher designed and managed trials, researcher designed and farmer managed trials, and farmer designed and managed trials (without researcher collaboration). Trials were implemented to examine the effects of phosphate rock fertilisers on potato and bean cultivation. Results indicated that different approaches to implementing farmer participation resulted in different styles of carrying out management operations by farmers, and a disparity in yields. Where farmers were in consultation with research staff they tended to apply the recommendations. In contrast, in farmer designed and managed trials farmers followed risk minimising strategies, applying a little of several products as a safety measure. Farmers were concerned less about the incidence of disease and pests, prime considerations of researchers, than the convenience and cost of various management strategies. The participation of researchers in trials thus introduced a bias, in which farmers uncertainty about introduced inputs were removed. There was also a considerable yield gap between farmer designed and managed trials and the trials in which farmers consulted researchers. Researchers frequently upgraded practices in trials which were ostensibly under farmer management. The introduction of farmer participation in the design of trials, in which farmers are involved in decision-making, is seen as important in revealing the strategies and goals of the farmers, in enabling technology to be adapted to their conditions, and in avoiding bias over recommended technologies.

7 ATIP (1986) **Farming systems activities at Mahalapye: Summary 1982-85.**

Research Report No.1, Agricultural Technology Improvement Project. Ministry of Agriculture, Gaborone, Botswana. 218p. ODI Loc. 1754.

8 ATIP (1986) **Farming systems activities at Francistown: Summary 1983-85.** ATIP Research Report No.2, Agricultural Technology Improvement Project. Ministry of Agriculture, Gaborone, Botswana. 109p. ODI Loc. 1754a. The reports describe the activities of the Agricultural Technology Improvement Society in Botswana, in the Francistown and Mahalapye districts. The Agriculture Technology Improvement Project was established in response to a need to improve and expand the capacity of national research and extension systems to develop and extend farming systems recommendations relevant to the needs of small farmers. Institutionalisation of the farming systems approach is a central feature of the project. The project was established on the premise that earlier R&D with a component of OFT had not adequately focused on farmers' problems or taken farmers' criteria for evaluation adequately into account. The two reports summarise activities at the Francistown and Mahalapye locations.

9 BAKER, D. (1988) **Village groups in Shoshong and Makwate.** ATIP WP-13. Agricultural Improvement Technology Project, Gaborone. 7p. ODI Loc. 1713.
The experiences and effectiveness of farmers groups in Botswana are reviewed, with reference to the Shoshong and Makwate areas. Experiences and procedures adopted by the Agricultural Technology Improvement Project (ATIP) in forming farmer groups are discussed.
Within Botswana there is a wide variety of rural group organisations. Despite their importance to village life most groups are not functioning effectively. For the purposes of on-farm research and extension, ATIP experimented with new procedures for the management of farmer groups. These procedures involved developing specific objectives and projects which serve as a focus for activity. Methods of encouraging membership involved giving farmers free seeds and advice as incentives; setting regular meeting dates; creating field trials for each farmer as a focal point for their involvement in the group,; use of field visits to compare results; and the encouragement of open discussion of problems and the implementation of trials. Other issues addressed include the efficiency of groups in relation to size, interaction and impact on the local community; and the need to involve more young farmers in groups.

10 BANGLADESH AGRICULTURAL RESEARCH INSTITUTE, ON-FARM RESEARCH DIVISION (1986) **Internal review workshop and research planning.** Bangladesh Agricultural Research Institute, On-Farm Research Institute, Jodhpur, Gazipur. 21p. ODI Loc. 1635. The findings and key issues discussed at a workshop of the On-farm Research Division of the Bangladesh Agricultural Research Institute are summarised. The objectives of the workshop were to develop research priorities and systematise research procedures. Among the key issues discussed were procedures for the development of feedback from farmers to research station, systematisation of research methodology and planning, the interaction between scientists and farmers, farmer participation in research, technical innovations developed by farmers, and linkages between research and extension services.

11 BERNSTEIN, R. H.; FITZHUGH, H. A.; KNIPSCHEER, C. (1983) **Livestock in Farming Systems Research.** Proceedings of Third Annual Farming Systems Symposium. Kansas State University, Manhattan, Kansas. pp.64-109. ODI Loc. 1755. This paper reviews the contribution of livestock to farming systems and national economies and draws attention to the need for explicitly including a livestock component in FSR/D projects. A typology of livestock systems is presented to provide a general framework for describing the diversity that

characterises agricultural systems and the role of livestock. Several ongoing programs, networks and projects that focus on the livestock component of the farming system are briefly described. Using the generally accepted stages in FSR/D project as a guide, problems that are encountered in utilising elements of the conventional cropping systems methodology to implement livestock systems projects are discussed and adaptations to livestock farming systems are suggested. Finally, future directions in FSR/D are proposed, with particular reference to the livestock component.

12 BIGGS, S. D. (1982) **Generating agricultural technology: Triticale for the Himalayan Hills.** *Food Policy*, Feb:69-82. ODI Loc. 1756. Examines research methods for generating agricultural technology in an Indian research programme, which aimed to develop triticale as a food crop for the people of the Himalayan Hills. Significant changes occurred in the priorities and organisation of the programme as a result of the timely analysis of information from on-farm trials and surveys, a review of past triticale data and a field workshop in the Himalayas.

13 BIGGS, S. D. (1988) **On-farm research in an integrated agricultural technology development system: case study of triticale for the Himalayan hills.** *Agricultural Administration*, 7(2):133-145. ODI Loc. 1613. The central role of on-farm research in an integrated agricultural technology development programme is discussed, with reference to programmes for developing triticale in the Himalayan hills. The dynamic relationship between programme justification, on-farm research, implications analysis, policy-making, on-station research and technologies for extension promotion are described in the context of an overall research and development system. Methods for conducting an on-farm research programme are suggested. These include exploratory surveys and other information-gathering activities, diagnosis of farmers' problems, on-farm experiments and development feedback systems. Implications which might be drawn by technical and social scientists at an action workshop for the development of triticale are discussed.

14 BIGGS, S. D.; FARRINGTON, J. (1989) **Agricultural research: A review of social science analysis.** Draft. London. ODI. 187p. A comprehensive review of the evolution of both conceptual and empirical aspects of social science analysis in agricultural research (SSAAR). An institution-based typology of agricultural research is developed to identify future SSAAR needs. The first part reviews the evolution of recent theory on the generation and diffusion of agricultural technology, first discussing the themes of modernisation, factor endowments, distribution and equity, world economy, ecology and institutional development in relation to agricultural research. Reviewing specific developments in theory, such as stages of growth models, induced institutional change, decentralisation models, political science models, organisation and management, research resource allocation, monitoring and evaluation and on-farm research. The second part highlights the shortcomings of existing typologies of agricultural research, developing a generalised institution-based typology and then uses it to identify gaps in current SSAAR and areas in which SSAAR analysis will be required in future. The bibliography contains over 900 references, most of them being classified in an annex into 28 thematic groupings.

15 BIGGS, S. D. (1989) **Resource-poor farmer participation in research: A synthesis**

of experiences from nine national agricultural research systems. OFCOR Project. Comparative study no.3. ISNAR, The Hague. 65p. ODI Loc. 1618.
The main objectives, structure and characteristics of farmer participatory research are examined in national agricultural programmes in Senegal, Zambia, Zimbabwe, Bangladesh, Indonesia, Nepal, Ecuador, Guatemala and Panama.
The methods of on-farm research, types of farmer participation, flexibility of the process of resource allocation, institutional and political context of research, the participation of farmers in institutional decision-making, and priorities given towards resource-poor farmers are examined. A typology of four different participatory methods is advanced: contractual, consultative, collaborative and collegiate research. In contractual research the role of the farmers is minimal, providing their farm resources for the researcher to experiment with. In consultative research farmers are solicited to describe their problems and researchers devise solutions. Collaborative research involves farmers and researchers jointly participating in the various stages of research. Collegiate research involves the scientists working to strengthen the informal R&D systems of the farmer. It is concluded that effective farmer participation is difficult to achieve and depends upon the abilities of research managers to both promote participatory research methods within the political and institutional context and mobilise resources for participatory research.

16 BYERLEE, D.; BIGGS, S. D.; COLLINSON, M. P.; HARRINGTON, L.; MARTINEZ, D.; MOSCARDI, E.; WINKELMANN, D. (1979) **On-farm research to develop technologies appropriate to farmers.** Paper presented to International Association of Agricultural Economists Conference, Banff, Canada, September 1979. 7p. ODI Loc. 0179.
Based on CIMMYT's experience with National Research Programmes, the authors advocate the collaboration of technical and social scientists in OFR.
Representative practices, priorities and problems are diagnosed with farmers through interviews, informal and formal surveys. Rapid analysis of this data allows delineation of recommendation domains. Solutions may be based on the practices of innovative farmers and are evaluated with a view to their short run pay off, social and economic consequences, level of risk and consistency with national policy. On-farm experiments should be conducted under farmers' conditions and actively involve farmers and extension workers to permit proper evaluation. OFTs can help establish priorities for experimental station research, policy making and extension. The need for practicable and replicable methodology in the context of scarce research resources is emphasised.

17 BYERLEE, D.; HARRINGTON, L.; WINKELMANN, D. L. (1982) **Farming systems research: Issues in research strategy and technology design.** *American Journal of Agricultural Economics*, Dec: 897-904. ODI Loc. 1766.
Examines organisational and methodological issues in the development of on-farm research with a farming systems perspective (OFR/FSP).
OFR/FSP can deal effectively with the complexities of the physical and social environment of farming households. Long-term research, attuned to farmers' problems is needed, but efficiency in costs, data processing and personnel time is important. The authors suggest a focus on the few most promising and feasible opportunities to increase productivity in different recommendation domains, consistent with policy objectives. Sequences of data collection are outlined, and suggestions for training of economists in skills for OFR are made.

18 CALDWELL, J. S.; LIGHTFOOT, C. (1987) **A network for methods of farmer-led systems experimentation.** *FSSP Newsletter*, 5(4):18-24. ODI Loc. 1620.
The rationale behind a network organised by the authors, which seeks to systematically document new methods being developed in Farming Systems Research/Extension, is explained. FSR/E is characterised by a methodology of on-farm research in which members of the farm household lead in developing trial designs and in defining the methods of conducting the trial and evaluating the results. On-farm trials in FSR/E often seek to change only one component in the farming system, but evaluate the changes on the basis of its effects on the whole farming system. FSR/E uses methods of statistical inference to assess the adoption and accessibility of new technology across a wide range of households. However statistical methods have not been developed to measure qualitative variables which are usually analysed in normative terms. As a result FSR/E research tends either to resort to multi-locational testing of farm management practices or becomes normative extension demonstrations of new technology. The aim of the authors is systematically to chart and compare problems in the design and analysis of on-farm experiments developed in different projects, and to identify new methods and their potential benefit to programmes. The experimental objectives, design, implementation and analysis of project activities in relation to the role of the farm household in on-farm research, are documented in matrix form.

19 CALDWELL, J. S. (1988) **Notes for the workshop on participative technology development and a comparison of terms with farming systems research/extension** (FSR/E) Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.
Notes, which compare the terminologies developed in FSR/E research with that of Participative Technology Development (ILEIA). Equivalent concepts are compared and contrasted and the operational contexts in which the concepts are applied are related.

20 CANADIAN UNIVERSITIES SERVICE OVERSEAS (1983) **Seminar Report: Rainfed rice-fish farming in southern N.E. Thailand.** CUSO Seminar at Surin Agricultural Technology College, N.E. Thailand, 9 -11 Nov. 1983. ODI Loc. 1767
The seminar was held with the objectives of providing a forum for farmers to exchange ideas on rice-with-fish farming, for researchers and extensionists to learn from farmers, and for the future directions of rice/fish R & D to be determined. Discussion groups were arranged in which farmers could interact with others - including those new to the technique - in their own dialect.

21 CERNEA, M. M.; GUGGENHEIM, S. E. (1985) **Is anthropology superfluous in farming systems research?** World Bank Reprint Series: no.367. World Bank, Washington D.C. *Farming System Research*, 4(9):504-517. ODI Loc. 1622.
It is argued that the sociological/anthropological study of people's organisations, motivations, value systems and behaviourial patterns should be regarded as an important area of farming systems research.
Anthropology and sociology are seen as making important contributions to three main areas of research. Firstly, they have developed research methods for dealing with small communities which are applicable to the collection and analysis of farming systems data. Secondly, they have experience of studying value systems, the rationale and the cultural context in which production systems have developed. Thirdly, their concern with social organisation can be utilised, to assess the potentials of local organisations to be incorporated into development strategies, and the implications for the interface between new technologies and local organisation.

22 CHAMBERS, R. (1980) **The small farmer is a professional.** *Ceres,* 13(2):20-23. ODI Loc. 1768.
Outlines the biases and limitations in conventional single-discipline approaches to rural technology development. Urges a revised approach seeking to understand farmers' situations in a holistic context which value ITK, avoid excessive data collection and avoid on-station bias. The approach should be interdisciplinary, acknowledge the value of learning from small farmers and of learning by doing.

23 CHAMBERS, R.; GHILDYAL, B. P. (1985) **Agricultural research for resource-poor farmers: The farmer-first-and-last model.** *Agricultural Administration,* 20:1-30. ODI Loc. 1769; ODI journals.
Critically assesses "transfer-of-technology" (TOT) models of research which characterise the Green Revolution, and propounds an alternative interdisciplinary and participatory methodology.
It is argued that the normal "transfer-of-technology" (TOT) model for agricultural research has built-in biases which favour resource-rich farmers whose conditions resemble those of research stations. TOT approaches have been modified through on-farm trials and demonstrations but the basic model and approach remain the same. A second emerging model is "farmer-first-and-last" (FFL). This starts and ends with the farm family and the farming system. It begins with holistic and interdisciplinary appraisal of farm families' resources, needs and problems, and continues with on-farm and with-farmer R and D, with scientists, experiment stations and laboratories in a consultancy and referral role. FFL fits the needs and opportunities of resource-poor farm families better than TOT, but there are obstacles to its development and introduction. These can be tackled step-by-step, through combinations of methodological innovation, interdisciplinarity, including the social sciences, and provision of suitable resources, rewards and training.

24 CHAMBERS, R.; JIGGINS, J. (1986) **Agricultural research for resource-poor farmers: A parsimonious paradigm.** Discussion Paper 220. IDS, University of Sussex. 17p. ODI Loc. 1770.
The transfer of technology (TOT) model is contrasted with the farmer-first -and-last (FFL) model and their applicability to conditions of resource-poor farmers are discussed.
With the TOT model of agricultural research - part of the normal professionalism of agricultural scientists - scientists largely determine research priorities, develop technologies in controlled conditions, and then hand them over to farmers via agricultural extension services. The TOT model has been adapted and extended through multi-disciplinary farming systems research (FSR) and on-farm trials. In contrast, the FFL model transfers initiative to resource-poor farmers. The authors argue that FFL fits the diverse and complex conditions and needs of RPFs better than TOT, and makes more sparing and cost-effective use of scarce scientists. A parsimonious form of FFL avoids multidisciplinary teams and much data gathering and analysis by relying on farmers' knowledge and self-interest.

25 CHAMBERS, R. (1986) **Normal professionalism, new paradigms and development.** IDS Discussion Paper no.227. IDS, University of Sussex, Brighton. 39p. ODI Loc. 1623.
It is argued that there is a need for new research methods to come to the fore to solve the crisis in development studies. This crisis has seen the frenetic rise and fall of intellectual fashions. Out of this milieu new approaches based on a new methodological paradigm are arising. The new methods are contrasted with the old.
The research methods, values and role of normal professionalism are stable and conservative. Normal professionalism is linked with the core-periphery structure

of power and knowledge, reproduced through teaching and defended by specialisation. Its values and rewards "first" biases which are urban, industrial, high technology, male, quantifying and concerned with the needs and interests of the rich. New professionalism reverses the values, research methods, roles and power relations of normal professionalism. It puts people first and poor people first of all. The "farmer-first" paradigm includes learning from the poor, decentralisation, empowerment, local initiative, and diversity. Development is not by blueprint but by learning process, flexible, iterative and adaptive. New professionalism questions conventional methodologies for appraisal, research, training and managing bureaucracies, and exploits gaps between disciplines as opportunities for the poor. Examples of new practices are given in relationship to socio-economic analysis at CIP which start with farmer evaluations, Rapid Rural Appraisal methods developed At Khon Kaen University in Thailand, re-orientation of bureaucratic methods in the Philippines and Thailand, and projects developed by voluntary organisations. It is concluded that the greatest challenge facing development professionals is to achieve reversals of working methods on a massive scale.

26 CHAMBERS, R.; PACEY, A.; THRUPP, L. A. (1989) **Farmer First: Farmer innovations and agricultural research.** Intermediate Technology Publications, London. 218p.
Publication of proceedings of IDS workshop "Farmers and agricultural research: Complementary methods", 26-31 July 1987.
The papers are organised in respect of farmer innovations, the tapping of farmers informal experiments; farmers agendas, using farmers goals and needs to define research activities; practical issues and methodology in carrying out research; and institutional issues of the integration of participatory methods into the existing institutional framework of research and financial support. The theme underlying the book is that the major issue in agriculture in developing countries, the sustainability of agricultural systems in risky environments, presents a challenge to agricultural policy and the agricultural sciences, which can only be solved through the development of a new methodology. The social and physical environment of resource poor farming systems are too complex and variable to be addressed only by formal scientific methods. Numerous field experiences with innovative methods of developing and diffusing agricultural technology are drawn from Latin America, Africa and Asia. These are highly participatory in character. In the farmer-first mode, analysis, choice and experimentation are done mainly by the farmers themselves with outside professionals mainly acting as catalysts and consultants.

27 CHAMBERS, R. **Notes and reflections on the workshop on farmers and agricultural research: complementary methods.** IDS, University of Sussex, 12 August 1987. 18p. ODI Loc. 1608.
A review of the Workshop on Farmers and Agricultural Research: Complementary Methods, held at IDS in July 1987. The objects of the conference, the different approaches to farmer participatory research and major issues which emerged are discussed.
The rationale behind the workshop was to discuss how agricultural science could better serve resource-poor farmers and pastoralists, and to take stock of new methods and approaches, based on participatory methods. These have arisen out of the restrictive scope of normal agronomic research in resource-poor environments and appreciation of the validity of indigenous technical knowledge and farmers' innovations. Different types of participatory research methods and experiences discussed at the workshop are noted. It is argued that researchers need to be able to develop greater freedom in experimenting with new complementary methods to further the process of production and reduce risks of

failure. Research needs to offer farmers a wider range of solutions to choose between, to further innovation in the variety of micro conditions which characterise resource poor environments. Restrictive and standardising rules need to be relaxed, since uniformity is inimical to the diversity, complexity and risk reducing strategies which characterise resource-poor farming systems. Some of the implications for the organisation of research and training, which have arisen out of participatory research, are discussed.

28 CHAROENWATANA, T. (1987) **Farmers and agricultural science.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 8p. ODI Loc. 1607.
Discusses the underlying theoretical concerns which have influenced the development of interdisciplinary Farming System Research (FSR) at Khon Kaen University in Thailand, and methodological procedures in developing interdisciplinary research.
It is argued that farmers' adoption of new technology is controlled not only by physical and biological factors, but also by socio-economic and cultural parameters. Agroecosystems analysis is advocated as a framework for developing a cross-disciplinary perspective for research, in which agricultural, socio-economic and management issues can be raised simultaneously. Research activities also need to be carried out by interdisciplinary teams, based on joint planning, collaborative fieldwork and regular team meetings. Increasing interdisciplinary thought and interaction between researchers is needed for success in FSR. Concepts and methods need to be flexible to fit particular situations, in order to develop technologies which will suit the needs of small farmers in particular circumstances and environments.

29 CHAVANGI, N. A.; ENGELHARD, R. J.; JONES, V. (1985) **Culture as the basis for implementing self-sustaining woodfuel development programmes.** The Beijer Institute, PO Box 56212, Nairobi. 24p. ODI Loc. 1771.
Fuelwood shortages in Kakamega District, Kenya, were due not to a shortage of woody biomass but to the social and cultural forces within households which determine access to wood produced on farms.
Discussions with men and women allowed potential intra-household conflicts to be avoided by identifying and promoting a plant capable of producing woody biomass to which conventional taboos and customs do not apply.

30 CHAVANGI, N. A. (1988) **Problem definition and a statement on the case for an expanded awareness programme in Kakamega district.** Kenya Woodfuel Development Project. 12p. ODI Loc. 1628.
Fuelwood shortages in the Kakamega district in Kenya are related to social and cultural values concerning the relationship between men and women, which determines control over land, and access to trees and firewood. The strategies of the Kenya Woodfuel Development Project (KWDP), in developing an action programme to solve this problem, without exacerbating social and cultural contradictions, are discussed.
Problems of fuelwood shortages are not related to a lack of tree planting activity. Surveys revealed that the wood biomass on farms was favourable and farmers replanted trees. Woodfuel procurement lies within the womens' division of labour and social and cultural attitudes towards women prevent them from owning land and planting trees. Woodfuel is considered a common property resource, but with increasing shortage women have to range further to collect fuel or use alternative resources on the household land to which they have access, such as the shoots of hedges and crop residues. The trees planted by men tend to be exotic species and do not include fuelwood. The problem of fuelwood shortage thus requires both new planting of woodfuel species and the transformation of some of the existing

wood resources into firewood species. The solution devised by KWDP to this delicate problem involving cultural attitudes, was to attempt to address the whole community and highlight the fuelwood problem as a community problem needing joint actions between men and women. KWDP also attempted to promote the growth of small bush-like species, around which there was ambiguity about their status as trees, and which women might be allowed to grow. Various communication media were utilised to raise awareness of the problem, including popular theatre, group meeting, demonstrations of firewood species on nurseries and free distribution of seeds.

31 COLFER, C. J. PIERCE (1987) **On farmer-researcher interaction.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 5p. ODI Loc. 1607.
Describes problems of communication in the interaction between researchers and farmers and methods used by researchers to improve communications with farmers, with reference to the Tropsoils Project in Indonesia.
The issues raised include respect for the farmers and their conventions, acting sensitively (admitting fallibility, listening to the farmers, not being overbearing, eye contact), and keeping promises.

32 COLFER, C. J. PIERCE (1987) **Farmer involvement in the Tropsoils Project: Two complementary approaches.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 19p. ODI Loc. 1607.
Describes the use of two different approaches to farmer participation in soil management research in the Tropsoils Project in Indonesia. The first is a collaborative method in which scientists and farmers design and implement experiments on the farmers' fields. The second is a focused study using social science methods, to analyse the farming system and help determine future research areas.

33 COLFER, C. J. PIERCE (1987) **Intra-team collaboration in the Tropsoils Project.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 9p. ODI Loc. 1607.
Recounts the interaction and co-operation which developed between researchers from different disciplines, in the Tropsoil Project in Indonesia.

34 **COLLINSON, M. (1988) A note on participative technology development as an institutional innovation.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 2p. ODI Loc. 1608.
It is argued that the conditions of research within each country embody different institutional and agronomic problems. Farming systems research needs to be flexible in its concepts, methodology and institutional set up, to allow different components of research to be adapted to different circumstances.

35 COLLINSON, M. P. (1981) **A low cost approach to understanding small farmers.** *Agricultural Administration,* 8:433-450. ODI Loc. 1773.
In view of the high cost of research, a broad focus is advocated rather than a narrower in-depth study. Procedures for establishing recommendation domains are illustrated with reference to Central Province, Zambia - including zoning, exploratory survey, and verification survey. An attempt is made to assess time/manpower requirements.

36 COLLINSON, M. P. (1985) **Senior agricultural administrator's networkshop on farm research.** CIMMYT, Lesotho. 24p. ODI Loc. 1774.
The role of on-farm research and its linkages with agricultural research and extension institutions, policy and planning, are discussed. Types of farmer participation in experimentation are classified and the involvements of different participants over the various stages of the research cycle are outlined.

37 CORNICK, T.; ALCOBER, D.; REPULDA, R.; BALINA, R. (1986) **Farmer participation in OFR & E: Some farmers still say "no". Lessons from the Farming Systems Development Project, Eastern Visayas.** Flora, C.B. & Tomecek, M. (eds.) *Farming Systems Research Symposium, Selected proceedings.* Kansas State University. p.233-248. ODI Loc. 1824.
Social structure and cultural norms make it difficult to identify when farmer participation is genuine. The provision of material incentives is likely to confuse the issue further. Case studies of 2 villages in the E. Visayas project (Philippines) showed wide variations in uptake of the technologies on which agreement had earlier been reached. Differences in the suitability of the technology, in the farming communities and in the way the trials were initiated account for these variations.

38 DAVIDSON, A. P. (1987) **Does farming systems research have a future?** *Agricultural Administration and Extension,* 24:69-77. ODI Loc. 1776; ODI Journals.
It is argued that social interactions which characterise farming systems and their integration into national and international systems of research, from the household to regional research centres, need to be considered to evolve effective research strategies. The farming system is more than a technical sphere of activity.
FSR activities intended to generate information useful for infrastructural planning and policy making are distinguished from the more frequently emphasised technical research, geared towards evaluation and delivery of a technology. The micro-level research should be placed within a macro-level context, on both practical and theoretical grounds, and that FSR necessarily has a wider social and political dimension.

39 DE GUIA, O. M. J.; SEVILLA, P. M.; POSAS, O.; MCDOWELL, R. E. (1984) **Report on livestock research and development for FSDP, Eastern Visayas.** Report no.21. FSDP, Leyte, Baybay. 29p. ODI Loc. 1822.
Collaboration with farmers' groups allows better understanding in livestock/crop systems, joint problem definition and description of sub-systems.
It facilitates analysis and evaluation of local feed resources, design and testing of a few low-cost interventions centred on on-farm resources, monitoring through visits, measurements and data collection and awareness of institutional and cultural constraints.

40 DRIJVER, C. A. (1988) **Points for discussion in participative technology development in sustainable agriculture.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 6p. ODI Loc. 1608.
Examines the relationship between technological development, participatory research methods and an integrated scientific framework, in the creation of sustainable resource utilisation systems. It is argued that lack of appropriate technology is only one of many problems in technology development. Research should be centred on the life-system of a community, consisting of on-farm and off-farm activities, and not on the agro-ecosystem. Research should take into consideration the perceptions of the community of social and environmental issues. It should include macro-analysis of environmental changes and socio-political relations between the people and institutions of administration and development.

It should assess the interests of various groups in the process of technological development. The growing use of participatory research methods in conservation programmes is noted and the need for a specific participatory method for conservation projects is raised.

41 EDWARDS, R. J. A. (1987) **Farmers groups and panels: Utilisation of a community perspective as a basis for natural groups.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 13p. ODI Loc. 1607.
Describes the setting up of farmers groups in the Lusaka Province of Zambia. Problems which have emerged, concerning group dynamics and researcher perspectives of the community, are discussed. It is argued that given limited resources, working with farmer groups accelerates the process of technological generation. It enables more effective and representative gathering of data, and wider dissemination of information about technology. Experiences of large formalised farmer groups have not been successful. There are logistic difficulties in implementing research in large groups. The interests of a small group of individuals tend to dominate large formal groups. By working with a community perspective, in which small low keyed groups have been formed around small clustered communities, successes have been achieved. These informal groups discuss material being tested and direct the teams research efforts into the small communities. There have been lively debates within meetings and improved feedback to researchers. Clustering of farmers has also improved the organisation of field trials.

42 EFFENDI, S. (1985) **The identification of farmers' production problems in Indonesia.** In Cernea, M. M.; Coulter, J. K.; Russell, J. F. A.; (eds.) *Research extension farmer: A two way continuum for agricultural development.* World Bank & UNDP Symposium, Washington. pp.51-70. ODI Loc. 1714; 1543.
Describes the institutional framework and procedures for on-farm and farming systems research in Indonesia.
Cropping systems research has evolved into farming systems research, in which the farm is viewed holistically, as a socio-economic entity. Problems are identified by multidisciplinary teams of researchers, conducting a quick agro-economic profile within three months. Land capability indices are systematically mapped, including edaphological factors, environmental determinants and present land use patterns. This is used to set research priorities. Having selected target areas, on-farm research is carried out in farmers' field. This aims to examine farmers cropping patterns, to evaluate farmers' management practices, to identify socio-economic constraints, to encourage farmers to adopt new technology, and to determine the productive potential and ability of research to remove constraints. Linkages have also been established with extension services and other government agencies to improve feedback mechanisms from the farm to research centres.

43 ENGEL, P.; HAVERKORT, B.; JIGGINS, J. (1988) **Concepts and processes in participative technology development.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 6p. ODI Loc. 1608.
Basic concepts related to participatory research are described and defined. The aim is to contribute towards the creation of a common terminology in participatory research and to indicate a logical order of different activities in the process of research. Standard formats for the processes of participatory research and for the description of operational approaches and stages are also suggested.

44 FARRINGTON, J.; MARTIN, A. M. (1988) **Farmer participatory research: A review of concepts and recent practices.** Occasional Paper no.9. ODI, London. 799. ODI Loc. ABA.
Recent innovations in participatory, problem-orientated approaches to research and development are reviewed and their potential and constraints highlighted.
Agricultural production in difficult areas faces multiple constraints, requiring intervention at several levels. It is argued here, on grounds of production and equity, that technology development is an important component of the necessary set of interventions. However conventional "technology transfer" strategies of R&D work poorly in complex and highly variable environments. As an alternative, much recent work has developed a participatory framework. Participatory research tends to focus on small numbers of clients. It is therefore more expensive per client than the technology transfer approach, but much more effective. Two questions need to be addressed in future work: how the costs of research can be spread over a large number of clients without loss of effectiveness, and to what extent flexible, participatory approaches can be incorporated into the work of programmes of national agricultural research services.

45 FARRINGTON, J.; MARTIN, A. M. (1988) **Farmer participation in agricultural research: A review of concepts and recent fieldwork.** *Agricultural Administration and Extension,* 29:247-264. ODI Loc. ODI Journals.
As 44.

46 FERNANDEZ, M. E.; SALVATIERRA, H. (1986) **The effect of gender related production management on the design and implementation of participatory technology validation.** In *Select Proceedings of Kansas State University's 1986 Farming System Research Symposium* (eds) Flora, C. B. & Tomecek, M. pp.739-750. ODI Loc. 1824.
The authors consider that agricultural production in communities cannot be understood as merely the sum of single enterprises under the direction of male household heads. They distinguish additional groups with varying degrees of experience and decision making power, eg. managers of sub-units, "task implementors" and reciprocal work groups, which must be involved in participatory research.

47 FERNANDEZ, M. E. (1986) **Participatory-action-research and the farming systems approach with highland peasants.** Small Ruminants Collaborative Research Support Program, Dept. Rural Sociology, University of Missouri, Columbia, Missouri. Technical Report Series No.75. 33p. ODI Loc. 1779.
This study attempts to critically analyse experiences in the high Andes where participatory-action-research is being carried out on production problems defined by peasant farmers. Alternative solutions are selected or designed from the perspective that the production unit is an integrated interacting system. The reasons for choosing particular methodological tools and how they have been used in community situations are discussed. A series of case studies illustrate the possible implications of these tools for research and extension efforts.

48 FERNANDEZ, M. E. (1987) **Crops, herds and the division of labour in the Andes.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 11p. ODI Loc. 1607.
Describes the organisation of the production system among highland agricultural communities in Peru. It is argued that the design and testing of new technology and extension work in the farming communities, must take into consideration the division of labour and the organisation of decision making. Five different groups with varying degrees of decision-making power are identified within the Peruvian Andean communities. Resources, crops and livestock management involves a

complex division of labour within different levels of the community and within families. There is a careful integration of specialisation to provide for efficient use of labour, technical knowledge and skill. Decision-making is organised to guarantee efficient planning between different productive activities. These are integrated into the overall productive system by groups responsible for different levels of management. This includes the community assembly, responsible for the allocation of natural resources; family production groups, responsible for production objectives; component task implementors, responsible for specialised activities, such as livestock, (which is the domain of women) and foodcrops. The successful design and introduction of technology needs to take into account the types of group which are responsible for the relevant activity, and which need to be involved in the process of research.

49 FERNANDEZ, M. E. (1987) **Women's agricultural production committees and the participative-research-action-approach.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 9p. ODI Loc. 1607.
Describes attempts by Grupo Yanapai, (part of the Small Ruminant Collaborative Research Support Programme), to develop women's groups for livestock production, in Andes communities in Peru. The objective of Grupo Yanapai is to develop livestock technologies suitable for community-based production systems. The project is committed to a participatory group methodology, concerned with the problems of livestock production among women. The main aims are to define concrete problems, screen and adjust technologies, and work among the producers to solve immediate problems. Women's Agricultural Committees were formed as an avenue enabling women to improve their organisational ability, to increase their decision-making role in the community. The solution to technical livestock problems is seen as closely related to the ability of women to strengthen their organisational base, so that they can jointly identify and find solutions to their problems. The major objective of the project is to train members of the women's groups to use their own natural and human resources more efficiently, and to become less dependent on outside technical and organisational advice.

50 FERNANDEZ, M. E. (1988) **Methodologies for participatory technology transformation.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. Also in ILEIA Newsletter 4(3) 1988, pp.15-17. 20p. ODI Loc. 1608.
Discusses participatory and group methods developed by Yanapai/Small Ruminants Collaborative Research Support Program, in Andean communities in Peru. The farming system of the Andean communities is characterised by a wide range of activities performed in a large variety of ecological sub-zones. Successful implementation of research requires the interaction between various component parts of the community-based farming system to be taken into consideration. This calls for the development of interdisciplinary research and participatory methods. Participatory methods have been evolved which involve farmers in all stages of research, from the diagnosis of problems to analysing data and readjusting research agendas. Participatory methods in adaptive research include on-farm trials and the development of farmer-defined useful technology, including multiplication of locally developed plant varieties. Participatory methods centre on establishing, training and working with farmers' and womens' groups, and strengthening their organisational abilities to accomplish innovation. Great flexibility and creativity is needed on the part of the researchers, to adapt research methods to the farmers' production system, taking ecological, economic and social organisational features into consideration. Researchers must develop communication skills, to take part in the process of experimentation within the

community as a mutual learning process, and to be able to express research findings in a manner which is accessible to the community.

51 FUJISAKA, S. (1988) **The need for incorporating farmer perspectives in on-farm research and development in the uplands.** IRRI, Manila, Philippines. Agricultural Economics Department. 17p. ODI Loc. 1632.
Four projects and two national policy approaches to the protection of upland areas from ecosystems degradation in different parts of the world are examined. Lessons learnt from evaluating these strategies contributed to farmer participatory research being conducted in the Philippine uplands.
Evaluations of the projects and programmes have suggested that the farmers' have not adopted introduced land conservation techniques. Issues concerned with technologies, extension methods and farmer adoption are considered. Technological adoption is influenced by the "fit" between the innovations promoted and farmer practices within a particular environment. Farmer approaches to problems need to be considered. Problems perceived as occurring within a general area nay not exist within a specific locality. Farmer perceptions underlying their practices are often technically sound. Science needs to build upon farmer practices and knowledge to generate farmer-usable alternatives. While farmers may be persuaded to use new methods through incentives, this can lead to the adoption of inappropriate technology. In the light of these experiences the Claveria project is working towards involving farmers in the process of problems diagnosis, building on farmer practices and perceptions, learning from local technological adaptations, allowing for spontaneous adaptation, and developing appropriate farmer-orientated methods of technology transfer.

52 FUJISAKA, S. (1988) **Agricultural anthropology in international rice research.** IRRI. Manila Philippines. Agricultural Economics Department. 27p. ODI Loc. 1633.
Examines the role of anthropology in rice research at the international Rice Research Institute (IRRI). Examples from research projects in the Philippines and Kampuchea are provided. Agricultural anthropology at IRRI tries to incorporate farmer perspectives in on-farm research and in research planning for collaborative country programmes. Work has focused largely on rainfed lowlands and upland rice environments where systems sustainability is a key concern. Farmers are interviewed about crop and resource management, problem solving, and their underlying technical knowledge. Rice micro-environments are described in scientific terms and in terms of farmer categories and use. On-farm work can then integrate contributions of both researchers and farmers in technology generation, adaptive research, and technology transfer. The agricultural anthropologist needs a working understanding of both scientific and farmers' concepts of agriculture and needs to incorporate ethnographic and agronomic techniques. The effectiveness of anthropology is enhanced if other members of the scientific team also have an interdisciplinary framework for research. On-farm work is also being carried out in Thailand, and farmer-appropriate research has been an objective in Madagascar and Laos.

53 GALT, D. L.; MATHEMA, S. B. (1987) **Farmer participation in farming systems research.** Networking Paper no.15, 1987. FSSP, University of Florida, Gainesville, Florida. 20p. ODI Loc. 1781.
Methods of incorporating farmers as partners in research, developing interdisciplinary research and research extension linkages are considered. Case material is provided from the strategies of research centres in Nepal.
In more sophisticated FSR approaches farmers are considered as partners in agricultural research and extension yet shorter and more cost effective methods for including farmers as participants are needed. The article addresses a number

of more frequently posed questions on FPR including: Why FPR? Do farmers really perform research? What can researchers learn from farmers? Should FPR be restricted to the design of trials? Should FPR be at individual, group, village or higher levels? What should be the pattern and frequency of monitoring of household decision-making? What is the role of extension in FPR?

54 GHILDYAL, B. P. (1984) **Rethinking soil physics research.** *Journal of Indian Society of Soil Science,* 32:pp.556-574. ODI Loc. 1782.
Areas of tropical agro-ecosystem research which are in need of greater attention are cited. This includes soil and climate interaction, and soil fertility problems affecting marginal and subsistence farmers in rainfed systems.

55 GIBBON, D. (1987) **Restoring regenerative systems of production in Sub-Saharan Africa: Research requirements.** *Disasters,* 11 Jan:53-58. ODI Loc. 1731.
It is argued that the dominant models in formal research in semi-arid tropical Africa are based on research approaches developed in temperate or more humid tropical areas, and are unsuited to the environment.
The old systems of resource management developed cropping strategies adapted to the marginal conditions of the environment. Returns to labour were assigned a higher priority than returns to land. The environment was exploited with a well-developed knowledge of soil and water management. These patterns have been disrupted over the last hundred years. Colonial and post-colonial agricultural policy has been based on increasing yield per unit area. Technological inputs have been developed without taking into consideration the needs of the farmers and the sustainability of the technology. New research objectives, methods and structures are required, which reflect these needs. These should be flexible and multidisciplinary, viewing the environment holistically. A range of survey, testing and monitoring techniques are required, which are based on incorporating farmer participation. Long term objectives and consequences need to be accounted for.

56 GIBBON, D. P. (1985) **On-farm research: Some alternative approaches.** Paper for symposium on Farming Systems Research and Extension, Kansas, October 13-16, 1985. 27p. ODI Loc. 1783.
Examines and assesses the relative merits of different approaches to on-farm research (OFR) with respect to their contribution to overall national research objectives, problems and needs of farmer clients, and environmental issues.
Much OFR has focused on a single crop or livestock type whereas a broader perspective which considers biological and organic systems and places farmers in the context of social structure and the political economy is necessary.

57 GOMEZ, A. A. (1985) **A farming systems research approach to identifying farmer's production problems.** Cernea, M. M.; Coulter, J. K.; Russell, J. F. A.; eds.) *Research extension farmer: A two way continuum for agricultural development.* World Bank & UNDP Symposium, Washington. pp.63-86. ODI Loc. 1714; 1543.
Outlines a methodology for research in which on-farm research augments on-station research. The function of on-farm trials is seen as validating the applicability of research station results, feeding back to researchers the farmers' production problems, and improving the responsiveness of research to changing farm conditions. On-farm trials are conducted in farmers' fields with the systematic selection of sample farms as representative of strata of the farming population. Surveys are conducted to identify problems for which technical solutions need to be found and new technology is tested in on-farm trials. Farmers manage the trials and participate in the evaluation process. The main source of manpower for implementing trials is recruited from existing rural development workers. The aims of the trials is to verify the superiority of new technology over existing farming practices.

58 GRAAP (1987) **Pour une pedagogie de l'autopromotion.** Groupe de Recherche et d'Appui pour l'Autopromotion Paysanne, Bobo-Dioulasso. 85p. ODI Loc. 1727.
Outlines a community based development method which promotes the initiative of the peasantry in West Africa to develop actions for its own self-reliant development. The researcher acts as a facilitator, encouraging the village community to elaborate, reflect and analyse their situation, develop solutions to their problems, reach consensus on the solutions and implement a plan of action. Research builds upon the tradition of community meetings in West Africa. The first stage of research consists in determining the main categories of people in the village, the main constraints in production, and the areas of conflicts between the groups. Meetings are held with sub-groups to develop an analysis of their specific problems. These are then addressed to the community meeting by sub-group representatives. The method encourages areas of conflicts and problems within the community to be aired. The facilitator acts as a mirror, posing questions to encourage the villagers to reflect and develop their analysis. Intergroup conflicts are related to constraints in the process of production. Solutions focus on resolving conflicts within the community and promoting developments which are in the interests of the whole community. The facilitator also makes interventions to help the community develop its agenda for action. This includes suggesting technical possibilities, explaining technical and scientific problems, drawing from the experiences of other areas, and making training facilities available to the community. Visual aids are used at group meetings. Problems of developing visual aid methods consonant with the culture of the people, and utilising cultural forms of the people (such as proverbs) to heighten awareness, are discussed in detail. The facilitator requires a considerable knowledge of the local culture of the people.

59 **GUPTA, A. K. (1985) On organising equity: Are solutions really the problem?** *Journal of Social and Economic Studies,* 2(4):295-312. ODI Loc. 1636.
Examines the role of the dominant scientific paradigm in agricultural policy for poor farmers and suggests an alternative socio-ecological paradigm.
The implicit and explicit assumptions behind dominant scientific and research policy models influence the development strategies of the state and its policies on equity. The dominant paradigm is concerned with standardisation. It does not apply itself to investigating the conditions and perceptions of the rural poor. It does not evolve rational scientific procedures for devising a number of alternative strategies from which the most feasible can be adopted. Several examples are given of policy decisions which have been implemented without collecting basic data on the conditions of the farmers and the allocation of resources to the rural poor. An alternative paradigm is developed which seeks to link macro-development policy with micro-allocative planning. This method is based on conflictive, iterative and interactive models, and seeks to build bridges between the areas of knowledge of the poor farmers and the ignorance of the social scientists. It develops both eco-specific and socio-economic parameters, taking environmental conditions, the resources, skills and risk-minimising strategies of poor farmers into consideration. The objective is to develop policies which make alternatives feasible rather than accepting the standardising constraints of "feasible policies".

60 GUPTA, A. K. (1986) **Strengthening farming systems research project. Half Yearly Report,** no.2, Bangladesh Agricultural Research Institute. 7p. ODI Loc. 1784.
Outlines the activities of the project at the old and new FSR sites of the Bangladesh Agricultural Research Institute, and the work of female scientists in the homestead study. Important aspects are: farmers' involvement, scientist

learning through discussion and case study, workshops with extensionists, self-criticism by scientists, attention given to traditional knowledge and management of household production and resources.

61 HARWOOD, R. R. (1979) Research in small farm development. Harwood R. R., **Small farm development.** Westview Press, Boulder, Colorado. pp.32-41. ODI Loc. 1693.
Outlines a method for on-farm research in which farmers participate at all stages of research.
The method uses social-economic surveys to build up detailed classifications of the environment and technology inventories. The researcher collaborates with farmers to plan and design trials. Farmers are free to adapt the experiments to their needs. Farmers are involved in the evaluation of the experiments. Trials continue over a number of years to test the adaptation of the technology in the long term. When the trials have proven to be successful adaptations to local areas, they can be extended to other farmers in the area through the normal extension channels. Farmer participation allows the close monitoring of the performance of technology under farmer management, the integration of technology into the farming system, and it encourages the adoption of successful innovation.

62 HATCH, J. K. (1981) **A Bolivian traditional practices project.** Rural Development Services, New York. 16p. ODI Loc. 1730.
Describes an innovative technique of data collection in which Indian communities in Bolivia are encouraged to record their farming knowledge and day to day practices. The records will eventually be compiled into a textbook (See **151**). As a consequence of this project other research activities have grown in which farmers are beginning to evaluate and test new technologies.
The project of data collection was so successful that other farmers wanted to participate in the project. Women in the project area demanded to be included and a woman's component was founded. The project also led to improved farm management skills, learnt through such activities as making inventories of crop and livestock. The project is now aiming to extend these skills and provide facilities for training farmers to experiment and evaluate new technologies for their suitability for adaptation to the local farming system. Research focuses on the powerlessness of the peasants. This is seen as related to their lack of knowledge and skills to lobby for available resources. Research will focus on providing training skills, to enable farmers to plan their resource needs, to prepare inventories of their needs, to monitor the distribution of resources within the community, to administer timely requests for resources, to keep records, and to evaluate the appropriateness of the technology.

63 HEINRICH, G. M.; GRAY, R.; MASIKARA, S.; WORMAN, F. (1987) **Farmers, extension and research link-up for agricultural development.** Agricultural Technology Improvement Project, Gaborone, Botswana. 3p. ODI Loc. 1786.
Describes work with groups of farmers at 3 villages in Tutume District as part of the ATIP. The purpose of group activity is to identify researchable problems, extend known technologies and develop improved farming systems. Farmers conduct their own trials and report back to the group at monthly meetings attended by research and extension staff.

64 HILDEBRAND, P. E. (1985) **On-farm research: Organised community adaptation, learning and diffusion for efficient agricultural technical innovation.** *FSSP Newsletter,* 3(4):6-9. ODI Loc. 1790.
The importance of the cumulative process of community learning and adaptation of technology through observation and experience is emphasised. On-farm trials conducted over a wide range of environments and diffusion domains facilitate

information flow and increase farmers' opportunities for direct experience of new technologies.

65 HORTON, D. (1986) **Farming systems research: Twelve lessons from the Mantaro Valley Project.** *Agricultural Administration,* 23(2):93-107. ODI Loc. 1641.
From 1977-80 the International Potato Center (CIP) conducted a series of interdisciplinary farm level surveys and experiments in the Mantaro Valley of highland Peru. The main lessons and problems arising out of research are summarised.
The twelve main points examined in the paper are: 1) the influences of environmental conditions and farm type on farmers' production methods and technological requirements; 2) the eagerness of small farmers to improve their methods; 3) recommended technological packages had many deficiencies; 4) problems could be solved through farmer application of existing technical knowledge; 5) most technologies needed to be tailored to the specific needs of farmers; 6) scientific specialisation presented many barriers to interdisciplinary research; 7) the project was costly in terms of operating capital; 8) the project's most valuable result was an institutional innovation, not an impact on potato production; 9) informal surveys and simple on-farm trials had many advantages over formal methods; 10) anthropologists played many useful roles; 11) many on-farm research results could be extrapolated to other areas; 12) on-farm research was useful for identifying and solving problems within existing systems devised by farmers, but not for designing entirely new systems. The main payoffs in on-farm research lie in strengthening existing institutional capacity to diagnose and solve problems within existing systems, and not in attempting to design and disseminate new cropping and farming systems.

66 HORTON, D.; PRAIN, D. (1987) **CIP's experience with farmer participation in on-farm research.** Paper presented to the "Taller para America Latina sobre Investigacion de Frijol en Campos de Agricultores", CIAT, Cali, Colombia, 16-25 February 1987. 11p. ODI Loc. 1789.
Outlines how farmer participatory research has strengthened on farm research in five areas.
It has led to: (i) improved scientists' understanding of farmers' conditions and their simulation in OFT; (ii) improved agronomic and socioeconomic analysis; (iii) enabled farmers to assess results for themselves; (iv) facilitated the diffusion of information; (v) improved linkages between the formal and informal R & D systems.

67 HORTON, D. (1987) **On-farm research: Experiences with potatoes.** English version of paper presented at "Taller para America Latina sobre Investigacion de Frijol en Campos de Agricultores", CIAT, Cali Colombia, February 16-25, 1987. 13p. ODI Loc. 1640.
The wide range of contexts in which on-farm research (OFR) can be utilised are described, with reference to research into potatoes conducted in the Mantaro Valley of Peru by the International Potato Center (CIP). OFR is often confined to trials which seek to establish recommendations for farm inputs under farm conditions. OFR is usually integrated into a top down transfer of technology model in which OFR seeks to improve the technology of the farmer and stimulate demand for the new technology by educating the farmer. Andean farmers have seldom followed these recommendations. In contrast, in the Mantaro Valley Project, an alternative model of OFR was developed. This worked within an interdisciplinary framework and sought to use OFR to diagnose agronomic problems, develop new technology, promote institutional innovations and evaluate the results of programmes. OFR is incorporated in a farmer-back-to-farmer model in which farmers are involved as active participants in research and their practices

form a base on which to develop innovations. In the Mantaro Valley interdisciplinary on-farm research provided solutions to the failure of pre-existing potato seed programmes. It suggested that the problems lay with the European seed potato certification model which was inappropriate to the conditions of the Andes. Research is now being conducted to improve traditional informal seed certification systems. Methodological developments in recent on-farm research are discussed. Advances have been made in incorporating farmers' own technology in OFR and increasing dialogue with farmers. Less progress has been made in institutionalising OFR into national R&D programmes.

68 HORTON, D. E. (1984) **Social scientists in agricultural research: Lessons from the Mantaro Valley Research Project, Peru.** IDRC-219e. IDRC, Ottawa. 65p. ODI Loc. 1788.
Describes 1977-80 CIP farm-level interdisciplinary research in the Mantaro Valley, Peru.
The objectives were to sensitise CIP and national programme scientists to the value of on farm research (OFR), to develop and field-test procedures for OFR with potatoes and to train national programme staff in the use of OFR techniques. Stresses that OFR requires flexible and adequate resources, that informal surveys have many potential advantages and that many results can be extrapolated. Examples stress the innovativeness of small farmers, and their willingness to adapt recommended practices to their circumstances.

69 ILEIA (1989) **Participatory technology development.** ILEIA, Leusden. 67p. ODI Loc. 1848.
Summarises the main findings of the ILEIA workshop on "operational approaches to participatory technology development in sustainable agriculture", 11-12 April 1988, and charts directions for future research.
Papers present the main conceptions which underlie participatory technology development and sustainable agriculture, which includes ecological considerations of farming systems, the value of local knowledge systems in developing technology, and the importance of the participation of the local people in the development of technology. Concepts in participatory research and various stages involved in research are defined. Methodologies are described, including methods for making inventories of indigenous knowledge, for testing of technology and for developing networks for the dissemination of information. Several matrices which compare and contrast various research methods are presented. A strategy for developing participatory research is outlined, based on starting with the people's priorities, on documenting research methods, producing training manuals and developing procedures for training. Comprehensive abstracts of all the papers presented at the workshop are included.

70 INTERNATIONAL POTATO CENTER (1985) **The role of anthropology in developing improved technologies.** *Appropriate Technology,* 11(4):11-13. ODI Loc. 1634.
The role of the anthropologist in International Potato Center (CIP)projects in Peru is examined and several illustrations given of their input into programmes. The primary role of the anthropologist has been that of a link between technical scientists and farmers. The anthropologist presents the technical scientists with the views of the farmers, an holistic analysis of the farmers' decision-making process, and analyses the implication of these factors for the design and adoption of technology. The anthropologists are integrated into interdisciplinary teams and involved in a systematic research cycle. The technology is tested on-farm with economic and social evaluations of its applicability. The technology is then modified in the light of these findings, with suggestions from anthropologists and discussions between social and technical scientists. The modified technology is

again evaluated on -farm. Both anthropologists and technical scientists share a participatory research framework in which the technology generated has to correspond to farmers' objectives.

71 JIGGINS, J. (1981) **Farming systems research: New name for old habits or the key to increasing farm productivity? An exploration with reference to sub-Saharan Africa.** Ford Foundation, Nairobi. 16p. ODI Loc. 1856.
It is argued that if agricultural science and technology are to make impact in sub-Saharan Africa, a farming systems approach to research and extension, with emphasis on methodological and training aspects, needs to be taken seriously. Some of the major criticisms of FSR - poor "customer" identification, lack of relevance, limited awareness of holistic context of productive activities are noted. The relevance of internal household structures for explaining poverty and productivity is emphasised. Micro-research methods with strong farmer participation are advocated. Such methodologies need elaboration.

72 JIGGINS, J. (1984) **Farming systems research: Do any of the FSR models offer a positive capacity for addressing women's agricultural needs?** CGIAR Impact Assessment Study, Working paper no.4, Washington. 15p. ODI Loc. 1737.
Examines concepts and methods in Farming Systems Research which might be biased against women. It is argued that FSR is biased towards on-farm activities and does not account for problems in food processing and preparation, activities in which women play a central role. Little emphasis is given to minor crops in which women are often predominant. Investigation of farming strategies and methods, and evaluation of the consequences of innovations and research planning, are rarely looked at from the perspective of women farmers. The focus on the household is questioned in the light of intra-household distributions of labour. Problems of assigning women's domestic labour to extra-economic categories are also addressed. Bias against women needs to be examined at all stages of research from the targeting of a population, to surveys, on-farm testing and farmer evaluations.

73 JIGGINS, J. (1986) **Gender related impact and the work of IARCs. Study paper no.17.** CGIAR, World Bank, Washington. 95p. ODI Loc. 1791.
Jiggins identifies a major theoretical weakness in the study of gender issues - the absence of a conceptual framework linking gender relations of production and reproduction between the public and domestic domains. She finds gender bias perpetuated and institutionalised at IARCs - through training programmes, sources of information and survey procedure and participant selection for on-farm trials.

74 JIGGINS, J.; ENGEL, P.; LIGHTFOOT, C. (1988) **Matrices on different steps of participative technology development.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 25p. ODI Loc. 1608.
Research methods are tabulated according to different indices, including details of the author, operational variables, types of participatory methods involved, the level of participation, the institutional framework in which research is conducted and the aims of research. Explanatory notes accompany some of the matrices.

75 JONES, S.; FLEMING, E.; HARDAKER, B. (1986) **Perspectives on agricultural research: A potential role for economics and social science.** South Pacific Smallholder Project, Working Notes no.10. Ministry of Agriculture. Solomon Island. 9p. ODI Loc. 1794.
The project aims to develop and extend technologies for food and cash crops for smallholders, through on-farm research, based on indigenous technical knowledge.

On-farm work should also identify problems to be researched in the formal research system. Meetings, on-farm trials, extended visits and discussions are held with cooperating farmers in five villages in different agroecological zones. Transfer of local varieties between agroecologically similar areas in different parts of the country is promoted.

76 KEAN, S. A. (1988) **Developing a partnership between farmers and scientists: The example of Zambia's adaptive research planning team.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.12. *Experimental Agriculture,* 24(3):289-299. ODI Loc. 1606.
Describes the operations of the Adaptive Research Planning Team of Luapula Province (ARPT-LP): one of nine provincial teams set up by the Ministry of Agriculture in Zambia to involve small scale farmers in the technology generation process. The ARPT-LP has followed the broad approach to Farming Systems Research (FSR) advocated by CIMMYT, establishing on-farm trials. Experience has shown that it is not only important to involve the farmers in the research process. It is also important to explain the objectives of FSR and to involve the farmers in the monitoring and evaluation of the research system. Through emphasising greater farmer participation, involving extension agents and local chiefs, improving communication skills, the ARTP has been able to develop a partnership with the farmers.

77 KLEENE, P. (1984) **Experimental approaches in southern Mali.** P. Matlon; R. Cantrell; D. King & M. Benoit-Cattin: *Coming Full Circle.* IDRC, Ottawa. pp.131-138. ODI Loc. 1801.
Describes three different experimental approaches which have been developed by the Rural Farming-Systems Research Division (DRSPR) in on-farm testing in seven villages in southern Mali.
The three approaches are agronomic testing, demonstration and farm counselling. In agronomic testing both researcher-managed and farmer-managed tests are conducted. Researcher-managed trials focus on particular technical problems and farmers are remunerated for land and services. The objectives of farmer managed trials is to find technical solutions to farmers' socioeconomic and productive constraints. Farmers participate in designing and evaluating the tests, but inputs are provided for farmers. Researchers measure and evaluate the trials. In farm demonstrations controls are not introduced and researchers do not measure the effects of the performance of new technology. The technologies are already tried and tested methods. The main aim is to raise the farmers awareness of the possibilities of the technology and to increase farmer participation. The success of the technology is measured by farmers' adoption. Farmers are involved more in testing and evaluating than in the design phase. Farm counselling involves training farmers to participate in the various stages of research and to train farmers in methods of data collection, design of trials and evaluation. Group methods of farmers discussing problems are an important forum. To develop counselling methods researchers need to work closely with other regional development agencies. The DRSPR developed its farm counselling programme in collaboration with an adult literacy programme in the area. Problems of farmer perceptions of the different incentives which accompany different types of testing (from monetary remuneration to no provision for inputs) are addressed.

78 KNIPSCHEER, H. C.; SURADISASTRA K. (1986) **Farmer participation in**

Indonesian livestock farming systems by regular research field hearings (RRFH) *Agricultural Administration,* 22:205-216. ODI Loc. 1795.
Methods for developing livestock-oriented farming systems research with collaboration between farmers and researchers are discussed.
Factors such as mobility of animals and their long life-cycle, lack of synchronisation of experimental units, non-divisibility and size of units, multiplicity of outputs and high statistical variability constrain livestock-oriented FSR and aggravate the problems of on-farm livestock research. During the testing stage of FSR, Regular Research Field Hearings (RRFH) can improve communication between scientists and farmers, thereby increasing mutual understanding and willingness to collaborate in evaluating potential technologies, and test results. Attendance records and discussion-participation rates indicate that RRFH have been successful in Indonesian small-ruminant research.

79 KNIPSCHEER, H. C. (1986) **Definition of research problems. ICARDA, Research methodology for livestock on-farm trials. Proceedings of a workshop held at Aleppo, Syria, 15-18 March 1985.** pp.277-281. ODI Loc. 1654.
Research procedures and problems which occur in the design and implementation of on-farm trials are examined. On-farm trials are examined in relation to the nature of problems perception, the type of trial conducted and the definition of target groups. Four types of problems perception are identified and the merits and disadvantages of each discussed. These include: farmers' perception of their needs, government perceptions, scientists perceptions, and research which seeks to identify unknown problems through establishing on-farm trials. Three types of trials are discussed, including researcher-managed trials, farmer managed trials and promotional or demonstration trials. Target groups need to be defined to develop appropriate technology. Sometimes target groups are defined after a technology and the target group is then defined to fit the technology. Failure to define a target group may lead to waste of resources. Within target groups, prime actors, such as men or women, need to be defined. The design of trials should proceed from a clear definition of the research problem, the target population and the purposes and objectives of research. Procedures for conducting on-farm trials vary from trial to trial according to different objectives and problem definition.

80 KUJAWA, M. A.; OXLEY, J. (1986) **Methodologies for conducting on-farm livestock research with mixed farming systems.** *Selected proceedings of Kansas State University's Farming Systems Research Symposium,* (eds) C. B. Flora and M. Tomecek. pp.532-549. ODI Loc. 1824.
This review of on-farm livestock research (OFLR) suggests that, because OFLR is relatively recent and methodologies are still developing, no clear set of guidelines exists. With such diversity and variation found at each research site, success in farming systems research will depend on an ability to modify experimental procedures to "fit" the research environment and objectives. For example, much OFLR is oriented towards determining statistically significant differences between treatments. If much variation exists between experimental units, tests for significance are best left to on-station research. OFLR should be limited to farmer-managed trials using their criteria. Publications of OFLR should include explicit descriptions of all methodologies used. Additional study into the effectiveness of research methods is needed.

81 LEV, L.; CAMPBELL, D. J. (1987) **The temporal dimension in farming research: The importance of maintaining flexibility under conditions of uncertainty.** *Journal of Rural Studies,* 3(2):123-132. ODI Loc. 1601.
Addresses the need for FSR to develop a perspective which takes account of long-term trends and the interaction between different factors over time, to

determine viable sets of choices from the outlook of small-scale farmers. This is illustrated with a case study from the Mandara Mountains in Cameroon.
Research tends to focus on a short, limited seasonal period. Emphasis on a longer period is necessary to develop a framework in which farmers can be seen as devising strategies in which immediate benefits are traded off for security and/or opportunity to maximise profitability over the long-term. Farmers have developed systems which allow them to maintain production within an environment in which climatic and economic conditions may vary from year to year. The relative capacity of the system to respond or conform to changing or new circumstances is defined as its flexibility. Three categories of flexibility are defined: 1) incremental learning, represents changes in the ability of the farmer to evaluate future sets of choices; 2) range of options, refers to the sets of choice which are available in future periods; 3) resiliency, is a measure of the ability of the system to survive intact from period to period. The concept of flexibility attempts to capture the dynamics of the effect of a current decision on future options to understand the complexity of farmers' decision-making process.

82 LIGHTFOOT, C. (1984) **On farm experiments in farming systems research.** *Proceedings of Kansas State University's 1983 Farming Systems Research Symposium*, ed. Flora, C, K.S.U.,Kansas. pp.558-563. ODI Loc. 1798.
It is argued that the conventional on-farm experimental methods employed by many Farming Systems Research programmes are inappropriate to FSR because they lack its essential components. It is suggested that on-farm experimental methods which do have the unique characteristics of FSR should be developed. Conventional on-farm experimentation and the unique characteristics of Farming Systems Research are first described. Examples from FSR programmes in Southern Africa show how conventional on-farm experimentation does not satisfy the special requirements of FSR. An experimental method based on the super-imposition of treatments on to existing crops is then described which shows how on-farm experimental methods can incorporate the characteristics of FSR.

83 LIGHTFOOT, C. (1986) **A report on the principles and practices of FSR used by the Farming Systems Development Project. Report no.42. Eastern Visayas Development Project, Baybay, Leyte.** 62p. ODI Loc. 1799.
The report, arising from FSR training lectures, outlines the development of concepts to guide field researchers. Research is an iterative process: involving description by farmers of their problems and classification systems, diagnosis of cause and effect, design of solutions involving farmers, on-farm testing which must be understood and implemented by farmers and assessed by them, and extension. The object is to build farmers' capability to judge and adapt technologies.

84 LIGHTFOOT, C. (1986) **Conducting on farm research in FSR: Making a good idea work. Networking Papers no.13.** Farming Systems Support Project, Gainesville, Florida. 20p. ODI Loc. 1663.
FSR methodologies are examined and alternative research procedures are suggested which incorporate the experimental knowledge and traditions of farmers. Existing FSR methodologies tend to be borrowed from research stations. They have not been designed to enhance the speed of adoption of new technologies, but are concerned with understanding physical and biological parameters. More appropriate techniques are needed for diagnosing, testing and designing experiments and for implementing on-farm trials. Methods which rely on developing farmer participation are advocated. In the diagnostic stage a balance needs to be achieved between the depth of long-term surveys and the prompt results of Rapid Rural Appraisal methods. Results from Rapid Rural Appraisals may provide too general a level of information. A method which combines the

sondeo with more detailed analysis is suggested. People outside the research team with on-farm research experience should be involved in the survey. The sondeo should incorporate farmer participation. After the report has been drafted in the field, results should be discussed with farmers and farmers' opinions solicited on the validity of the findings. The sondeo should be followed up by detailed surveys which focus on a small number of variables, key areas and in-depth investigation of farmers' perceptions and experiences. In the testing and design stages farmers should be involved in all stages of research including the screening of technologies. It may be useful to provide farmers with a wide range of possible solutions and allow them to choose the most appropriate. It is advocated that on-farm research should be implemented by the farmer and should be overlaid and superimposed on farmers' plots and cropping systems. Simple experimental methods are needed which enable the farmers to implement the trials. This has advantages of increasing the range of farmer interest and involvement in research. It frees the researchers to carry out other tasks and enables a larger number of trials to be conducted. It is also important to solicit farmer reactions to innovations as feedback for generating research priorities.

85 LY, T; BALINA, F. T. EDS (1988) **Report on a workshop on operational methods of conducting participatory research in the upland areas of Philippines.** *Proceedings of Philippine Upland Research and Extension Training Workshop*, June 19-24, 1988. ATI-NTC-Visayas-VISCA, Baybay, Leyte, Philippines. 198p.
The major aim of this workshop, attended by ten projects working in the upland areas of the Philippines, was to exchange experiences of participatory methods, and identify procedures for carrying out research.
The various operational stages each of the ten projects follow are systematically recounted in detail. This includes documentation of diagnostic methods, experiment design, testing, evaluation, and dissemination. These stages of research are described according to the purpose of the method, the main sources from which information is collected, the scope of use for the method, a step by step description of the activities carried out in implementing the method, types of farmer participation used, the extent to which the method increases the farmers capacity, and the financial, management and training requirements for implementation of the method.

86 MATLON, P. (1984) **Technology evaluation: Five case studies from West Africa.** P. Matlon; R. Cantrell; D. King & M. Benoit-Cattin: *Coming Full Circle.* IDRC, Ottawa. pp.95-118. ODI Loc. 1801.
Defines six different types of on-farm trials, their different uses and gives five examples of their operational contexts in ICRISAT programmes in West Africa.
On-farm trials are categorised as researcher-managed and farmer managed. Three different levels of trials are differentiated in each category, depending on the nature of participation of farmers in the trial. At the lowest level of participation farmers contribute labour and land. At the highest level of participation all inputs are purchased and managed by farmers; the farmers are free to experiment and modify the tests. Different levels of farmer participation are appropriate to the different aims of trials. Where researchers intend to verify the agronomic performance of technology in a wide range of agroecological conditions than are prevalent on research stations, and to determine responses to treatment with precise measurements and controls, researcher-managed trials are most appropriate. Where the aims of the trials are to determine the ways in which farmers incorporate new technology, adoption patterns and the impact of technology, a high level of farmer management of tests is desirable. Evaluation criteria used to determine the effects of on-farm trials are discussed. The tests do not form a final screening of technologies but are an integral part of an on-going process to determine the various factors which successful technologies

must take into account. Specific examples are given of how on-farm testing programmes have developed in accordance with specific objectives. Farmer and researcher evaluations of tests generated further hypotheses for the modification of the technology. Problems of the high variance of on-farm testing in relation to differences in social and environmental condition, bias in farmers' perceptions of new technology, and the training of staff capable of supervising trials are discussed.

87 MATLON, P.; CANTRELL, R.; KING, D.; BENOIT-CATTIN, H. EDS (1984) **Coming Full Circle: Farmers' Participation in the Development of Technology.** IDRC-189e. IDRC, Ottawa. 176p. ODI Loc. 1803.
These proceedings of a meeting of natural and social scientists at Ouagadougou, 20-25 September 1983, conclude that farmers can assist in the analysis of their farming systems, act a source of technology, modify and evaluate OFT.
Increased farmer participation can be achieved if researchers respect and make use of farmers' knowledge, ensure they understand the purpose of experiments and allow farmers to modify experiments. The promotion of farmer-to-farmer interaction is endorsed, as is a cross-fertilisation of ideas between NGOs (who have participatory experience) and other research institutions (which, at the time of writing, did not).

88 MATTESON, P. C.; ALTIERI, M. A.; GAGN, W. C. (1984) **Modification of small farmer practices for better pest management.** *Annual Review of Entomology,* 29:383-402. ODI Loc. 1553.
Advocates an holistic approach to the development of pest management strategies for small-scale farmers, rooted in an ecological and socio-economic analysis which takes local farming knowledge into consideration.
Traditional crop protection practices represent a rich resource for scientists seeking to create pest management strategies which are adapted to the conditions of small tropical farms. Several traditional pest management strategies are described which utilise polycultures, divisionary species to repel pests, promote natural control agents, and which maintain a diversity of food crop varieties which confer partial resistance to pest attack. Not all these traditional pest management strategies are suitable for modification to modern times. But traditional cropping systems form a useful basis for further developing technologies which are adapted to the farmers' needs and resources. Research must start on the farmers' fields and augment and build upon existing practices. Innovation must proceed from a consideration of farmers' environmental and socio-economic conditions. Extension strategies need to be attuned to the farmers' system and methods for training farmers from diverse backgrounds in pest management need to be developed.

89 MAXWELL, S. (1986) **Farming systems research: Hitting a moving target.** *World Development,* 14(1):65-77. ODI Loc. 1806.
It is argued that although targeting is a key element in farming systems research, neither the concepts nor the procedures take sufficient account of the fact that farming systems are in constant flux: the "target" is not static, but continuously on the move. A framework is presented for the analysis of change and the practical implications for farming systems research are analysed.

90 MCDOWELL, R. E. (1984) **Systems approach to livestock production.** Cornell International Animal Science Mimeo. no.7, Department of Animal Science, Cornell University, Ithaca, N.Y. 11p. ODI Loc. 1807.
Guidelines are given for developing a strategy for planning and implementation of change-oriented livestock programmes. Working within a farming systems context, the stages of research are discussed and problems of institutional, cultural and economic constraints are raised.

91 NOREM, R. H. (1986) **Basic interviewing and note taking skills for the informal survey in FSR & E.** *Selected proceedings of Kansas State University's 1986 Farming Systems Research Symposium*, (eds.) Flora, C. B. and Tomecek, M. 56-57. ODI Loc. 1824.
Discusses the skills necessary for successful scientist/farmer interaction: techniques for establishing rapport, "attending" behaviour, question structure, observation, providing positive feedback, sharing experience and focusing discussions, and problems of recording and interpreting information.

92 OAKLEY, P. (1987) **State or process, means or end? The concept of participation in rural development.** *Ideas (RRDC Bulletin)*, March 1987:3-9. ODI Loc. 1669.
Examines different interpretations, definitions, political philosophies and methods involved in the conception of participation.
Participation is seen as a qualitative process developed in relation to perceptions and ideological paradigms. Different conceptions of participation include:
- collaboration, in which rural people take part in projects in which decisions have already been taken.
- community development, in which rural communities play an active role in developing a specific goal-orientated project for which they have some responsibility for management.
- organisation, in which people are encouraged to develop local organisation to improve their involvement in decision-making.
- empowerment, in which the aim is to develop rural people's ability to be self-reliant and independent. Participation can be conceived as a means of achieving a development objective or as an end in itself, a form of empowerment.
It is argued that the over-riding obstacles to the development of meaningful participation of rural peoples are socio-political structures, which have a long history of marginalising and oppressing the rural poor.

93 OKALI, C.; KNIPSCHEER, H. C. (1985) **Small ruminant production in mixed farming systems: Case studies in research design.** Paper for FSSP 5th Annual Research and Extension Symposium, Kansas State University, October 1985. 25p. ODI Loc. 1811.
Examines methods for developing participatory on-farm research for small ruminant production, in the light of the experiences of two programmes, in Nigeria and Indonesia.
Research methodology in on-farm trials remains generally limited to the conventional approach which hinges on control of variables, replication, numerical measurement and focus on the technology itself. Transferring this on-station research methodology to farmers' fields has led to the exclusion of the farmers from the design process and reduced them to labourers. But family farmers being small have the capacity to incorporate innovations into their system in a variety of ways which scientists are unable to predict. The variability in farm populations and the size of their enterprise require alternative sampling and evaluation procedures. This is particularly relevant for secondary farming systems enterprises such as small ruminants.

94 OKALI C.; SUMBERG J. E. (1986) **Examining divergent strategies in farming systems research.** *Agricultural Administration*, 22:233-253. ODI Loc. 1672.
The experiences of small interdisciplinary research teams working in micro-localities in the ILCA Humid Zone Programme in southern Nigeria are outlined. Farming systems research procedures are examined and the relevance of location-specific research for regional development is evaluated.
Various baseline surveys completed by the team are described and assessed. Attention is drawn to the value of focused surveys whose results can be quickly

incorporated into research programmes. The team's gradual integration of village and experimental station work is documented in detail and used to emphasise the advantage of early involvement of farmers in the development of an experimental model. Operational procedures are described to demonstrate that direct farmer involvement encourages flexible views of technology on the part of researchers. This flexibility is essential if technology is to be developed for wider geographical areas. The paper concludes by examining problems which emerge when various experiments within a programme are taking place in different locations. It is argued that a temporal perspective of different stages of research at various localities needs to be developed. Location-specific work has a legitimate role to play in research for regional development.

95 OLATUNDE, A. O. (1988) **Farmer participation in research and extension in Nigeria.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 6p. ODI Loc. 1608.

Describes the framework of participatory research carried out by the Agricultural Development Projects (ADP) in Nigeria.

Participatory research is based upon the use of diagnostic surveys, which seek to prioritise agricultural problems with farmers. Indigenous and researcher developed technologies are screened for suitability and tested in on-farm trials with the collaboration of farmers. The adoption of technology by farmers is constantly monitored and evaluated. Technology which is unacceptable to farmers is rejected. Participatory research is conducted in a framework of close liaison between researchers, extension agents and farmers. Research involves organised extension training and joint visits of researchers and extension agents to farms in which problems are discussed with farmers. Researchers and extension managers meet monthly. The implementation of participatory methods has led to improved relations between farmers, extensionists and researchers. Extension activities have become more practically orientated. Farmers express greater satisfaction and confidence with the process of technological innovation and experience improved yields. The paper examines constraints on the development of farmer participatory methods, including lack of research cooperation between various departments and institutions, inadequate extension facilities, lack of appropriate technology, and the capital costs of providing comprehensive services.

96 PATANOTHAI, A. (1985) **Transfer of existing technology, another approach in farming systems research: A case of peanut after rice in northeast Thailand.** Khon Kaen University, Thailand. Paper also presented at the International Conference on multiple cropping systems, Jiangsu Academy of Agricultural Sciences, Nanjing, Jiansu, People's Republic of China, October 9-12, 1985. 8p. ODI Loc. 1724.

The transfer of farmer adapted technology can be a useful approach in generating appropriate technologies for farmers in marginal environments. Methods involved in a project, developed by the Cropping Systems Project of Khon Kaen University in northeast Thailand, to transfer sequential cropping of peanuts after rice to other areas are described.

Researchers studied farmers' cropping patterns in Surin province. Farmers had successfully established cropping of peanuts after rice in rainfed conditions. Attempts by researchers to innovate successful double cropping systems without irrigation were not successful. Farmers' land preparation and cultural methods were studied. Farmers' techniques were found to be superior to researcher recommended techniques. The cropping pattern was however dependent upon high soil moisture in the dry season. Farmer participatory trials were established in other areas with high moisture during the dry season, using the Surin cropping system. After four years of testing the cropping system trials were extended into

new areas. The study of farmers' cropping systems and experiments with farmer participation are useful in helping researchers to understand the conditions under which a technology can work and farmers' decision-making perspectives. They can also provide guidance for future research direction.

97 POLLAK, S. P. (1987) **Rice, genetics, harvesting techniques and social relations: The Javanese experience.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 39p. ODI Loc. 1609.
Examines the impact of modern rice varieties on social relations and the employment of labour in rice harvesting in Java
It is argued that the agronomic characteristics of introduced rice varieties developed by IRRI led to changes in rice harvesting techniques. This reduced both the skill and intensity of labour required for harvesting and resulted in increasing unemployment and depression of wages among rice labourers. It also displaced female labour. The new varieties have resulted in the redistribution of incomes from poorer farmers and labourers to rich landowners. Increasing total food production has not produced increasing food for the most needy. In introducing new varieties IRRA did not take into consideration the effects of the agronomic characteristics of rice on labour usage and vertical social relations. Experimental rice breeding programs were divorced from the complexity and economic realities of rural farming conditions. It is argued that research institutions should promote socially appropriate technology and develop sensitivity to the social impact of technology when applied to particular contexts.

98 REIJ, C. (1987) **Soil and water conservation in sub-Saharan Africa: The need for a bottom up approach.** n.a. 19p. ODI Loc. 1739.
The main issues in soil and water conservation in sub-Saharan Africa are pinpointed and some principles are identified for the development of a participatory conservation methodology.
The main types of conservation techniques are examined including indigenous soil and water conservation methods. Problems in the scale of intervention, the labour requirements for conservation work, the use of incentives, long and short term benefits, training and extension and land tenure are examined. The main elements identified for participatory conservation programmes include the selection of simple but efficient technologies, which make use of indigenous conservation techniques, which are popular among the people and involve them in experimentation. Intervention should be on a small scale and focus on the farmers' fields rather than on large-scale communal activities. This can be later followed up by a village conservation plan elaborated by the local people, as they gain experience of conservation projects. Conservation methods which minimise labour inputs for maintenance of the conservation works should be given priority. A substantial training programme should be provided for local people. A support programme should be organised. This should minimise material incentives. Oxfam conservation programmes are examined.

99 RHOADES, R. E.; BOOTH R. H. (1981) **An interdisciplinary team research approach to the design and transfer of post-harvest technology.** CIP. "Social science at the International Potato Centre: Report of the second social science planning conference". Lima Peru. pp.66-79. ODI Loc. 1673.
An interdisciplinary team approach which actively involves the farmer as a partner in research is described, in the light of research into post-harvest storage technique for potato cultivation, in the Peruvian Andes.
The work of the social scientists complement the biological scientist in understanding village socio-economic structure. The research paradigm is based on the farmer-back-to-farmer paradigm (see **100**). In addition to outlining this

paradigm the relationship between biological scientists and social scientist is discussed. It is argued that for meaningful interdisciplinary research scientists and social scientists must work together at all stages of research, with the active participation of the farmer. The role of anthropologists, as a link between the technical scientist and farmers, in developing an holistic understanding of farmers decision-making is discussed.

100 RHOADES, R. E.; BOOTH, R. H. (1982) **Farmer-back-to-farmer: A model for generating acceptable agricultural technology.** *Agricultural Administration,* 11:127-137. ODI Loc. 1819.
It is argued that the increasing emphasis on interdisciplinary research since the 197Os has in practice produced multidisciplinary teams of scientists with independent roles rather than interdisciplinary teams.
Farmer-back-to-farmer involves farmers, social scientists and natural scientists working together to reach a common diagnosis of the problem and to design, conduct, evaluate and disseminate research. The research process is iterative and interactive; conflict may be necessary if perspectives do not easily coincide. The example is quoted of potato storage in Peru: Scientists working on-station at CIP had considered storage losses to be the most important post-harvest problem, whereas the anthropologist, based on his research in villages, suggested that farmers did not perceive small, shrivelled or spoiled potatoes as waste since they were all useful (as animal feed, dried potatoes, etc). The main problem was eventually redefined as one of excessive sprouting of new potato varieties in traditional dark room storage. Scientists identified storage in diffused light as a means of inhibiting sprouting. After working on the design of seed stores on the research station they began to consider the changes in seed storage methods which would be compatible with farmers' needs and conditions. Farmers' evaluation of the research outcome was positive, and they adapted the technology to suit local materials and storage facilities.

101 RHOADES, R. E. (1982) **Understanding small farmers: Sociocultural perspectives on experimental farm trials.** Social science department training document 1982-3. CIP, Lima, Peru. 9p. ODI Loc. 1682.
Outlines seven procedures to improve interaction between researchers and farmers in on-farm trials and help researchers understand the farmers' viewpoint. The procedures are based on incorporating a farmer perspective into on-farm trials, in which technological solutions are modified to the farmers' needs. This includes ensuring the problems researchers are investigating are seen as important by the farmer; that farmers understand the role of trials; that farmers have access to the inputs required for the new technology; that the technology can be incorporated into the existing conditions and activities within the farming system; that the technology is relevant to farmers' economic strategies; that the technology is compatible with the local culture; and that the technology meets the long-term needs and strategies of the farmers.

102 RHOADES, R. E. (1983) **Tecnicista versus campesinista: Praxis and theory of farmer involvement in agricultural research. A post-harvest example from the Andes.** Paper presented at Workshop on Farmers' Participation in the development and evaluation of Agricultural Technology. ICRISAT/SAFGRAD/IRAT. Ougadougou, 20-24 September 1983. 24p. ODI Loc. 1675.
Two different approaches to agricultural research are contrasted in the light of the development of post-harvest technologies in a CIP programme in the Andes and Philippines, and an alternative research strategy is suggested.
In the tecnicista approach science and local research-extension organisations are seen as part of a superior technology which will generate solutions on-station and transfer them to farmers. In contrast the campesinista approach views farmers

technology as rational systems of adaptation, based on local knowledge, which cannot be improved upon by scientists. Manifestations of both approaches in CIP research are discussed. It is argued that farmers are dissatisfied with the research efforts of both approaches. The campesinista approach leads to endless research into indigenous farming practices without providing any concrete solutions to problems. However farmers have many serious technical problems for which there are no local solutions. The tecnicista approach on the other hand provides farmers with technologies which are not adapted to local conditions and farmers' needs. An alternative paradigm is suggested: the farmer-back-to-farmer paradigm (see 100), based on interdisciplinary research to understand farmers' decision- making, in which the farmer participates as a partner. The aim of research is to develop technology as a set of principles which farmers can adapt to their cultural circumstances and needs. It is crucial to understand how farmers adapt and modify technology, and to incorporate farmer evaluation into the adaptation of technology. Technology also needs to be monitored to determine its effects on the well-being of farmers and society.

103 RHOADES, R. E. (1984) **Breaking new ground: Agricultural anthropology.** CIP, Lima. 84p. ODI Loc. 1815.
Departing from a review of the historical role of anthropologists as defenders of traditional agriculture against modernisation, this book argues that the insights they could have provided would have assisted sensitive agricultural development, and outlines the positive experience of CIP in drawing together natural and social scientists at the earliest stages of research projects.

104 RHOADES, R. E. (1986) **Using anthropology in improving food production problems and prospects.** *Agricultural Administration,* 22:57-78. ODI Loc. 1818.
Explores the role of social anthropology in agricultural research and development. For the first time since the 1940s, social anthropologists are showing an interest in applying their profession to problems related to basic food production and utilisation. Similarly, development agencies and agricultural research organisations are more receptive to anthropology than at any point in history. Potentials, limitations and misconceptions of using anthropology for improving basic food production are discussed. A case study of agricultural anthropology at CIP is described.

105 RHOADES, R. E.; HORTON, D. E.; BOOTH, R. H. (1987) **Anthropologist, biological scientist and economist: The three musketeers or three stooges of farming systems research?** International Potato Center (CIP) Lima. 40p. ODI Loc. 1679.
The experiences of an anthropologist, economist and biological scientist in interdisciplinary research are recounted and lessons are drawn.
It is argued that research can only become interdisciplinary when the contrasting disciplines focus on understanding farm conditions, and generating technology to solve the farmers' problems. Constructive conflict between members of the research team from different disciplines plays an important part in developing an interdisciplinary approach. Conflicts between researchers challenge the assumptions and jargon which become rooted in the pursuit of disciplinary research, and allow new fields of research to be developed within each of the disciplines. This enables more holistic research methodologies to develop.

106 RICHARDS, P. (1987) **On the south side of the Garden of Eden: Creativity and**

innovation in sub-Saharan Africa. Dept. of Anthropology, University College, London. 11p. ODI Loc. 1823.
Contrasts European-based models of agricultural development with African ones, in which important interactions are found between farmers' R & D and local processes of natural change, particularly among the classic forms of shifting agriculture. Interactions between choice of crops (which imply specific uses of land and labour) and household demands for food and cash are particularly important. African ecological experience has important lessons from history for the design of current policies.

107 RICHARDS, P. (1987) **Agriculture as a performance.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 9p. ODI Loc. 1607.
Argues that social action or performance theories and ethnographic methods need to be integrated into research among resource poor farmers. These methods focus on the farmers as social actors, and investigate the ways in which farmers achieve results and their perception of their agricultural performance.
It is argued that plan and performance are often confused. Farmers' intercropping patterns are cited as an example. These are not the results of a predetermined plan based on an indigenous technical knowledge and ecological adaptation. Cropping patterns arise from the specific circumstances a farmer faced in a particular year and vary with the fortunes of the farmer. Indigenous knowledge is seen as a patch and mend theory, a self-help therapy of trial and error, through which farmers put their mistakes behind them. It has different objectives from scientific analysis and should not be appraised by the standards of science. Agriculture is seen as a performance in which the farmers judge their success by their action on the farm, and the extent to which these further their social projects. Social factors and skills, such as the ability to raise large labour teams, frequently determine the success of farming ventures. These factors cannot be divorced from technical aspects of agriculture. Researchers need to understand the contexts in which farmers carry out their agricultural performance. Without a conception of social action, dialogue between researchers and farmers may result in cultural mis-communication. The knowledge the researcher seeks of farmers' practices and the social actions the farmers engage in may be based on completely different conceptions.

108 ROCHELEAU, D. E. M. (1987) **The user perspective and the agroforestry research and action agenda.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 29p. ODI Loc. 1607.
The complexity of agroforestry is discussed. It is argued that an integrated framework is necessary where technical research is complemented by research into the social and economic environment of the users of the technology. A participatory method is advocated in which the perspective of the users of the technology is incorporated. Several problems facing agroforestry research are discussed. Forest lands are used by multiple users and research needs to cater for the needs of all these groups. The rural landscape which the people have shaped over time, embodies their land tenure systems, land use and settlement patterns, economic specialisation, etc., must be understood to make sense of the present landscape, and design systems which blend into the existing landscape. Since many forest management systems are relatively unknown to formal science, the indigenous knowledge of the users needs to be researched to facilitate the development of technologies and the selection of germplasm. A research agenda is drawn up, consisting of four different types of research activities, integrated into a framework in which the users of the technology participate in the design of the technology. These are: research into indigenous knowledge; research into

improving agroforestry prototype technologies, to make them flexible and able to cater for divergent needs; adaptive research, which adjusts prototype systems to local conditions; action research, which investigates and creates appropriate social, economic and policy mechanisms for the adoption of the technology. Problems of developing interdisciplinary research teams are also addressed.

109 SANGHI, N. K. (1987) **Participation of farmers as co-research worker: Some case studies on dryland agriculture.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 28p. ODI Loc. 1607.
Examines experiences of on-farm research in India, and suggests research methodologies to involve farmers in the development and modification of technology in dryland areas.
Over 70% of new technologies developed for dryland areas have failed to take root among farmers and remain confined to research stations. Further intensification of extension services has not shown great promise in improving the situation. An increasing number of scientists have recognised that there is a need to modify research methodology in order to make it more sensitive to local conditions. "Interphase projects" have been introduced, which seek to test research station recommendations under farm conditions, and utilise feedback from the farmers, to refine technology to existing socio-economic conditions. The experiences of these projects are discussed and suggestions are made for the further improvement of research methodologies. Specific attention is given to the building of mechanisms in research which minimise subjective issues, such as the temptation of scientists to be seen to achieve success, and farmers' attraction towards adapting new technology uncritically, so as to gain subsidies. Specific suggestions are made which provide the farmer with a greater control in choosing the research priorities. A few case studies dealing with dryland agriculture are discussed. These support the viewpoint that the farmers in India have the aptitude and capabilities to participate as co-research workers with the scientists in modifying technologies to suit their situation.

110 SCHEUEMEIER, U. (1988) **Approach development: A contribution to participatory development of technology based on practical experiences of Tinau Watershed Project, Nepal.** Landwirtschaftliche Beratungszentrale, Lindau, Switzerland. 39p. ODI Loc. 1738.
Outlines the principles on which Approach Development (AD), a participatory research method, developed in the Tinau Watershed Project, in the hills of western Nepal is based.
AD sees the farming families as the focus of research and attempts to put their knowledge of their own situation to use. Rural people are assisted in identifying and formulating their problems and in finding their own solution. AD attempts to strengthen farmers' innovations and to help focus their vast unreflected knowledge of the farming system. The researcher acts as a facilitator, encouraging the farmers to develop a hypothesis which is tested by experiments. The farmers then reflect on the results of the experiments which are discussed with researchers. This leads to further hypothesis and testing, generating a continuous research cycle of adaptation, centred on the farmers.

111 SEULZER, R. (1987) **Working with the people: A model of stimulating self-sustaining development processes.** Glauner, H. J. & Suelzer, R. eds *Landliche entwicklung auf der basis von Farming Systems Research (FSR) und partizipationsmodellen.* Der Tropenlandwirt Beiheft nr. 32, University of Kassel, Faculty of International Agriculture, Witzenhausen, West Germany. pp.64-85. ODI Loc. 1728.

Describes the development of participatory workshops in the Tinau Watershed Project in Nepal. Farmers evaluate the extent to which development projects fit in with their individual and communal situations. Village workshops originally aimed at involving farming communities in decision-making and planning of research activities. Experience showed that this was an impracticable objective, since under the present government run extension system farmers are unable to participate in defining and designing research agendas. Gradually a form of village workshop evolved in which people are encouraged to understand development as a function of their own resources, their environment, and outside assistance. This helps develop the capacity for local initiative. The workshop encourages participants to describe their personal circumstances and provides a conceptual framework for understanding individual problems in relationship to development. Participants are encouraged to formulate village development plans and make requests from authorities for development assistance. The workshops act as a forum in which villagers are encouraged to think holistically of their development needs. They enable programmes to be explained and clarified, and allow extension staff to explain their objectives. They also provide insights into the socio-economic structure of the village for researchers. Operational stages in the organisation of a workshop lasting 10 days are described. Techniques include brainstorming, group discussion, visual aids, films, field tours, and training in practical planning and resource monitoring.

112 SÍMARAKS, S.; KHAMMEANG, T. (1988) **Transfer of technology, extension and evaluation used by Farming Systems Research Project, Khon Kaen University.** Farming Systems Research Project, Khon Kaen University. 18p. ODI Loc. 1722.
Describes the methodological concepts and tools used in the Farming Systems Research Project at Khon Kaen University in Thailand, to facilitate the adoption of appropriate technology by farmers.
Rainfed farmers in northeast Thailand have not readily adopted technologies introduced by researchers. Major limiting factors have been the inappropriateness of both the technology and the methods of technological transfer. Farmers have however modified researcher-generated technology to suit their environment. The development of appropriate technology and extension methods is dependent upon a careful and holistic analysis of the farming system. Research has attempted to develop methods of farmer-to-farmer extension. Technical innovations and adaptations of farmers are investigated, analysed, and transferred to other areas with similar environments. Experienced farmers are encouraged to act as agents for the dissemination of technology and researchers act as facilitators. On-farm trials have been developed as means of adapting, demonstrating and disseminating technologies. Diagnostic methods used in research include Rapid Rural Appraisal (RRA) and Agroecosystems Analysis. Techniques used in testing and disseminating technologies include group workshops, farm visits, field days and farmer training. The design of trials is being constantly modified, to encourage greater farmer participation, and the dissemination of innovations among farmers by themselves. Attempts are also being made to develop techniques of participatory evaluation, which allows the complexity of farmers' criteria and long-term trends to be taken into consideration. Although technologies may be rapidly adopted by farmers, this is not necessarily a success, for in subsequent years the technologies may be rejected as a result of unforseen consequences.

113 SINGH, K. P. (1986) **Study of agro-climatic and socio-economic conditions and**

introduction of relevant technology in rice farming system of plateau region of Bihar, India. Paper for Socio-Economic Field Survey in Rice Farming System workshop, New Delhi, L.N. Mishra, Institute of Economic Development and Social Change, Patna, 1986. 9p. ODI Loc. 1826.
Exploratory and diagnostic surveys indicated the inapplicability of research station findings to farmers' conditions. Contact with farmers identified a series of research questions, emphasising: security over high yield; low capital and power requirements; and local involvement. Three women development officers are working in village women's centres and with women farmers.

114 SIRIWARDENA, S. S. A. L. (1988) **Problems of application of new input technology where there is no farmer participation: Some experiences in the Mahaweli settlement scheme, Sri Lanka.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 13. ODI Loc. 1608.
Describes research into the problems and constraints facing farmers in the Mahaweli settlement scheme in Sri Lanka and the development of an action programme based on the formation of farmer credit associations, as a solution.
The Mahaweli irrigation scheme has resulted in increasing pauperisation of the majority of farmers. 80% of farmers have failed to move beyond a subsistence level in the last six years. New technologies have not been integrated into the complex traditional farming system. This has resulted in a large number of farmers abandoning the new technologies and relying on low cost inputs which protect them against economic and social insecurity. An action programme was developed which addressed the issue of financial insecurity and encouraged farmers to form an investment and development fund. The concept of an action fund arose out of participatory research with farmers, and analysis of family budgets. Relationships between farmers and the bureaucrats of the irrigation project is examined. It is suggested that the project tends to favour the richer farmers. Several constraints which have arisen out of destruction of traditional aspects of the farming system are discussed. This includes: the eradication of medicinal herbs; the loss of water buffalo; the expenses of fertilisers and new hybrids in comparison to traditional methods of manuring, composting and green manuring; and the inegalitarian distribution of water under the project.

115 SOLLOWS, J. (n.d.) **On-farm research: Some thoughts.** CUSO, Ubon, Thailand. 5p. ODI Loc. 1696.
Methodological principles for on-farm trials are outlined in the light of the experiences of research into rice-fish farming in Thailand.
It is argued that on-farm trials should be simple and flexible. They should be farmer managed to approximate farm conditions. Researchers should concentrate on monitoring and measuring the experiments and refrain from imposing controls on the trials. Trials need to accommodate the wide variations in farm conditions. With simple trial design, a large number of farmers can participate and inter-farm variations be noted. On-farm research must be flexible in thought and implementation, to allow accommodation of unforseen factors. On-farm activities need to be synchronised with the activities of the farmer and not developed for the convenience of the researcher. The most important aspect of on-farm research is seen as building the relationship with the farmer. Collaborative research must utilise the talents of the farmer and build upon appropriate indigenous knowledge.

116 STEINER, K. G. (1987) **On-farm experimentation handbook for rural**

development projects: guidelines for the development of ecological and socio-economic sound extension messages for small farmers. GTZ, Eschborn, West Germany. 307p.

A handbook for rural development projects, which outlines methods for conducting farmer participatory research ,from the implementation of exploratory surveys to the evaluation of on-farm trials, and dissemination of technology.

The aims of research are defined as the generation of new technology which fits into existing farming systems and helps overcome constraints; the provision of feedback from field to research stations and policy makers; and the generation of recommendations which farmers are able to adapt. Farmer participation in research is important in reducing the time and cost in adapting technology, and in strengthening farmers' abilities to carry out their own experiments. Farmers need to play an active part in identifying, designing, testing and evaluating technologies which fit into their environment. The different stages of research are defined as selection of target areas, diagnosis, design, testing, evaluation and extension. Methods of conducting participatory research in all these stages are discussed including selection criteria, recommendation domains, types of interview and designing trials. In relation to on-farm trials three different types of trials are identified:

(1) technician-managed technician-executed. This is associated with exploratory trials in which hypothesis are being tested. The farmers' main input is use of their fields.
(2) Technician-managed farmer-executed. This is associated with modifying technology to fit the farming conditions and constraints, in which the farmer follows guidelines given by the technician.
(3) Farmer-managed, farmer-executed. Farmers are free to modify recommendations as they see fit. This is usually associated with testing the adaptability of technology to the farmers' needs, and successful innovations become extension recommendations.

The type of farmer participation incorporated into trials is seen as a reflection of the aims and objectives of the trials, and the different stages in testing technology. Examples of operational procedures are given from GTZ projects in Zambia and Benin.

117 SUTHERLAND, A. J. (1987) **The benefits of adopting a community approach to farmer selection.** Adaptive Research and Planning Team, Research Branch, Ministry of Agriculture and Water Development, Lusaka, Zambia. 14p. ODI Loc. 1701.

Examines problems and biases involved in selection of farmers for participation in research activities, in the light of the experiences of the Adaptive Research Planning Team in Zambia.

It is argued that vigorous methods of farmer selection can be introduced with comparatively little investment in time, which improves the quality of on-farm research. A community approach is advocated based on the systematic identification of social units within a specific area. Local communities are selected as target areas. A quick survey is carried out into the local community structure from which target households can be selected, according to criteria of farm size and household typology. Households need to be defined in terms of household composition and links with other houses. Households within the community will be selected to take part in trials in relation to variations within the community household structure, and in order to understand the significance of relationships between different households on production strategies. Households can also be matched with the nature of specific farm trials. The community approach also has benefits in reducing the distance between individual trials, allowing more effective agronomic monitoring, improving interaction between researchers and farmers, and ensuring that a cross-section of the community participate in experiments.

118 TAYLOR-POWELL, E.; VON KAUFMANN, R. (1986) **Producer participation in livestock systems research: Experience with on-farm research among settled Fulani agro-pastoralists in Central Nigeria.** *Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium*, (eds) C.B. Flora and M. Tomecek. pp. 257-276. ODI Loc. 1824.
The project aimed to improve dry season livestock nutrition through forage production and feeding. Various problems were encountered: inappropriate research techniques, data collection difficulties, participant selection and cooperation, bias due to incentives, limited experience and resources of participants. Through a programme of on-farm trials the researchers' objectives were brought in line with producers' priorities and feeding strategies.

119 TRIPP, R. (1982) **Data collection, site selection and farmer participation in on-farm experimentation.** Working Paper 82/1. CIMMYT, Mexico. 25p. ODI Loc. 1831.
Improved site selection and farmer/scientist communication during on-farm research can increase the availability and reliability of agronomic and socio-economic data. Information on farmers' circumstances should be sought throughout the experimental period, to refine the recommendation domains.
Explanation of the purpose and practices of the trial and the roles of farmers and scientists, farmers' assistance in site selection and their observations and opinions of trial performance, are vital. Trials are planned with extension agents, taking into account logistical constraints and farmers' interests and experience.

120 TRIPP, R. (1985) **Anthropology and on-farm research.** *Human Organisation*, 44(2):114-124. ODI Loc. 1832.
Seeks to establish how anthropologists eschewing conventional long-term "participant-observation" techniques, can contribute in the short-term to the enhanced relevance of technology development by identifying on-farm research techniques that can be utilised by researchers having little social science background.
Diagnostic surveys need to be sharply focused in order to avoid excessive data collection. Anthropological techniques in the conduct of trials can help to understand farmers' criteria of evaluating trial outcome. The INIAP experience in Ecuador is quoted as a successful example of anthropological involvement in OFR: experimental variables were kept to a low number, and farmers permitted substantial freedom in manipulation of the technologies introduced.

121 TRIPP, R. (1989) **Farmer participation in agricultural research: New directions or old problems?** *Discussion Paper 256.* IDS,University of Sussex, Brighton. 35p. ODI Loc. 1849.
It is argued that the concept of farmer participation is too vague to constitute a new paradigm for adaptive research or to signal a new direction for agricultural research.
Methodological innovations in participatory research and techniques of utilising indigenous knowledge and farmer experimentation add to the repertoire of techniques available to adaptive research. They complement techniques developed by conventional research, but do not replace them. Farmer participation does not constitute a research methodology or a research strategy. It cannot solve the problems of carrying out research in diverse environments, of creating more sustainable agricultural systems, or of developing research policies which improve the interface between national research programmes and resource-poor farmers. These problems are dependent upon improving research strategies. The methodological innovations of farmer participation make a contribution to research,

but are no substitute for improvements in research organisation, planning and management.

122 VAN DER KAMP, J.; SCHUTHOF, P. (1988) **Methods of participative technological development.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 56p. ODI Loc. 1608.
Defines and discusses the major concepts involved in participatory research. Nine distinct methods of carrying out participatory research are compared and contrasted.
Participation, indigenous technical knowledge, farmer-scientist/extensionist interaction and sustainable agriculture are defined as the major elements involved in participatory research, and discussed. The nine different methods are defined and contrasted according to a specific structure which examines the major characteristics, the research objectives, stages in research procedure, skills required in research, the experiences of groups utilising the approach, limitations and risks involved in research. A bibliography of major theoretical writings on the approach and list of resource persons utilising the method are provided. The methods include the farmer-back-to-farmer approach (Rhoades); on-farm varietal trials (Ashby); adaptive experimental trials (Box); the "maieutic" method in which the researcher acts a catalyst to bring about locally inspired transformation (GRAAP); farmer's innovatory workshops and panels (BARI, Gupta); farmer groups (ATIP); farmer-first approach (Lightfoot); people centred agricultural improvement (World Neighbors); and innovatory participation in programme design (KWTP).

123 VAN DER KAMP, J.; SCHUTHOF, P. (1988) **Techniques, tools and concepts. Workshop "Operational approaches for participative technology development in sustainable agriculture"**, ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.
Defines fifty terms used in participatory research, with sources listing their origins. Terms include concepts, research techniques and research materials.

124 VAN DER KAMP, J.; SCHUTHOF, P. (1988) **Selected literature. Workshop "Operational approaches for participative technology development in sustainable agriculture"**, ILEIA, Leusden, 11-12 April, 1988. 26p. ODI Loc. 1608.
Contains bibliographies on farmer participatory research, agro-ecosystems analysis, establishing networks and building links, on inventories of existing technology, transformation of technology, embedding transformed technology, and overall strategies for technology development.

125 VERBECK, K.; SANOGO, B.; KLEENE, P. (1986) **The farming systems research/development/extension linkage: Experience from Mali: Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium**, (eds) C.B. Flora and M. Tomecek. p.152-164. ODI Loc. 1824.
Following "participative" village surveys, the FSR programme selected ten villages for research work with non-users of animal traction. Draught oxen, tools, training and inputs were provided for farmers fulfilling credit requirements and tillage improvement and agronomic advice was available for the non-qualifiers. Questions of the potential divisiveness of the approach, the levels of community involvement and researcher intervention in support services are raised.

126 VERHAGEN, K. (1987) **Concepts and content of a trainer's manual for the**

training of field workers. Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.
Notes on the contents of a manual which will be produced by ILO and CEBEMO for the training of fieldworkers. The objectives of the manual is to raise the competence and commitment of fieldworkers to promote rural organisation and cooperative action, for self-reliant development.
Training involves a deepening of fieldworkers' awareness of the process of marginalisation of rural people and of actions to counter this. Training emphasises the ability to organise small scale village-based groups and the development of networks of cooperating village groups.

127 VERMA, G. P. (1987) **Farmers' participation in watershed management: Experience of Indo-UK Dryfarming Project, Indore (M.P.), India.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 14p. ODI Loc. 1607.
Narrates the experiences of a water and land management project in winning over the confidence of farmers after initial hostility, in Indore in India.
The aim of the project was to introduce appropriate land and water management practices, to enable farmers to grow two crops a year instead of one. Attempts to introduce new techniques were not well received by the farmers, who had bad experiences of a recent soil conservation project and were not convinced of the value of the project. Successes were eventually achieved by changing the priorities in research, building the farmers' confidence by developing programs in which they were interested. The project developed crop and animal inoculation demonstrations in the farmers' fields. Successes in higher yield production resulted in changes in attitudes of the farmers towards the project. Gradually, aspects of the land and water management project were introduced, in accord with the interests of the farmers.

128 VIERICH, H. (1984) **Accommodation or participation? Communication problems.** Matlon, P. et al (eds) *Coming Full Circle.* pp.17-26. ODI Loc. 1803.
Sources of confusion in communications result from people's failure to distmguish between stereotyped and spontaneous behaviour; group and individual behaviour; ideal and real behaviour; and folk vs. scientific descriptions and analyses. The paper focuses on how these affect communication between farmers and researchers and between researchers from different disciplines.

129 VUKASIN, H. L. (1987) **Case example of people's participation in development and the management of natural resources.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 17p. ODI Loc. 1608.
This paper documents and describes instances of small-scale development projects throughout the world in which the local people have participated.
Different participative methods are described. The examples illustrate that success can be achieved by involving the local people in decision-making activities of projects. Addresses of contact people for the various projects are supplied.

130 WATERS-BAYER, A.; BAYER, W. (1988) **Zero-station livestock systems research: Pastoralist-scientist cooperation in technology development. Workshop "Operational approaches for participative technology development in sustainable agriculture",** ILEIA, Leusden, 11-12 April, 1988. 21p. ODI Loc. 1608.
Describes the evolution of participatory methods in the Subhumid Zone (SHZ) Programme, an ILCA project among Fulani agropastoralists in northern Nigeria. The SHZ programme began in 1978 with a nebulous concept of livestock systems research and without a clear methodology of participatory R&D. However the

decision not to establish a research centre brought the project scientists into close contact with the pastoralists. In on-farm trials the participating Fulani pastoralists showed an unwillingness to accept scientists' recommendations without question. They experimented with scientists' technological packages and made their own modifications. This eventually resulted in the development of collaborative research in which researchers' investigations into the Fulani pastoral system revealed its rationale. From a new perspective, which took the practices and objectives of the pastoralists into account, the researchers were able to develop a forage technology which suited the Fulani. This led to the creation of a more stable and efficient animal and crop production system. The project also came to identify constraints in the policies of government agencies and research institutions towards the pastoralists' flexible system of resource utilisation. These policies sought to ban the movement of livestock over large areas and prevent the incorporation of cropping systems into pasture land. The project worked to propagate ideas of the efficiency of the agropastoral system among researchers and policy makers. Some problems with the research framework of the project are identified, including communication problems, lack of promotion of Fulani self-reliant organisation, and a lack of orientation towards resource-poor farmers.

131 WATERS-BAYER, A. (1989) **Trials by scientists and farmers: Opportunities for cooperation in ecofarming research.** In Kotcshi, J. (ed): *Ecofarming practices for tropical smallholdings: Research and development in technical co-operation.* GTZ, Eschborn, West Germany. p.161-183. ODI Loc. 1741.
Different types of interaction between researchers and farmers are related to different types of on-farm trials. It is argued that different types of trials have different objectives and complement each other as part of a total research process. Five different types of trials are defined: (1) scientists' on-station trials; (2) scientists' on-farm trials: (3) farmers' on-farm trials (researcher designed and managed); (4) farmers' participatory trials (farmer managed); (5) farmers' informal trials (which scientists only observe). It is argued that interaction between all these types of trials plays an important part in the research process. Observation of farmers' informal trials enables scientists to identify problems and potential solutions and prepares them to develop participatory trials with farmers. Collaboration in participatory trials enables researchers to understand the constraints and strategies of farmers. It also strengthens the informal experimental skills of the farmers. Scientist managed on-farm trials enables researchers to make complex measurements, and to experiment with adapting new technology which differs substantially from local farming practices. Having developed the technology, scientists are then in a position to determine the conditions under which it can be successfully applied. On-station research seeks to investigate problems identified in the field and results are returned to the field for testing. Examples of projects utilising different forms of trials in research are given from Tanzania, Burkina Faso, Colombia, Rwanda and Benin. Collaboration between researchers and farmers in a framework which regards the farmers as rational and innovative, and utilises the tools and methods developed by the two experimenting traditions can greatly improve the impact of research.

132 WORMAN, F.; MERAFE, Y.; NORMAN, D. (1988) **Increasing farmer participation in FSR/E: The ATIP experience with farmer testing groups.** Paper presented at Philippines upland research and extension and training workshop, VISCA, Baybay, Leyte, June 19-24. Department of Agricultural Research. Agricultural Technical Improvement Society (ATIP) 16p. ODI Loc. 1651.
Describes the approach of the Agricultural Technical Improvement Project (ATIP) to farmer participatory research in Botswana. Informal farmer groups have been utilised as a method of integrating farmer participation into research and extension, to facilitate Farmer-Managed Farmer-Implemented (FMFI) trials.

ATIP has experimented with researcher-managed and extension-managed groups for testing of new technology. Researcher-managed groups examine a wide range of options tested by a mixed group of volunteer farmers. In contrast, extension-managed trials conduct local testing for adaptability on a limited number of recommended technologies and on one or two technologies in the final stages of farmer testing. The operational approaches and procedures of both types of groups are examined. Researcher-managed groups have operated since 1985. In three years farmers collaborating in the experiment have expanded from 12 to 130 organised in three groups. Extension managed groups have operated since 1987. Advantages in the use of farmer groups include the ability to expand the numbers of technologies being tested. Larger numbers of farmers are able to participate in experiments. Communications between farmers, extensionists and researchers have improved, and earlier feedback on the development of technologies is generated. Extensionists are also integrated into the process of technology design and modification. Joint farmer/extension/researcher field days have been very successful: the interaction between members of different farmer groups have generated new discussions which have provided extensionists and researchers with additional information. Some problems in working with farmer groups include the limitations this experience provides for the collection of statistical data for analysis; the logistics of determining the optimum size of farmer groups, incorporating new members and maintaining the continuity provided by old members; lack of viable technical solutions to some of the problems raised by farmers for solution. Farmer reaction to the farmer testing groups has been positive and research has successfully focused on farmer identified problems.

133 YOUMANS, D. (1986) **Modes of farmer participation in FSR/E: FSRP Project, Lesotho.** *Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium*, (eds) C.B. Flora and M. Tomecek. p.249-256. ODI Loc. 1824.
The different participatory roles played by farmers in a project in Lesotho are defined. This includes: "collaborators", testing enterprise and activity mixes; "cooperators", participating in field trials; village committees as "learners" in an extension education programme; farmers as "adopters" of technology; and farmers as "teachers" of other farmers through diffusion networks. Farmers act as "evaluators"; their perceptions of change are the principal criteria of project effectiveness.

2 INDIGENOUS KNOWLEDGE SYSTEMS

134 ALTIERI, M. A.; ANDERSON M. K. (1986) **An ecological basis for the Third World.** *American Journal for Alternative Agriculture,* 11(1):30-38. ODI Loc. 1644.
A strategy for small farm development in the Third World is suggested, emphasising preservation of traditional farming systems while maintaining biological and genetic diversity. Basing agricultural development on indigenous knowledge, technology and social organisation can provide important guidelines for the design of cropping systems that allow low-income farmers to produce subsistence and cash crops with minimal dependence on external inputs. Alternative agricultural systems based on indigenous farming systems which achieve moderate to high levels of productivity by manipulating resources that are internal to the farm can be developed. The resulting systems are more sustainable and economical, thus increasing the equity of the system. Several rural development programmes in Third World countries, especially in Latin America, that incorporate these agroecological principles are discussed. In contrast to approaches that have been transferred from the USA, without necessarily being suited to the circumstances of small farmers, and which require the purchase of

expensive inputs, these programs include sustainability, stability, and equity as goals, along with increased production. Rural development strategies based on peasant systems that are biologically and economically stable are proving to be a viable alternative for a great portion of the impoverished rural population in the Third World.

135 BAKER, D. (1979) **Appropriate methodology: An example using a traditional African board game to measure farmers' attitudes and environmental images.** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):37-40. ODI Loc. 1855.

A more conscious effort to develop "appropriate" research methodologies in developing countries is advocated to provide alternatives to conventional social science methods. It is essential for researchers to use elicitation techniques which are appropriate to the cultural context and tailored to the abilities and requirements of the local community. In this way interactions between interested parties can be structured so that the initiative in answering questions rests with local people. Field trials at Oluwatedo, Oyo State, Nigeria, adapted the Ayo board to elicit farmers' perceptions of weeds and pests. Ayo is the Yoruba version of a popular African game which has its roots in the ancient Egyptian game of Mancala. The Ayo board format was used in conjunction with repertory grid methodology to focus discussion on farming problems. Numerous scenarios can be devised using this format to generate genuine dialogue between farmers and outside research workers. [Modified editorial abstract].

136 BARROW, E. G. C. (1987) **Extension and learning examples from the Pokot and Turkana, pastoralists in Kenya.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 26p. ODI Loc. 1607.

Discusses ways in which the traditional knowledge and land management systems of pastoralists in the dry areas of northern Kenya can be incorporated into development and extension programs, as a form of participatory research. Two projects are described to illustrate this theme. In the range management project with the Pokot in Baringo District, traditional grazing management techniques are used as a basis to develop participatory research and identify constraints. The traditional range management system is based on the assignment of different land to dry season grazing, wet season grazing, and reserve land for times of stress. Extension agents, working on suggestions of the Pokot, introduced methods of resowing reserve grazing areas with grass. This idea was taken up by the pastoralists. In the social forestry project in Turkana, the intimate knowledge the Turkana have developed of woody resources, is used as the basis for developing forest conservation programs and devising extension programs. Extension agents are trained in a participatory method based on Turkana knowledge of woodland management, which also seeks to make the Turkana aware of newly emergent problems facing woody resources. Extension methodologies are examined and the attitudes of donor and implementing agencies discussed. It is argued that people will only incorporate innovations when they are fully aware of the implications for their environment. Traditional knowledge systems form a basis for heightening awareness of environmental issues. Diagrams are presented to illustrate the relationship between land use systems, technical inputs and extension.

137 BARROW, E. G. C. (1987) **Value of traditional knowledge in present day soil conservation practice, the example of the Pokot and Turkana.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 15p. ODI Loc. 1610.

Advocates the use of traditional knowledge and land use systems as a base on which to conserve and manage soil and vegetation, among Pokot and Turkana pastoralists, in the dry areas of northern Kenya. Traditional land management systems have important soil and water conservation benefits. Both the Pokot and Turkana have developed rotational grazing patterns for cattle. Stock are grazed in the lower plains during the wet season and gradually moved into the wetter, higher hills in the dry season. Substantial areas of land are also reserved for grazing in times of stress. This strategy helps to optimise fodder production, conserve the herb layer of vegetation, and protect reserved areas for future use. Conservation measures are extended to the protection of trees and bushes, which protects the soil from erosion. The Turkana also manage and conserve areas of woodland along the main watercourses. With modern pressures, including urbanisation, the growth of livestock populations resulting from improved medical and feeding facilities, traditional grazing patterns are threatened and eroded. Technologies developed for high potential land is being replicated in the dry areas. It is argued that traditional technologies such as the flexibility of livestock grazing and herding, and the organisation of traditional livestock associations may be used as the base on which to build programs to conserve and protect the environment. Modern facilities, such as health, extension and educational services can be orientated around the traditional grazing system.

138 BARROW, E. G. C. (1988) **Trees, people and the dry lands: The role of local knowledge.** Turkana Rural Development Programme. 27p. ODI Loc. 1853.
The richness of indigenous knowledge systems is illustrated with reference to silvo-pastoralists: the Pokot and Turkana in Kenya and the Sukuma In Tanzania. Strategies for incorporating indigenous knowledge into extension programmes are discussed. The ethnobotanical knowledge of the peoples is shown to be ecologically sound and well integrated into the land management system. However there are constraints within traditional systems. The integration of indigenous knowledge into extension programmes forms a basis for overcoming these constraints. It forms the basis on which to build upon the existing skills of the people and to introduce appropriate innovations which they understand. It provides an avenue through which people can gain a better understanding of technology and management practices and enables constraints in existing systems to be identified. In the Turkana Rural Development Programme the traditional knowledge of the silvo-pastoralists has formed the basis for developing extension training. Investigation of indigenous knowledge revealed that a serious constraint lay in the lack of regeneration of young trees in wooded areas and possible solutions were then suggested to the communities, which utilised their existing knowledge. This has heightened awareness about environmental issues and led to increasing tree planting activities.

139 BASANT, R.; SUBRAHMANIAN, K.K.: (1987) **Diffusion of agromechanical technology in a backward region.** Sardar Patel Institute of Economic and Social Research, Ahmedebad. 218p. ODI Loc. 1545.
Examines the problems posed in the development of agro-mechanical technology for less developed areas in the Gujarat. The interaction between R&D personnel and local artisans with farmers is contrasted. The small size of farms and diversity of local social and environmental conditions, and the fragmentation of market demand for implements creates problems for the development of modern large-scale manufacture of farm implements. Problems in production are compounded by poor distribution and servicing channels. The perspectives and needs of farmers vary from district to district, and are not understood by R&D personnel. The process of adaptation and modification of technology needs to take place at a decentralised level, in response to specific agro-climatic conditions. An interface needs to be built between local farmers and researchers, in which the agro-

mechanical needs of the people are assessed. Despite these problems, local artisans have played an important role in innovating agricultural implements and making adaptive changes to them in response to the needs of farmers. Strengthening of local artisan-based fabrication networks and providing linkages for formal R&D to support the growth of local technological capabilities can form a basis for speeding up the process of technology diffusion.

140 BASANT, R. (1988) **Indigenous knowledge and technology diffusion: A case study of agro-mechanical technology in Gujarat, India.** Working paper no.16. Gujarat Institute of Area Planning, Ahmedabad. 31p. ODI Loc. R-GUJ WP16.
Examines different conceptual models of the process of technological innovation and diffusion. The importance of indigenous knowledge in the process of adaptation and improvement is discussed with reference to the diffusion of mechanical technology among resource-poor and more developed areas of the Gujarat. Sociological, geographical, economic and economic history perspectives on innovation and diffusion are examined. It is argued that most approaches to technological diffusion utilise a framework which excludes the role of indigenous knowledge. The adaptation of technology in the Gujarat has developed in the context of interaction between the information networks of farmers and artisans. Modifications to technology occur on the basis of farmers' perceptions of their needs and the available technological capability of the local artisans. Adaptation of technology is an important part of diffusion, in which the knowledge of the artisan and the farmer are utilised to fit and modify the technology to local conditions. In the process of diffusion of technology over a wide variety of local environments, local knowledge is an important element in ensuring the adaptation of the technology to specific conditions. This knowledge is vital to the process of innovation and can be utilised by science to develop a methodology and techniques for diffusion of technology at the local level.

141 BASANT, R. (1988) **Agro-mechanical technology in a developed area: A study of diffusion.** Gujarat, Institute of Area Planning, Ahmedebad, India. 222p. ODI Loc. R GUJ.
Examines the process of technical innovation and diffusion of mechanical technology in six relatively developed villages in the Kheda district of the Gujarat. A survey was carried out among a random sample of cultivators and all the artisans resident in the six villages. Ownership patterns, prices and sources of agricultural implements are described. The main constraints in technological diffusion are identified. The interaction between artisans and cultivators in the process of innovation discussed. Case studies are presented of the development and diffusion of three bullock-drawn implements, which have become popular. Results of the survey indicate that artisans acquire an intimate knowledge of local environmental conditions to design and create implements. Artisans make special efforts to gather feedback from farmers, through trials, demonstrations and field trips. Artisans build up information networks, collecting data on farmers' technical problems related to machinery, and on the farming system. Artisans are also constantly adapting technology to local conditions. Adaptation and improvement is an important element through which technology is diffused. Given the large variation in environmental conditions the process of technical adaptation manifests itself as a local level activity. It is suggested that to create an effective process of technological dissemination, formal science needs to strengthen the informal local artisan-based mechanical technology networks. A useful starting point to develop research capabilities is an assessment of adaptation and innovation at the local level. This will help identify the important elements in technological change and diffusion, local technical capabilities, and help determine possible training programmes to upgrade local skills.

142 BASANT, R. (1988) **The diffusion of agro-mechanical technology for Indian rainfed farming: An exploratory analysis.** Discussion Paper no.24. Agricultural Administration (Research & Extension) Network. ODI, London. 34p.
Reporting on a survey of four villages in a resource-poor district of Gujarat, India, this paper analyses changes recently introduced to non -mechanised equipment in response to biological innovations such as the introduction of new crop varieties. The process of innovation is shown to be much more complex than commonly suggested by those studies which classify it into "adoption" or "non-adoption". Innovation frequently involves modification of existing equipment, and partial adoption of new technologies. It is a process characterised by trial and error and by frequent interaction between farmer and local artisan. Innovation and diffusion commonly occur as distinct stages in respect of technologies developed on-station. With agro-mechanical technologies developed at village level, by contrast, these "stages" overlap considerably, diffusion being characterised by near-spontaneous spread of the technologies, with repeated further modification to suit new circumstances. Implicit in the paper's conclusions is that attempts to develop small-scale non-motorised technology must be highly participatory if they are to succeed. Furthermore, by contrast with many other technology types, a distinct group of "local experts" other than farmers themselves can be identified: local artisans have an important role to play and need to be drawn equally strongly into the participatory process.

143 BELL, M. (1979) **The exploitation of indigenous knowledge, and the indigenous exploitation of knowledge: Whose use of what for what?** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):44-50. ODI Loc. 1855.
It is argued that concern with indigenous technical knowledge (ITK) must go beyond interest in extracting fragments of it to make marginal improvements to existing types of R and D project. The main issue must be the extent to which local groups are involved in, and have influence upon, the technical changes which affect their lives. The range of potential uses for ITK is far wider than those involved in R and D. The central concern must be with augmenting the whole spectrum of indigenous capabilities to create, transform and use technical knowledge. This implies there must be a shift from the dominant approach to rural technical change which merely seeks to introduce into rural society techniques conceived and developed outside it. Rather, one must seek the technological development of rural society which enables it more effectively to pursue and control its own path of technical change. [Editorial abstract]

144 BELSHAW, D. (1979) **Taking indigenous technology seriously: The case of inter-cropping techniques in East Africa.** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):24-27. ODI Loc. 1855.
Examines research strategies in relationship to intercropping in East Africa and the potential impacts of basing research on existing cropping systems. Although intercropping is widely practised in rainfed tropical small-scale agriculture, agricultural researchers have not systematically explored the rationale for it and have rarely attempted to improve it. Instead, they have concentrated on planting crops in pure stands and extension advice has been to replace IC with pure stands. This has reduced the impact of research and extension activities. A review of East African experience from the 1930s considers reasons for the research concentration on pure stand planting and reveals two phases when formal experiments on IC were carried out. Despite generally favourable results, neither of these led to including IC in extension advice to farmers. IC can contribute to one or more of five common objectives of small-scale farmers, but the standard design of agronomic experiments at best takes account of only one of these, so that benefits are underestimated and erroneous policy conclusions drawn. The paper advocates

multidisciplinary research for small-scale agriculture and active participation by farmers themselves. [Modified editorial abstract]

145 BROKENSHA, D.; WARREN, D.; WERNER, O. EDS. (1980) **Indigenous knowledge systems and development.** University Press of America, Lanham. 459p. ODI Loc. 1852. A collection of articles which examine the relationship between indigenous knowledge systems (IKS) and development. The emphasis is on the relevance of IKS for development planners, the need to develop a strategy for development from below. Recognition of IKS can improve the interface between national research systems and local communities, and encourage community awareness and self-reliance. Methods of eliciting IKS are and the possibilities of training agricultural extension agents in IKS are discussed.

146 BROKENSHA, D. (1986) **Local Management systems and sustainability.** Department of Anthropology, University of California. Paper presented for the Annual Meeting of Society for Economic Anthropology, April 3-4, 1986. 27p. ODI Loc. 1619.
Issues and problems in implementing development strategies based on local agricultural management, local knowledge systems and the participation of local people are discussed. It is argued that indigenous knowledge of agriculture is a valuable resource and an essential foundation for the development of sustainable agricultural systems. Participatory methods are important in linking local interests with national objectives, and need to involve local people in decision making, implementation and monitoring of projects. Participatory methods can tailor programmes to local needs and give early warnings when things begin to go wrong. The key to success is to find the best institutional framework in which to work. An institutional framework is suggested which concentrates on building up local capabilities within local institutions; investigates the resources and strengths of the local community and institution; determines the outside support required to complement local resources; and adopts location specific strategies.

147 COLFER, C.J.P.; GILL, D.; AGUS, F. (1987) **Indigenous agricultural models: a source of insight for soil science.** Tropsoils Project, Sitiung, West Sumatra. 24p. ODI Loc. 1172. This USAID-funded project studied aspects of traditional agriculture prior to establishing agricultural development projects with transmigrants, in particular the indigenous soil and land classification systems. Soil sampling was based on indigenous definitions: household surveys including land ownership, income and labour distribution were undertaken.

148 EDWARDS, R. J. A. (1987) **Farmers' knowledge: Utilization of farmers' soil and land classification in choice and evaluation on trials.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 11p. ODI Loc. 1607.
Critically examines the uses of indigenous knowledge to generate information about the farming system, with reference to soil classification in Botswana and land classification in Zambia. Indigenous knowledge is compared with other methods of data generation. It is argued that indigenous technology has advantages in the speed with which knowledge can be generated. It also enables the researcher to see technological issues from the point of view of the farmer. However the quality of knowledge generated by indigenous knowledge may be crude when compared with conventional research methods. This is seen to be the case for soil classifications in Botswana, but not for land classification in Zambia. It is necessary to collect information detailing the ways in which farmers use their different classification systems, before they can be of any real value to researchers. Specific hypotheses concerning the uses and validity of indigenous

knowledge need to be tested, to determine the contexts in which the knowledge is relevant.

149 FRE, Z. (1987) **Taking indigenous pastoral production systems seriously: The case of the Beni-Amer in Eastern Eritrea.** Discussion paper presented at Manchester Workshop on "Changing rights in property and problems of pastoral society". 26p. ODI Loc. 1629.
The pastoral system of the Beni-Amer of the western lowlands of Eritrea and eastern Sudan is described. It is argued that attempts to introduce new cattle breeds and techniques should take the genetic base of local cattle breeds and indigenous technical knowledge into consideration, before designing projects.
The concepts and methods of cattle breeding and cattle management are described. The Beni-Amer have specially selected Bgait breeds of cattle for aesthetic qualities, suitability to arid conditions and high milk-yielding potentials. Most of the principles on which the pastoralists organise the cattle production system are sound, although underutilised. The cattle breeding system is also adaptable and has been adjusted to new conditions in which the Beni-Amer have been forced to cross-breed, and have established principles of cross breeding for hybrid vigour. The pastoralists do not perceive introduced breeds of cattle as superior to their local breeds, nor do they consider their production system as inferior. As a result they do not respond favourably to transfer of technology programmes based on western perceptions of livestock management. The knowledge and perceptions of the pastoralists is a valuable asset which should be incorporated into livestock extension programmes.

150 GUPTA, A. K. (1987) **Scientific perception of farmers' innovation in dry regions: Barriers to scientific curiosity.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 11p. ODI Loc. 1607.
Research methodology in India is examined in the light of farmers' technical knowledge. A framework for research is suggested in which the farmers' knowledge and scientific pursuits can develop in a complementary manner. It is argued that scientific classifications of peasant practices are often based on unscientific principles, including romanticisation. The mere documentation of farmers' practices is insufficient for scientific value to be derived. Critical observations need to be subjected to scientific testing. Ground rules need to be developed for classifying farmer knowledge, validating or rejecting its concepts, and linking farmer knowledge with scientific methods. The scientific testing and classification of farmer knowledge is important, since it may extend the frontiers of science itself. To achieve these ends, the institutional framework of science needs to be expanded to include new areas of integrated research. This includes the study of the history of peasant innovation, methods of farmer experimentation, socio-political and ecological perspectives on technology generation, and resource allocation.

151 HATCH, J. (1981) **Peasants who write a textbook on subsistence farming: Report on the Bolivian Traditional Practice Project.** *Rural Development Participation Review (Cornell University),* 2(2):17-20. ODI Loc. 1785.
The project enabled two groups of peasant farmers in difficult agroecological environments to write a "textbook" of their indigenous production systems and subsistence strategies. Participating households kept a daily journal of their crop, livestock and other activities. Bolivian scientists made regular visits to compile the data and to learn from farmers through "task narratives", i.e. farmer-planned and conducted classes. Three female technicians worked with women. The information was intended to generate insights to guide use of present

resources and to explore potential for transforming production by a combination of traditional practices and science.

152 HOWES, M.; CHAMBERS R. (1979) **Indigenous technical knowledge: Analysis, implications and issues.** *Rural Development: Whose knowledge counts? IDS Bulletin,* 10(2):5-11. ODI Loc. 1855.
This review of the discussions of a workshop analyses of indigenous technical knowledge (ITK), examines its potential for rural development, and outlines implications and issues.
ITK is compared with institutionally organised science and technology. It can be seen in terms of stock and process: a rich but underutilised stock of knowledge; and the potential of processes through which knowledge can be can be generated, assimilated, and transmitted. Implications include the use of new methods for eliciting ITK, changes in the values and reward systems of professionals and officials concerned with rural development and the need for further research and analysis. [Editorial abstract]

153 HOWES, M. (1979) **The uses of indigenous technical knowledge in development.** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):12-23. ODI Loc. 1855.
Reviews a selection of the literature on indigenous technical knowledge (ITK), considers various accounts of the nature of ITK, and describes cases, such as botanical knowledge and awareness of changes in the ecosystem, where ITK often has a comparative advantage. Alternative modes of interaction between ITK and organised science are considered along with their feasibility in various situations. Suggestions are made about how research can improve understanding of ITK and enlarge its practical role in development activities. [Modified editorial abstract]

154 JUMA, C. (1987) **Genetic resource utilisation and conservation: A Kenya pilot project.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 34, ODI Loc. 1607.
A research proposal which examines the role played by existing Kenyan institutions and policies in promoting genetic resource conservation and utilisation. The study will be conducted through the collection of information on the patterns of utilisation of indigenous plants as a source of subsistence, and their conservation in Bugoma District of Western Kenya. Plant specimens will also be collected for purposes of proper botanical identification. The data collected in the field research will form the basis for identifying policy options of genetic resource utilisation and conservation. In addition, the relevance of current policies and institutions to these patterns will be assessed with the view of identifying any inconsistencies. The findings of the study will lead to the formulation of an action-research project in the area in which various community-based conservation approaches will be tried. This phase will be done in collaboration with existing government and community activities in the region. The study rests on the assertion that maintaining long-term food security requires innovative policies and flexible institutions which promote the utilisation and conservation of the country's genetic resources.

155 MALARET, L.; NGORU, F. N. (1989) **Ethno-ecology: A tool for community based pest management farmer knowledge of termites in Michakos District, Kenya.** *Sociobiology,* 15(2):197-211. ODI Loc. 1846.
Surveys were conducted with groups and individual farmers to determine the scope and relevance of farmers' knowledge of termite ecology and pest control and to generate hypotheses for testing. Meetings were held with three groups of farmers (of about 20 people each) to gain descriptions of termite species, habitat,

types of pest attack, plants resistant to attack and control methods. Thirty farmers were selected for further in-depth interviews. Four farms with different soil characteristics were selected for monitoring of termite species and damage to crops. The farmers' classification of termites revealed a high degree of consistency and close correspondence with scientific taxonomy, although four termite genera were not identified as distinct by farmers. Farmers provided valuable information on termite distribution and 19 control methods, including the impact of different land uses on the abundance and diversity of termites. They listed five annual crops and 26 perennials which were vulnerable to attack, and 24 perennials which were resistant. Diagnosis of the farming system using local ecological knowledge enables a rapid generation of information which can be used to establish field trials. Areas identified for further testing on the basis of farmers' knowledge systems include trials with resistant plant species to determine their potentials as pesticides or repellents, and trials with farmers' control methods to determine their efficacy. A research programme in which indigenous knowledge systems form the basis for ecological monitoring, and in which on-farm trials are constructed to test these hypotheses is advocated.

156 MCCALL, M. (1987) **Indigenous knowledge systems.** Working Paper no.36. University of Twente. Technology and development group, Twente, Netherlands. 18p. ODI Loc. 1691.
Concepts of participatory research are critically evaluated. It is suggested that ITK forms an important concept which can operate to generate conditions for the development of participatory methods. Local level development requires effective participation by the rural population. Participation is often conceptualised as a top-down approach of getting local people to implement the policies and decisions of external intervention organisations, such as the state. Effective participation cannot be enforced or taught but grows out of awareness and self-confidence. A policy of actively eliciting and utilising ITK can generate self-confidence, and convince outsiders of the utility of rural participation as a means of complementing development activities. The articulation of ITK can act as a means of participatory development and as an end in itself, raising local people's confidence and empowering local communities.

157 MORAN, E. F. (n.d) **Socio-economic aspects of research on tropical soil biology and fertility.** Indiana University. 40p. ODI Loc. 1808.
Farmers' local knowledge and soil conservation practices make an important contribution to research on soil fertility maintenance in tropical areas, by providing ideas and priorities for experimental testing. Moran notes the need to understand practices in the wider household context, and the necessary participation of a range of informants if researchers are to draw on differential knowledge. Knowledge of local soil classification systems is also important for an understanding of management sequences and can assist in site selection and description for on-farm trials.

158 REIJ, C.; TURNER, S.; KUHLMAN T. (1986) **Soil and water conservation in sub-saharan Africa: Issues and options.** Prepared by Centre for Development Cooperation Services, Free University of Amsterdam, in cooperation with Africa Division, International Fund For Agricultural Development. 82p. ODI Loc. 1647.
Examines problems in the conservation of soil and water resources among small scale farmers in rainfed agricultural areas in Africa. A participatory approach to conservation is advocated, in which farmers are trained to carry out conservation activities, which are rooted in the indigenous knowledge, skills, resources and local institutions of farmers. Soil and water conservation programmes in Africa have failed as a result of the introduction of inappropriate techniques. Expensive mechanised conservation methods, inappropriate incentives to local people based

on employing labour to carry out incentives, high labour requirements to carry out maintenance which farmers do not have enough time for, and top down approaches which rely on legislation and regulation to enforce conservation, have all contributed to this failure. Indigenous African farming systems, when not disrupted by commercialisation, exhibit sound conservation methods and a heritage of adaptability and flexibility. Although most farming systems are under severe pressure from disruptions and environmental degradation, they are usually grounded in detailed knowledge of the local environment and local adaptations. This forms a valuable base for the development of soil and water conservation strategies for the future. To succeed conservation strategies need to involve local farmers in environmental management, focus on local practices, train farmers to be able to carry out conservation tasks and supplement gaps in local knowledge.

159 RHOADES, R. E. (1985) **Traditional potato production and farmers' selection of varieties in eastern Nepal.** Potatoes in food system research series no.2. CIP, Lima, Peru. 52p. ODI Loc. 1681.
Describes traditional potato production and post-harvest technologies in the lowland Terai and Ilam Hill areas of Nepal. Comparisons are drawn with potato farming technologies in the Peruvian Andes. The agronomic practices, folk potato taxonomies and farmer germplasm management technologies are described. The similarities between Andean and Himalayan potato technologies are discussed in the context of rational adaptation to similar environments. Nepali potato landraces are highly varied: thirty-five distinct varieties were identified of which 20 varieties were being cultivated in one village alone. Varieties are described and classified according to farmers' assessments of their agronomic, nutritional and economic qualities. Farmers exhibit considerable knowledge and interest in potato landraces, and innovations of new varieties and dissemination of seed is one of the most developed aspects of potato farming technology. Introduced potato varieties and technological practices need to be as adaptive as the existing technology. New germplasm can complement existing proven varieties and proven local varieties may profitably be upgraded through cleaning and breeding. The study of local practices and adaptations is recommended as a basis for future production improvement efforts.

160 RHOADES, R. E. (1985) **Thinking like a mountain.** Draft of article published in M. Tobias (ed.) *Mountain Peoples*, Oklahoma. Also in ILEIA Newsletter 4(1)1988: pp.3-5. 16p. ODI Loc. 1678.
Describes many of the adaptive technologies that mountain people have developed for their fragile environments and economy. The main problem experienced by mountain environments today is conceptualised as the modernisation of the traditional cultural systems of the people without promoting the destruction of the fragile environment. It is argued that the principles on which traditional highland economy are based need to be incorporated into planning policy for mountain communities, in which concern with land management, community responsibility, low energy technology and ecological sustainability should form central issues.

161 RICHARDS, P. (1979) **Community environmental knowledge in African rural development.** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):28-36. ODI Loc. 1855.
The role of community environmental knowledge in rural development is examined and methods of investigating such knowledge. The scope and limitations of farmers' knowledge concerning agricultural pests is illustrated in a case study. The process of knowledge formation is a consequence of the kinds of observation the farmer is able to make. Inaccuracies may stem from observational limitations. On the other hand the farmer's own point of view reflects dimensions of

experience of which the researcher or extension agent may be unaware. These dimensions may be vital to the success or failure of rural development schemes and should be systematically incorporated into the research and development process. This in itself implies new approaches to eliciting information which hand over the initiative in interviews to the respondent. Repertory grid analysis is discussed as an example of a relevant methodology. The paper finally discusses how an improved capacity to research and monitor development problems at the village level might help redress the imbalance which results from technocratic control of planning decision making. [Modified editorial abstract]

162 SWIFT, J. (1979) **Notes on traditional knowledge, modern knowledge and rural development.** *Rural Development: Whose Knowledge counts? IDS Bulletin,* 10(2):41-43. ODI Loc. 1855.
The body of knowledge, science and techniques used by rural people is well documented and can make an important contribution to development, but there is a conflict between it and modern knowledge. Modern knowledge is an instrument of power belonging to the technician. By emphasising government agent's knowledge, development projects devalue traditional rural people's knowledge, and deny them creativity. New institutional ways of releasing the creative abilities of rural people are needed, in order to achieve a synthesis of traditional and modern knowledge. [Modified editorial abstract]

163 THRUPP, L. A. (1987) **Building legitimacy of indigenous knowledge: Empowerment for third world people or "scientized packages" to be sold by development agencies???** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 14p. ODI Loc. 1607.
Examines the nature of indigenous knowledge (IK) and the ramifications of the structure and methodology of R&D on the marginalisation and legitimisation of IK. It is argued that the IK of resource-poor farmers is not only a technological adaptation, but is also derived from cultural traditions, epistemological systems and the social roles of people in a community. IK is based on a totally different conceptual framework from that of formal science. Since IK does not fit the methodologies of formal science and R&D, it tends to be marginalised. Although indigenous technical knowledge has been utilised in Farming Systems Research, the farmers' knowledge is often abstracted from its cultural setting and from the socio-political environment. It is made to fit the rational concerns of the scientist. Indigenous knowledge needs to be legitimised by according respect to the knowledge system, to enable the people to gain confidence in themselves. The people need to be fully involved in all stages of development programs. Legitimisation of IK is seen as a basis for the empowerment of local communities. The need to make institutional adjustments in R&D and extension services is also addressed.

3 FARMER EXPERIMENTS AND INNOVATIONS

164 ABEDIN, Z.; HAQUE, F. (1987) **Learning from farmer innovations and innovator workshops: Experiences from Bangladesh.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 21p. ODI Loc. 1607.
Discusses the setting up of Innovatory Farmer Workshops in Bangladesh. These are used as a method of gaining information and insight into farmers' informal innovations, and to help define new research areas.
Several examples of farmer innovations are described. Farmer innovations are sometimes ahead of the scientist, and farmers are experimenting with new modes

of cultivation which scientists have only hypothesised. Methods of gaining in-depth knowledge of farmers' innovations are examined including face to face discussion and farmer workshops. The development of farmer workshops in Bangladesh is narrated. Workshops are based on the joint participation of farmers, researchers and extension personnel. Implications concerning the size of workshops, the nature of informal group interaction and the various stages involved in learning about farmer innovations are addressed. The influence of workshops on the formulation of research programmes is discussed.

165 BIGGS, S. (1980) **Informal R&D.** *Ceres,* July-August:23-26. ODI Loc. 1703.
The vitality of informal R&D systems of farmers in Asia is described. Methods through which formal scientific and informal R&D systems can be more closely linked are discussed.
It is argued that the informal system of farmer experiments is dynamic and has contributed as much to genetic development as formal research. Many new varieties have utilised genetic stock developed by farmers. Farmers' existing crops and cropping systems have more yield potential than is realised. Formal research has tended to dismiss non-adoption of technologies by farmers as a sign of their backwardness. However farmers have often modified and adapted inappropriate technologies, which they have then passed onto the extension services for widescale dissemination. Recent research has become aware of the need to adapt technology to local agro-climatic and socio-economic conditions. Informal R&D has an important part to play in the fine tuning of technology. It can contribute technical and organisational methods which make more efficient use of resources scarce to farmers, provide signposts for new areas of research, and methods of conducting research and classifying knowledge. Formal research needs to develop survey techniques, on-farm experiments, and other methods for improving interaction with farmer-experimenters, within an interdisciplinary framework, in order to solicit feedback from the farmer.

166 BIGGS, S. D.; CLAY, E. (1980) **Sources of innovation in agricultural technology.** Paper prepared for the Development Studies Association Workshop on Science and Technology, Oxford, March 1980, 33p. ODI Loc. 1759.
Examines the environmental and biological characteristics of agriculture which shape the process of technical innovation.
The interaction of natural selection and deliberate human selection and experimentation is shown to be the primary source of a continuous process of innovation, placing farmers as well as the formal R and D system in an innovative treadmill. The importance and limitations of farmer informal R and D are reviewed. A discussion of the characteristics and potential of the formal R and D system leads to the identification of some major problems of policy inherent in, and specific to agricultural R and D. These include: genetic vulnerability, choices between environmentally specific or widely adapted technologies, the location of research activity and the links between agricultural producers and scientists.

167 BOX, L. (1987) **Experimenting cultivators: A methodology for adaptive agricultural research.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 20p. ODI Loc. 1607.
Describes efforts in the Dominican Republic's Adaptive Agricultural Research Programme to design agricultural research methods complementary to those practiced on-station.
An attempt was made to link the crop knowledge of cassava cultivators to that of researchers, extensionists and agrobureaucrats. In so doing, knowledge chains were established between the various actors. Cultivators' experiments were taken as the starting point of the research, and knowledge derived from such experiments was

operationalised into adaptive trials. Criticism of on-station trials has resulted in rapid development of methods involving on-farm trials. Given the risks, costs and design problems of on-farm trials, it is argued that some serious drawbacks exist. A two-fold alternative is proposed: firstly, cultivator experiments are made more amenable to statistical analysis; second, on-station trials need to be adapted to production conditions facing cultivators. This two-fold adaption is the key characteristic of adaptive research. Social scientists are seen as brokers who follow a biographical approach to problem identification. The importance of adaptive research is stressed in forming a link between informal experiments done by cultivators and formal ones done by researchers. It is through such trials that communication interfaces are created, and knowledge networks can be integrated.

168 BRAMMER, H. (1980) **Some innovations don't wait for experts: A report on applied research by Bangladeshi peasants.** *Ceres,* 13(2):pp.24-29. ODI Loc. 1762.
Describes an unofficial research and extension network amongst farmers in Bangladesh, operating independently of the official programme. Farmers' informal research has a practical orientation, and is capable of dealing with highly complex cropping systems and adaptations appropriate to specific micro-environments eg. rice varieties in relation to anticipated flooding depth and planting methods on saline capped soils.

169 BUNCH, R. (1985 (1st pub. 1982)) **Two ears of corn.** World Neighbors, Oklahoma. 248p. ODI Loc. ABA.
Outlines an approach to agricultural development which focuses on building on farmers experimental traditions and building local institutions to extend farmer innovations and carry out training. Bunch argues that effective approaches to agricultural development have been based on experimentation by farmers in their own fields. Projects should aim to assist farmers in developing their own agriculture, through farmer involvement in problem identification, programme planning and research agenda, and development of village-run extension training. Criteria for choosing appropriate technology for small-scale experimentation, and for institution building are discussed.

170 BUNCH, R. (1987) **Small farmer research: The key element of permanent agricultural improvement.** Workshop on '62 Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 8p. ODI Loc. 1607.
The main goal of development projects should be to train and motivate farmers to continue the process of innovation and technological adaptation, and to develop their own autonomous farmer forums for the exchange and synthesis of knowledge about the innovatory process. Innovations undertaken by farmers in soil conservation, plant spacing, intercropping, pest and disease control, introduction of new native species, labour saving devices etc., are described. Examples of new technologies spreading from farmer to farmer, outside of development and extension programmes are described to illustrate the resourcefulness of farmers. It is argued that the most effective introduction of technology is that which involves small-scale experimentation. This enables the farmer to be involved in innovations without large costs and risks. Issues of teaching farmers skills in small-scale experimentation, and gradually preparing them to take responsibility for experimentation and innovation as a program comes to an end, are also addressed.

171 DOMMEN, A. J. (1975) **The bamboo tubewell: A note on an example of indigenous technology.** *Economic Development and Cultural Change,* 23(3):483-489. ODI Loc. 1778.

Describes how, in response to the high cost of steel pipe for tubewells, an innovative farmer in Saharsa District, Bihar, experimented with a bamboo and coir tube. This proved successful, and within 4 years 33,000 bamboo tube wells were in use in Bihar.

172 GHILDYAL, B. P. (1987) **Drought prone rice environment in east Madhya Pradesh - Farmers' innovations + Farmer evaluation of rice breeding material in rainfed lowlands of east India + Appropriate technology, simultaneous innovation and farmer to farmer extension in upland rice production in east India.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 6p. ODI Loc. 1607.
Three essays, documenting the innovative skills of farmers in adapting rice technology to their environment, showing that their innovations are often at variance with the recommendations of scientists. The first essay describes techniques farmers have evolved to survive drought- prone environments, including methods of green manuring, puddling, soil and water conservation and utilisation of soil catenas. The second essay describes the failure of plant breeders to experiment with new conditions specific to the farmers' environment. In Mahudadi Alluvial Lowland the rice growing areas suffer from stagnant waters. Instead of growing the rice variety recommended by breeders, with high disease resistance and high yield potential, farmers selected a variety rejected by the experimental station, but which grew the best under stagnant water. The third essay describes new techniques adopted by farmers, based around the introduction of high yield rice and line sowing in Orissa. These techniques rapidly spread from farmer to farmer without formal extension activities. The rice had not been officially released.

173 HOSSAIN, S. M. A.; SATTAR, M.; AHMED, J. U.; SALIM, M.; ISLAM, M. S; SALAM, M. U. (1987) **Cropping systems research and farmers' innovativeness in a farming community in Bangladesh.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 26p. ODI Loc. 1607.
Describes component technology trials, crop pattern testing and pattern monitoring research, carried out in rainfed and irrigated sites by the Cropping Systems Research and Development Programme of the Bangladesh Agricultural University between 1980-1986. The farmers were more dynamic in their environment than the researchers and more efficient in choosing appropriate technology.
The objectives of research was to refine technologies, give alternative improved cropping patterns, and observe adoption of technologies by farmers. The study also investigated farmer and researcher interaction and their innovativeness. The findings indicated that the farmers were more dynamic than the researchers in designing and adjusting cropping patterns, and in using technologies in their environment. The farmers were continuously changing their cropping patterns depending upon the amount, duration and time of rainfall, fertility of soil, their choice and preference, market prices etc. As a result, in most of the cases, they adopted partial recommendations of the technologies refined or generated at the research sites. The partial adopting of cropping systems technologies was associated with the above factors, along with the farmers' own assessment and innovativeness.

174 JAMA, B. (1987) **Learning from the farmer: What is the role of agricultural research in Kenya.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 14p. ODI Loc. 1607.
Charts the development of integrated agroforestry research in Kenya. Argues for an interdisciplinary approach to agricultural and forest management problems

based on farmer participation and utilisation of farmers' Indigenous Technical Knowledge (ITK). This is illustrated with the experience of an agroforestry project in the Kilifi District of Kenya.
The main aim of the agro-forestry project was to halt declining soil fertility through the promotion of agroforestry. Alley cropping with Leucaena luecocephala was developed as an on-station solution and demonstrated to the farmers. The farmers adopted the alley cropping techniques, but substantially transformed the technology. Leucaena was not cultivated to improve soil fertility and was not planted in alleys alongside foodcrops. It was introduced as a fodder crop and planted randomly. The modified technology spread rapidly from farmer to farmer. In introducing the technology, the agroforestry project had failed to identify the main constraints facing farmers. The farmers, who were not consulted at the beginning of the project, determined the real problem - dry season fodder shortage for livestock - and modified the technology to solve the problem. The agroforestry project was used to solve a problem which a second project, the Dairy Development Project, had failed to solve dry season fodder production. Through the farmers' innovations, the two projects were brought together and on-farm participatory research developed, in which the resources of both projects were used more efficiently to create sustainable agricultural innovations.

175 JOHNSON, A. W. (1972) **Individuality and experimentation in traditional agriculture.** *Human Ecology,* 1(2):149-160. ODI Loc. 1793.
In contrast to the popular perception that traditional agriculture is characterised by conformity to traditional rules, the diversity of individual practices is noted. It is argued that systematic, low-risk experimentation is the norm. With the introduction of modern technology, there is a need to preserve the low risk experimentation approach, to maintain diversity and to carry out tests under local conditions.

176 LIGHTFOOT, C. (1987) **Indigenous research and on-farm trials.** *Agricultural Administration and Extension,* 24:79-89. ODI Loc. 1800.
A combination of conventional and indigenous research methods allows farmers to adapt technologies to their own specific conditions, and generates better feedback on appropriate research needs.
Indigenous research can be the basis for on farm trials, and formally designed trials may be unnecessary where farmers have their own methods. There are problems: skills needed to elicit farmer knowledge, the slow pace of indigenous research and risks borne by farmers. Lightfoot argues for balanced participation of farmers and researchers.

177 MACDONALD, I. S.; BARTLETT, A. P. (1985) **Progressive farmer research.** Ian Macdonald and Associates LTD, London. 7p. ODI Loc. 1711.
Participatory farmer research seeks to utilise the innovations made by farmers in extension activities and incorporate them into recommendations to farmers.
Research establishes who the major innovatory farmers within a community are and interacts with them to find out the major farmer innovations taking place. Innovatory technologies are screened and tested in on-farm trials, to establish their suitability to the farm conditions of the majority of farmers. Successful technologies are then disseminated to a larger number of farmers by the extension services. Examples of innovations in Pakistani villages are given. These are mainly new adapted crop varieties and husbandry practices.

178 MAURYA, D. M.; BOTTRALL, A. (1987) **Innovative approaches of farmers for raising their farm productivity.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 30p. (includes annexe, diagrams) ODI Loc. 1607.

The structure of agricultural research in India is critically examined. Research is highly centralised and does not reflect the problems of resource poor farmers. The development of on-farm research, utilising the experimental and innovative traditions of the farmers, is advocated. It is argued that the traditions of innovation among Indian farmers are vital and largely define today's agricultural practices. Many of the plant varieties developed by farmers have been able to compete successfully with introduced varieties and have been retained by the farmers. However the rich variety of farmers' plant breeds is being threatened by research policies, which seek to replace local genetic stock with high yielding varieties. The conditions under which new varieties and technologies are tested on experimental stations do not reflect the situation in farmers' fields. Farmers frequently conceive newly developed technologies as being inappropriate to their needs. Several instances are cited where farmers have had to adapt introduced technology to their conditions, and where they have evaluated new technology differently from researchers. On-station research needs to be integrated with on-farm research. The problem of developing appropriate technology to the needs of rainfed upland farmers is being addressed by research at the Narendra Deva University of Agriculture and Technology. Farmers are participating in the testing of advanced rice lines and experimenting with them on their fields. Farmers are allowed to select from a number of advanced breeder's lines which have been selected by researchers to match the characteristics of the local varieties of the farmers. Farmers' experiments with these lines are being monitored and used to select and develop new varieties appropriate to local conditions.

179 MCCORKLE, C. M.; BRANDSLETTER, R. H.; MCCLURE (1988) **A case study on farmer innovation and communication in Niger.** Communication for Technology Transfer in Africa, Academy of Educational Development. Washington. 125p. ODI Loc. 1718.

A report on the results of a survey in Niger into farmer innovations, farmer perceptions of innovation and the communication networks farmers utilise to transfer innovations.

An informal survey of seven villages with distinct local conditions was conducted in conjunction with an in depth survey of one village. Twenty case studies were collected tracing the information routes through which an innovation was disseminated. Nigerian farmers were found to have a rich tradition of innovation, to actively seek out and experiment with new ideas. They planned, implemented and evaluated on-farm experiments methodically and demonstrated an awareness of the complex interaction among the many variables in the farming system. Criteria for judging suitable technologies included risk, income generation, cheapness, ready availability, labour saving, and fit into existing farming practices. Extensive information networks exist through which new innovations and practices from other areas spread into new areas. The information networks are described and include individual expert farmers whose knowledge is sought out by other farmers; radio listeners who disseminate information from radio broadcasts to other farmers; and various types of groups including cooperatives, young people's association, and islamic marabout. Relations between farmers and research and extension services are weak. Little of the technology promoted by the agricultural services is considered suitable by farmers. Farmers frequently adapt technology from formal research and extension. However feedback to research and extension services on farmers' modifications to recommendations and farmer preoccupations is poor. Methods in which the dissemination of knowledge about innovations can be improved are suggested, based on strengthening farmer-to-farmer communication networks and farmer-researcher-extension feedback loops. This includes allowing farmers to participate in the testing of researcher generated technologies, and offering farmers greater incentives to systematically conduct experiments. In relation to information media, greater use can be made of

television, radio and publications to disseminate findings and technologies and discuss topics determined by farmers. Koranic literacy should also be utilised as a source of promoting agricultural information. Women's and young people's associations can be mobilised to participate in research and cooperatives cultivated as centres of agricultural information.

180 NETTING, R. (n.d.) **Farming systems change and indigenous agrarian development: Kofyar farmers of the Nigeria Savanna.** Arizona University. 25p. ODI Loc. 1809.
Traces indigenous change among the Kofyar, N. Nigeria, from traditional intensive homestead subsistence cultivation, to extensive cash cropping in the Benue Plains. An analysis of such responses can help isolate conditions conducive to planned interventions. The Kofyar received no technical or financial assistance; the adaptation was based on familiar crops, tools, methods and labour organisation.

181 RHOADES, R.; BEBBINGTON, A. (1988) **Farmers who experiment: an untapped resource for agricultural research and development.** Paper presented at the International Congress on Plant Physiology. New Delhi, India. February 15-20. 29p. ODI Loc. 1677.
Farmer experimentation with potatoes in two zones of Peru are described and the nature of experiments are analysed. Experimental processes are traced in both traditional highland potato production systems and in non-traditional potato areas in highland jungle. Three types of farmer experiments are identified: (1) curiosity experiments, (2) problem solving experiments, (3) adaptation experiments. It is argued that experimentation is integral to farmers' activities, a part of the process of adaptation to a constantly changing physical and socio-economic environment. A case study is discussed, which traces the impact of successful experimentation in Oxapampa, a high jungle district. While this led to widescale commercial potato cultivation, technical knowledge of cultivation did not produce the information which could sustain potato cultivation. In 1984 potato production entered severe crisis as a result of widespread blight, shortage of labour, and price collapses in Lima. Consequently, farmers have shifted back to livestock management and maize and bean production. Experimentation is placed within the broader context of agricultural research.

182 RHOADES, R. E. (1987) **The role of the farmer in the creation and continuing development of agriculture and systems.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 20p. ODI Loc. 1607.
It is argued that farmers have an important role to play in agricultural research. Problems of developing an equal partnership between farmers and scientists in R & D and in matching up the comparative advantages of their different traditions of research are examined. Present efforts in international agricultural research and development are still dominated by the 'transfer of technology' model. This model assumes that the scientist generates technologies for the benefit of farmers. It is argued that farmers also generate technologies and production-utilisation systems. Modern agriculture is seen as a mere afterthought to some 10 000 years of farmer experimentation and technological breakthroughs. Three contemporary case studies are utilised which illustrate the problem solving approach of farmers and how it compares to the 'transfer of technology' model. The conclusion is drawn that combining farmers' and scientists' methods first requires a better understanding of farmer-based research on the part of the scientists. A low-key focused approach in development efforts is recommended.

183 RICHARDS, P. (1985) **Indigenous agricultural revolution.** Hutchinson, London. 192p.

Examines institutional top-down research strategies and farmers' informal research and development systems in relation to the ecological diversity of the West African environment. A populist approach is advocated, based on strengthening the farmers' own innovative capacity. The centralised top-down research systems with their emphasis on high yielding varieties and 'package deals' of inputs do not perform well in West Africa, where ecosystems diversity is especially great. In contrast West African farming systems are shown to be closely adapted to ecological dynamics. Case studies from Sierra Leone and Nigeria illustrate the inventiveness of West African farmers. This includes innovations in labour organisation, variety selection and intercropping in relation to specific micro environments and soil catenas. The rich traditions of farmers' on-farm experimentation are illustrated. It is argued that their should be less emphasis in research strategies on introducing improved varieties and new farming methods, and more on developing approaches which utilise local adaptation and inventiveness for agricultural development. The links of agricultural extension programmes with farmers are suggested as a useful starting point to build links between the informal R&D of farmers and formal research systems. Training can be provided for extension agents in methods of participatory research, the collection of survey data, and concepts of farmer innovation.

184 RICHARDS, P. (1986) **What's wrong with farming systems research.** Paper for Conference of the Development Studies Association, University of East Anglia. 8p. ODI Loc. 1820.
Despite some success in understanding intercropping, labour bottlenecks, etc. Richards criticises conventional FSR as a slow expensive process with too narrow conception of farming systems. It obscures the characteristics of the production process and impedes assessment of the potential for change. Decision-making involves complex, sequential processes, with interaction between members of a household and between household and community. Farming communities are seen as taking the lead by doing the job of incorporating technologies into their own conditions. Scientists' role is to provide materials for farmers' experiments and monitor results and feedback.

185 RICHARDS, P. (1986) **Coping with hunger: Hazard and experiment in an African rice farming system.** Allen & Unwin, London. . ODI Loc. 1821.
Discusses farmers' experiments and selection of rice planting materials, and their indigenous technical knowledge in Sierra Leone. Varietal categories reflect Hogbuama farmers' concern to spread labour inputs and strike a balance among family hunger, household needs and private cash requirements. Farmers had confidence in the local procedures they had established. Peasants are not conservative: they make their own varietal selection through trials and introduce 2-3 new varieties on a wide scale per generation. The possibility exists of promoting village-level seed multiplication units managed by farmers, and of linking local research initiatives with formal R & D services.

186 RICHARDS, P. (1987) **Experimenting farmers and agricultural research.** Department of Anthropology, University College London. 20p. ODI Loc. 1685.
Examines the characteristics of small-scale farmer experiments, in relation to the author's fieldwork experience among the Mende in Sierra Leone, and in relation to research literature. Literature on developing complementary methods for a better understanding of farmer experiments and for utilising it in formal research is reviewed, including papers from the 1987 IDS conference: Workshop on Complementary Methods. The continual process of farmer adaptation and innovation is discussed. It is argued that as research increasingly attempts to develop technologies suited to the specific needs of resource-poor high-risk environments, the innovatory skills of farmers may play a useful role in generating

and testing technologies under local conditions. Different types of complementary methods which utilise farmer experiments are examined. Concepts of developing a research partnership between farmers and researchers are also questioned. It is argued that the most thought provoking of farmer experiments may be those which are least explicable in scientific terms. The vigorous defence of the intellectual autonomy of the experimenting farmer may prove to be a better prospect for scientific enquiry in the long term.

187 RICHARDS, P. (1989) **The spice of life? Rice varieties in Sierra Leone.** Dept. of Anthropology, University College London. 11p. ODI Loc. 1742.
Farmers' experimental traditions of rice selection and adaptation in Sierra Leone are described. Socio-economic and agronomic reasons underlying farmers' choice and use of rice varieties are explored. Farmers' experiments in several ecological areas, in upland and wetland rice systems are described. These experiments are conducted within an old framework of land management based on utilising flood advance and flood retreat. Rice varieties are matched to the soil moisture in different localities and varieties are bred to fit into specific localities. Systems of soil moisture management in Africa have been little researched. Rice breeders and farmers have worked from fundamentally different precepts. The modern varieties which have been adopted by farmers have only succeeded because they have been capable of assimilation into the management practices of farmers. This has been fortuitous and modern varieties have not been bred to fit into local land management systems.

188 STOOP, W. A.; PATTANAYAK, C. M.; MATLON, P. J.; ROOT, W. R. (1982) **A strategy to raise the productivity of subsistence farming systems in the West African semi-arid tropics.** International Crops Research Institute for the Semi-Arid Tropics. Sorghum in the Eighties. Proceedings of the International Symposium on Sorghum, 2-7 Nov. 1981 81, Pantacheru, Andhra Pradesh, India. pp.519-526. ODI Loc. 1688.
Discusses adaptations of traditional farming systems to the environment of the sudanic and sahelian zones of Africa. In the light of these adaptations, strategies for the improvement of sorghum and agronomic practices are suggested. In spite of the superior yield performance of introduced sorghum varieties, farmers continue to prefer their local varieties, for other qualities including resilience and adaptation to risk-reducing strategies. To define needs to which new varieties need to be adapted, an holistic interdisciplinary FSR approach is advocated. Technical research should test local varieties, breed hybrids, breed for resilience and agronomic characteristics better suited to local conditions. Varieties should be tested on farmer-managed trials under local farming conditions, in which farmers are encouraged to experiment and modify recommendations. The farmers' tests should be utilised as feedback for a better understanding of the merits and limits of the technology under investigation, and as an integral part of the research process of adapting technology to the needs of the farmer.

189 SUMBERG, J.; OKALI, C. (1988) **Farmers, on-farm research and the development of new technology.** Workshop on 'Farmers and agricultural research: complementary methods', Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.16. *Experimental Agriculture,* 24(3):333-342. ODI Loc. 1606.
Critically examines the role of the researcher in farmer participatory research with reference to alley farming in West Africa. On-farm trials tend to be highly structured and focus on the testing and validation of packaged technology. They use abstract criteria and measurements developed on experimental stations. It is argued that the main determinants of success must be farmers' adoption, experimentation and modification of technology. The levels of analysis and

synthesis, on which farmers base their assessment of technology, are more complex than the experimental models and simulations of the farming system developed by researchers. The researcher's time is better spent in studying the main system constraints, defining research areas and monitoring the way in which farmers incorporate the technology into their system. These are methods of identifying technical problems. The role of on-farm research should be to ensure that the principles of innovation are valid, that they are appropriate to the local environment, that the problems, solutions and innovations developed by the farmer are carried back to the station for investigation.

190 VAN DER PLOEG, J. D. (1989) **Potatoes and knowledge.** Dept. of Rural Sociology, University of Wageningen, Netherlands. 17p. ODI Loc. 1733.
The local knowledge system of Andean potato cultivators in Peru is contrasted with scientific plant breeding methods. It is argued that the two systems are based on dissonant concepts and methodologies. The local knowledge system of Andean potato farmers is closely interweaved with the labour process and is rooted in diversity. Local knowledge does not lend itself to standardisation, It is an 'art de la localite', in which farmers have knowledge of individual plots. Distinct varieties of crops (genotype) are matched and bred to fit the environmental conditions (phenotype) of specific plots. The knowledge system is dynamic since the conditions of land are changing and being improved by the labour of the farmer. The system of knowledge follows a cycle of observation, interpretation, evaluation, and manipulation of specific localities and varieties. In contrast, scientific plantbreeding starts with a concept of an 'ideal plant type', which must be superior to the 'traditional' varieties, and which will induce the farmers to accept the improved variety. Ideal type genotypes are bred into the variety. The phenotypical conditions are then derived by testing the variety in experimental stations. The genotype will only prove to be successful if the required conditions can be effectively repeated in the farmer's field. While the farmer's experiment followed a step by step progression in which land improvement and potato breeding go hand in hand, scientific knowledge creates a set of standardised procedures which the farmer must follow to successfully grow the crop. These two systems cannot be integrated since the art of the locality falls outside scientific design. The introduction of new varieties creates new dependency problems in which the farmer must abandon the art of the locality and becomes dependent on external inputs and credit. The successful introduction of new varieties leads to the increasing marginalisation of local knowledge. The new varieties - no longer being adapted to the local conditions of the farm plot - degenerate. This re -enforces the farmer's dependency on science and new inputs, but creates scepticism among them of the value of science. Local technicians respond to this scepticism by characterising the farmers as ignorant, and hostility develops between farmers and technicians.

Part Two: APPLICATIONS

4 DIAGNOSIS

191 ACABA, M.; APURA, D.; CABILING, J.; DE PEDRO JR, R.; LIGHTFOOT, C. (1986) **A study of farmer's evaluation of camote varieties.** Farming Systems Development Project - Eastern Visayas, Visayas State College of Agriculture, Baybay, Leyte, Philippines. 40p. ODI Loc. 1659.
Farmers in the Eastern Visayas experiment with sweet potato varieties and have developed their own criteria for screening different breeds. Research methods were devised to elicit the criteria farmers utilise in their experiments and to establish the principles farmers used to evaluate two improved varieties.
Research utilised a reconnaissance survey in which delimited specific information was elicited from a small targeted group of farmers. The main areas investigated included farm characteristics - the size, typology, tenure, farmers' sources of income etc.; farmers' knowledge of sweet potato varieties and methods of identification; farmers' criteria for screening sweet potato - including yield, taste, storage, maturity period, suitability to types of land; and planting and harvesting schedules. The crop was monitored on the farm in relation to farmers' screening criteria and empirical measurements made were possible. Results reveal that farmers utilise a wide range of sweet potato varieties for different purposes. These include varieties which are selected as ground cover to suppress weed growth and prevent soil erosion, which fit into sequential cropping patterns, which have good storing properties, which have short maturity and ability to withstand drought. The conventional breeding objectives of producing uniform crops with high yields, sweet taste, long maturity for a single harvest, are inappropriate to the needs of the small farmers. Individual farmers' responses to guide questions are documented and illustrations of varieties of sweet potato are provided.

192 BLACKIE, M. J. (1984) **Research design and implementation in the Sebungwe Region of Zimbabwe.** P. Matlon; R. Cantrell; D. King & M. Benoit-Cattin: *Coming Full Circle.* IDRC, Ottawa. pp.51-62. ODI Loc. 1801.
Describes diagnostic research methods developed at the University of Zimbabwe to cater for the needs of the communal farming areas, which have been neglected under settler colonialism. Communal areas, such as the Sebungwe region in which research was conducted, are characterised by unfavourable agroecological conditions and considerable ecological diversity. The early diagnostic stages of a research programme are described. Baseline data was collected to define priority areas of research. A reconnaissance survey was conducted, making use of the existing data of the agricultural services in the area and eliciting the different perspectives of farmers, government officials and the private sector. Results are discussed with researchers from different disciplines to determine the potential of the university to carry out a research programme. The research programme is further defined with the collaboration of national and regional agricultural and development agencies. Working with the local agricultural and extension services, the proposed project is taken to the villages and discussed with farmers. The various stages of field research are discussed and farmers encouraged to comment on them, to help develop the design of experiments. This helps to generate a research agenda which reflects the capabilities of the university and the perspectives of the farmer.

193 CHAMBERS, R. (1985) **Shortcut methods of gathering social information for rural development projects.** In Cernea, M.: *Putting people first: Sociological variables in rural development.* Oxford University Press, for the World Bank, Oxford. pp.399-415. ODI Loc. 1625.
The potentials of Rapid Rural Appraisal (RRA), as a cost-effective method of investigating rural conditions for the design of rural projects are examined. It is argued that RRA has advantages over both unstructured short visits to rural areas and large scale academic and survey research. Short rural visits do not allow comprehensive investigation of rural conditions and are prone to bias. They tend to be orientated towards the more accessible better off areas and the richer farmers. Investigation lacks rapport with the local people. Large-scale academic and survey research tends to be inefficient with long delays between the collection of data and its publication. Data is collected according to conceptions of proper procedures and academic excellence and not according to criteria of relevance. Expensive and large questionnaire surveys and anthropologists' long duration fieldwork are undertaken. Often the detail and quantity of data collected results in complex reports, which are out of date by the time they are published and unusable. RRA methods offer a quick and cost-effective method of generating particular data. The aim of RRA is to improvise a flexible framework in which data can be quickly and systematically collected, through interacting with the local people. This is achieved by developing principles of optimal ignorance and appropriate imprecision. Optimal ignorance limits the quantity of information gathered by demarcating the main areas of interest and excluding unnecessary areas of research. Appropriate imprecision recognises that surveys often implement a degree of accuracy which is unimportant. Several techniques of eliciting knowledge and learning from local people are discussed, including the use of key indicators, group interviews, key informants, informal questionnaires, use of aerial surveys, combining existing secondary data and knowledge with research findings, and short visits of multidisciplinary teams of researchers to villages on data collecting trips. Although there are dangers that RRAs may provide superficial and erroneous data, these problems can be addressed by developing control over optimal ignorance and appropriate imprecision to maintain cost-effectiveness, rather than developing more comprehensive but less cost-effective survey methods.

194 OLFER, C. J. PIERCE (1987) **How to ascertain which crops are grown.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 6p. ODI Loc. 1607.
Advocates the study of farmers' dietary patterns, as a means of ascertaining the range of crops grown, the types of location farmers are cultivating, and the extent to which crops are grown for subsistence or the market. Case material is used from Indonesia. It is argued that the collection of data on diet can help scientists locate dietary deficiency and introduce crops which enhance the diet and fit in with the farmers' eating habits. The wide range of forest plants consumed by farmers can also be used to identify potentially valuable new crops. The types of land from which crops originate reveal aspects of the land management system. The proportion of food consumed which is bought and which is grown on farmers' plots, reveals their degree of participation in the market economy.

195 CONWAY, G. R. (1987) **Diagrams for farmers.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 17p. ODI Loc. 1607.
Discusses potentials for use of diagrams in participatory research among farmers and farming groups, as a diagnostic technique for understanding dynamics of the farming system and likely consequences arising from interventions and innovations. Various forms of general purpose and focused diagrams are discussed, including those developed for agroecosystems zoning and sustainability analysis. It is argued

that diagrams are a simple, schematic device, which present information in a readily understandable visual form. This is illustrated with examples of how farmers in Pakistan have been able to present their predicaments to researchers and other farmers, and identify system constraints, through the use of diagrams. Methods of introducing diagrams into participatory research are discussed, including the incorporation of diagrammatic techniques into the curriculum of village schools and the introduction of diagram-focused discussions as a basis for the activity of farmer groups.

196 CONWAY, G. R.; MCCRACKEN, J. A.; PRETTY, J. N. (1987) **Training notes for agroecosystem analysis and rapid rural appraisal.** International Institute for Environment and Development, London. 60p. ODI Loc. 1627.
Concepts and methods of rapid rural appraisal (RRA) are defined and discussed. Practical guidelines on methodology are developed, and formulated as in a training manual. The RRA methods are described in the context of exploratory surveys and agroecosystems analysis. The aim of agroecosystems analysis is to promote a stable and sustainable agricultural system. Goals of increasing production are developed, within parameters which seek to protect environmental resources and ensure equitable distribution of resources among rural people. RRA attempts to develop systematic, semi-structured, multidisciplinary and interactive research methodologies, which generate rapid cost-effective results and view the agrarian system holistically. Four different types of RRA methodologies are defined. Exploratory RRAs obtain initial information about the agroecosystem or a new topic of research. Topical RRAs investigate specific topics with key questions and hypotheses and seek to generate further hypotheses. Participatory RRAs involve local villagers and local officials in decisions about further research actions and develop on-farm trials. Monitoring RRAs assess the progress of trials and experiments and the implementation of development activity. Different types of research procedures are defined and outlined including the incorporation of secondary data into research, semi-structured interviews, and the use of direct observation. Various techniques are discussed including the use of diagrams, maps, transects, seasonal calendars, historical profiles of political and environmental events, analysis of trends over time, bar diagrams, flow diagrams, decision trees, venn diagrams and workshops. An agenda of research procedure and techniques for agroecosystems analysis is developed.

197 EDWARDS, R. J. A. (1987) **Mapping and informal experimentation by farmers: Agronomic monitoring of farmers' cropping systems as a form of informal farmer experimentation.** Workshop on 'Farmers and agricultural research: Complementary methods', IDS, University of Sussex, 26-31 July 1987. 12p. ODI Loc. 1607.
Expounds the advantages of systematically collecting agronomic information on farmers' fields, mapping farmers' activities and monitoring the productive mechanisms and strategies that farmers have developed and their effect on crop growth. It is argued that the collection of such data can assist the planning and refining of on-farm and on-station trials, and can form the basis for integrated research and better interaction between different specialists. This improves awareness of farmers' crop production practices and provides information on technologies which farmers are already utilising, which can help the design of relevant on-station research programmes. The issue of the relationship between agricultural and social scientists in designing appropriate research methodologies for agronomic monitoring, and the need for interdisciplinary research is also addressed.

198 EKLUND, P. (1987) **Low cost diagnostic methods for low input strategies in sub-saharan Africa: A proposal for institution building.** Workshop on "Farmers

and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 9p. ODI Loc. 1607.
Describes the use of Rapid Rural Assessment (RRA), as a low cost diagnostic survey method, in Zaire and Zambia. RRA is used to generate rapid feedback for the design and redesign of rural development projects, and as a complement to farming systems research. RRA is developed on the basis of formal interviews with a small sample of households within the research area, and a small group of interviewers, who are trained in workshops in the field area. The aim of the surveys is to identify signs of and trends towards land degradations and non-sustainable agricultural systems; identify the feasibility and preconditions for sustainable agriculture in the area; identify promising technologies for resource poor agriculture; train participants in basic skills of diagnosing farmers' constraints; and monitor farmers' adoption of improved practices. RRA can only be carried out after a basic knowledge of farmers' decision making, environmental and socio-economic constraints has been gained.

199 FLOQUET, A. (1989) **Conservation of soil fertility by peasant farmers in Atlantic Province, Benin.** Kotschi, J. ed: *Ecofarming practices for tropical smallholdings, research and development in technical cooperation.* GTZ. Eschborn, West Germany. pp.31-56. ODI Loc. 1734.
Describes practices and constraints in existing systems of shifting cultivation in the derived savanna areas of the Atlantic Province in Benin. Possible solutions for removing constraints based on local cropping innovations are discussed. The land resources of farming families have decreased. Fallow periods and soil fertility are declining. This has resulted in falling yields and increasing problems of weed invasion. Farmers are obliged to develop more intensive and sustainable systems of land use to avoid environmental degradation. The aims of research were to identify farmers' problems and needs; to describe existing technologies developed by local farmers to maintain soil fertility; examine the scientific validity of these innovations; and select the most promising for on-farm trials for further development. Research involved a socio-economic survey of the 80 communities in the whole province, collecting information on land rights, labour and economic activities, and relating these factors to gender and wealth. Informal interviews were conducted with small groups of farmers in each of the communities, with the participation of extension agents. Economic and agronomic constraints were discussed from the perspective of the farmers. This was followed by 100 interviews with individual farmers, in which quantitative data were collected on their economic circumstances, their cropping systems and their perceptions. Different cropping systems are described and related to socio-economic factors. This includes farming strategies which attempt to introduce shorter fallows, longer cropping systems, or permanent cultivation. In the light of the findings, it is suggested that alley farming should be investigated for farmers attempting to stabilise three year bush fallowing followed by 5-6 years of cropping; and that where land pressure is forcing farmers to introduce non-fallowing systems, the intercropping of oil palms with annual crops may be a solution.

200 GALT, D.; YAZMAN, J.; REED, D.; HAWKINS, R. (1988) **Kotjahari samuhik bhraman and proposed research program.** Report no.7. Ministry of Agriculture, Farming Systems Research and Development Division, Kumaltar, Nepal. 43p. ODI Loc. 1725.
Describes an interdisciplinary research group trek (*samuhik bhraman*) to a new research site at Kotjahari in the Rakum District of Nepal, which carried out an informal survey and determine research priorities for the area. The *samuhik bhraman* was carried out by researchers from different research institutions in Nepal. The survey lasted five days. Research began with a key informant survey in which 12 farmers were interviewed about farming conditions. Results were

discussed by the researchers and formed the basis on which individual interviews of farmers and group interviews were organised. Group interviews were carried out with one group of 25 male farmers and another of 14 female farmers. Researchers broke up into smaller teams examining specific problems. They reported back to researchers and to farmer group meetings to clarify the findings. In contrast with the general methodological principles established for a group trek (see 238) a final meeting with farmers to present the results and a proposed research programme did not take place since the area had not yet been approved as a research site. In the light of the survey the production system of the farmers is described, ecological and socio-economic constraints are defined and recommendations for a research programme are drawn up, including delineation of the target area for research, experiments to be implemented, experimental design and evaluation criteria. It is also recognised that if the research agenda is to be implemented it needs to be discussed at a meeting with farmers. Briefing notes given to researchers are also included, outlining research procedures and protocol.

201 GRANDSTAFF, S. W.; GRANDSTAFF, T. B.; LOVELACE, G. W. (1987) **Rapid Rural Appraisal: Draft summary report.** Khon Kaen University, Thailand. Rural Systems Research and Farming Systems. Proceedings of the 1985 International Conference on Rapid Rural Appraisal. 46p. ODI Loc. 1626.
Overviews and summarises the proceedings of the 1985 conference on Rapid RURAL Appraisal, held at Khon Kaen in Thailand. RRA methods have become important in view of new research objectives which require technologies to be constantly developed and readjusted to solve local problems and constraints. Rural societies are also changing rapidly and information on them soon becomes obsolete. Research methods are needed which allow the monitoring of technological adoption, generate feedback, allow local knowledge to be utilised to complement the existing knowledge of researchers, and collect and analyse data rapidly. RRA is a response to these problems and needs. It is a methodology based on multidisciplinary research in which researchers interact with and learn from rural people and utilise rapid iterative and feedback generating methods. While the number of RRA practitioners is still small a proliferation of RRA research, methods, tools and techniques have arisen, in response to different environments and research objectives. Five different types of RRA activity are identified, including agendas for action research, for basic understanding, methodological development, for training of research personnel, and for community self-awareness. Experience has shown that RRAs are most successful when they have shared a systematic conceptual framework and clearly defined key principles, in association with a flexible array of methods, tools and techniques, designed to improve the quality of the appraisal in particular local conditions. Two important issues for the further methodological development of RRAs are identified. Firstly professional research methodologies need to be refined and further research applications designed or tested for their incorporation into RRAs. Secondly, RRA methods need to be disseminated among a wider group of people working on development projects, and the needs of researchers and rural people participating in research need to be monitored. Other issues addressed include the development of training methods and materials, and the propagation of RRA methods in government and other development institutions.

202 HILDEBRAND, P. E. (1981) **Combining disciplines in rapid appraisals: The sondeo approach.** *Agricultural Administration,* 8:423-432. ODI Loc. 1787; ODI journals. In Guatemala a reconnaissance survey team of ten, equally split between socio-economists and technologists and operating in pairs, has been used to assess farmer constraints and technology needs in advance of agricultural research. On each of four days the pairing changes. Quantified information and questionnaires

are not required and the survey lasts only one week. Daily post-survey team discussions are regarded as essential. Each member of the team prepares a report and these are finally amalgamated into one joint report. Experience has shown that combined disciplines can, if well managed, produce incisive and efficient diagnoses of rural conditions and needs, and educate the participants in multidisciplinary thinking.

203 LAMUG, C. (1987) **Interaction of upland farmers and scientists.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 12p. ODI Loc. 1607.
Describes the different research and extension methods used in interaction between scientists and upland farmers in the Philippines. An overview of the work of the Upland Development Program of the Bureau of Forest Development (BFD) is provided. The upland farming communities consist of tribal groups and market orientated migrant farmers, with different land use patterns, production strategies and lifestyles. The Upland Development Programme seeks to strengthen the capability of the BFD to improve resource management techniques among the upland farmers and to develop effective farmer participatory methods. Three sets of research and extension methods used are discussed, involving varying degrees of interaction between farmers and researchers. Rapid Community Appraisal aims to gain a quick overall conception of the characteristics of the farming system, through the use of informal surveys, quantitative survey methods, group meetings and direct observation. Comprehensive community Appraisal involves periodic interaction with selected farmers over a long duration, with observation of all farming activities, complemented with testing and measurement techniques on farmers' fields. Agroforestry Technical Support involves field personnel who are in regular contact with the farmers, conduct on-farm trials and on-site demonstrations, in which farmers participate, and carry feedback to the scientists.

204 LANG, M. G.; CANTRELL, R. P. (1984) **Accenting the farmer's role: Purdue Farming Systems Unit.** P. Matlon; R. Cantrell; D. King & M. Benoit-Cattin: *Coming Full Circle.* IDRC, Ottawa. pp.63-70. ODI Loc. 1801.
Describes the role and evolution of diagnostic surveys in the on-farm research programme of the Purdue Farming Systems Research Unit in Burkina Faso. Simple diagnostic techniques which utilise the knowledge of the farmers are described. Economists worked with agronomists and carried out surveys into farming conditions and farmers' perceptions and strategies to help develop trials which responded to the needs of the farmer. The trials were based around the use of chemical fertilisers and water-retentive tied ridges with cereal and legume crops. Empirical data on farm households, and field and yield statistics were collected. "One shot" surveys were also developed, based on simple techniques of eliciting farmer perceptions of their problems and strategies.

205 LIGHTFOOT, C.; DE PEDRO, R.; SALADAGA, F. (1987) **Screening of sweet potato cultivars by subsistence farmers: Implications for breeding.** Philippine Root Crops Research and Training Center, Visaya College of Agriculture, Baybay, Leyte, 25p. ODI Loc. 1854.
Describes the criteria subsistence farmers use in the Eastern Visayas to screen sweet potato cultivars and contrasts these criteria with those used by research institutions to breed high yielding varieties. Research took the form of informal interviews and participant-observation of experimenting farmers in their fields. Twelve farmers were also supplied a selection of improved sweet potato varieties which they planted and screened. Information was collected on farm typology, characteristics for distinguishing varieties and criteria for assessment. Results indicated that the commercial breeding objectives of high yielding, short maturing, single harvest, bush types are inappropriate to small farmers. In years of stress

they are prepared to compromise on most criteria for short maturity. The farmers seek prolonged sequential cropping, prolonged underground storage without rotting, and weevil resistance. Farmers cultivars are the products of many years of screening. However farmers' experience constraints in their crossing techniques and their gene pool. It is argued that strategies which seek to combine the strength of farmers criteria for screening and assessing cultivars with the breeders strength in germplasm , sophisticated crossing and replication will produce more suitable varieties.

206 MAXWELL, S. (1986) **The role of case studies in farming systems research.** *Agricultural Administration,* 21:147-180. ODI Loc. 1805.
Advocates the study of a small number of "cases" as complementary to rapid appraisal techniques, particularly where long-term, sensitive data of a causal or complex nature is needed. The advantages and problems are outlined, arguing that case studies permit better multidisciplinary contact and are cheaper than large scale multi-visit surveys.

207 MCCRACKEN, J. (1988) **Topical rapid rural appraisal.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 8p. ODI Loc. 1608-20.
Outlines a topical Rapid Rural Appraisal (RRA) method. This is based on filtering and focusing research findings on a specific topic, in which each additional stage of research is dealt with systematically, more precisely and in more depth. The method is centred on the use of diagrammatic techniques. These are used to build up a model of the hypothesis and the structure of research. Cartoon sketches and flow diagrams are used in field research to elicit data from informants. When the key issues have been identified, they are summarised in short written accounts. These are then distilled into an extended hypothesis on the problem which is then subjected to further follow up RRAs.

208 NTSEANE, P. G. (1988) **ATIP groups report.** ATIP WP-11. Agricultural Technology Improvement Project (ATIP) Gabarone, Botswana. 7p. ODI Loc. 1712.
The results of an informal survey examining farmers' assessments of Agricultural Technology Improvement Project (ATIP) farmer groups, carried out among 18 group members (six men, twelve women) in three villages in Francistown Botswana, are discussed. Francistown ATIP has established 3 farmer groups in the villages of Matobo, Mathangwa and Marapong since 1986. Farmers are involved in decision making and monthly group meetings of farmers and ATIP staff are used as a forum to discuss problems and evaluate trials and new technologies. The membership of groups has expanded rapidly. The objectives of the survey were to find out communication problems which might exist in group interaction in relation to the large size of groups (Matoba has over 50 members), and to elicit farmers' assessment of ATIP adaptive research. Farmers were divided into three target groups: "progressive farmers" with their own draught power and no labour shortage; middle farmers with insufficient draught power and no labour problems during weeding time; and poor farmers with no draught power and severe labour problems. Results indicated that farmers did not perceive themselves as members of a functioning group, but as individual farmers interacting with ATIP staff. The size of groups in relation to number of ATIP staff was too large. The size of groups resulted in farmers having difficulty in expressing their problems. It is recommended that smaller farmer groups be created. The widespread reliance of farmers on tractors for ploughing, and delays in ploughing resulting from the limited numbers of tractors, created problems for the operation of on-farm trials. Farmers were generally unpressed with ATIP trials and felt they were relevant to their farming conditions.

209 OKALI, C.; CASSADY, K. (1985) **Community response to a pilot farming project in Nigeria.** Discussion Paper no.10. African-American Issues Centre, Boston. 28p. ODI Loc. 1732.
Describes a community-based survey which sought to understand why certain types of individuals were under-represented in an alley farming project in southwest Nigeria. The alley farming project started between April and June 1984 and 68 alley farms were planted with leguminous trees and food crops. The composition of alley farmers was biased. While women made up 31% of the population, only 18% of alley farmers were women. There was also a disproportionate number of small ruminant owners among the alley farmers. The survey focused on the whole community and not only on the participating project farmers. It examined competing economic activities within the two villages. Formal survey methods were used to collect information on the village economy as a whole, the categories in the village population and in the alley farming population. Intensive informal interviews were also conducted to elicit how women fit in the economy, the relationship between farming and land tenure, and farmers doubts about the project. A recommendation domain or target population was not delineated: the whole village population was conceived as a potential recommendation domain. Preliminary findings are discussed. These suggest that women's competing labour requirements for oil palm processing during the period when the project was initiated partly accounts for this lower level of participation. Other factors include men and women jointly participating in alley cropping on the man's land and other features of land tenure.

210 PIELAGO, G. D.; DISTRAJO R. P.; GAYON, L. P.; APURA, D. G.; DE GUIA, O.M.; DE PEDRO, R. C.; LIGHTFOOT, C. (1987) **A diagnostic study of the problem complex in shifting cultivation systems of upland farmers in Basey, Samar.** Farming System Development Project - Eastern Visayas. Visayas State College of Agriculture, Baybay, Leyte. Philippines. Farming Systems Development Project - Eastern Visayas Working Paper no.11. 28p. ODI Loc. 1657.
Examines the constraints and problems which shifting cultivators face in opening and abandoning land, in the uplands of Samar in Philippines. The main research methods involved an informal diagnostic survey of a 30% sample of the total 65 households cultivating upland rice. The survey involved visits to farm fields to highlight questions and took several months to complete. The main areas examined included farm typology, cropping systems, land classification and methods of shifting cultivation. Systems diagrams were used to analyse the data and suggest areas of possible technological intervention. Results revealed that criteria for opening land was related to fallow regeneration. The main criteria for abandoning land were related to weed regrowth, soil exhaustion, and multiplication of red ants which attacked farmers. The main constraints were labour problems and pest and disease infestations of crops. Four possible areas of technical intervention are suggested in the light of the diagnostic survey. These solutions employ techniques which: 1) reduce soil exposure, 2) reduce cogon grass regeneration in the surrounding areas, 3) increase soil fertility, 4) limit pest and disease infestations. Technological intervention must be adapted to the existing socio-economic conditions.

211 RHOADES, R. E. (1983) **The art of the informal agricultural survey.** Social Science Department Training Document 1982-2. CIP, Lima, Peru. 40p. ODI Loc. 1683.
Analyses the characteristics of different types of survey and outlines useful procedures for interaction with farmers while conducting surveys. Informal surveys are examined in relation to (1) feasibility studies; (2) reconnaissance studies - to gain basic information for the design of more in-depth investigation; (3) for pin-pointing farm-level problems in on-farm experimentation. The use of

secondary data, definitions of region of research, use of aerial photographs and maps, farm typology and agroecological zoning are discussed. The importance of good field procedures, polite and sympathetic attitudes to farmers, timing interviews to coincide with slack periods, observing local customs, and promptly writing up the results of interviews after their completion, are emphasised.

212 RHOADES, R. E. (1985) **Informal survey methods for farming system research.** *Human Organisation,* 44(3):215-218. ODI Loc. 1816.
Outlines useful procedures for interaction with small farmers, emphasising the importance of good preparation (reviewing earlier reports; deciding what kind of information is required), of an attitude of politeness and sympathetic enquiry, of timing interviews to coincide with slack periods for the farmer, of observing local customs and adequately writing up the interview once completed.

213 SMUTKUPT, S. (1988) **Rapid rural appraisal (a lecture).** In Ly, Tun, Balina, F. T. eds: *Report on a workshop on operational methods of conducting participatory research in the upland areas of Philippines.* Proceedings of Philippine Upland Research and Extension Training Workshop, June 19-24, 1988. ATI-NTC-Visayas-VISCA, Baybay, Leyte, Philippines. pp.194-198. ODI Loc. 1726.
Outlines the principles and methodology on which Rapid Rural Appraisals (RRA), as carried out by Khon Kaen Farming Systems Project, are based. The RRA team in a specific project is interdisciplinary and consists of 15-21 researchers. They are divided into smaller teams of between 3 -5 in the field. The scope of RRA includes diagnosis of the physical, biological and socio-cultural environment. Each team is assigned a particular aspect of the farming system to focus on and they exchange information during the field trip. RRAs involve semi-structured interviewing techniques in which questions are raised in response to the perceptions of the farmer. Methods of direct observation are used, in which researchers accompany farmers to examine farm fields and environmental conditions. Various mapping techniques are used. Before carrying out fieldwork, secondary data is consulted. Individual and group interviews are both utilised. The knowledge of the farmers about the environment and farming conditions is elicited and information is collected from at least three different points of view.

214 SWIFT, J. (1981) **Rapid appraisal and cost effective participatory research in dry pastoral areas in West Africa.** *Agricultural Administration,* 8:485-492. ODI Loc.
1828. Examines methods and problems in the collection of data on livestock among pastoral communities in West Africa. Livestock research requires long time series data. "Ground truth" is necessary to complement satellite imagery and national statistics, but there are problems of motivation and high cost if outsiders undertake this work. It is suggested that data gathering networks could be established within pastoral communities to provide information necessary to assess range condition, animal numbers, productivity and the domestic economy, eg. ILCA-trained local enumerators in Mali. The method needs considerable preparation but is low-cost once established.

215 WAHYUMI, S.; KNIPSCHEER, H. C.; GAYLORD, M. (1987) **Women's decision-making role in small ruminant production: The conflicting views of husbands and wives.** *Agricultural Administration and Extension,* 24: p91-98. ODI Loc.1835.
Part of a questionnaire addressed to wives of sheep and goat farmers in Cirebon, Indonesia, was later administered to their husbands. In the light of the results, it is argued that careful selection of sampling units and survey instruments is needed to minimise sex bias in survey results. The results of both surveys showed husbands and wives reporting significantly (ANOVA) different levels of

participation in small ruminant management. A Spearman rank correlation test indicated consistency between two data sets as wives and husbands tended to rate similarly the wife's role in decision making relative to that of other wives.

216 WOTOWIEC, P.; POATS, S.; HILDEBRAND, P. E. (1986) **Research, recommendation and diffusion domains: A farming system's approach to targeting.** Paper for conference on Gender Issues in Farming Systems Research and Extension, University of Florida, Feb 26 1986. 14p. ODI Loc. 1836.
The authors propose refininculture", ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.
Describes the methods developed and problems encountered in on-farm research, by the Farming Systems Research Programme of the Bangladesh Agricultural Research Institute. The aim of research was to develop biologically stable and economically viable cropping systems, by testing cropping patterns in farmers' fields. Trials were carried out with seven different cropping patterns in different agronomic conditions in rainfed and irrigated, highland and lowland localities. The aim of research was to promote new technologies through developing farmer participatory methods; developing an extension strategy based on a systems approach; and identifying and solving problems related to socio-economic problems of the farmers. Monitoring of the project revealed that the majority of farmers did not adopt the full technological package, but adapted aspects to their needs. Although farmers perceived the improved performance of new introduced varieties, they adjusted their strategies to risk factors. They sowed a large number of crop varieties, in case of poor performance by the introduced varieties in a subsequent year. Many farmers also had insufficient capital with which to follow the recommendations. The experiences indicate that class-specific technologies need to be created in addition to eco-specific technologies.

5 ON-FARM RESEARCH: FARMER PARTICIPATION IN TESTING AND EVALUATION

217 BAKER, G.; KNIPSCHEER, H. C.; DE SOUZA NETO, J. (1988) **The impact of regular research field hearings (RRFH) in on-farm trials in northeast Brazil.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.11. *Experimental Agriculture,* 24(3):281-288. ODI Loc. 1606; 1607-27.
Describes field trials in which the effectiveness of farmer participatory research was evaluated as part of a larger project among small-scale livestock farmers in Brazil. It is argued that Regular Research Field Hearings (RRFH) enhance the effectiveness of technology. These are based on dialogue and interaction between farmers, researchers and extension agents to contribute to researcher and extension agent understanding of the production system, and farmers' knowledge of livestock technology and production. Thirty farmers were randomly assigned to three groups. One participated as a control group, receiving no technology, the second received the technology package and the third group received the technology and participated in RRFH. The group participating in RRFH experienced a significantly higher level of success with the technology, measured according to criteria of weight gain in livestock, farmer perception of animal performance, willingness to pay for the technology and the farmers' evaluation of their satisfaction.

218 JHA, K. P.; GANGADHARAN, C. (1987) **On-farm rice research for resource poor farmers in Orissa.** *Farming Systems Research Newsletter,* Part I, 1(3):10-16; Part II, 1(4):15-21. ODI Loc. 1695.
Describes on-farm trials conducted on resource poor farmers' fields in the Orissa area of India, on marginal land. Research stations cannot represent the wide variations in conditions which occur on small farmer lands, in relation to ecological and socio-economic conditions. On-station research needs to be complemented by on-farm research. On-farm research was conducted on problem sites including laterite soils, waterlogged conditions, and areas with pest and disease problems. Farmer participation was utilised at every stage of research, as a basis for feedback to research stations for the further refining of technologies and recommendations. The results of trials using new plant varieties and fertiliser recommendations and farmer evaluations are documented.

219 KHAN, M. R. K.; MOULA, G.; RAHMAN, H.; ABEDIN, Z. (1988) **The farmers' participative technology development and evaluation at the farming systems research site, Jamalpur, Bangladesh.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.
Describes the methods developed and problems encountered in on-farm research, by the Farming Systems Research Programme of the Bangladesh Agricultural Research Institute. The aim of research was to develop biologically stable and economically viable cropping systems, by testing cropping patterns in farmers' fields. Trials were carried out with seven different cropping patterns in different agronomic conditions in rainfed and irrigated, highland and lowland localities. The aim of research was to promote new technologies through developing farmer participatory methods; developing an extension strategy based on a systems approach; and identifying and solving problems related to socio-economic problems of the farmers. Monitoring of the project revealed that the majority of farmers did not adopt the full technological package, but adapted aspects to their needs. Although farmers perceived the improved performance of new introduced varieties, they adjusted their strategies to risk factors. They sowed a large number of crop varieties, in case of poor performance by the introduced varieties in a subsequent year. Many farmers also had insufficient capital with which to follow the recommendations. The experiences indicate that class-specific technologies need to be created in addition to eco-specific technologies.

220 KHAN, S. U. (1986) **Successful implementation of Block Production Program in Nepal.** Ministry of Agriculture, Nepal. Block Production Programme, Khumaltar, Nepal. 71p. ODI Loc. 1665.
The Block Production Programme is based on a participatory group method which creates a team of researchers, extension agents and farmer cooperators who encourage all farmers within a given area to join a Production Block and agree to apply recommended technology. The technology is screened in trials carried out under farmer conditions, in farmer fields alongside traditional farming practices. A Block Production Team is formed to disseminate new technology. Farmers are encouraged to join and trained to act as Agricultural Assistants. The aim is to encourage all farmers within an area to join the block, which can then be serviced with a more efficient support service, in which a wide range of research institutions and support agencies can be integrated. Methods of disseminating technology are also based on participatory methods, including mass meetings, group discussions, field visits and farmers' Field Days. With many farmers participating, the Block Production Teams are able to intensify their work, and have been assisting individual farmers to draw up detailed production plans. The Production

Teams also provide feedback to research stations on farmers' needs and the effectiveness of improved technology.

221 LEV, L. S. (1986) **The inclusion of time factors in the design of on-station and on-farm trials: A case study from Kilosa District, Tanzania.** In Flora, C. Butler & Tomecek, M.: *Farming systems research and extension: Management and methodology*, Kansas State University, Kansas. FSR Paper Series no.11. pp.577-589. ODI Loc. 1653.

FSR/E research in the Kilosa district of Tanzania has attempted to develop research methodology in which the constraints, opportunities and performance of farmers are taken into account. A key conception in the re-orientation of research has been a focus on the temporal dynamics of peasant decision-making, and the integration of timing considerations in farm research. Research usually concentrates on the allocation of resources within a short and specific time period. Although farmers frequently operate double cropping systems based on two rain seasons, most commodity orientated research has concentrated on the maximising of yield in the major rain season. Research in Kilosa focused on farm experimentation with cropping sequences, based on new improved crops. These aimed to address questions of bottlenecks in labour expenditure on weeding and land preparation. Trials were designed to extend over the major and minor cropping seasons. Kito, a short duration maize was introduced for the minor season in an intercrop with cowpea. Staha, a high yielding maize with disease resistance and similar characteristics to traditional maize varieties was intrculture", ILEIA, Leusden, 11-12 April, 1988. 7p. ODI Loc. 1608.

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222 LIGHTFOOT, C. (1981) **Experiences in designing and evaluating technical packages for small farmers, the case of Botswana.** *Farming Systems Newsletter,* 6:9-12. ODI Loc. 1662.
The potential for improved farm management practices to increase yields using traditional technology is examined. In field trials comparing the performance of traditional and improved technologies, in farmers' fields and at research stations, no significant increase in yield could be attributed to new technologies. However there were noticeable differences in yields achieved on farmers' fields and at research stations. Research stations achieved higher yields through more efficient crop husbandry. There is a great potential to improve yields on farmers' fields with traditional technology. Traditional technologies are also well adapted to farmer circumstances, incorporating such strategies as risk minimisation. The large investment in resources required by new technologies often conflicts with the low input philosophy of small-scale farmers. It is argued that improvements for small farmers can be achieved by improving husbandry systems and creating more efficient systems of resource allocation. Further areas for research on this theme are delimited, including improvement in the use of draught power, family priorities

in allocation of labour, and demonstrations to farmers of the benefits of improved husbandry methods. There is a need for the design of technology packages to respond to specific target groups and farming characteristics.

223 LIGHTFOOT, C. (1982) **Agricultural research for development of small farmers: a closer look at traditional technology.** *Botswana Notes and Records,* (14):51-58. ODI Loc. 1661.
The performance of traditional and improved technologies on small farmers' fields and on-station is examined in Botswana. The farming system of small scale farmers is outlined. It is argued that no significant increase in production has been achieved by the introduction of improved technologies. Within categories of farmers utilising improved technologies and categories using traditional technologies, there are considerable variations in yields. Variations in yields are independent of the type of technology utilised and are related to management practices. High yields achieved on research stations with traditional technology suggests that traditional technologies have a much higher yield potential than is achieved by the majority of farmers. The main problems preventing farmers achieving higher yields relate to the timing and management of farming activities, particularly in relationship to planting and ploughing. Until research investigates traditional farm management techniques in Botswana and potentials for improvement, there is unlikely to be increased food production.

224 MARTIN, A. M.; GIBBONS, D. (1980) **On-farm trials 1977/79.** Research Report no.8. ICARDA, Aleppo, Syria. 60p. ODI Loc. 1801.
Describes farmers' involvement in and perceptions of the cereal programme's field verification trials at ICARDA. Secondly, it gives an account of three farmer-requested on-farm trials run by the FSR programme in their study villages and the problems and issues raised. Thirdly, recommendations for future on-farm trials work are made.

225 NORMAN, D.; BAKER, D.; HEINRICH G.; WORMAN F. (1988) **Technology development and farmer groups: Experiences from Botswana.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.15. *Experimental Agriculture,* 24(3):321-331. ODI Loc. 1606.
Describes and evaluates the Agricultural and Technology Improvement Project's (ATIP) attempts to set up farmer groups in Botswana. The researchers participate with farmer groups in projects established to promote arable crop production technology and gain feedback from the farmers. ATIP is committed to farmer group participation as a method of developing low cost on-farm research. Farmer groups meet regularly with researchers and extension agents to develop on-farm trials and evaluate the results. It is argued that farmer groups improve farmer participation in the technology development process, that the interaction between farmers in the groups improves linkages between researchers, extension agents and farmers. The effects of the size, social composition and nature of interaction between farmers, on group performance is examined. A typology of different farmer groups is suggested based on different research objectives, different types of farmer participation and the particular role of the researcher.

226 PRAKAH-ASANTE, K.; SANDHU, S.; SPENCER, D. S. C. (1984) **Experiences with rice in West Africa.** P. Matlon; R. Cantrell; D. King & M. Benoit-Cattin: *Coming Full Circle.* IDRC, Ottawa. pp.119-124. ODI Loc. 1801.
Describes the operational procedures followed by the West African Rice Development Association (WARDA) to involve farmers in on-farm testing of technology. Early on-farm trials are managed by researchers and test the components of technical packages in small plots on farmers fields. Those which

show promise are further tested in adaptive trials which are managed by farmers, with advice and consultation from researchers and extension agents. The trials are evaluated on the basis of yield data, economic benefits and social criteria. Farmers contribute to the evaluation of the technology, and in the light of this modifications are made. On the basis of evaluation some techniques are recommended for the extension services for general dissemination, others are recommended for specific farm types, and some are returned to research stations for further investigation and modification. Training programmes are also recommended to the extension services in the light of adaptive trials.

227 RUSSELL, N. (1984) **Tapping the farmer's wisdom.** *IDRC Reports,* 13(2):18-19. ODI Loc. 1824.
Based on the experiences of Cameroon's National Root Crops Improvement Program, it is argued that farmer participation in on-farm research can play an important role in adapting technologies developed at experimental stations to farmers' conditions. The on-farm trials programme, begun in 1982, aimed to increase farmers' participation in problem solving and to encourage dialogue between farmers, scientists and extensionists. Scientists had been reluctant to work in the uncertain environment of farmers' fields, while extensionists had tended to be physically and intellectually isolated from research scientists. Two improved sweet potato varieties were tested and evaluated by farmers. Experimental station research remains the programme's foundation, but it is guided by criteria of relevance to farmers.

228 SINGH, K. P. (1985) **Rice based farming system research for resource poor farmers on plateau region of Bihar, India.** Paper presented at Rice-based Farming Systems Research, methodology workshop, organised by the Ford Foundation, New Delhi, Ramakrishna Mission, Narendrapur. 24p. ODI Loc. 1694.
The farming system of resource poor farmers in the plateau area of Bihar in India is described. Socio-economic, administrative and organisational constraints are outlined. Technologies designed in research stations and on-farm trials with farmer participation are described. On the basis of a diagnostic survey into the farming system, on-farm trials were designed to develop techniques of line sowing, line transplanting, use of fertilisers and improved seeds cultivation. Trials were conducted in farmers' fields with farmers collaborating in the management of trials. Farmers identified several problems which were used to develop further research priorities. Based on farmer responses to the trials, it was decided to develop a simple trial design in forthcoming years, and dispense with replicate trials.

229 SOLLOWS, J. (1986) **Farming systems research: Rice/fish culture investigation, Ubon, 1984-1986.** CUSO, Ubon. 9p. ODI Loc. 1827.
Outlines methods for introducing rice-fish culture in parts of N.E. Thailand through on-farm trials. The trials included variations in stocking intensity and impact on fish of chemical fertiliser applied to rice. The importance of researchers' willingness to accept modification by farmers of the technology they recommend - owing, in particular, to wide variations between farmers - is stressed.

230 SOLLOWS, J. (1987) **Rice-fish culture in Ubon, northeast Thailand.** CUSO, Ubon, Thailand. 13p. ODI Loc. 1689.
Describes the adaptation of rice-fish farming techniques to the conditions of farmers' rice fields in northeast Thailand. Research methodologies are also documented. Trials were conducted on farmers' fields, with emphasis given to represent poor farmers in the experiments. Farmers were involved in the formulation of research activities and the design of trials. Trial designs were kept simple and were flexible, able to accommodate changing research priorities,

changing circumstances and farmers' adaptations. To make experiments approximate farmers' conditions, trials were superimposed on farmers' fields and controls were kept to a minimum. Farmers were encouraged to design and manage controls. Data was mainly collected through monitoring the trials. Problems of monitoring and measuring results in relation to changing conditions of research and farmers' adaptations are described in detail. As a result of research findings and farmers' interests and perceptions, new trials were superimposed onto the original trials in the third year of research. These investigated the positive effects of fish culture on rice yields, which had been noticed by farmers and researchers.

231 WORMAN, F.; HEINRICH, G.; MASIKARA, S.; MABONGO, B.; BOCK, S. (1987) **1986-87 Farmer's groups technology options testing trial (farmer managed/farmer implemented)** Department of Agricultural Research, Ministry of Agriculture, Botswana. Agricultural Technology Improvement Project (ATIP) PR F87-6. 53p. ODI Loc. 1650.
Describes Farmer-Managed Farmer-Implemented (FMFI) groups, and the farm experiments initiated by the Francistown Agricultural Technology Improvement Project (ATIP) in Botswana. Farmer groups test technologies deemed ready for dissemination, and also experiment with untested technologies which, due to lack of time, cannot be tested under research managed conditions. The group concept was discussed at communal meetings and interested farmers were invited to a secondary meeting. At this meeting farmers were asked to select innovations which seemed most relevant to their situation, and to test others with some research guidance and provision of inputs. Monthly meetings were held with the group to discuss problems and progress. In this way, farmers demonstrated which types of innovations they found most appropriate. Researchers were able to observe the effectiveness of these innovations and work with farmers towards development of improved crop production systems. By including extension agents in the monthly group meetings extension became incorporated into the farming systems development process. In 1987, 97 farmers from three villages participated. The majority of trials were concerned with double ploughing innovations and hand row planting trials. Due to poor rainfall there was high crop failure in the trials and farmers reported late planting date for the trials. Observations of plant numbers, growth and vigour was favourable for the trial plots, as was reduced time in weeding. Despite problems with the trials, farmers showed interest in continuing with group activities and on-farm trials.

232 WORMAN, F. D.; HEINRICH, G. M. (1988) **Two operational approaches to participative technology development used by the Agricultural Technology Improvement Project, Francistown, Botswana.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 14p. ODI Loc. 1608.
The Agricultural Technology Improvement Project (ATIP) in Francistown, Botswana, has developed farmer groups as a method of farmer participatory research. Two types of farmer groups have been established: research managed and extension managed groups. The operational context in which the farmer groups have developed is described. The farmer group approach grew out of a farming system project and agro-ecosystems analysis, in which researchers came to the conclusion that a single technology package could not work in Botswana's harsh environment. ATIP began to experiment with several technologies and to attempt to identify technological options which would be relevant under different seasonal farming conditions, and to develop a sequential farming decision-making perspective. Farmers, views on the suitability of technology were solicited. Farmer groups evolved as a practical method of organising research, given scarcity of research resources. Farmer groups allowed the testing of a greater number of

technologies under a great variety of situations than was possible under researcher managed trials, and allowed for greater farmer input into research. The objectives of researcher-managed farmer groups are to test a broad range of technologies under farmer-managed conditions, to involve farmers and extensionists in the farming systems development process, to determine types of innovation most suitable to different types of farmers, and to refine the techniques of organising farmer groups. The objectives of extension-managed groups are to test a limited range of extension recommended technologies, test a few researcher recommended technologies and to assess the efficiency of farmer groups as avenues for extension work. Extension and research activities are drawn up at collaborative meetings between extension and research staff. Farmer group meetings are used to solicit suggestions from farmers on the modifications of technology. Experimental designs are suggested by research staff and field trials are managed by farmers with extension and researcher input. Farmers are encouraged to assess and analyse the results of farm trials at group meetings. ATIP is also monitoring the extent to which the technologies which farmers are testing are being incorporated and disseminated by farmers.

6 ON-FARM RESEARCH: FARMER PARTICIPATION IN DESIGN, TESTING AND EVALUATION

233 ASHBY, J.; QUIROS, C. A.; RIVERA, Y. M. (1987) **Farmer participation in on-farm varietal trials.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. ODI, Agricultural Administration (R&E) Network, Discussion Paper No 22. 32p (conf); 30p (ODI) ODI Loc. 1607.
This paper asks what contribution farmers can make to the criteria (usually defined by breeders) for accepting or rejecting new varietal material. In CIAT bean trials, earliness of maturation was found to be an important criterion to farmers but had not been considered by researchers. Important differences also emerged in respect of grain size; smallness attracted a lower price in commercial varieties but was not a disadvantage for domestic consumption where flavour and cooking characteristics were important. Farmers also expressed strong preference for a more upright plant architecture, to facilitate weeding, than had been considered to date. With cassava variety selection, a different approach was adopted, providing farmers with a range of material and basic agronomic information on each type, and then deriving their selection criteria from the varieties they planted. Group discussion permitted rapid synthesis of farmers' common practices and alternative management strategies, and had the added advantage over survey-type investigations of allowing researchers to check their understanding of farmers' views in the course of the discussion. However, care needs to be taken in selecting group members so that the interests of specific groups (in this case, those producing for market and those for domestic consumption) are to be adequately understood and represented.

234 BELL, K. A.; GARROD, G. (1986) **Farming systems approaches at Lumle Agricultural Centre.** Nepal, Department of Agriculture, Farming Systems Research and Development Division. "Papers presented at the 1st Farming Systems working group meeting", August 11-13, 1986, Pokhara, Nepal. pp.15-26. ODI Loc. 1697.
Describes the operational framework for FSR research at Lumle Agricultural Centre (LAC), situated in the mid-hills zone of the Western Development Region in Nepal. The mid-hill zone is situated away from major communication networks. The farming systems are characterised by great agroecological and socio -economic diversity. Minor crops, which do not receive much emphasis in national agricultural programmes, play an important role in the production system. To

investigate problems under these conditions, LAC has developed a multidisciplinary team capacity with horticultural, livestock, forestry and social science components in its research teams. The focus of research is to develop a holistic analysis of the farming system. Farmer participatory methods have been developed to complement on-station research. Farmers participate in the diagnosis of the farming system, the planning of research activities, the management of trials and the evaluation of technology. The Combined Trek has developed as a central research method, in which multidisciplinary research teams visit field sites. The teams carry out surveys, appraise and diagnose the farming system. Research plans are drawn up in the light of these findings and field trials are designed. Group meetings form an important part of the Combined Trek, in which researchers discuss their objectives and findings with farmers, and utilise interaction with farmers as a means of developing and evaluating their research agenda. After designing a research agenda for the site, a fieldman is appointed to monitor and record the results of trials. Technicians frequently visit the trial site and monthly meetings take place between fieldmen and senior staff. Secondary multidisciplinary teams also visit the site to review the research programme. A programme of fixed consultations between researchers and farmer groups to evaluate and review trials has developed, to ensure that farmer feedback is utilised in the evaluation of research activities.

235 CHAVES, L. E. E. (1987) **On-farm research: Some experiences on farmers' participation in Colombia.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 17p. ODI Loc.
1607. Describes "adaptive research and adjustment of agricultural technology", a type of on-farm research conducted by the Division of Rural Development in Colombia. Research findings from experimental stations are selected for specific areas and tested in local farming conditions with farmer participation. They are adapted to the agronomic, social and cultural realities of small farmers. The various stages in research are charted from the identification and diagnosis of problems to on-farm research. Farmers participate in the diagnosis stage, by identifying their circumstances and the problems they face. The technological needs of farmers are determined in research stations. Farmers participate in designing the experimental project and manage and collect data from on-farm trials. Farmers participate in analysing and evaluating the results of the trials and the feasibility of the new technology. Methods of farmer participation in diagnosing problems are described. Advantages of farmer participation include better feedback, improved relations between researchers and extensionists, better relations between research agents and farmers, increased adoption of technology, and economies in research costs.

236 FARMING SYSTEMS RESEARCH & DEVELOPMENT DIVISION (1986) **Naldung Farming Systems site, "Samuhik Bhraman" & proposed research programme.** Report no.5. His Majesty's Government, Ministry of Agriculture, Kathmandu, Nepal. 50p. ODI Loc. 1700.
The results of an interdisciplinary joint team trek (*samuhik bhraman*) to Naldung farming system site in the Khabre district of Nepal are discussed. Informal surveys were developed to analyse the production system. Multidisciplinary research teams spent a few days at the site discussing research problems and issues with farmers and developing group discussions. A guiding principle of research was to involve the farmers in the process of defining research priorities and in evaluating research results. The farmer is viewed as the client. The report describes the site and agricultural production system, and the problems in production as perceived by the farmers and researchers. The involvement of farmers in the process of developing research plans and in designing research

activities is described. The individual trials of the research proposal are documented, with a summary of the objectives, methods of research, evaluation criteria and location of experiments.

237 MATHEMA, S. B.; GALT, D. L.; ET AL (1986) **Report on the process of the group survey and on-farm trial design activity, Naldung Village Panchayat, Kavre District, Nepal.** SERED Report no.2. Dept. of Agriculture, Socio-economic Research and Extension Division, Khumaltar, Nepal. 36p. ODI Loc. 1802.
Describes treks conducted jointly between agriculture, animal health and forestry department staff to identify problems requiring research, propose quick "opportunistic" trials, and feed information back to commodity and disciplinary agricultural researchers. Interviews with groups of farmers organised by local ward chairmen proved more efficient than individual interviews. In identifying problems, scientists tended to focus on those resolvable at an individual farm level, whereas local leaders saw community-level problems as more important. The treks opened the way for discussion of future interdisciplinary work, on such issues as what the composition of a trek team should be and how the views of women might more adequately be solicited.

238 MATHEMA, S. B.; GALT, D. L. (1987) **The Samuhik Bhraman process in Nepal: A multidisciplinary group activity to approach farmers.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 16p. ODI Loc. 1607.
Describes the processes involved in *samuhik bhraman*, an interdisciplinary and interdivisional research group trek, carried out in Nepal. Researchers and technical staff, from different departments, visit distant agricultural areas, to carry out diagnostic research based on rapid rural appraisal methods. The objective of the *samuhik bhraman* is to facilitate interdisciplinary fieldwork; to focus multidisciplinary expertise on a limited target area; to interact efficiently and rapidly with local farmers to determine the main problems and constraints in the farming system. Research findings are followed up with on-farm trials and other research and extension activities, designed by the research team. Research findings are also utilised by research centres, to tailor technologies more closely to the needs of the farmers. The initial *samuhik bhraman* to new target areas lasts four days. Research activities include informal informant and household surveys and farmer group interviews. The research team jointly write up and review research findings in the field, discuss and evaluate their findings with farmers, prioritise the main problems, and design trials with farmer participation, before leaving. Follow up secondary *samuhik bhraman* are also undertaken, to existing FSR sites, to assess, re-adjust and reinforce research activities. Logistic problems facing the *samihik bhraman* within the present structure of agricultural research in Nepal are also addressed.

239 MATHEMA, S. B. (1988) **Farmers' willingness to collaborate in on-farm research on farming systems research sites in Nepal.** Paper presented at the 8th Annual Farming Systems Research/Extension Symposium, Fayetteville, Arkansas, October 9-12, 1988. 13p. ODI Loc. 1664.
The development of on farm research (OFR) in Nepal is documented and the types of farmer participation which have been developed in research are discussed. Multidisciplinary research carried out with farmer collaboration is considered a central feature of the process of identifying problems and potential solutions. It is argued that farmer participation is needed in all stages of research to generate technology which is suitable for the needs of farmers. Through discussion farmers can help identify factors limiting agricultural production. By involving farmers as experimenters, testers and evaluators of technology, ideas which are not acceptable to farmers can be screened out an early stage. It is also important to involve

farmers in decision making regarding the planning of research activities. Attempts have been made to address this through the development of the group trek (*samuhik bhraman*). Teams of multidisciplinary researchers visit rural areas and meet with groups of farmers to discuss forthcoming research activities in the area and solicit feedback for design of projects. The results of a survey into farmer perceptions of OFR are discussed. The main reasons farmers gave for collaborating in OFR were: it furthered their knowledge of agriculture, it led to improvements in their farming practices, gave them access to free inputs, and resulted in increases in productivity.

240 PANDEY, M. P.; OLI, K. P.; GREEN, T. (1986) **Initial approaches to FSR at Pakhribas Agricultural Centre.** Nepal, Department of Agriculture, Farming Systems Research and Development Division. Papers presented at the 1st Farming Systems Working Group Meeting, August 11-13, 1986, Pokhara, Nepal. pp.27-40. ODI Loc.
1697. Discusses the beginnings of the implementation of an FSR approach at Pakhribas Agricultural Centre (PAC), in the mid-hills of the Eastern Development Region of Nepal. The complexities of the hill farming system and the failure of conventional research to develop and adapt technologies for these conditions, has led PAC to develop a multidisciplinary FSR approach. Central to research activities is the Joint Trek (*samuhik bhraman*). Multidisciplinary research teams visit site areas and interact with farmers and community leaders to diagnose the farming system, plan and monitor research activities. Procedures involved in site selection; the development of the concept of a recommendation domain; and the delimitation of groups of farmers for which specific technologies can be targeted; are discussed. Commodity research and FSR are integrated. "Thrust" programmes have been developed, in which multidisciplinary teams work on the solution to particular problems with farmer collaboration. Research plans and recommendations are developed on the basis of study of on-farm conditions.

241 WILLIAMS, R. D. (1988) **Enhancing research and extension linkages.** Malawi Agricultural Research & Extension Project, Lilongwe. 4p. ODI Loc. 1690 Describes participatory research and extension methods which have been developed for smallholder horticulturalists in Malawi. Research and extension activities focus around the perceptions of farmers. A diagnostic survey among banana cultivators revealed that the main constraints related to cash shortages, which prevented cultivators applying the recommended levels of inputs. Researchers then modified the technology to select appropriate levels of farm management techniques to complement the farmers' resource base. Extension programmes devised appropriate training programmes for cultivators and designed trials with scientists. Farmer evaluations of technology are utilised as feedback and rejected technologies are modified until adoption occurs.

242 ZAFFARONI, E.; BARROS, H. H. A. (1988) **Operational approach in participative technology development for small farmers in northeast Brazil.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 14p. ODI Loc. 1608.
Describes the operational approach to participatory research with small-scale farmers, developed by the Farming Systems Research Project of the University of Paraiba in northeast Brazil. The aim of the project is to help small farmers to improve productivity, generate sustainable agricultural technology, and develop researcher and extension collaboration with farmers. The first stage of research consists in the analysis of the farming system. This is achieved through survey methods. Extensionists carried out 350 questionnaires among small-scale farmers. Analysis of the survey was carried out by interdisciplinary teams of researchers from different institutions. Having identified the main constraints, on-farm trials

were devised. The design of trials took into consideration the existing technology of the farmers and was discussed with farmers at meetings. The trials introduced new cropping patterns and were tested alongside traditional cropping systems in farmers' fields. The experiments were managed by researchers and extension staff. Researchers monitored the trials and discussed results at monthly meetings with the farmers and extensionists. Extension and farmer training is also an important component of the project. The new technology is designed to involve only minor changes to the farmers' practices and has been adopted or selected in part by farmers.

7 ON-FARM RESEARCH: FARMER PARTICIPATION WITH FARMER EXPERIMENTS

243 BUNCH, R. (1987) **Case study of the Guinope integrated development program, Guinope, Honduras.** Paper presented to the International Institute for Environment and Development's conference on Sustainable Development, London, April, 1987. 12p. ODI Loc. 1764.
Describes a development programme in the Guinope district of Honduras, based on utilising farmers experiments and developing extension activities to spread farmers' innovation. Farmers are involved in all stages of research, from design and planning to testing, evaluation and extension. Beginning in 1981 the programme worked with villagers on soil conservation, technology for increasing maize production, extension training and vegetable production. A loose knit federation of village agricultural clubs was established, to coordinate experiments and share results.

244 CHAVANGI, N. A.; NGUGI, A. W. (1987) **Innovatory participation in programme design: Tree planting for increased fuelwood supply for rural households in Kenya.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 34p. ODI Loc. 1607.
Describes the work of the Kenya Woodfuel Development Programme (KWDP), to develop self-sustaining tree planting systems, to contribute to fuel and wood supplies in densely populated districts of high agricultural potential, in Kenya. The KWDP operates at a district level, closely co-operating with ministries and other development agencies. The initial stage of research consists of district based surveys, to define the diversity of environmental and social systems present, to identify the main cultural issues affecting farm management, to develop a range of technical and extension options which accommodate traditional practices and the indigenous knowledge of the people. The local people are involved in project design, in defining their circumstances and woodfuel problems. Farmers are provided with tree seedlings by extension agents. They are not informed of cultural preparations, but are encouraged to use their existing knowledge of tree planting and to experiment in on-farm trials. The trials are closely monitored with the aim of developing designs of technical agroforestry options, tuned to the needs and strategies of different categories of farmers. The farmers experimental designs provide feedback to formulate research strategies for further trials. On-farm trials in Kakamega and Kisii are described, as are 25 farmer groups formed in Kakamega to discuss fuelwood issues. Extension strategies, based on people's participation are described, including the utilisation of drama groups, rallies, field days and film shows.

245 DE JAGER, A. (1988) **Towards self-experimenting village groups.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 12p. ODI Loc. 1608.
Describes an extension method devised in the Northern Region of Ghana, based on the creation of participatory farmer groups, which are encouraged to develop

their own experiments and appropriate technology. The project, established in 1986, set up 8 farmer groups and aims to create an additional 4 groups every following year. The average size of the groups is 25 members. They have been organised around extension contact farmers. The farmer groups are being trained to identify problems, gather relevant data, design experiments, test possible solutions and evaluate results. Through initiating group discussions extension staff identify local problems. They elicit successful local technology and ideas which can form the basis for subsequent innovation. Experiments are designed by project staff and farmers are trained in methods of self-experimenting. The groups choose individual members to carry out experiments on their own land. These are supervised by extension staff. Field days are held when group members visit all the experimental sites in their locality. The experiments are monitored and analysed by the project leader and extension supervisor. The results are presented to a group meeting where they are assessed and evaluated by group members. The extension agents summarise the evaluations of farmer groups and score and rank the various experiments according to the interest shown in them by the farmers. Problems encountered in the project are summarised. These include the unfamiliarity of extension staff with participatory methods, the high degree of extension involvement in organising the farmer groups, the low level of education among farmers, and poor infrastructure facilities. Reservations are expressed as to whether the ultimate aims of establishing self-experimenting groups can be achieved. Nevertheless the objective of creating interest among farmers and active participation in research is upheld as important in the promotion of new technologies and sustainable agriculture.

246 FUJISAKA, S. (1988) **Farmer participation in upland soil conservation research and technology dissemination in the Philippines.** IRRI, Manilla, Philippines. Agricultural Economics Department. 30p, including tables & diagrams. ODI Loc. 1630.

Describes farmer participatory research in Claveria in the Philippine uplands. Research is centred on the problems of land degradation and soil depletion on hill slopes. Research focused on utilising farmer experiments and developing farmer-to-farmer extension. A model for on-farm research and technology generation is suggested contrary to the transfer of technology model. This consists of understanding farmers' practices, perceptions and technical knowledge; utilising this knowledge and incorporating farmer experiments into research to help identify possible solutions. A dynamic on-farm research programme is developed in which different technical alternatives are experimented with in trials developed by farmers and researchers. Farmer-to-farmer extension involves farmer adaptors (those who have already adopted variants of the technology being tested) giving advice, participating in joint consultation and disseminating technology to other farmers. At Claveria the possible solutions identified by farmers and researchers to problems of soil erosion involved experimentation with contour hedgerow cropping techniques. These techniques were being used by neighbouring farmers at Cebu, in a World Neighbors project. Links were established with Cebu farmer-adaptors and they trained Claveria farmers in hedgerow cropping management techniques. The Claveria farmers tested the new technology and devised new alternative hedgerow cropping methods and plant combinations tailored to local needs. The experiments were monitored by the scientists who helped in selecting different variations of cover plants and in devising new experimental hypotheses. Researchers also investigated problems which arose out of the experiments, such as pest multiplication in the hedgerows. Farmers'

technical knowledge and experiments are valuable resources for on-farm research, particularly in identifying relevant issues in the adaptation of technology to specific local conditions.

247 FUJISAKA, S. (1988) **A method for farmer-participatory research and technology transfer: Upland soil conservation in the Philippines.** IRRI, Manilla Philippines. Agricultural Economics Department. 20p. ODI Loc. 1631.
A method of participatory research is described which utilises farmer perceptions to help determine research priorities, which conducts research that integrates the different concerns and contributions of farmers and scientists, and utilises farmer to farmer technological transfer. The method is incorporated in research in the slopes of Claveria in Misamis Province of the Philippines. Initially 55 farmers were randomly selected and informally interviewed. Farmers with sloping land reported declining yields due to soil erosion. Assessment of the farmers' ideas about technical solutions and scientists knowledge suggested that solutions developed by a World Neighbors project at Cebu might be appropriate. Six farmers and two local researchers visited Cebu for training in contour hedgerow techniques using fodder grasses and tree legumes. On return to Claveria they experimented with the technology, adapting it to local conditions, working as a cooperative group. The group established 7 000 m of contour hedgerows planted on 10 parcels of land averaging 0.8 ha in size. Farmer experiments and adaptations are being monitored by scientists. Scientists are evolving other research activities around farmers' practices and adaptations, creating a "menu" of technical alternatives. Farmer-adaptors are also training other farmers interested in soil conservation. Cebu and Claveria farmers have continued to meet, evaluating each others' experiences and appreciating differences in local environments. Farmer-to-farmer training is being expanded: Claveria farmers are now training upland farmers and technicians from Zamboanga del Sur. The paper evaluates concepts of farmer participation critically. It is argued that they have often been superficial and have not led to any meaningful incorporation of farmers' perceptions.

248 GUBBELS, P. (1988) **Peasant farmer agricultural self-development: The World Neighbors experience in West Africa.** Draft version of paper presented at Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. A full version appears in *ILEIA Newsletter,* 4(3):11-14. ODI Loc. 1608; ODI Journals.
Describes the operational framework of World Neighbors (WN) projects in West African countries - Togo, Mali, Chad and Burkina Faso. The aims of the projects are to facilitate the extension of new techniques and encourage small-scale experimentation among peasant farmers. WN projects seek to build upon the existing knowledge and innovatory traditions of farmers. They aim to strengthen the farmers' potential to analyse constraints in the farming system, and to solve their problems in their own way. The focus of WN programmes is to build farmers' organisations for technical development rather than to diagnose the farming system. Main research priorities are identified from existing work within the area: from the existing programmes of agricultural and extension services, existing indigenous innovations outside the project areas, indigenous innovations within the project area, and from the experiences of local farmer groups initiated by WN. Having identified the main research areas, WN works intensively with 3-5 pilot villages, encouraging farmers to systematise and organise their experiments and innovations. Farmer groups are initiated and encouraged to develop links with existing research agencies and development agencies, and to take responsibility for the acquisition of inputs. WN promotes the development of networks of village-based farming organisations. Farmers are trained to screen technology developed by formal research institutions and also by local innovatory

farmers. Farmers are trained to carry out on-farm trials. WN also conducts and organises on-farm trials for research centres. WN trains farmers to work as extension agents and employs them to extend successful technologies to other villages.

249 KIRKBY, R. A. (1981) **The study of agronomic practices and maize varieties appropriate to the circumstances of small farmers in highland Ecuador.** PhD dissertation presented at Faculty of Graduate School, Cornell University. 252p. ODI Loc. 1652.

Outlines a participatory method, developed in the highlands of Ecuador, to involve farmers in developing and testing technologies through on-farm trials. Trials were designed for small scale maize cultivators and experimented with double cropping of maize and peas. Methods were developed to elicit the considerable knowledge local communities have of crop production. This included lengthy informal discussions with farmers and observation. These were complemented by experimental on-farm trials which revealed the rationale behind local practices. Conventional on-farm trials, with emphasis on variety and fertilised packages for a single crop and specific uniform requirements for trial sites, often prevent resource-poor farmers from participating. Relatively simple experiments were devised which could be repeated over a large number of farms in different localities and under different socio-economic conditions. This proved to be a useful tool to develop a systems perspective in which variations in local farming systems can be analysed. Informal experiments were devised. Farmers collaborated in the design, testing and evaluation of innovations on trial sites superimposed onto farmers' cropping systems. A wide variety of experiments were conducted into the feasibility of extending double cropping systems by sequential cropping of early and late crop varieties. Results suggested that subsistence-oriented farmers prefer to plant an early pea variety with late maize varieties. Commercially oriented farmers were prepared to introduce an early maize variety, and harvest lower staple yields for greater pea production.

250 KUYPER, J. B. H. (1987) **On farm agroforestry research in Kisii, Kenya.** Nairobi, Kenya. Beijer Institute. 7p. ODI Loc. 1611.

The operational framework of the Kenya Woodfuel Development Programme (KWDP) in Kisii is described. The KWDP is working to develop agroforestry methods for increased woodfuel production on smallholder farms, and to develop extension methods in agroforestry. The main aims of the programme are to develop technical packages and extension methods which are tailored to specific micro environments and which can be taken up by the existing extension services. On-station and on-farm research are integrated in the programme. On-station research yields basic information on tree growth and woodfuel production potentials under optimal conditions. On-farm trials give indications of production potentials in specific local environments and possible adaptations of technology to prevailing local conditions. On-farm trials are being conducted with 20 farmers. On-farm trials are loosely structured. The farmers are responsible for managing and devising the trials. The role of KWDP is to provide farmers with a wide range of planting material and advice. The farmers are given maximum room to develop their own ideas, to organise the physical parameters of the trials, to choose species, planting distance and planting sites. The farmers' choices become an important element of research and researchers investigate the farmers' reasons for making particular choices and their assessment of their decisions. Farmers are creatively experimenting with different plants, different techniques and different management methods. They are developing new insights into the suitability of a wide range of species to their particular needs and circumstances, rejecting some of the species and suggesting alternatives.

251 LIGHTFOOT, C. (1986) **A short methodological account of a dynamic systems field experiment: The case of legume enriched fallows for the restoration of soil fertility, eradication of Imperata, improvement of pasture, and reduction in labor for cultivation, in the Philippines.** Draft paper for 1986 Farming Systems Symposium, Kansas State University, October 5-8, 1986, Farming Systems Development Project - Eastern Visayas, Ministry of Agriculture, Tacloban, Leyte, Philippines. 23p. ODI Loc.
1658. Methodological techniques developed in the uplands of the Eastern Visayas, among coconut farmers in marginal environments, are discussed. It is argued that experimental design need to be systems orientated, dynamic and flexible and capable of responding to farmers' changing perceptions. Farmers view their farm problems holistically. The problems which emerge from their conceptions articulate complex interactions between several components of the farming system. By focusing on farmers' perceptions of their problem complex, researchers are able to examine interactions between components of the whole farming system. Upland farmers have developed complex farming systems in which, within marginal conditions, they exploit a wide range of ecological variables. Farmers operate a fallow system, resting the land after between one to four years. Farmers are increasingly dissatisfied with the time it takes natural vegetation to recuperate, the problems of controlling the growth of cogon species on farm plots, and poor livestock pasture. After intensive discussions with farmers, legume planted fallows were eventually adopted as a hypothesis worthy of testing. Farmers were involved with testing of Centrosema. However farmers found Centrosema planting to be laborious and its growth too slow to control cogon. Experiments were then shifted to another legume, Kudzu, which was sown into Centrosema plots. In responding to farmer perceived needs, experiments had to be simple for farmers to implement, and flexible to enable them to be adapted to farmers' findings in the experimental process.

252 LIGHTFOOT, C.; DE GUIA JR, O.; ALIMAN, A.; OCADO, F. (1987) **Letting farmers decide in on-farm research.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 24p. ODI Loc.
1607. Describes research methods developed in the Philippines, based on the farmer-first paradigm, to enable farmers to determine research priorities, based on the use of systems analysis and diagrams. Research concentrates on determining the main systems problems and is not component-focused or commodity-oriented. Research proceeds in three stages: problem identification, systems diagnosis, and hypothesis elaboration. Methods have been developed to enable the farmer to identify the main problems and constraints and to postulate solutions and carry out experiments, based on their knowledge of the agricultural system and their traditions of experimentation. Systems diagrams are utilised as a means of enabling farmers to analyse their agricultural system and identify the main constraints. The diagramming exercise forces the researcher to listen to the farmer. The aim of research is to minimise the bias of the researcher and maximise the input of the farmer, based on their concerns. The farming system is treated holistically and solutions are sought within the system, and within the capacity of the farmers.

253 LIGHTFOOT, C.; OCADO, F. (1987) **Operational description of methods in participative technology development: A Philippine case.** "Workshop operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April 1988. Also in ILEIA Newsletter 4(3) 1988, pp.18-19. 13p. ODI Loc. 1607.
The Farming Systems Development Project - Eastern Visayas (FSDP-EV) is committed to developing participatory research in the Philippines, in which

farmers are encouraged to maximise their input into the identification and solution of farming problems. The research procedures which have been developed to achieve these objectives are outlined for a project in Gandara. The emphasis of research is on holistic analysis of the farming system, rather than on generating component technology and crop trials. The stages of research are to identify appropriate problems which the farmers would like to elaborate further; diagnose the processes and reasons surrounding the problems existence; generate hypotheses for testing and implement farmer led experiments. At each stage farmers decide the major research issues. Initial research methods include group and individual discussion with farmers and informal surveys. Systems diagrams analysis forms the central activity in diagnosing problems and generating solutions. It provides a picture of the complex of issues and interactions the farmers perceive. They elaborate the main problems and relationships between different parts of the system, which are incorporated into diagrams drawn in group meetings. Possible solutions are discussed by researchers and farmers until a consensus is reached on a potential solution. Farmers and researchers carry out experimental trials to test hypotheses. The design of the experiments is left to the farmers. Researchers only provide guidance. Researchers participate in the experiments by providing materials, collecting data and measurements of the trials. The researchers' analysis of data and the farmers' responses are discussed at group meetings. In Gandara, the main problem identified was spread of *Imperata* into farmers' fields. The main solution suggested by the farmers was to experiment with vining legumes to shade out *Imperata*. The involvement of farmers in research has also increased the capacity and skills of farmers in working together and advising each other, and could prepare them to develop farmer-to-farmer training.

254 LIGHTFOOT, C.; PIELAGO, G.; DE GUIA JR, O.; DE PEDRO JR, R. (1987) **A participatory method for upland research: Systems-problems in shifting (kaingin) cultivation.** Paper presented at Second National Conference on Research in the Uplands, Viasayas State College of Agriculture, 1-6 December 1987. Visayas State College of Agriculture, Philippines. 13p. ODI Loc. 1656.

Describes a participatory farming systems approach, developed by the Farming Systems Development Project-Eastern Visayas (FSDP-EV), to understand and solve problems encountered by farmers in the Basey uplands of Samar in the Philippines. The nature of shifting agricultural strategies are discussed. Criteria which farmers use for opening and abandoning land are described. Systems problems surrounding shifting cultivation are analysed. A participatory research method is outlined in which farmers are encouraged to develop and test hypotheses and solutions. Farmers face considerable problems in maintaining the productivity of their land under shifting agriculture. They are forced by lowering yields, encroaching weeds and red ant infestations to shift their plots and plant new lands. Farmers are dissatisfied with the short duration of acceptable yields before they have to abandon land and expend labour in opening new land. Diagnosis of the farming system was achieved through informal surveys administered over several months. Data was analysed with the participation of farmers in a series of group meetings. Analysis was carried out with the aid of systems diagrams. These were drawn from the solicited responses of farmers, in which farmers explained the interactions in their farming system and the causal relationships between different elements. Ideas from five key farmers, based on their own experiences of conducting experiments, were examined to find solutions. After field trips to other areas to screen possible technological solutions, farmers chose to experiment with live legume mulches intercropped with cereal crops. The objectives of this were to stabilise yields, maintain soil fertility, and reduce weed regeneration. It is argued that commodity oriented cropping systems research cannot grasp the complexities of shifting cultivation. The systems approach

enables farmers to test and develop various hypotheses within the complex of bio-physical and socio-economic conditions they experience. Six months after the beginning of the project successes were reflected in the informal adoption of the technology by neighbouring farmers. Forty-five farmers underwent farmer-to-farmer training. The systems approach encourages high levels of farmer participation and large numbers of farmers are willing to collaborate in experiments.

255 LIGHTFOOT, C.; DE GUIA JR., O.; OCADO F. (1988) **A participatory method for systems-problem research: Rehabilitating marginal uplands in the Philippines.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.13. *Experimental Agriculture,* 24(3):301-309. ODI Loc. 1606.
Reports on farmer participatory techniques, to identify systems problems on degraded land, among resource poor farmers in the Philippine uplands. Problems in the agricultural system are addressed in terms of the fundamental structure of the agricultural system. Farmers were assisted in listing the issues which most concerned them. Systems analysis and diagrams were used to identify bio-physical and socio-economic constraints and to locate systems problems. Farmers decided which systems problems they wanted to resolve. The invasion of *Imperata cylindrica* into fallow lands and crop fields was isolated as a key systems problem, resulting in declining yields, which forced farmers to abandon cultivation, fallow earlier and recultivate more lands. Farmers were helped to develop experimental strategies, based on their knowledge, to solve the problems. They experimented with vining legumes to suffocate *Imperata*, improve soil fertility and reduce the costs involved in early recultivation of fallows.

256 MATLON, P. J. (1982) **On-farm experimentation: ICRISAT farmers' tests in the context of a program of farm-level baseline studies.** ICRISAT. Ouagadougou, Burkina Faso. 20p. ODI Loc. 1666.
On-farm research procedures developed by ICRISAT in Burkina Faso are described. The project experimented with on-farm trials in six villages in three ecological zones, involving 50 participants. On-farm trials were conducted in association with a survey to collect baseline information on the participating farmers. The main aim of research was to develop procedures for combining trials and surveys to elicit farmer perceptions and constraints. On-farm testing was first carried out in researcher-managed trials to screen suitable technologies. These technologies were then tested in farmer-managed trials. On-farm sorghum trials are described. Trial sites were divided into six blocks in which two experimental and one local variety of sorghum were planted. Each variety was planted twice: with improved management recommendations and with traditional techniques. The traditional management trials functioned to assess the risk factor induced in adapting new technologies under current management techniques. Results indicated that levels of potential financial loss incurred by planting improved varieties with traditional management techniques was significantly greater than for local sorghum. Problems of the degrees of complexity in trial design that farmers are capable and willing to manage, farmer deviation from recommendations, and bias introduced into trials by farmers are discussed. As a result of the investigation of these problems, research into the nature of farmers' experimental traditions was initiated.

257 MATLON, P. J. (1985) **A critical review of objectives, methods and progress to date in sorghum and millet improvement: A case study of ICRISAT/Burkina Faso.** Ohm, H. W. & Nagy, J.: *Appropriate technologies for farmers in semi-arid West Africa.* Purdue University, West Lafayette, Indiana. pp.154-179. ODI Loc. 1692.
In the light of on-going research carried out by ICRISAT in Burkina Faso, new strategies for sorghum and millet varietal breeding are suggested. These are based on interdisciplinary research, in which farmer experiments are used as a basis for screening varietal material. New elite varieties of sorghum and millet developed on-station often perform badly under farmer conditions, as a result of on-farm stress, which severely reduces yield performance. Rainfed systems of agriculture prevail and the region's soils have poor water holding capacities, creating a highly variable and risky cropping environment. New varieties need to be bred for adaptation to farmers' low level technological systems, and for resistance to stress. West African varieties which exhibit adaptive hardiness need to be screened and utilised as breeding material. New research procedures are required in which new varieties and advanced lines should be tested on-farm, under farmers' low input conditions. A strategy which involves increasing interaction between researchers and farmers, in which farmers participate at various stages of the breeding programme in defining appropriate objectives and testing materials and concepts, will reduce the time required to arrive at adapted improved varieties.

258 MAURYA, D. M. (1986) **On-farm rice research for resource poor farmers of Eastern Uttar Pradesh, 1984.** Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh. 58p. ODI Loc. 1804.
Emphasises the importance of understanding local agricultural systems in developing appropriate rice technology for resource-poor upland rainfed rice farmers, through on farm trials. It is suggested that farmers should be allowed to select, test and perfect alternatives from a range of new technologies according to their own criteria and objectives. More work is necessary on the design of statistically valid trials appropriate to conditions of high variability.

259 REPULDA, R. T.; QUERO JR. , F.V.; AYASO III, R. B.; DE GUIA JR., O.; LIGHTFOOT, C. (1987) **Doing research with resource poor farmers: FSDP-EV perspectives and programs.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 33p, includes tables and diagrams. ODI Loc. 1607.
Describes the research methods and strategies adopted by the Farming Systems Development Project (FSDP-EV) in the Eastern Visayas of the Philippines, in developing a Farming Systems Research (FSR) approach geared towards small upland farmers. The farming system of the area is characterised by fragile environmental factors which make capital investment very risky. Cultivation systems are complex and flexible, based on a wide range of cropping patterns, to cater for different and varying natural and social conditions. Shifting cultivation predominates. The duration of the fallow is dependent upon farm size, soil fertility and available capital. The soils cannot support intensive cropping without excessive inputs of capital. Intensive cultivation is not an important objective of farmers, since there are high land to labour ratios. Under these conditions research and technology geared towards the introduction of new crops and component technology are inappropriate. New technology has failed to take a hold among farmers who are unwilling to expend large sums of cash on the technology. The FSDP-EV has developed new programmes, based on farmer participation in deciding new areas for research. Techniques have been developed to elicit the farmers' problems; to understand the interaction between different

parts of the farming system; to investigate and build upon the experimental traditions of the farmers. Research has been community based. Farmer-to-farmer extension links have been developed, in which farmers are trained to design, implement and monitor trials. Experiments have been conducted with solutions which lie within the capacity of the farmers, such as the utilisation of vining legumes to improve soil fertility, rather than with high input solutions. The generation of component technology has been rejected as a research agenda. Research has developed an holistic, systems approach, of helping farmers to identify problems within their farming system, and finding solutions which lie within the range of their experiences and practices. Examples of the research activities being carried out in several localities are described.

260 RHOADES, R. E. (1986) **Storing seed potatoes in Peru.** In: IDRC. With our own hands: Research for third world development. Canada's contribution through the International Development Research Centre, 1970-1985. Ottawa, Canada. pp.187-202. ODI Loc. 1680.
Describes the operational stages of research, carried out to develop appropriate and simple potato storage technology for small-scale farmers in the Peruvian Andes. Research was carried out by small interdisciplinary teams. Research was based on continuous dialogue with farmers to identify the main constraints in production and adapt new technology to the needs of the farmer. The major constraint was seed storage technology. New varieties of seeds adopted by farmers produced long sprouts and lost considerable weight under traditional dark room storage techniques. The sprouts had to be pulled off before planting and this involved considerable outlays in labour and time. On-station research identified diffuse light storage methods as a possible solution. The technology was refined and modified to cut down costs and complexity, and designed to fit into farmers' living arrangements. Roofed verandas in their houses were adapted as stores. Farmers' experiments with the stores proved to be successful, but they felt the storage trays were too expensive. Scientists then redesigned the trays so that they could be produced by local craftsmen. Farmers then began to adapt the technology to their socio-economic needs. Dialogue with farmers continually redefined the objectives of research and the design of technology. Farmers were treated as experts in the local system whose knowledge provided the base for the definition of the problem, design of experiments and modification of technology for adaptation to farm conditions. This continuous interaction between farmers and researchers forms the basis for the farmer-back-to-farmer model. Diffuse light storage technologies has been widely utilised throughout the world by farmers and adapted to local conditions. This is indicative of the experimental traditions of farmers and illustrates the value in involving them as a partner in research. CIP has been disseminating diffuse light storage technologies with success in over 20 countries.

261 RHOADES, R. E.; BATUGAL, P.; BOOTH, R. H. (1985) **Turning conventional agricultural research on its head: The farmer -back-to-farmer approach.** ASPAC. Food & Fertilizer Technology Centre, Tapei, Taiwan. ASPAC. Extension Bulletin No.223. pp.23-37. ODI Loc. 1674.
The role of the farmer in relation to the development of technology is discussed in the light of a programme, introducing potato as a new crop to the Philippines. The farmer-back-to-farmer model (see **100**) was adopted for the introduction of potato cultivation in the Philippines. After an exploratory farming systems survey, farmer managed trials were established. Farmers were responsible for the trials, received no handouts and took all the risks. Farmers were encouraged to make modifications to the design of the trials if they wished. Farmers kept daily records of their cultural operations and participating farmers maintained close contact with each other. Local technicians from national agricultural research

organisations provided support to farmers and monitored the trials. The technology has been well received by farmers and they are adapting it to local conditions, experimenting with cropping systems, different locations and planting dates. The linkage with national research institutions has been important in developing the programme.

262 RHOADES, R. E. (1986) **Changing a post-harvest system: Impact of diffused light potato stores in Sri Lanka.** *Agricultural Systems,* (19):1-19. ODI Loc. 1676.
Describes the socio-economic conditions surrounding farmers' initial adoption of diffuse light potato storage techniques in Sri Lanka, and the impact of the new technology on the farming system. Due to rising costs of foreign potato seed, unavailability of seeds at optimal planting times, government decisions to cut back in the importation of seed potato, heavy losses in storage, and extension involvement in promoting new methods of potato production and storage, farmers were receptive to new storage techniques. Farmers adapted the storage technology to their own needs and conditions, modifying existing dwellings as stores, blending new technologies with the old, and devising security methods of protecting their seeds against theft. Various benefits cited by farmers in adopting the new technology are related to farming strategies. The new technology also had important effects on the farming system: increasing yield, changing cropping patterns, reducing dependency on foreign seeds and bringing prestige to the national research and extension services. Constraints on increased production are also analysed, including problems of seed degeneration, shortages of seed, and pest and disease problems. Continuing monitoring of the technology is necessary to access socio-economic consequences.

263 TAN, J. G. (1986) **A participatory approach in developing an appropriate farming system in 8 irrigated lowland villages.** *Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium,* (eds) Flora, C.B. & Tomecek, M. p.215-232. ODI Loc. 1824.
A participatory method developed by Agency for Community Educational Services Foundation (ACES) in eight villages in the Luzon area of the Philippines is outlined, with examples from two programmes. In the first stage of research a community organiser (CO) familiarises himself/herself with the people's culture and identifies problems in production. The CO engages in discussion with the farmers and they are encouraged to develop possible solutions and prioritise solutions. The farmers are then encouraged to experiment with solutions. They are encouraged to stay away from ready packaged remedies. Results are monitored by researchers, discussed with farmers, and evaluated by farmers. If the experiment is favourably evaluated and the farmers decide to pursue it, careful planning is carried out to implement a programme to further improve the techniques. Group meetings are held to focus on the activities undertaken by farmers and to reflect on the procedures they have developed; to summarise the main advantages of the innovation, and to develop the farmers' self -confidence and ability to solve their own problems. In one programme this method was used to diversify village production away from rice monocultures. In a second programme villagers examined the effects of cultivation of high-yielding varieties and devised a programme of diversification of rice breeds, experimenting with local varieties collected from different farmer organisations. The method encourages local self-reliance. The researchers act as catalysts, encouraging the farmers to make their own analysis and develop their own appropriate solutions.

264 WRIGHT, P.; BONKOUNGOU, E. G. (1984) **Soil and conservation as a starting point for rural agroforestry: The OXFAM project in Ouahigouya, Upper Volta.** OXFAM, Burkina Faso. 18p. ODI Loc. 1684.
Describes an OXFAM project in the Yatenga province of Burkina Faso, which develops water harvesting techniques to capture surface run off rainfall to prevent land degradation. The project is based around developing the participation of farmer groups. The initial project involved eight selected village groups, who were involved in designing trials to experiment with microcatchment water harvesting techniques to reverse land degradation for agroforestry. The trials were managed by the farming groups cooperatively. Farmers were encouraged to experiment and develop their own ideas. Neighbouring farmers began to show great interest in the experiments. They adapted them to improve traditional soil erosion control techniques on their individual plots, and to bring badly degraded land back into cultivation. The microcatchment techniques were however abandoned in favour of more labour efficient contour barrier techniques. Methods were developed to enable farmers to improve their management of contour barriers. A two year extension campaign was devised to disseminate the technology to over 500 farmers in 100 villages. Extension involved using villages which had already adopted the techniques as demonstration centres. The contour barrier methods were adapted by farmers to their own needs. In contrast with the successes they achieved in bringing degraded land back into cultivation, the original trials with tree planting showed no immediate benefit. The success of the project was reflected in increasing cereal production, land improvement and widescale adoption of the technology by farmers. Problems of maintaining soil fertility on permanent plots, which have arisen as a result of the construction of barriers, are also addressed.

265 WRIGHT, P. (1986) **Water and soil conservation by farmers.** Ohm, H. W. and Nagy, J. G. (eds): *Appropriate technologies for farmers in semi-arid West Africa.* International Programmes in Agriculture Purdue University, West Lafayette. pp.54-60. ODI Loc. 1837.
Describes the experiences of Oxfam's efforts to reduce soil erosion and run-off in Burkina Faso. Oxfam introduced levelling devices to facilitate construction of micro-catchments. Farmers were more eager to introduce cereal crops than the trees initially advocated by the project. Farmer participation in the design of the innovation, and its dissemination were essential to the project's success in spreading the techniques among hundreds of farmers. Management of the environment depends not only on individual, but on community-level participation.

8 DISSEMINATION

266 CARROLL, T. F.; BAITENMANN, H. (1987) **Organizing through technology: A case from Costa Rica.** *Grassroots Development,* 11(2):12-20. ODI Loc. ODI Journals; 1621.
ANAI is an NGO operating in Talamanca in Costa Rica. Its main objectives are to develop new methods and technologies, and farmer organisations to end dependence on monocropping, which has left farmers vulnerable to market price swings and plant disease epidemics. The main technical activities of ANAI consist of finding and adapting superior plants for specific agroeconomic purposes and for specific micro-environments. ANAI works closely with established research institutions for this purpose. The centre of ANAI's programme consists of tree nurseries (*viveros*) around which community nursery groups have been organised. Tree nurseries are situated in all the communities ANAI works with. The aims of the nursery are to provide the group members with seedlings to plant on their farms. The nurseries produce enough seedlings annually for each group member

to plant one or two hectares of their own land with fruit, spice and timber trees. Groups range from 6-59 members. ANAI provides the nursery groups with materials and the groups provide local labour and management resources. The nurseries are managed by a group of local volunteers who organises the work schedule of all the members on the nursery. ANAI staff work with each nursery, providing management training and technical guidance. ANAI technical assistance is built upon a participatory method in which feedback from dialogue with farmers is utilised to guide further research activities. Monthly assemblies are held in which ANAI staff and group representatives meet to discuss and plan further activities. ANAI is also developing activities in the marketing and processing of produce and exploring new markets.

267 DEMONSTRATIVA, G. (1985) **La Bregadera.** Boca del Rio San Juan (Uraba) Antioquia, Colombia. 25p. ODI Loc. 1671.
An extension manual produced for farmers. The manual describes several innovations experimented with at La Bregadera demonstration farm, in the Uraba district of Colombia (see **280**). The innovations are simply outlined and rely on illustrations to convey the main ideas. Innovations include cropping techniques such as green manuring and planting distances; composting and waste disposal techniques, including biogas and latrine excrement processing; harvesting technologies and solar and wind generated power.

268 ENGEL, P. G. H. (1988) **Participatory extension: Increasing farmer participation and influence through developing appropriate extension methods.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 35p. ODI Loc. 1608.
A method of developing extension activities, which emphasises interaction with farmers and the development of participatory methods, is discussed. A framework which can be utilised by fieldworkers in extension activities is outlined. The operational framework in which a similar participatory extension method was developed in Colombia is also examined. It is argued that the design and development of participatory extension methods which allow greater participation of rural people is essential, to ensure the participation of farmers in extension programmes. A procedure for research is propounded, which enables the researcher to find the best method of developing participatory research within a particular context. This is based on a systematic approach to participatory diagnosis in which communication techniques are emphasised. This incudes clarifying the aims and objectives of research, taking into consideration the limitations of the resources available to the research programme and to the participants. The most appropriate means and media for communication need to be defined, as do procedures for selecting participants and developing participatory activities. Field staff need to stimulate free and open discussion while at the same time providing structure to the process by channelling discussion into particular areas. The operational context in which all these factors were developed in a Colombian project is described. The aim of the project was to adjust extension activities to the felt problems of the farmers. The participants included men and women rural dwellers, field staff and researchers. The main communication media used were questions, slides, puppet shows, group discussions and blackboards.

269 ENGEL, P. G. H. (1988) **Participatory diagnosis.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 3p. ODI Loc. 1608.
Participatory diagnosis (PD) is a method to analyse the problems which farmers face, with the participation of the farmers. It determines priorities of extension

activities and extension programmes. This paper defines the objectives and operational methods of PD research.

270 GALLIKER, U. (1987) **Elaboration et adaption de techniques dans la vulgarisation agricole.** Landwirtschaftliche Beratungszentrale, Lindau, Switzerland. 37p. ODI Loc. 1721.
Describes a participatory extension technique "Elaboration an Adaptation of Technology" (EAT), which has been developed in Rwanda, by Projet Agricole de Kibuye, in five different communities. EAT is based on allowing farmers to analyse their problems and adapt technology to their personal conditions. The method is flexible and based on dialogue between farmers and extension agents, in which farmers are encouraged to make an analysis of their conditions, find the best solutions, and utilise their experimental skills to adapt new technologies to their conditions. Unlike in an FSR approach, research does not seek to find technical solutions adapted to the conditions of the peasantry, but to develop the capacity of the farmers to generate their own solutions. Farmers are seen as the centre of the process of research and adaptation. Dialogue is utilised as the main form of external collaboration. The extension agents help the farmers to develop a research agenda out of which experimentation and adaption occurs. The EAT methodology is contrasted with FSR, OFR and Recherche-Development.

271 GUBBELS, P. A. (n.d.) **Ghana: An approach to promoting tree growing in Africa.** World Neighbors, Oklahoma City. 11p. ODI Loc. 1735.
Describes an approach to promoting tree planting activities based on using group meetings for awareness raising, farmer-to-farmer extension and encouragement of self-reliance, in the Garu area of northern Ghana. In three years World Neighbors has helped to create a network of tree-growing communities in over 40 villages in the Garu area. The project builds on local tree conservation practices. After establishing contact with a village, a meeting is organised to discuss the importance of trees in the people's lives and for the environment. The meeting acts to mobilise people to take action and form a tree planting project. Volunteers are recruited to form a village tree committee. The committee recruits individuals, disseminates seedlings from the central project nursery and establishes local nurseries. Once a year committee members attend a training workshop, in which techniques of planting seedlings and maintaining nurseries are discussed. These techniques are disseminated by the committee members who become trainers in their communities. The aim of the project is to establish self-sustaining village-based nurseries. The committees also experiment to develop new tree-planting technologies.

272 GUBBELS, P. A. (n.d.) **Women farmers: Cultivation and utilization of soybeans among West African women through family health animation efforts.** World Neighbors, Oklahoma City. 17p. ODI Loc. 1736.
Outlines a method developed by World Neighbors' Family Health Advisory Service (FHAS) in West Africa, to promote soybeans production to supplement family nutrition programmes. Women farmers are targeted and research also focuses on the processing and preparation of food. Although soybean is a high protein, low-input high-yielding crop, it has not been introduced in West Africa on a significant scale. Introduced varieties have failed to adapt to local conditions and fail to fix nitrogen efficiently. No effective local market has developed for soybeans and they have not been incorporated into the local diet. The FHAS has introduced soybean as a protein supplement, and has made West African women the focus of the soybean programme. Research has been carried out into dietary patterns and new methods of preparing soybeans were innovated, based on the ways local women process dawa dawa (tamarind). Wild varieties of soybeans adapted to the local environment were identified and disseminated. These have

maintained good seed viability and nitrogen fixing properties. Soybeans have gained popularity as a substitute for dawa dawa, particularly since dawa dawa trees are increasingly scarce and soybeans are easier to prepare. The method of disseminating the technology involves a select number of women experimenting with the crops on small plots of land. If the experiments are successful, two volunteer women from the village are invited to a workshop on soybean technology. They are trained to be trainers and return to their villages to disseminate the technology to other women. Experiments are also being conducted in using soybeans as a nutrient supplement in porridge. In each district where soybean technology has been introduced it has spread rapidly, beyond the confines of the project.

273 HAVERKORT, B.; ENGEL, P. (1985) **The systems approach, agricultural development and extension.** IAC, Knowledge systems in agricultural development, Manual for Workshop III, International Course on rural extension, International Agricultural Centre, Wageningen, The Netherlands. 34p. ODI Loc. 1638.
The role of the extension worker in R&D and the relationship between the farmer and extension agent are examined. Extension is considered as one element in a comprehensive knowledge and information system involving the farming community, research institutions, government services and non-government and private organisations. Extension agents do not simply have the role of transferring information between researchers and farmers, but should be involved in building networks between groups of farmers and between farmers and other categories of people. Extension services need to work within a comprehensive and holistic framework of analysis, to be able to plan appropriate extension activities. Systems analysis is used to conceptualise and define elements within the agricultural system and determine basic variables within the development process. Of central importance is the concept of the agricultural knowledge system, a dynamic open-system of knowledge responding to an ever-changing environment, embodying the practices of the farmers and the knowledge of research and development services. Agricultural production is seen as a function of the existing level of knowledge. Systems of communication and the accumulation of experiences within a community determine the way knowledge develops within a community. A detailed study of the knowledge system within the community is an important activity for deciding upon the most appropriate tools of intervention.

274 JINTRAWET, A.; SMUTKUPT, S.; WONGSAMUN, C.; KERDSUK, V. (1985) **Extension activities for peanuts after rice in Ban Sum Jan, Northeast Thailand: A case study in farmer-to-farmer extension methodology.** Khon Kaen University, Khon Kaen, Thailand. 46p. ODI Loc. 1646.
An extension method developed by the Farming Systems Research Project at Khon Kaen University in northeast Thailand is described. Farmers are encouraged to develop experiments and educate each other. Extension agents act as facilitators, giving technical advice. Technology is evolved and modified in the light of farmers' experiences. Given the complexities of research into environmental and farming conditions of rainfed areas in Thailand, an FSR approach has been developed which seeks to utilise farmers' adaptations and innovations as the base to generate new technology. Farmer innovations and advanced techniques are evaluated for their adaptive potential in other areas. They are tested in new areas with on-farm trails conducted by local farmers and evaluated for agronomic and economic performance and according to the farmers' abilities to cope with the new techniques. Research is carried out by interdisciplinary teams of technical and social scientists and extension specialists. Participatory extension methods have been developed. In Ban Sum Jam a double cropping system was introduced in which peanuts were planted after rice. These techniques were based on practices carried out by other Thai farmers in Surin.

Ten farmers were selected as participators and at meetings were informed about the cultural practices involved in the peanuts-after rice cropping system. The farmers developed on-farm trials with extension support. A visit to Surin was arranged for two of the farmers, where they worked with two trainer-farmers. Based on insights gained in their visit to Surin these two farmers were able to introduce further modifications to land preparation methods to adapt them to the specific local environment at Ban Sum Jan. After harvesting of peanuts, five farmers were interviewed to elicit farmer perceptions of the experiment, to be used in appraising the project. The resulting peanut yields were lower than expected, which suggested that more research needed to be carried out in the adaptation of the technology to local conditions. Participatory methods enable gradual changes to be introduced to improve the cropping system, based on farmers' experiences. The systems approach focuses on the farmer rather than on new technology or the environment; enables farmers' to test technology; and proceeds from the perspective that with more understanding of technical issues farmers are better able to solve problems. The village economy and farming system is described, and details of the personal circumstances, perceptions and yields of the ten participating farmers are given.

275 JOHNSON III, S. H.; CLAAR, J. B. (1986) **FSR/E: Shifting the intersection between research and extension.** *Agricultural Administration,* 21(2):81-94. ODI Loc. 1603; ODI Journals.
Examines the relationship between research and extension and the necessity to redefine and transform this relationship as an FSR approach is developed. Reference is made to the activities of the Adaptive Research Planning team in Zambia. The basic principles of FSR are outlined, including farmer participatory methods in which information moves from the farmers to researchers for technology generation. It is argued that without incorporating extension, FSR is incomplete. Extension activities cannot be merely appended onto FSR, but an FSR approach in extension needs to co-evolve with research into a mutually functioning system, which works together to answer the question of the technological needs of farmers, and to define locations and types of farmers suitable for the dissemination of specific technologies. This requires that both research and extension agents be active in all steps of diagnosing, testing, analysing and disseminating results. Farming systems research and extension should develop joint field activities and joint budgetary, staffing and operational responsibilities. The experiences of the ARPT in developing integrated research and extension is outlined. Research Extension Liaison Officers have been created to bring about closer linkages between researchers and extension agents.

276 MILLAR, D. (1988) **"Alafia" farmers extension programme (1988-1994)** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 9p. ODI Loc. 1608.
Outlines the objectives and strategies evolved by the Alafia Farmer Extension Programme in the Archdiocese of Tamale in northern Ghana. The programme, which started in 1988, seeks to promote the adoption of new technologies, and train farmer groups to become self-reliant. The technologies introduced are high yielding short-duration cereals, fertilisers and other methods of raising productivity. A grain storage programme is also being developed. The objective of the programme is to start 5 farmer groups of 5 members in various parishes, which will expand to groups of 15 farmers in 6 years. In the first phase of the programme the 5 participating farmers are supervised in the cultivation of a field trial on a one acre plot of their land by extension field staff. After two years they will cultivate a group farm, collectively adjusting and improving the technology, with the help of field staff. They will be replaced by another 5 farmers in the initial phase, who after another two years will replace them in the

group farm. By the fifth year of the programme there should be 15 members of the groups in different stages of participation. It is envisaged that the experiences gained in the group farm will prepare the farmers to become the nucleus of a further 5 groups, providing the basis for the emergence of self-sufficient farmer groups. The farmers remunerate the extension programme for the services and technology they receive with grain. This grain will form the basis for developing a collective grain storage programme. The training of field staff in extension and monitoring methods is also an important component of the project.

277 NYAMA, T. P. (1988) **Teko Agricultural Project small farmers' revolving loan fund.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 9p. ODI Loc. 1608.
The Teko Agricultural Project (TAP), which operates in Moyambo in Sierra Leone, is an NGO which seeks to introduce appropriate technology to farmers and help them organise self-reliant farmer groups with credit facilities. The project both identifies appropriate farm technology suitable to local conditions and provides inputs and managerial assistance to local farmers. TAP carries out research on a demonstration farm to identify technologies suitable to local conditions. It supervises on-farm trials with the participation of local farmers. Suitable technologies are then made available to local farmers by TAP. In meetings with farmers, scarcity of capital and high interest rates charged by money-lenders were identified as major constraints on the adoption of new technology. To accomplish its aims, TAP has encouraged the formation of village-based credit organisations (Revolving Loan Development Committees). These have utilised traditional rotational credit organisations to establish village funds which can grant loansto needy farmers and purchase inputs for the community. Each village has a committee, elected by the community, which recommends farmers to receive loans, and creates an inventory of all farm inputs required for the coming agricultural season. Teko acts as the main link between farmers, development and government agencies, purchasing the inputs required by farmers and transporting their produce to markets.

278 PEUSE, H. G.; MMBAGA, W. D. S. (1987) **Helping farm groups problem-solve: A workshop macrodesign for extension workers.** *Agricultural Administration,* 26(1):17-26. ODI Loc. 1668.
Describes the operational framework for extension work based on a five-step problem-solving method for group workshops of farmers and extension agents. The aim is to enable farmers and extension agents to play an active role in assessing agricultural problems and in devising solutions. A systems analysis problem-solving method is utilised. The main role of extension agents is to act as a facilitator, encouraging farmers to develop their own analysis. Activities consist of cognitive discussions and role-playing activities. After reaching a consensus on the problems, the farmers are encouraged to develop and screen a wide range of solutions. Visual grid representation methods are used to weigh up the merits of solutions. After agreeing on the most apt solutions the group is encouraged to develop a plan of activities. Extension agents offer support activities identified by farmers. The workshops act as a forum for mutual learning for extension agents and farmers.

279 RAINTREE, R. B. (1979) **Extension research and development in Malindi: Field test of a community-based paradigm for appropriate technology innovation among the Tagbanwa of Palawan.** PhD. Anthropology, University of Hawaii. 294p. ODI Loc. 1813.
A methodology is explored for stimulating direct community involvement in research and development of appropriate technologies through an account of his work among the Tagbanwa. The critical role of the community based catalyst

worker in stimulating local problem solving based on traditional concepts and technology is emphasised.

280 RAMIREZ, R.; VILLA, I. (1985) **Where the campesinos are consultants.** *Ceres,* 107:34-38. ODI Loc. 1670.
La Bregadera is a demonstration farm established in the Uraba region of Colombia by Comunidad por los Ninos, a non-government organisation. Its aim is to develop sustainable technologies, demonstrate these technologies to neighbouring communities and develop community participation. Experiments are carried out on the demonstration farm to adapt and develop appropriate technologies and practices, which are integrated into local farming systems and which utilise the farmers' existing resource base. Traditional and modern technologies are experimented with side by side. An extension method has been developed with local communities based on horizontal learning, in which the scientists develop awareness of the farmers living and learning environment. A partnership of learning has developed between the farmers and scientists in which they discuss and design experiments jointly and develop evaluation standards together. The scientists suggest alternative farming techniques and possible areas in which new components can be integrated into local farming practices. The farmers adapt and alter technologies to their needs and guide scientists in their search for alternatives. The management of the demonstration farm has been entrusted to a local village leader. La Bregadera has also produced an educative booklet specifically targeted to local farmers (see **267**).

281 SIMARAKS, S.; KHAMMEANG, T.; URIYAPONGSON, S. (1986) **Farmer to farmer workshops on small farmer dairy cow raising in three villages, northeast Thailand.** Farming Systems Research Project, Khon Kaen University, Thailand. 19p. ODI Loc.
1720. Describes the development of a farmers' workshops in northeast Thailand. It was used as a tool for improving and disseminating farmers' innovations. Farmers from three villages in three different localities participated in the workshop to develop their dairy management practices. Researchers utilised the workshops to enable farmers, who have developed different solutions to similar problems, to discuss the problems and principles on which solutions can be sought to improve dairy production methods. The workshops also enabled researchers to understand problems and solutions from the perspective of the farmers, to develop objectives for the management of future projects and a methodology for farmers' workshops. Each of the three villages took turns in hosting representatives from the other villages in their village. Under the informality of the village environment farmers felt free to develop discussions. Field tours and visits were integrated with the workshop to enable farmers to view the different management techniques. Group discussions clarified issues involved in problem identification and problem solving. Researchers participated as facilitators, organising workshop design, developing role playing games, deciding the numbers of participating farmers, structuring and designing the workshop along specific criteria. They intervened in the discussions to the minimum, but recorded data. In the light of the performance of the workshop, modifications were made to its design. Farmers learnt from each other, incorporating and adapting elements of each others technology into their dairy production system.

282 WILAIRAT, A. (1985) **Sesame before rice: A potential cropping system for rainfed farmers in northeast Thailand.** Khon Kaen University, Thailand. Paper also presented at Workshop in Agroecosystems Research in Rural Resource Management and Development, University of Philippines, Baguoi, Philippines, March 18-22, 1985. 19p. ODI Loc. 1723.

Outlines a farmer-to-farmer extension method, developed at Khon Kaen University in Thailand, in which successful cropping systems adapted by farmers to specific conditions in one area are disseminated to other areas with similar conditions. The methodology involved in the dissemination of sequential cropping of sesame before from Basi Ran to other areas is described. Research is carried out to determine bio-physical and socio-economic factors affecting the adoption of cropping systems. This includes defining criteria for the selection of suitable sites in which the cropping system can succeed, the cultural preparations of the land which are necessary, and the marketing potential of the crop. Having analysed the determinants on which the successful adaptation of the cropping system is based, potential areas to which the technology can be extended are identified. Experiments are conducted in other areas with farmer participation to identify constraints in the adoption of the technology, and to adapt the technology to specific local conditions. The cropping of sesame before rice was found to be a low-input high-return system with a high potential for extension into other areas of rainfed Northeast Thailand.

9 RESEARCH ORGANISATION

283 ALEXANDER, D. M. (1987) **Paradigms in farming systems research (FSR): An African prognosis.** MSc dissertation submitted in Tropical Agricultural Development, Reading University. 75p. and appendices. ODI Loc. 1648.
Examines the organisational structure of FSR research in Africa and the relationship between national and international research institutions. The structure in which FSR is carried out in Africa is not conducive for the emergence of participatory methods. Research takes place in a skewed structure of resource allocation in which international agencies are favoured in relation to national research centres, in which local research centres receive least priorities, rich farmers are favoured against the poor, and top-down bureaucratic procedures characterise national institutions. National bodies have certain characteristics which are favourable for the systematic development of FSR in a national framework. However to realise this potential requires a re-organisation of the structure of research, in which international bodies cooperate with national organisations to disseminate useful research methodologies, and national research organisations become more responsive to local level organisations and the needs of the farmer. It is argued that a bottom-up approach would allow local level capability to develop and reduce dependency on advanced countries. National development aspirations can create a favourable framework in which FSR can coexist. Case studies of national research bodies in Kenya, and the international research centres of IITA, IAR and ICRAF are used to develop the argument.

284 ASHBY, J. (1986) **Farmer participation in technology design and transfer.** Project proposal presented by CIAT to W. K. Kellog Foundation. 15p. ODI Loc. 1645.
Outlines a project by CALI to incorporate a participatory methodology within a national project in Colombia, through training existing researchers and extension agents. The project aims to demonstrate the effectiveness of participatory methods in generating the adoption of new technology designed to fulfil the needs of small farmers, and to develop methods of institutionalising participatory methods within existing national programmes. Participatory methods are incorporated into existing programmes for technology transfer, as part of the ICA Integrated Rural Development Project in Cauca. The basic steps in the participatory methodology involve research and extension agents interacting with farmers, and participating in farming activities to familiarise themselves with the

farming system and build a rapport with the farmers. The research and extension personnel then provide farmers with the opportunities to seek information and ask questions about a range of new technologies. The aim of this is to elicit farmers perceptions, preferences and decision-making models, which can then be utilised to develop experimental designs for on-farm trials. Farmer managed on-farm trials are implemented. Researchers and farmers meet to evaluate the technology and its adaptation to local conditions. Farmers' evaluations are combined with agronomic and economic analyses to formulate recommendations. Recommendations incorporate flexible options to reflect the diversity of needs to which the technology is being adapted. Efforts are made to incorporate the least privileged groups, women and young people into research. Training for this participatory method is aimed at about 60 ICA extension orientated researchers and extension agents and is based on intensive short courses and on-the-job training. Training focuses on attitudes towards small farmers, diagnostic and evaluation skills and communication skills for group discussions and focused dialogue. Training methods and materials are discussed, including a video, now available, which highlights basic concepts in participatory research.

285 BIGGS, S. D. (1979) **Timely analysis in programmes to generate agricultural technologies.** Paper presented at Rapid Rural Appraisal Conference, IDS, University of Sussex, 4-7 December 1979. 13p. ODI Loc. 1706.
Examines the organisational structure of research and suggests methods to improve feedback mechanisms for the collection and analysis of data and prioritising of research agendas. A role for social scientists in monitoring research organisation is suggested. It is argued that the main problem in agricultural research is the development of suitable research systems which are relevant and viable in different parts of the world. This development is impeded by top-down approaches. Feedback to higher levels of research planning, on the relevance of current research strategies, is lacking. An on-going interaction between different levels of research organisation is required in which there is a timely collecting and analysis of data from the micro level. This should be utilised to plan research strategies and programmes at higher levels of decision-making. Several topics for research by social scientists are suggested, which are based around improving the responsiveness and relevance of research. This includes investigations of the informal R&D systems of farmers; the interaction between formal and informal systems; analysis of existing efforts to incorporate informal R&D systems into formal research; and a review of past efforts to develop on-farm research proposals and the reasons for which they have been supported or rejected.

286 BIGGS, S. D. (1980) **On-farm and village level research: An approach to the development of agricultural and rural technologies.** Indian Agricultural Research Institute, 1980. Economic problems on transfer of agricultural technology. Proceedings of a national seminar 9-10 November, 1978, New Delhi. pp.7-19. ODI Loc. 1612.
A systematic framework for the organisation of research is suggested based on multidisciplinary and participatory research, taking both factors of the organisation of local projects and national research objectives into consideration. It is argued that formal R&D systems do not analyse the specific technical and institutional problems of their clients. An integrated interdisciplinary approach is needed, involving collaboration between natural and social scientists. Research strategies need to take account of the fact that farmers have developed their own R&D systems. Formal research should attempt to complement this system rather than reproduce its areas of research. This requires the development of methods of field observation, survey techniques and on-farm and village level research. Three major criteria are suggested for identifying specific problems: ecological, economic and socio-economic factors. Socio-economic factors are seen as the most complex,

demanding increasing collaborative work between technical and social scientists to identify and create technologies suitable for specific groups and classes of people. Research priorities and the allocation of research resources need to be developed in relation to national development plans and other national resource factors. They need to weigh up the returns of investments in technology, the merits and constraints involved in a range of research strategies, and take into consideration the available research and development resources and skills available.

287 BIGGS, S. D. (1980) **Research and Development on a new food crop: Triticale for the Himalayan hills.** Institute of Development Studies, University of Sussex. 66p. ODI Loc. 1614.
Examines changes in the organisation of research which evolved in the development of triticale as a food crop for the Himalayan hills. These changes developed in the light of on-farm research, which took farmers' practices and perceptions into consideration. Interdisciplinary analysis from discussions with farmers and on-farm trials led to revision of priorities in the triticale programme. Organisation and management procedures in the experimental station programme were changed to permit close supervision of a broader range of possible triticale breeding activities at a smaller number of locations at different altitude zones in the Himalayan hills. Plant breeding objectives were revised and greater emphasis was placed on producing stable high-yielding environmentally suitable triticale and less on changing the aesthetic attributes of the grain. The new objectives took into consideration the complexity of local environmental conditions and socio-economic factors. The success of triticale was analysed in relation to the range of cropping patterns and strategies practised by farmers. The results of the triticale programme produced new implications for research on hill crops, fertilisers and reforestation. It also influenced the strategies of CIMMYT in Mexico.

288 BIGGS, S. D. (1983) **Monitoring and control in agricultural research systems: Maize in Northern India.** *Research Policy,* 12: pp.37-59. ODI Loc. 1757.
The ways in which an on-farm maize research project influenced, over a four-year period, the overall priorities and programmes of a maize research programme in Northern India is examined. The programme also generated information for agricultural extension systems. Special attention is given to analysing the way in which the three components of the on-farm research project (trials, surveys and communication methods) provided a learning and feed-back linkage from village level situations to experiment station research. Lessons from the case study include the importance of (1) having the on-farm research and experiment station research under the same research decision-maker; (2) conceptualising research as a dynamic and adaptive process with even major changes taking place between years; (3) being able to change easily in response to farm level information, the research priorities and the allocation of research funds between disciplines, research stations, etc; and (4) allocating at least a minimum of research resources to the on-farm research component of an overall programme.

289 BIGGS, S. D. (1983) **Generation and diffusion of agricultural technology: A review of theories and experiences.** World Employment Prog. Research Working Paper, Technology and Employment Programme, ILO, Geneva. 88p. ODI Loc. 1760.
This review of theories of agricultural technology generation and diffusion attempts to identify major sets of themes and preoccupations which have resulted in different types of theory and policy action. It identifies five different themes - world economy, distributionalism, national factor endowments, environmental, research and extension institutions - which came in response to the preoccupations of and the policy action in the 1950s and 1960s of modernisation and transfer

theory. Priorities for future research funding include conservation of non-renewable resources, selective labour intensive technologies and stability in farming systems. The analysis of research and diffusion institutions is a major area where research is needed.

290 BIGGS, S. D. (1984) **Agricultural research: A review of social science analysis.** Discussion Paper no.115. School of Development Studies, University of East Anglia, Norwich. 102p. ODI Loc. 1765.
The review is for agricultural research policy makers and planners concerned with the role of social science analysis in agricultural research. It assesses a broad range of different types of historical (ex-post) and planning (ex-ante) literature. Studies of international, national and informal research and development (R & D) systems are covered. The technologies discussed mostly concern seed varieties, agronomy practice, agricultural chemicals and different forms of mechanisation.

291 BIGGS, S. D. (1984) **Linkages between agricultural research, extension and farmers: Linkage analysis + Planning demonstrations and on farm research + Guidelines for planning and implementation of trials, demonstrations and minikits + JT Feed-back report.** Notes printed in FAO/APROSC/ODG Planning Training Manual. Edition II: District level. *Training programme for Agricultural Planning at the district level in Nepal.* FAO, Kathmandu, Nepal. 14p,10p,5p,5p. ODI Loc. 1705.
Training notes/manual prepared for an Agricultural Planning course in Nepal. Several aspects of research, extension and farmer linkages are examined. Problems in agricultural research are located in the organisational structure of research, in the linkages between different branches of research, and between local farm level and the district level. Solutions are suggested to systematise research and extension linkages, incorporate farmer evaluations, improve feedback to agricultural district services and research stations, and systematise on-farm research.

292 BIGGS, S. D. (1985) **A farming system approach: Some unanswered questions.** *Agricultural Administration,* 18:1-12. ODI Loc. 1702.
Farming Systems Research is defined, its methods described, and problems in its research framework addressed. Institutional features of FSR research are examined, including linkages between on-farm and on-station research, the participation of farmers in the evaluating technology, the development of interdisciplinary research teams, strengthening of local research capability, flexibility in research planning, and commitment of research teams towards solving the problems of farmers. It is argued that while the development of technical methodologies has been given considerable attention, organisational issues - including the political milieu, professional interest groups, sources of funding, evaluation of projects, the relationship between local level research and the wider research system - have not been addressed. The implications of local resources, and political and socio-economic conditions, on agricultural research in developing countries need to be analysed.

293 BIGGS, S. D. (1986) **Institutional innovations by agricultural researchers.** Paper prepared for conference on Farming Systems Research for Resource-Poor Farmers in East India, L.M. Mishra Institute and Rajendra Agricultural University, Patna, November 24-28. 8p. ODI Loc. 1758.
Although the principles of Farming Systems Research are of wide potential validity, differences between institutions in historical, political and socio-economic setting, and in combination of disciplines and access to research resources means that each would have to be innovative in developing its own techniques for performing the different functions of FSR. It is becoming recognised that

researchers are responding to this requirement, thereby playing a critical role in "de-packaging" and selectively using only parts of methods and models used in other situations.

294 BIGGS, S. D.; GIBBONS, D. (1986) **The farming systems approach: Success or otherwise?** Norwich: School of Development Studies, University of East Anglia, 1986. (mimeo). A much-reduced version was published in *SPAN*, Vol.29(2), 1986, p.53. 10p. ODI Loc. 1761.
Examines the characteristics of Farming Systems Research. Problems in research are defined and related to basic policy and political issues. FSR is viewed as an approach to organising agricultural research and extension, rather than a set of techniques. It should adapt to specific social and political situations, taking into account environmental impact, effects on employment, marginal groups and gender issues. It should strengthen linkages between different sections of the ARE system and encourage on-farm participation and innovation by local scientists, and the participation of farmers in setting research priorities and the management of on-farm research.

295 BIGGS, S. D.; ROOD, P. G. (1986) **Notes on farming systems research in Nepal.** Working paper for the On-farm Client-Orientated Research (OFCOR) Project, ISNAR, The Hague, Netherlands. 11p. ODI Loc. 1704.
The structure of research activities in Nepal is examined. Case studies are documented to show the various sources of innovations, and the importance of farmer innovations in developing technologies which have been disseminated by national programmes. It is argued that research can benefit from a strengthening of activities based on investigating and diagnosing farming systems. Less emphasis needs to be placed on the transfer and testing of commodity technologies. The effectiveness of formal research can also gain from the expending of a greater proportion of research funding on strengthening the informal R&D of farmers, and improving the interaction between the formal and informal research systems.

296 BIGGS, S. D.; GIBBON D. (1986) **Farming systems research: Progress in developing countries.** *Span*, 29(2):53. ODI Loc. 1617.
The objectives and operational structure of farming systems research is examined. Its main achievements and problems are identified. Farming systems research is an interdisciplinary research method involving both social and natural scientists in on-farm research. It utilises surveys and field trials to improve dialogue between researchers and farmers, and enables existing farming conditions to influence research station programmes. The institutional setting of FSR research sometimes fails to develop forms of farmer participation in the projects. Some of the most interesting FSR has occurred where local staff and extension staff have adapted aspects of FSR to their institutional context, rather than following a rigid FSR approach. It is argued that FSR needs to develop more of a collaborative approach and less of a doctor-patient approach. Farmers should become more involved in the decision-making process of developing research priorities and have more responsibility in the organisation and management of projects.

297 BIGGS, S. D. (1987) **Research for resource-poor farmers: Research policy lessons from the spread of improved wheats.** Paper from "Symposium session on the political and institutional dimensions of agricultural policy in developing countries". Agricultural Economics Society Conference. University of Reading, 3-5 April, 1987. 8p. ODI Loc.
1616. Examines the relationship between agricultural research and development policy, research strategies, and the successful introduction and spread of high yielding wheat varieties. Several implications are drawn from these experiences

for research in resource-poor environments. It is argued that the success of the Green Revolution technologies did not originate from a top-down approach but from a research policy in which scientists were given enough funds, freedom and professional support to be innovative, and in which the informal research of farmers was recognised and participatory methods utilised. The development of these techniques was not problematic, since the environments in which high yielding wheats were being introduced were fairly uniform. In contrast, in resource-poor environments the development of complementary methods is more problematic, as a result of the complexity of agro-climatic and socio-economic conditions. These conditions require the development of innovative research methods, to generate a research framework in which new technologies can be tailored to a variety of differing local environments.

298 BOX, L. (1982) **Food, feed or fuel? Agricultural development alternatives and the case for technological innovation in cassava cultivation.** *Quarterly Journal of International Agriculture,* Special Issue:34-48. ODI Loc. 1709.
Plant breeding programmes should develop varietal research in the context of the production system and farming strategies of different types of cultivators. In the light of this thesis, the research strategies of CIAT for the development of cassava in South America are critically evaluated. They are found to have an urban commercial export-oriented bias. Different cassava production systems in South America are defined, including peasant cultivation, export production for the EEC livestock feed market, and for ethanol production in Brazil. The adaptive skills of peasant cultivators and their selection of cassava varieties to fit into a complex variety of environments and complex multicropping systems is documented. This is contrasted with the high-yield monocultural farming system of commercial production, using costly inputs. It is argued that international and national research institutions only began to show interest in cassava when its commercial livestock feed potential became evident. Research strategies have focused on the needs of high-yield monocultural production and fail to take the production strategies of peasant cultivators into account. Cassava research strategies at CIAT are examined and found to be inappropriate to the needs of peasant cultivators. An alternative research strategy is suggested in which commodity crops are placed within the context of the production system. Here, research focuses on adapting varieties to specific production strategies: for peasant farming and for capital intensive production. Research needs to develop a socio-economic framework of the consequences of policies (e.g. pricing policies) developed for one sector on other sectors. Cassava breeding programmes for peasant farmers need an interdisciplinary framework in which social science methods and agronomy are integrated, and an adaptive approach which focuses on the specific socio-economic characteristics and production strategies of the peasant cultivator.

299 BOX, L. (1986) **The Experimenting farmer: A missing link in agricultural change?** Hinderink, J. & Szulc-Dabrowiecka, E. (eds.): *Successful Rural Development in Third World Countries.* Netherlands Geographical Studies no.67, Utrecht. pp.87-95. ODI Loc. 1707.
Examines the implications of the institutional framework of research, on farmer experimentation and adaptation of rice and cassava varieties in the Dominican Republic. It is argued that state intervention may have adverse effects on agricultural transformation. Cassava varieties have largely been selected by experimenting cultivators who continuously adapt new varieties. The planting material originates on farmers' fields and farmers build up collections of different varieties. The criteria which farmers use to evaluate cassava varieties are described. Networks of experimenting farmers are built up in which farmers exchange information about plant breeding and different varieties. Cassava cultivators are self-reliant: the research and extension services have not come up

with new varieties which farmers have adopted. In contrast, with rice cultivation modern varieties (MVs) strongly influence production. They are promoted by government and linked with credit facilities to encourage adoption. On-farm experimentation is much less common with rice MVs than with cassava, since the state insists on exclusive use of certified seeds, and discourages experimentation. Informal seed producing networks have declined among rice cultivators and have been replaced by small credit cooperatives, which are highly dependent upon the state. State organisation has acted as a barrier for the development of rice cultivators' experiments. However many farmers still cultivate traditional rice varieties and continue to experiment, in a fashion similar to cassava farmers. It is suggested that when agricultural knowledge is dominated by a few formal institutions, and no interaction develops between experimenting farmers and scientists, agricultural production systems are inefficient. If cultivators are allowed to build up their organisational capacity and participate in the process of agricultural development, successful transformation of agricultural knowledge systems may take place.

300 BOX, L. (1986) **Commoditization and the social organization of crop reproduction: Conceptualization and cases.** Long, N; van der Ploeg, J. D.; Curtin, C.; Box, L.: *The Commoditization debate: Labour, process, strategy and social network*. pp.100-117. ODI Loc. 1708.
Examines the implications of the institutional framework of research on farmer experimentation and adaptation of rice and cassava varieties in the Dominican Republic. This is compared with the structure of seed potato production in the Netherlands. In the Dominican Republic, cassava varieties have largely been selected by experimenting cultivators who continuously adapt new varieties. The planting material originates on farmers' fields and farmers build up collections of different varieties. The knowledge system is largely based on informal communication involving experimentation by a great number of disparate cultivators. Networks of experimenting farmers are built up in which farmers exchange information about plant breeding and different varieties. Participation of the research and extension institutions is minimal. The new varieties developed by research and extension services have failed to be adopted by farmers. With rice cultivation a dual system prevails, related to the degree cultivators are dependent upon modern varieties. Modern varieties are the preserve of research stations and government seed certification policies discourage farmers from experimenting with reproduction. Experimentation occurs mainly among local varieties on marginal lands, but is discouraged by state policy, which utilises credit facilities to make farmers dependent upon their dictates. The structure of research in the Dominican Republic is contrasted with potato seed production in the Netherlands, in which there is a high degree of cultivator participation in the vegetative reproduction of clones. Cultivators participate in crop reproduction through their own producer associations and through informal hobby clubs. State institutions have been unable to exert a decisive influence over seed breeding because of the power of private cultivator and trader interest groups. The informal knowledge of cultivators has played an important role in developing clones. It is argued that the commoditisation of crops does not necessarily require the externalisation of decision-making in seed production programmes. Cultivators can continue to experiment with crop reproduction and make valid contributions to science. Formal science can make use of the experiments of cultivators by developing networks in which cultivators can participate with scientists in crop development.

301 CERNEA, M. M.; COULTER, J. K.; RUSSELL, J. F. A. (1985) **Building the research-extension-farmer continuum: Some current issues.** Cernea, M. M.; Coulter, J. K.; Russell, J. F. A. (eds): *Research-extension-farmer: A two way continuum for agricultural development.* World Bank & UNDP Symposium, Washington. pp.3-12. ODI Loc. 1714; 1543.
Examines methods to make research more effective, in which research becomes more relevant and responsive to farmers' needs, extension becomes more participatory and less top-down orientated, and research and extension activities are integrated. Better methods of feedback are required. Procedures need to be worked out for research and extension personnel to carry out adaptive research jointly, to meet regularly in monthly workshops, and to plan projects jointly. Research planning needs to be more decentralised, with programmes drawn up at the regional or agroecological zonal level. Skills of extension agents need to be upgraded with new training programmes, and career incentives. Farmers need to be involved in all stages of research: from the identification of problems to field tests, evaluating the acceptability of technology, and accounting for social, economic and institutional constraints. Local farmers and people can also be employed in extension work.

302 CHAMBERS, R. (1984) **Notes and thoughts on agricultural research and the role of the Ford Foundation.** 10p. ODI Loc. 1624.
The requirements for research in India to respond to the needs of resource-poor farmers (RPF) are discussed. The Farmer-First-and-Last (FFL) model for agricultural development is propounded and the extent to which its methodologies have been incorporated into research in India are evaluated. It is argued that although the transfer of technology (TOT) approach has been successful with resource-rich farmers, attempts to apply it to research among resource-poor farmers (RPF) have been disappointing. The TOT approach still continues to dominate research priorities, despite the fact that there are over 250 million RPFs in India. Research priorities should no longer be concerned with raising food production per se, but with enabling resource-poor farmers to be productive. Research needs to be reorientated to develop strategies which systematically diagnose problems and research priorities with the farmer, develop on-farm research with farmer participation integrated with research station programmes, and evaluate farmers' adoption of technology (the FFL approach). The level of development of participatory methods within India is evaluated. Outlines for the development of research policy and for the funding of research activities are suggested.

303 COLLINSON, M. (1988) **The development of African farming systems: Some personal views.** *Agricultural Administration and Extension,* 29(1):7-22. ODI Loc. 1643. Institutional features which inhibit the adoption of farming systems research (FSR) in east and southern Africa are examined. Innovatory characteristics of FSR are identified including: the development of technology appropriate to local conditions; participation of farmers in the process of technological choice and development; and the setting of research agendas according to farmers' needs and problems. Implementation of these features requires changes in institutional policy, modification of top-down approaches to technology transfer, and greater farmer involvement in decision-making. Case studies of the development of FSR in Ethiopia, Kenya and Zambia demonstrate that progress in the adoption of FSR methods have been slow and hesitant. Factors inhibiting the development of FSR are discussed, including the influence of government institutions, donor agencies and professional agricultural economists. Government institutions are often authoritarian, paternalistic and biased towards western agricultural technologies. Donor agencies are unsystematic in their

technical and financial support, fail to integrate projects into a national framework of research, follow new fads from year to year and fail to employ long-term and quality staff. Agricultural economics has failed to develop relevant criteria and a professional consensus on useful approaches and principles for small farmer conditions. Long term systematic research strategies need to be developed. Projects need to be evaluated according to professional criteria. New ideas need to be systematically tested and evaluated.

304 COLLINSON, M. P. (1987) **Farming systems research: Procedures for technology development.** *Experimental Agriculture,* 23:365-386. ODI Loc. 1667.
Farming Systems Adaptive Research (FSAR) procedures and methodologies are described in the light of improving decision-making in agricultural research. FSAR has evolved to complement the traditional research approach, by improving linkages between research centres and farmers and allowing more relevant recommendations and priorities for research to be made. Methods of diagnosing the farming system, designing and screening technologies, carrying out on-farm experimentation, and evaluating results are described. This includes the use of formal and informal survey methods, the involvement of farmers in experimentation, and the incorporation of farmer assessments of technology into technical evaluations. Close collaboration needs to develop between researchers, production specialists, and agencies servicing the technology. Recommended technology should be capable of being serviced locally if it is to be sustainable. The need to decentralise decision-making in relation to recommendations and servicing, and the contrasting centralised institutional set up of many agricultural institutions, is identified as the major institutional problem facing FSAR.

305 CONROY, C. (1987) **Seminar on environmental conservation and Norwegian development assistance, Nairobi, 1-3 September 1987. Briefing paper and background reading materials for the working group on: Environment and research.** IIED, London. 41p. ODI Loc. 1642.
The structure of research in research centres in Africa is critically examined, in a briefing paper developed in the context of the policy framework for Norwegian development assistance for Africa. The central problem for research in Africa is the failure of researcher generated technology to be adopted by the farmers. Research has usually been conducted within a top-down approach which has underestimated the potentials of local agricultural practices, but which has also failed to generate technology which farmers find practical. This paper addresses the question of developing an alternative research framework based on a participatory approach. The relationship between basic and applied research and the integration of participatory research with experimental stations and extension services is raised. It is suggested that international and national research institutions could benefit from an integrated approach in which agencies deal with all natural resources within an ecological zone, instead of specialising in single crops and narrow sectors. The unfavourable balance of resource allocation to national research institutions, in comparison to international agencies is raised; as are deficiencies in donor project funding and the need to systematise development funding policies. Background reading material is included.

306 CORNICK, T. R.; KLINE, W.; UQUILLAS, J. E.; LIGHTFOOT, C.; ZUIDEMA, L. (1987).**Institutionalizing farming systems research and extension: Cornell University's experience in Ecuador and the Philippines.** Cornell International Agriculture Mimeograph 115. Cornell University, New York. 53p. ODI Loc. 1660. The lessons and experiences derived from two FSR/E projects, the Ecuador's Bean-Cowpea Project (CRSP) and the Philippines' Farming Systems Development Project - Eastern Visayas (FSDP-EV), are compared and contrasted. Training methods and issues, the interdisciplinary approach, methodological

procedures, institutional integration and administrative organisation are discussed. Both projects have attained notable successes. This is reflected in the extent to which both projects have been supported and institutionalised in national research and extension structures and have developed a local capacity to carry out FSR/E research. It is argued that the ultimate test of the success of FSR/E must be its institutionalisation within developing countries. The three main features of FSR/E research are defined as an interdisciplinary methodology, an holistic approach to the production system and the development of farmer participation. Although FSR/E projects can differ considerably in their activities, as is the case with CRSP and FSDP-EV, the essence of the FSR/E approach involves the integration of these three features into international and local research efforts.

307 DELMAN, J. (1988) **The Agricultural Extension System in China.** Network Paper no.3. ODI, London. 32p. ODI Loc. 1749.
This paper describes the historical evolution of agricultural extension in China from imperial times, paying particular attention to the changes introduced following the post-1978 liberalisation of agricultural production. The numerous agencies currently involved in crop and animal extension are described, as are research-extension linkages, extension techniques, and the training system. Particular attention is paid to the recent emergence of privatisation in extension. Contracts are widely being drawn up between agricultural producers (or their representative agencies) and individual extension workers to provide advice over a fixed period. Such contracts appear likely to emerge strongly in the future in areas which have received little attention from publicly-funded extension, such as fruit crops, small ruminants, poultry and minor cash crops. On the other hand, the strong coordinating influence of the centralised extension system remains necessary and is unlikely to be eroded to any substantial degree. Extension services have inherited a "commandistic" approach from their partly political role in 1948-78. This is now being resisted by farmers and some recognition is emerging in official circles of the need to take into account the importance of complex farming systems as a risk-aversion strategy, and of identifying technologies which more adequately reflect farmers' needs and opportunities than the (mainly foodgrain) commodity-oriented approach adopted hitherto.

308 DENNING, G. L. (1985) **Integrating agricultural extension programs with farming systems research.** Cernea, M. M.; Coulter, J. K.; Russell, J. F. A. (eds): Research extension farmer: A two way continuum for agricultural development. World Bank & UNDP Symposium, Washington. pp.113-135. ODI Loc. 1714; 1543.
Examines an organisational framework and methodological procedures, for the integration of farming systems research with Training & Visit system of extension. The extension services develop closer linkages with farming system research. They develop their recommendations in response to FSR rather than from a research station. Research planning is carried out by regional technical committees with research and extension representation. These production programmes also have a management committee in which in addition to the agricultural services, local politicians, local government, the private sector and farmers are also represented. Extension personnel are trained in systems thinking, participate in multilocational on-farm trials and participate in research activities and planning. Research methods involve varying degrees of farmer participation at different stages of research. Major constraints to the development of integrated research are located in the institutional framework.

309 EGGER, P. (1988) **Participatory technology development: Who shall participate?** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 10p. ODI Loc. 1608.

It is argued that Farmer Participatory Research (FPR) needs to develop an agenda which promotes participatory methods within formal research and development institutions and seeks to reform working methods within these organisations. Farmer participatory research should not be developed as another project based school of thought. FPR should attempt to build on existing research and not replicate current programmes. Various areas in which FPR should seek to reform existing practices and work for new institutional procedures are discussed. This includes: the extension of participatory research to include the participation of farmers and farmers' organisations in agricultural research; the strengthening of interdisciplinary research and of links between development agencies, research centres and extension services; and the implementation of participatory decision-making within research institutions. To achieve this FPR needs to generate practical principles, methodologies and training methods.

310 FARRINGTON, J. (1988) **Farmer participatory research: Editorial introduction.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.10. *Experimental Agriculture,* 24(3):269-279. ODI Loc. 1606.

Introduction to six papers (**217, 76, 255, 323, 225, 189**). Places farmer participatory research in the context of the institutionalisation of research methods and the allocation of national agricultural research resources. The paper argues that a substantial part of national agricultural research resources should be allocated to difficult areas. It argues that farmer participatory research is a powerful cost effective method of carrying out research in the complex agro-ecological conditions of difficult areas. It examines the ramifications of national resource allocation and planning on research in difficult areas. It argues that decentralisation of national agricultural research and support services is necessary for the implementation and effectiveness of participatory research.

311 FARRINGTON, J. (1988) **Private voluntary organisations as a link between resource-poor farmers and formal agricultural research and extension services - unexploited potential? A proposal for research.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 4p. ODI Loc. 1608.

A research proposal which seeks to identify ways in which private voluntary organisations (PVOs) can be linked into the process of R&D to generate technology of greater relevance for resource-poor farmers. It is postulated that PVOs can complement research carried out by government agencies in developing countries, since they frequently operate in the areas where infrastructure and government services are at their least developed. PVOs and formal research and extension services can benefit from a closer collaboration. The activities of PVOs are community orientated and committed to the empowerment of local communities. This puts them in the position of being able to gain valuable knowledge of local conditions, to assess local needs, and develop integrated research and participatory methods of research. They can identify constraints and local potentialities for development. They can generate valuable feedback to formal research institutions and promote new technologies. PVOs could benefit from greater access to the technical knowledge and facilities of research institutions, including training. The proposal seeks to classify the various types of PVOs which are engaged in field projects based on long term development goals in specific areas, and assess the extent to which their agricultural-related activities can be integrated with formal research and extension services. Research will also examine the relationship between PVOs and research and development organisations in the UK. The potential of the Overseas Development Institute (ODI), as an independent research organisation, to develop links with PVOs is also discussed.

312 GALT, D. (1987) **Informal observations on institutionalizing FSR in Nepal.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 4p. ODI Loc. 1607.
Notes and tables comparing and contrasting the structure and relative advantages and disadvantages of government sponsored and independent Farming Systems Research in Nepal. It is argued that a pluralism of research centres integrated into different research structures, utilising different FSR methods may complement each other.

313 GUPTA, A. K. (1987) **Matching farmers' concerns with technologists' objectives in dry regions: An exploratory study of scientific goal setting.** Indian Institute of Management, Ahmedabad. 254p. ODI Loc. 1367a.
As 314.

314 GUPTA, A. K. (1987) **Technology for dry-farming: How the scientists, students and farmers view the challenge?** W.P. no.708. Indian Institute of Management, Ahmedabad, India. 32p. ODI Loc. 1637.
The implications of a survey carried out among university scientists, research station scientists, post-graduate researchers and farmers are discussed. The objectives of the survey was to understand the factors which determine the choice of research agendas for dry areas, and the awareness and interest of researchers in farmers' perceptions and conditions of life. The perceptions of the scientists of indigenous technology were studied and contrasted with the perceptions of the farmers. Post-graduate research carried out between 1973-1983 in several agricultural related disciplines was studied in the context of its relevance towards investigating conditions of farmers in dry areas. The study found that there was considerable mismatch between the way scientists and farmers perceived of the problems. The research of scientists was found wanting in relation to understanding the perceptions of farmers, in the low priority assigned to research in dry areas, in developing interdisciplinary research, in adapting technology, and investigating local environmental conditions. Problems with research methodologies are also located in policy and lie with policy makers , who promote uniform policies which have usually been developed in well-endowed irrigated regions and are inappropriate to dry areas. The paper addresses the need for research policy to be restructured, to take into consideration the many variations in local environment which characterise dry areas.

315 GUPTA, A. K. (1987) **Organising the poor client responsive research: can tail wag dog?** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 73p. ODI Loc. 1607.
Farmer participatory research is placed within a socio-economic, ecological and institutional framework. It is argued that in addition to the issues involved in the generation of new technology, farmer participatory research needs to develop a concept of its role in the institutional framework of R&D and a political conception of the position of poor farmers. A conceptual model of poor farmers is developed, based on a socio-ecological paradigm of complex adaptations to risky environments and scarce resources. It is argued that although farmers have valuable knowledge of their environment, their adaptations to poverty prevent them generating new technology. There is a role for scientists to create new demands, utilising the existing practices of poor farmers as a base for generating new technology. Methods and techniques linking formal research activities with the specific conditions faced by resource poor farmers are discussed. The relationship between research institutions, farmers and research policy is discussed. Issues of bias of research institutions towards serving dominant interests, and the

marginalisation of research into the conditions of resource poor farmers, are addressed.

316 GUPTA, A. K. (1988) **On the concept of knowledge: A conundrum of criticism, commitment and control in peasant science.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 10p. ODI Loc. 1608.
This paper asks what constitutes success in scientific research and what are the implications of scientists' concepts of success. The social context in which science is practised is examined. It is argued that concepts of success must be developed more rigorously. Success should not only be defined by researchers' constructs of what constitutes a successful technology and a successful adaption to a particular environment. Technology should also be judged by the conditions under which peasant farmers can reproduce the innovations. The participation of farmers in projects is not a sufficient criterion to determine successful implementation of participatory methods. The quality of interaction between researcher and farmers needs to be questioned. The models developed by the scientists must convey the complexity of the farming system and also be intelligible to the farmers. The relationship between technical knowledge and inequalities within the community, and the social categories of farmers researchers interact with need to be examined. Methods of strengthening links between formal research and local knowledge systems are discussed. Ethical and moral issues in technological development, the transfer of knowledge between researchers and farmers, and control over knowledge are addressed.

317 GWORGWOR, N. A. (1988) **On-farm adaptive research: Researcher-farmer experience in northern Nigeria.** Workshop "Operational approaches for participative technology development in sustainable agriculture", ILEIA, Leusden, 11-12 April, 1988. 12p. ODI Loc. 1608.
The development of on-farm research in Kano state in northern Nigeria is described. The Agricultural Development Projects (ADP) act as an interface between research stations, extension agents and farmers. They screen new technology for suitability for local farming conditions, organise farm trials and develop new projects for the extension services. Research activities begin with a diagnostic survey of local farming conditions. The results of these are used at research stations to screen new technology. Experiments are carried out on-station to devise and tailor suitable technologies. These technologies are tested by the ADP at different localities. Suitable technologies are then further tested by farmers in on -farm trials. The trials are supervised by local extension services, which are supplied with materials and logbooks in which to monitor the results by the ADP. ADP researchers also provide extension services with special training on how to carry out farm trials. The log books are used by the ADP to analyse results of field trials in a large number of localities. Research has met with positive feedback from farmers and extension staff, who have both felt the trials were practical and relevant. The interaction between farmers and extensionists has also improved.

318 HAVERKORT, B. (1988) **Agricultural extension and agricultural knowledge in an international perspective.** Paper presented at the 35th International Course on Rural Extension, Wageningen 1987. 36p. ODI Loc. 1639.
The relationship between local agricultural development and extension programmes and development support are examined from an international perspective. Allocation of resources and quality of research are compared in developing and developed countries and new strategies are suggested for research in developing countries. Investments made in agricultural research and extension are considerably more favourable for western agriculture than for agriculture in

developing countries. The type of technology being developed is also biased by its western origins and is directed towards the needs of the West than towards the rural population in developing countries. This is attributed to historical and economic factors originating in colonialism, and to the biased perceptions of researchers and policy makers in developing countries, who have made inappropriate assessments of development potentials. New methods of research and extension are advocated which mobilise existing skills and knowledge of the people, which support the development of rural organisations to achieve development objectives, and which comprehend development objectives within a holistic systems framework.

319 JABBAR, M. A.; ABEDIN, A. (1987) **The evolution and significance of on-farm and farming systems research in BARI, Bangladesh.** Second Study Workshop on the Organization and Management of On-Farm Research, the Hague Sept 1987. Rev. version of report prepared for the Second Study Workshop on the Organization and Management of On-Farm Research, held at ISNAR, the Hague Sept. 1-4,1987. 167p. ODI Loc. 1602.
The evolution of on-farm client-orientated research (OFCOR) at the Bangladesh Agricultural Research Institute is traced within the context of national agricultural research policy. The organisation, management, research approaches and procedures for OFCOR are critically examined. The origins of the On-Farm Research Division (OFRD) lay in the re -organisation of research carried out into soil fertility, cropping systems and extension and research, to improve research linkages. The management of research is assessed according to the effectiveness of planning and implementation of trials, the collection and dissemination of information, the disciplinary backgrounds and calibre of personnel, the allocation of financial resources, and the linkages between different institutions. The FSR approach utilised at BARI is examined according to the awareness among scientists of on-farm research principles, methods and objectives; according to the development of interdisciplinary awareness and procedures; the criteria used to select sites and participants; the level of participation of farmers in research; utilisation of feedback to develop research priorities; and linkages between on-farm research and extension and development agencies. Methods to assess these criteria included visits to field sites and interviews with scientists. Shortcomings in research approaches and organisation are pinpointed.

320 KEAN, S. A.; SINGOGO, L. P. (1988) **Zambia: Organization and management of the Adaptive Research Planning Team (ARPT), Research Branch, Ministry of Agriculture and Water Development.** OFCOR case study no.1. ISNAR, The Hague. 266p. and appendices. ODI Loc. 883080.
Key organizational and managerial issues which have emerged in the operation of on-farm client-oriented research (OFCOR) of the Adaptive Research Planning Team in Zambia (ARPT) are analysed, and specific recommendations are made for strengthening its performance. The ARPT was established in 1980. It is a national programme with seven provincial teams, each having a farming systems economist, agronomist and research and extension liaison officer. These are backed up by a national coordinator, four regional sociologists and one nutritionist. The main aims of ARPT is to collect information on the different farming systems in Zambia, adapt component technology to farmers' needs, identify unsolved technical problems for central research station investigation, instigate research with extension services and farmer participation, and provide feedback to planners and agricultural institutions. Methods used involve zoning, surveys, on-farm trials and on-farm testing with farmer groups. The report examines ARPT's performance in relation to its problem solving approach; application of an interdisciplinary perspective; criteria for classifying major farming systems and farming groups; the implementation of farmer participation; the communication of feedback for

establishing research priorities and planning; collaboration with extension and development agencies. In relation to farmer participation, recommendations for improving performance include: more rigorous methods for farmer selection using household characteristics data; the further refinement of methods to explain the aims and objectives of research to farmers, in terms they comprehend; greater discussion with farmers on results of tests; the establishment of permanent farmer groups; strengthening the role of local leaders in ARPT activities; the improvement and regularising of techniques to record farmers comments about trials; and the organisation of farmer field days led by farmers.

321 KORTEN, D. C. (1980) **Community development and rural development: A learning approach.** *Public Administration Review,* Sept/Oct:408-511. ODI Loc. 1796.
Effective community controlled social organisations are important instruments enabling the rural poor to give meaningful expression to their views, to mobilise self-help activities and enforce demands. Past community development programmes have often lacked participation by the rural poor in planning and implementation. Korten argues that funding should take account of the need to develop this institutional capacity, and not be geared solely to immediate results.

322 MATLON, P.; SPENCER, D. S. (1984) **Increasing food production in sub-saharan Africa: Environmental problems and inadequate technological solutions.** *American Journal of Agricultural Economics,* 66(5):671-676. ODI Loc. 1655.
New technologies developed for sub-saharan Africa are frequently inappropriate, poorly respond to farmers' changing needs, and fail to create sustainable responses. A re-orientation of research objectives and methods is needed, involving greater farmer participation. The evolving technical and social conditions of African agriculture are outlined and current technological innovations evaluated. New technology performs poorly under farmer conditions and demands a level of management which small farmers are unable to provide. Research systems have failed to develop methods of diagnosis and systematic monitoring and feedback from technology transfer. Three recommendations are made for the reform of current research programmes: more research into farmers' conditions; more on-farm testing of technological components incorporating farmer perceptions, for feedback to reassess on-station priorities; and a balance between long-term and short-term objectives based on technical evaluations over a number of years.

323 MAURYA, D. M.; BOTTRALL, A.; FARRINGTON J. (1988) **Improved livelihoods, genetic diversity and farmer participation: A strategy for rice breeding in rainfed areas of India.** Workshop on "Farmers and agricultural research: complementary methods", Institute of Development Studies, University of Sussex, 26-31 July 1987. Farming Systems Research series no.14. *Experimental Agriculture,* 24(3):311-320. ODI Loc. 1606.
Critical of centralised on-station approaches to rice breeding in India, an alternative strategy is advocated, utilising the agronomic characteristics of small scale farmers' rice in rainfed areas to select advanced lines of breeding material. Breeders' advanced lines of rice are selected from research stations for testing, according to their similarity with the traditional varieties of participating farmers. The advanced lines are tested in on-farm trials, alongside traditional varieties. Farmers' evaluations are used to select the most promising lines. This enables high-yield new lines to be tested in a much shorter period than in official rice breeding programs, and to be selected to fit local agro-ecological conditions. The implications of on-farm rice breeding programs for the structure of research policy, seed multiplication constraints and legislation, and the maintenance of genetic diversity are examined. Decentralisation of research policy is advocated.

324 MERRILL-SANDS, D. (1988) **Introduction to the ISNAR study on organization and management of on-farm client-oriented research (OFCOR)** Introduction to Kean, S. A. and Singogo, L. P.: *Zambia: Organization and management of the Adaptive Research Planning Team (ARPT)*, Research Branch, Ministry of Agriculture and Water Development. 3p. ODI Loc. 1649; 883080.
The aims and objectives of a series of ISNAR studies which aim to develop guidelines for research planning, organisation and management in relation to on-farm client-oriented research (OFCOR) are explained. OFCOR is defined as an interdisciplinary approach to technological adaptation which utilises farmer participation in research, provides feedback from farmer to research station on farmers' needs, and integrates research with the work of extension and development agencies. While research methodologies have developed significantly in recent years, organisation and management issues for OFCOR have been largely ignored. Most countries have had to experiment with various forms of organisation and have proceeded by trial and error. It has become increasingly apparent that the success of OFCOR methodologies depends on institutional factors. To attempt to highlight and systematise managerial and organisational issues, ISNAR has initiated a study of the integration of OFCOR in nine national agricultural research programmes in Ecuador, Panama, Guatemala, Zambia, Zimbabwe, Senegal, Indonesia, Bangladesh and Nepal. A flexible approach is being incorporated into the analyses, which acknowledges that different methodological approaches, different human and financial resource bases and research capacities, will require different organisational capabilities. The studies examine both macro level national institutions, specific specialised programmes, and micro-level organisations. A diversity of types of institutions and methodological approaches are to be included in the study.

325 PANTH, M. P. (1986) **The farming systems research and development division: Strategy and structure.** Nepal, Department of Agriculture, Farming Systems Research and Development Division. "Papers presented at the 1st Farming Systems working group meeting", August 11-13, 1986, Pokhara, Nepal. pp.1-5. ODI Loc. 1697.
Describes the organisation of the Farming Systems Research and Development Division (FSR&DD) of Nepal. The FSR&DD has developed a multidisciplinary approach to integrate various branches of research and investigate complex farming problems. Methods of participatory research are being developed to generate appropriate technology, which is relevant to farmers' needs and conditions. Research sites are established in different agroecological regions to generate technologies which can be disseminated to other settlements in similar areas.

326 PRAIN, G. D.; SAMANIEGO, F. U. (1986) **Beyond the farming system: On farm commodity research in the Peruvian Highlands.** Paper for Farming Systems Research Symposium, Kansas, 5-8 October 1986. 20p. ODI Loc. 1812.
Informal farmer's networks exist in Peru, which disseminate farmers' knowledge and innovations in crop technology between different localities. The implications of this phenomenon on research strategies is examined. Whilst there has been a positive movement in national and international agricultural research towards understanding and working with small farming systems, the resulting approach has generally concentrated on localised, in-depth studies. However, both farmers and national programmes rely on interconnections, which cross-cut farming systems boundaries and affect the systems themselves. Such interconnections are often crop-specific. Commodity research programmes with a strong on-farm component have a real potential for understanding farming complexities in both local and extended contexts. In the Peruvian Central Highlands it was possible to identify informal potato seed systems involving interconnections within complex local

farming systems and between farmers and an extensive marketing system which had implications for the strategy of distributing high quality seed being utilised by the Peruvian National Potato Programme.

327 RAMAN, K. V. (1987) **Scientists' training experience in promoting interactions with the farmer.** Workshop on "Farmers and agricultural research: Complementary methods", IDS, University of Sussex, 26-31 July 1987. 14p. ODI Loc. 1607.
Describes research and training methods which have been developed in Indian agricultural institutions to provide scientists with the opportunity to interact with farmers, acquaint them with problems of rural farming conditions, and encourage them to formulate problem-solving action orientated research proposals of relevance to farmers' conditions. Three training and research programmes are described, which contribute to achieving these objectives. Firstly, the Rural Agricultural Work Experience programme, initiated by Andhra Pradesh Agricultural University in Hyderabad, seeks to familiarise undergraduate students with rural problems and conditions by sending students to spend a semester in a village, in the vicinity of a research station. The students interact with farmers, researchers and extension workers. The emphasis of the programme is on learning from the farmer. Secondly, the Indian Council of Agricultural Research has established a mandatory Foundation Training Course of five months duration for all scientists it admits. Interdisciplinary teams of scientists are sent out to conduct surveys and develop research projects in the villages, and interact with farmers and extension agents. Thirdly, the National Agricultural Research Project has been set up to assist the Agricultural Universities in carrying out problem-solving location-specific and production orientated research. The project divides India into 127 specific agro-ecological zones. Multidisciplinary teams of researchers work in each zone. Basic diagnostic surveys are carried out, ascertaining the main problems and constraints in local farming systems. Farmers participate in the research through questionnaires and zonal workshops in which research objectives are discussed with farmers, development agencies and extension workers. On-farm trials are systematically carried out on farmers' fields, testing and evaluating research station technologies and eliciting feedback from farmers. Training projects for farmers with visits to research stations have also been developed. The effects of these programmes has been to increase the number of research programmes which take local and regional problems into consideration.

328 RAWSON, E. M.; GROSZ, R. K. (1986) **Institutionalising farming systems research and extension in Rwanda's Buberuka Highlands.** *Selected Proceedings of Kansas State University's 1986 Farming Systems Research Symposium*, (eds.) C.B. Flora and M. Tomecek. pp.33-45. ODI Loc. 1824.
Describes efforts in the Farming Systems Improvement Project to institutionalise FSR/E into existing research and extension systems without creating an artificial project-dependent structure. The project aims to involve farmers, researchers and extensionists in research and dissemination follows a Rwandan government re-structuring of research services in 1983 to facilitate farmer participation.

329 RHOADES, R. E. (1986) **Improving the food system of Asia: The role of the farm household in potato and sweet potato research and development.** Discussion proposal to the Dutch Government from CIP, Lima. 20p. ODI Loc. 1817.
This proposal, with funding agreed in March 1987 and led by Rhoades, seeks to broaden the user-group focus of agricultural research, which, even with recent participatory methods, has focused narrowly on "the farmer", to the neglect of women and other important actors at or beyond the household level, in food production and utilisation. The project focuses on potato and sweet potato, which have been neglected. It will identify, train and support individuals from Asian

developing countries to conduct research. A specific intention is to facilitate joint activities between Asian national researchers and western social and technical scientists.

330 RICHARDS, P. (1986) **New models for low-resource agricultural research and extension in sub-saharan Africa.** Office of Technology Assessment, Congress of United States, Washington D.C. 80p. ODI Loc. 1686.
In this report to the OTA for the evaluation of agricultural research agendas in Africa, the role of farmer participatory research in developing technologies for farm-level adoption by resource-poor farmers is investigated. The institutional framework in which participatory methods may succeed is examined. Literature on participatory research is reviewed and a detailed case study of Sierra Leone is used to suggest how participatory research may reorientate the research agenda. Various participatory methods are described from diagnostic rapid appraisals to action-oriented programmes involving farmers in the experimentation process, methods which build upon indigenous knowledge and farmers experiments, and research utilising farmers' groups and panels. Participatory research is seen as important in creating technologies which are adapted to specific local ecosystems. Participatory research is by nature gradualistic and incremental and capable of being integrated into a number of established research and development trends. A cautious approach is advocated in which participatory research is integrated into a small number of research and training institutions with a sympathy for participatory methods and some experience of FSR. Exploratory programmes should be established, and the accumulated experience and results used to implement more comprehensive programs.

331 ROLING, N.; ENGEL, P. (1988) **IKS and knowledge management: Utilising indigenous knowledge in institutional knowledge systems.** Paper presented for conference on "Indigenous knowledge systems: Implications for agriculture and international development", Academy for International Development, Washington, 27p. ODI Loc. 1850.
Examines elements of a research policy and an institutional framework which will enable indigenous local knowledge to be incorporated into research. It is argued that given the diversity and instability of rainfed environments, technology development based on indigenous knowledge is the most expedient way of improving the practices and cultivars of local farming systems. The inadequacies of top-down research strategies are pointed out. It is argued that research strategies must assist farmers to carry out their own research and enrich them with scientific knowledge. The farmers must be considered as part of the agricultural knowledge and information system (AKIS). A policy framework which can accommodate IKS, which aims to improve the interface between agronomists, local farmers and research and extension institutions is examined.

332 SAGAR, D.; FARRINGTON, J. (1988) **Participatory approaches to technology generation: From the development of methodology to wider-scale implementation.** Network Paper no.2. ODI, London. 50p. ODI Loc. 1748.
This paper seeks to identify cases of participatory technology development for resource-poor farmers which have gone beyond the initial phases of research, or development of research methods, to wider scale implementation of the findings of research. By comparison with the plethora of studies of farmer participatory research, there are relatively few which deal with dissemination and feedback. In the 6 case studies from Africa, Asia and Latin America presented here, a wide diversity of approaches is evident. These range from modification of essentially centralist extension models such as Training and Visit in order to generate greater adaptability to local conditions through creating more "demand-pull", to highly innovative models relying less on public funding than on collaboration between

research institutes and a wide range of local agencies, many of them non-governmental. Many commonalities in objectives and methods emerge, including joint efforts between change agents and farmers (or their representatives) to conduct local adaptability trials: the presentation of technology "options" to farmers, instead of fixed prescriptions: the promotion of linkages among farmers or their organisations as a force for dissemination, and the development of strong mechanisms for feedback to researchers. More evidence needs to be assembled and published of the costs of individual approaches, the extent to which farmers have adopted the technologies offered, and the ways in which extension and feedback methods have evolved to suit particular circumstances.

333 SPIJKERS, P. A. N. M.; BOX, L. (1981) **Cultivators and their crops.** Agricultural University Wageningen, Department of Rural Sociology of the Tropics and Subtropics, Essays in Rural Sociology in honour of R. A. J. van Lier. Wageningen, Agricultural University. pp.264-304. ODI Loc. 1710.
The adaptive traditions of peasant cultivator systems in crop reproduction are examined in relation to cassava cultivators in the Dominican Republic and rice farmers in Colombia. The strategies of research centres in both countries are critically evaluated in relation to their contribution to peasant cultivation systems. The long history of peasant adaptations of crops to their needs is discussed. The wide range of cassava and rice varieties utilised by peasant cultivators to meet different requirements are described. Crop research and development programmes have expanded rapidly in recent decades and international and national research centres increasingly dominate seed varietal breeding strategies. There has also been a disjuncture between the knowledge systems of the peasant cultivators and research centres. However the new varieties generated by research centres have failed to meet the needs of cultivators. In South America, CIAT has failed to develop a single variety of cassava which has been widely adopted by cultivators. Modern varieties do not respond to the conditions of cassava cultivators. New varieties of rice have not been adapted to the conditions of poor farmers in Colombia. Agricultural policy has heavily promoted the adoption of new varieties, and the new conditions of production have led to a deterioration in the position of small-scale rice-cultivators. The new varieties have not been able to fulfil all the functions which locally adapted landraces achieved. Modern varieties have not developed full resistance to disease and have to be replaced every two years by new breeds. Farmers have become dependent upon research centres for reproducing seeds, input supplies, recommendations and credit. It is argued that future research should take the conditions of peasant cultivation into account and recognise the valid achievements of peasant cultivators in adapting and reproducing new varieties to their conditions. The social sciences have an important role to play in improving the interaction between scientific research and the knowledge systems of cultivators: to produce knowledge which is relevant to crop scientists and crop cultivators.

334 STOOP, W. A. (1987) **An overview of linkages in NARS with emphasis on the research-extension linkage.** ISNAR, The Hague. 52p. ODI Loc. 1687.
It is argued that the incorporation of a farmer participatory framework into research and extension linkages in national agricultural research services can improve dialogue between the two sectors and improve the quality and relevance of their respective performance. The common institutional separation between research and extension is related to the isolation of researchers from farmers, and the "top-down" approach to technology transfer. The incorporation of a farmer-back-to-farmer research approach is advocated, as the basis for a research agenda in which research activities would be adapted to the characteristics of the major regional agricultural systems. In place of formulating standard

recommendations, technology can be adapted to local conditions. This would result in technology being designed to meet the needs of the farmer. As a result of more relevant research, the extension services would improve the quality of their extension products, the status of their personnel, their ability to advise farmers, and provide relevant information on technological needs to researchers. Researchers would benefit from better interaction with farmers and extension services, resulting in increasing relevance of their work.

335 THAPA, H.; GREEN, T.; GIBBON, D. (1988) **Agricultural extension in the hills of Nepal: Ten years of experience from Pakhribas Agricultural Centre.** Network Paper No.4. Agricultural Administration (Research & Extension) Network.ODI, London. 30p. Outlines how extension sections have been developed within a multidisciplinary research, production and services centre at Pakhribas Agriculture Centre (PAC). A range of issues of management and methods in the extension service, including methods of targeting disadvantaged groups are discussed. PAC was set up in 1973 with UK finance, initially as an agricultural training centre for ex-Gurka soldiers. Its research and extension activities expanded over the years, and proposals to incorporate it into the broader Nepal research and extension services provide the opportunity to review progress during this early period of comparative freedom in devising its own extension methods and organisations. Major difficulties in providing external inputs into the Nepal Hills have led to the development of methods capable of enhancing productivity with only minimal new inputs. Farmer-to-farmer seed exchanges provide an important vehicle for dissemination. The emphasis, particularly in recent years, has been on strong participation by farmers in the design and management of trials, decentralised decision-making within the extension service and the avoidance of rigid "packages" of technology. The role of extension on input supply is also discussed: seeds provide an important example of creating confidence in, and a demand for, the technology among farmers, and of how farmers need to be trained in the skills necessary to manage further development of the technology for themselves. Experience at PAC has shown that hill farmers are responsive to the opportunities offered by sensitively identified new technology. Extension has played an important role in this process, not least because of its highly participatory character, its frequent interaction with researchers, flexibility in the adaptation and testing of new technologies and avoidance of the "technical expert" image. The challenge now lies in spreading these features over a wider area.

336 THIELE, G.; DAVIES, P.; FARRINGTON, J. (1988) **Strength in diversity: Innovation in agricultural technology development in Eastern Bolivia.** Network Paper no.1. Agricultural Administration (Research & Extension) Network. ODI, London. 45p. ODI Loc. 1747.
This paper outlines the main trends in the organisation of agricultural technology development in Latin America, placing recent developments in Eastern Bolivia within this context. A brief review of technology generation and diffusion in Bolivia since the 1950s reveals how recent participatory approaches have departed from "mainstream" trends. Low population densities and difficult communications prompted the abandoning of a conventional Ministry-led research and extension model. Informal links had long existed in Eastern Bolivia between researchers and "intermediate users" such as NGOs, Producers' Organisations and area-based government programmes. Current technology generation and diffusion efforts are seeking first, to define more accurately the interface between researcher-led and user-led technology development and, second, to create more systematic links with diverse intermediate users in both technology transfer and feedback. The high level of professionalism of many of these intermediate organisations, their long-standing contacts with technology users and their detailed local knowledge, work in favour of stronger linkages and have allowed them to make useful

contributions to the annual planning of the "formal" research system's activities. Although several difficulties remain, this highly decentralised approach appears more likely to be sustainable and productive than conventional "top-down" systems.

337 VERHAGEN, K. (1987) **Self-help promotion: A challenge to the NGO community.** CEBEMO/ Royal Tropical Institute, Oegstgeest. 152p. ODI Loc. .
Reports on the findings of a CEBEMO project to develop a methodological framework for the development of self-help organisations, and to assess the effectiveness of NGOs as self-help promotion agencies. The study was conducted in collaboration with NGOs in Brazil, Indonesia and Thailand. Local NGOs in the three countries were used to carry out the study, which became an exercise in self-assessment. Strategies and instruments used by local NGOs to promote development of local self-help associations are analysed, as is the structure, functions, organisational and development performance of the self-help organisations. Results suggested that the most effective self-help promoting institutions are small organisations, where staff can function as a team, but where the institution is integrated into a network of support organisations which can provide backup technical and other services which NGOs are unable to provide. Problems of finance are also addressed. Self-help promoting institutions need to develop financial independence. However the search for financial autonomy can side track local organisations into developing a richer clientele to the detriment of their main work. A devolution of power from international developing agencies to developing country organisations is seen as a method to solve the ambiguity in the relationship between local NGOs and donor agencies. NGOs should not merely respond to the financing policies of their overseas partners. They need to develop a policy which is based on the ethical and technical dimensions of financing, which upholds an explicit focus on promoting self-help and alleviating poverty.

338 WHYTE, W. F. (1981) **Participatory approaches to agricultural research and development.** Cornell University, New York. 106p. ODI Loc. 1729.
Critically examines agricultural research methodology during the post-war period and the development of a new conceptual framework based on participatory and interdisciplinary research. The innovative skills of farmers are noted and methods of involving them in research are discussed. Elements of the new methodology include research in farmers' fields with farmers conducting trials, helping to identify problems, setting criteria for evaluation and evaluating projects. The small farmer needs an organisational base to participate in R&D and in decision-making. Local farmer organisations need to be integrated into the planning process with government bureaucracies. While many important developments in methodology are noted, many obstacles remain in the organisational factors of agricultural policy, administration and training. National agricultural administration is frequently uncoordinated and the agricultural institutions operate in isolation. International agencies fail to coordinate their activities in the context of national development plans and objectives. Their is often a great cultural separation between the culture of the farmers and the elitism of the agricultural services. Professionals tend to exaggerate their own knowledge and downgrade that of the small farmers. Political factors tend to impede the development of farmer organisations: government agencies attempt to control them rather than stimulate their further development.

339 WIRASINGHE, S.; WEERASINGHE, S. P. R.; FERNANDO, M. H. J. P. (1985) **On-farm validation of technology in heterogeneous Sri Lanka.** Cernea, M. M.; Coulter, J. K.; Russell, J. F. A. (eds): *Research extension farmer: A two way continuum for agricultural development.* World Bank & UNDP Symposium, Washington. pp.93-112. ODI Loc. 1714; 1543.

Examines the role of the extension services in adaptive research in Sri Lanka, and describes research procedures. Sri Lanka has been divided into eight agroecological zones. Each zone has a Regional Technical Working Group (RTWG), representing the Research, Extension, Education and Training services, and Farms and Horticultural Divisions of the Department of Agriculture. The RTWG meets twice each cultivation season to review and plan its strategy. The adaptive research programme is devised by researchers, but on farm trials are supervised by the extension services. The Training and Visit (T&V) system has been adopted by the extension services since 1979. Extension agents visit contact farmers at fortnightly intervals, making recommendations to the farmers and carrying feedback on farmers' production problems to district level organisations. Unresolved problems are referred to the RTWG, which can prescribe further on-farm research or on-station research to be conducted to solve the problems. On-farm trials are conducted on farmers' fields in widely dispersed locations. The farmers are involved in the preparation of land, management of trials and marketing of produce. The trials serve to monitor the adaption of technology to farmers' environment, and as a means of disseminating successful technology to farmers and extension agents through the organisation of field days. Field trials in Bandarawela and Maha Illuppallama are described. Problems in research strategies are identified. Problems include a focus on crops rather than farming systems and farmers, lack of economic study of farmers' strategies, the need to upgrade and expand extension programmes, and the need to develop research in interdisciplinary extension methodologies.

340 ZANDSTRA, H. G. (1987) **Farming systems research and extension: Achievements and future.** *FSSP Newsletter,* 5(1): ODI Loc. 1839.
Examines the achievements of farming systems research. It is noted that emphasis on farmer participation in on farm trials has sometimes lessened the emphasis on experimental techniques permitting valid comparisons. The importance of long-term sustainability in FSR, the value of farmers' local knowledge and the need for effective monitoring, appraisal and field staff training are stressed. The expansion of OFR should be integrated into National Research Systems, involve commodity and livestock programmes and strengthen links with policy planners.

SUBJECT INDEX

GEOGRAPHICAL INDEX

AUTHOR INDEX

Complementing *Farmer Participation in Agricultural Research: a review of concepts and practices* by John Farrington and Adrienne Martin (AAU Occasional Paper 9), these analytical abstracts prepared by Kojo Amanor deal first with conceptual and general methodological issues in participatory research, moving on to examine their practical application in diagnosis, on-farm experimentation and dissemination of agricultural technology. A final section examines efforts to design research strategies along more participatory lines.

ODI's Agricultural Administration Unit (AAU) was established in 1975, with financial support from the Ministry of Overseas Development (now ODA).

The aim of the AAU has been to widen the state of knowledge and the flow of information about the administration of agriculture in developing countries. It does this through a programme of policy-oriented research into selected subject areas and the promotion and exchange of ideas and experience in four international Networks of individuals directly involved in the implementation of agricultural development. The four networks are concerned with Research and Extension, Irrigation Management, Pastoral Development and Social Forestry. Members are drawn from a wide range of nationalities, professional backgrounds and disciplines.

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