



Agricultural Extension: Challenges and Lessons

Challenges

In the twenty-first century, it will be increasingly necessary, to take a whole-systems approach to organized, positive change in rural places says George H. Axinn. For extension, it means helping farming people toward sustainable increasing productivity - particularly in small-scale mixed-farming systems in rainfed areas, upland areas, and in other neglected areas. It also calls for measuring success in terms of the consumption and production of rural people. This will require agricultural extension systems which help farm men and women to organize themselves in ways which empower them - to lead extension and to exert enough power and influence over research systems so that they generate useful, practical information which meets the needs and interests of those farming people, says Axinn.

Axinn highlights five major challenges to agricultural extension in the twenty-first century:

Control and accountability

If there is little accountability to farmers, neither a government extension system nor an NGO is likely to be controlled by farmers.

Sustainability

An issue is ecological sustainability for humanity to survive in the coming generations. The implications of sustainability for agricultural extension both technical and economic dimensions and also political, cultural, social and other dimensions need to be considered.

Role of women in farming and extension

Gender issue pervades all aspects of extension activity. There are implications for women farmer led extension for the timing, location and language of extension activities.

Participation

Strategies for achieving more participation through farmer-led approaches to extension are significant and should guide the future.

Greed and corruption

Greed and corruption if ignored, can defeat the best extension strategies.

(Axinn George H. Challenges to agricultural extension in the twenty first century In Farmer Led Extension: concepts and practices, ed by Vanessa

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Scarborough et al. London, Intermediate Technology Publications, 1997).

Lessons

Changes and challenges affecting extension are indicative of wider forces at work in society say Rivera and Gustafson. Without a knowledge and appreciation of both global and individual country forces, and their implication for agricultural development and extension in particular, attempts at improving extension are less likely to succeed. The paper discusses lessons gained from international experience of agricultural extension, which could be of relevance to developing countries.

Six main points discussed are:

Extension does not stand alone Extension does not stand alone. Externalities involving both physical and institutional infrastructures are required for extension to operate fully:

Extension needs a supportive policy framework

A policy commitment and planning for extension development including price, credit and marketing policies favourable to agriculture and supportive of production efforts of extension services is needed.

Different sector extension systems can be successful

Different systems viz. public, semi-public and private sectors with their different purposes and approaches to technology transfer can work separately or jointly and be successful;

Good management is a main condition for successful extension Good management is a main condition for successful extension\

This involves institutionalization of organizational planning and system management processes.

Local participation is a key to extension programme success

There is need for strategies for including farmers in extension programme development. Maintenance of operational links between research, extension and farmers also helps to ensure farmer involvement in the determination of technology generation and transfer.

Extension is a long process

It involves long term commitment involving policy support and provision for recurrent costs.

The paper also raises the issues of: whether there should be public extension services and, if so, how they should be paid for; who the target groups should be; what extension methodology is preferred; and how public extension services should be managed.

(Rivera, William M. *Lessons on agricultural extension: In Global Perspectives. JOURNAL OF EXTENSION SYSTEMS, June 1996 Vol. 12*)

Farmer participatory Research and extension

Experience over the last decade suggests that participatory approaches to technical change are falling into: public sector approaches which are generally part of a client orientation strategy and rarely aim to do more than enhance the functions of technology design and delivery and NGO approaches which generally aim for empowerment of weaker groups. John Farrington reviews complementarities and tensions between the two approaches and suggests ways forward.

Policy conclusions

- Donors, NGOs and others have developed a range of approaches to participation. The need is for support to governments to implement the most functional types of participation on a wide scale.
- This necessitates substantial reform within government to stimulate market provision of technology services to better off farmers and allow public sector resources to be switched into dealing with problems of difficult areas.
- Wide scale replicability should be a key design criterion for any future approaches developed by NGOs or special projects
- Stronger participation in difficult areas depends on widespread basic literacy, which remain govts responsibility. But incomes need to rise.
- There is potential advantage for partnerships between NGOs and government for difficult areas which can happen if each moderates its prejudices
- Such partnerships also rely on agreed and transparent monitoring of the interaction process
- Donors can help in testing approaches to multi-agency partnership

(Farrington, John. *Organizational roles in farmer participatory research and extension: lessons from the last decade. MANAGE-ODI Natural Resource Perspectives no. 27, January, 1998*).

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Farmer led extension

Extension approaches which are locally controlled and managed approaches are found necessary. Governments, non-governmental organisations, farmers and other developing agencies throughout Asia, Africa and Latin America have been experimenting with a range of approaches to extension. These include the campesino-a-campesino movement of Central America, farmer field schools in South Asia and others. These approaches promote farmers and other rural people as the principal agents of change in their communities. (Some of these cases have been documented in an earlier issue of the Digest).

Given here are some extension experiences, principles and methods in farmer to farmer extension.

Extension Experiences

Chris Garforth and Nicola Harford identify trends in the way agricultural extension is thought about and provided; reflect on the growing disenchantment with the public sector; and identify key issues which must be taken into account in a more farmer-led approach to extension.

Among the changes in the way people view extension, four relevant are: recognition that extension is not the exclusive domain of extension agencies; the growing variety of forms of provision; an expansion of the agenda which extension is expected to address; and changes in our understanding of how extension works.

There is a growing disenchantment among donors with public-sector involvement in agricultural extension. Main reasons given for reducing public expenditure on extension are: the view that benefits which accrue to individual farmers from extension advice and support should be paid for, just as any other input; the high recurrent costs of national extension organizations set up initially with donor support; the recognition that uniform, hierarchical government bureaucracies are not the best way of providing a flexible service tailored to the needs of different categories of farmers and varied agro-ecological and economic conditions; and the success of developed countries in moving extension towards a commercial, cost-recovering activity, while at the same time enabling it to become more responsive and accountable to clients.

Key Issues identified

Payment for extension services. Moves to shift some services to the private sector and introduce partial cost recovery from clients could be an important part of the mechanism by which extension becomes more farmer-led.

Welcoming diversity. Having a variety of extension service providers, with different approaches and methods, working with different categories of clients is a response to the diversity within the farming sector. A farmer-led extension system needs to be able to respond to this diversity.

Training extension personnel. Extension personnel need to have a deep understanding of farming systems and the interaction between agriculture and the physical and socio-economic environment. Not only in content but the training methodology also needs to be in line with requirements of extension for sustainability.

Equity and targeting. There is need to develop approaches that build on women's environmental knowledge and tasks within the rural economy.

Role of farmers' organizations. A strong structure of farmers' organizations offers the opportunity for greater efficiency, effectiveness and equity of provision and access. They can also be a vehicle through which farmers can pay a contribution for services, become actively involved in the planning and management of extension, and act as a voice for their members, in getting services which meet their needs.

Effective use of mass media. Apart from one-way communication of information, mass media can also be used to facilitate widespread farmer-to-farmer extension. Where local radio stations exist, there is a lot of scope for use of media to stimulate and sustain change in farming systems and the management of natural resources.

Search for effective participatory methods and approaches. There is need to develop methods and approaches which allow farmer-clients to dominate the extension process.

The need for a partnership between professionals and clients in planning and managing change at farm and community level is recognized. (Garforth, Chris and Harford Nicola. *Extension experiences in agriculture and natural resource management in the 1980s and 1990s* In *Farmer Led Extension: concepts and practices*, ed by Vanessa Scarborough et al. London, Intermediate Technology Publications, 1997).

Linkages

Research-Extension Linkages

Evidence shows that integrating research, education and extension can improve overall performance of agricultural technology systems. This paper discusses some of the problems and opportunities related to integrating research, extension and education institutions, and to incorporating the active participation of farmers in technology innovation.

In the last decade, there have been important shifts in approaches to agricultural research, extension and education, especially in the developing world. A major premise underlying these shifts is that research, extension and education need to be farmer-participatory and interactive in order to contribute agricultural knowledge and technology that results in collective learning, enhances local capabilities and generates sustainable development processes and practices. Policies that address

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linkages directly and facilitate structural and functional linkages among REE organizations on a more permanent basis are needed.

In order to improve the effectiveness of agricultural technology systems, suggestions are:

- REE must be viewed as an integrated agricultural knowledge and technology system;
- Focus is needed on REE functions, instead of just organizational structures;
- A pluralistic approach is likely to have advantages;
- promotion of informal networking at many levels with an incentive system that rewards collaboration.
- Strengthening and empowering "client groups" .

Research, extension and education need to be seen as parts of an integrated agricultural technology system say the authors. (Van Crowder, L and Anderson, J. *European Journal of agricultural education and extension* Vol.3 No.4 March 97

NGO-GO collaboration

Several factors have led government agencies and NGOs towards more collaborative efforts in agricultural research and extension.

Three main types of NGO-government collaboration are presented

- Government agencies seek collaboration with NGOs in order to see their programme efforts and activities spread more widely.
- NGOs initiate collaboration with government agencies for help in 'scaling up' their programme successes to reach a larger number of communities.
- Government agencies seek NGOs' help to become more responsive to poor farmers' needs.

This section describes efforts aimed at developing collaborative links between farmers, NGOs and public sector extension systems. The cases cover perspectives from both government and non government agencies, present the rationale for collaboration; forms of collaboration; benefits; problems and lessons of collaboration.

Lessons learned

- Farmers can be very active partners in extension and can set an agenda and direct a process in which government agencies and NGOs can participate to meet the needs of the farmers and their communities.
- The extension approach used should ensure that farmers are encouraged to share their experiences with others.
- Though collaboration between government agencies and NGOs is difficult, significant benefits can be achieved.
- During the process of collaboration, stereotypical views held by one group of the other partner can be broken down, even if slowly.
- It is important to get the agenda and parameters of collaboration right at the outset.

Farmer Led Extension: concepts and practices, ed by Vanessa Scarborough et al. London, Intermediate Technology Publications, 1997).

Improving effectiveness of agricultural research and extension

A study on improving the effectiveness of agricultural research and extension in India by John Farrington, Rasheed Sulaiman and Suresh Pal examines the issues facing agricultural research and extension and draws out issues relating to research extension linkages. The study is a part of the component on improved watershed and area development strategies in rainfed areas (managed by IFPRI, Washington), of an ICAR Research project on sustainable rainfed agriculture. Some of the issues related to agricultural extension and the recommendations are given below.

Strengthening the O&M of Extension

The recent growth in radio, television and video in many villages, and advances in farmer-to-farmer extension approaches, offer opportunities for new approaches to extension.

Recommendation 18. Recommendation 18. Try out new approaches to extension, which rely less on face-to-face contact between extension agents and farmers and more on innovative vehicles (such as mass media) and on support of farmer-to-farmer information exchange.

Much of the extension service is currently driven by targets and restricted to the varieties of crops that have been officially released.

Recommendation 19: Recommendation 19: Increase flexibility so that extension workers can focus more on identifying farmers' requirements and responding to them.

Training is currently conducted in three different types of organisations (the SAUs, the KVKs and the departments of agriculture), leading to gaps and overlaps. The curricula of training courses should be modified to cover the complexity and diversity of rainfed farming, needs-assessment methods, the conduct of on-farm trials, the assessment of risk, the understanding of risk-averting techniques, working in multi-organisational partnership in research and extension, group formation, the

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development of leadership skills, conflict resolution etc.

Recommendation 20: Recommendation 20: Set up a joint committee at the state and district levels with representations from SAUs, KVKs and Department of Agriculture to streamline and strengthen extension staff-training procedures.

Principles and Methods

Extension Principles for a Broad Impact

Future extension concepts must show ways in which, despite meagre public means, complex extension content can be transferred as widely as possible. The analysis of extension systems in India, Kenya, Zimbabwe and Taiwan highlight the following key elements for a successful extension system.

Strong, self-financed farming organisations. Strong, self-financed farming organisations. An agricultural extension with a broad impact in developing countries leans on strong, self-financing farming organisations. Wherever they are lacking, the extension service should try to train them to this end based on existing organisational structures.

Self-complementary variety of extension organisations. Self-complementary variety of extension organisations. Extension achieves a broad coverage when the state-dependent and the independent (commercial) extension organisations on one hand and the generally integrated and specialised extension organisations on the other hand complement each other.

Extension with farming groups instead of single consultation. Extension with farming groups instead of single consultation. Work with farming groups (instead of individuals) forms a central feature of a broad impact extension as in this case efficiency increases and exchange between the farmers is encouraged.

Decentralise decision structures and flexibility in order to adapt the extension to local needs Decentralise decision structures and flexibility in order to adapt the extension to local needs. A broad impact requires the adaptation of an initial extension approach to local conditions. Through a decentralised decision structure, an extension service attains the necessary flexibility to undertake such an adaptation.

Personal responsibility of the farmer. Personal responsibility of the farmer. The larger the self-responsibility of the farmer, the more an extension service meets the needs of the farmer and the better chances are that it can develop a broad impact.

Regular Contact. Regular Contact. A significant feature of an agricultural extension, which has a broad impact, is the regular contact between advisers and farming families.

Variety of extension methods. Variety of extension methods. Extension, which has a broad impact, is characterized by a variety of applied methods. The adapted use from mass media to a wide range of methods should be included in the consultation service.

Economically interesting extension content. Economically interesting extension content. Agricultural extension can only develop a broad impact if the extension content is economically interesting for the user.

Regular in-service training and a strong agricultural education system. Regular in-service training and a strong agricultural education system. An extension with a broad impact requires regular in-service training of the advisers as well as a functioning agricultural education system.

Adapted infrastructure and mobility. Adapted infrastructure and mobility. An extension service must ensure sufficient infrastructure for the extension personnel and their mobility in order to have a broad impact.

Functioning supply with production means. Functioning supply with production means. An agricultural extension can only have a broad impact when the producers have access to the necessary production means and services.

Motivated extension personnel. Motivated extension personnel. An extension system can only develop a broad impact when the advisers are motivated.

Close contact between research and extension. Close contact between research and extension. Close contact between research and extension. An extension which has a broad impact is distinguished by research and extension working closely together. At the national level there needs to be a co-ordination mechanism. At the regional level the adaptation of research results to the local situation is indispensable. (Extract from a Summary of Prof Abraham Blum's publication "Bausteine für eine breitenwirksame Beratung", LBL, 1996. In BeraterInnen News 2, 1997)

Principles and methods

Farmer -to-Farmer extension employs a wide variety of methods. A study of methods used by the campesino-a-campesino movement, World Neighbors-supported farmer-led extension programme in the uplands of Sumba, Mag-Uugmad Foundation/World Neighbors-supported Soil and Water Conservation Project in Cebu, IIRR-supported Upland Farm Management Project (Baile), Farmer-to-farmer extension programme in Nepal indicate that farmer-to-farmer extension networks share some field methods. Common ones include:

- * Training of farmers and farmer-extensionists by external agents and other farmers in technological developments, communication, extension and training skills.

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- Cross-visits among farmers and exposure of farmers to other institutions.
- Facilitation of farmers' research into, and testing and adaptation of, new technologies and management practices
- Farmer group formation and development, and regular group meetings for planning, learning, sharing experiences and problems, evaluation, etc.

Others include: conscientization; leadership training; facilitation of farmers' research, mass mobilization; forming and managing linkages among farmers, NGOs and government; and developing conflict-resolution skills. Ultimately each farmer-to-farmer extension network has to decide upon the field methods best suited to its own objectives, resources, demography, agro-ecology and social and economic situation.

(Principles and methods in farmer to farmer extension in *Farmer Led Extension: concepts and practices*, ed by Vanessa Scarborough et al. London, Intermediate Technology Publications, 1997).

Sustainable agriculture through extension

There are concerns about the environmental impact of agricultural technologies and over the long term sustainability of farming systems in Asia. Although extension programme content includes sustainable technologies, public sector extension approaches and methods continue to reflect a technology transfer paradigm. In situations where mass media and extension materials contain little information to help farmers decide how to adjust farming practices in the interest of sustainability, national and donor policies can enhance sustainability of agriculture by increasing complementarity between extension providers and encouraging changes in the extension approach, extension worker training and mass media treatment of agricultural and environmental issues says Chris Garforth.

Policy conclusions

- extension programmes should highlight local development or adaptation of technologies: address the needs of specific categories of clients; support farmers' organisations and farmer to farmer extension; and influence both collective and individual behaviour
- Diversity of extension provision from agencies in the public, private, NGO and academic sectors gives clients greater choice of sources of information to support long term sustainability of their farming
- Extension worker competence can be improved by training which addresses learning objectives specifically related to sustainability and by introducing management practices which support continued learning and professional development
- Mass media coverage and relevance of content to rural audiences can be improved at low cost. Radio should be used specifically to promote farmer to farmer communication
- Extension materials should be designed to offer options and problem solving strategies, facilitate decision making and technology adaptation and contain more explicit treatment of sustainability in relation to technical content.

(Garforth, Chris. Supporting sustainable agriculture through extension Asia. *MANAGE- ODI natural Resource Perspectives* no. 21, June 1997)

Approaches and Models

Pluralism and extension

Drawing on an experience with a project in Vietnam, this paper discusses the implications of using extension to help the poor in a pluralistic environment. Common failures of extension approaches are analyzed which include issues such as the inadequacy of assessing extension effectiveness based on simple production and adoption targets; and extension institutions working under assumptions that do not take diverse activities under farming into account. This has led to rethink extension's role, based on an awareness of the ways in which farmers integrate technological information with other aspects of farm management, leading to the platform approach - a new way of conceptualizing extension. The complexity of rural development demands that farmers, input suppliers, local officials and other actors meet and negotiate to arrive at joint decisions for addressing complex problems of natural resource management. Extension can play a key role in this process by initiating, organizing, participating and following up on these platforms. This suggests that extension institutions should not strive merely to deliver research results but need to act as professional service organisations, being able to adapt priorities as ideas emerge from an ongoing dialogue between field staff and farmers.

This necessitates new attitudes toward structural reform. Extension planning should shift from its present emphasis on administrative directives, to identifying ways to strengthen links between the satisfaction of the extension agent and the satisfaction of the farmer.

Recommendations to support this reorientation of extension institutions are given which include the use of participatory methodologies to support platform approaches; flexible management to assist extension agents in meeting these challenges; finding ways to improve relationships and communication among farmers, researchers and extensionists; and the development of more qualitative indicators to evaluate the success of this new extension in meeting the needs of the poor.

(Christoplos, Ian. *Poverty, pluralism and extension practice*. IIED Gatekeeper series no 64, 1996)

This book "Farmer Led Extension; concepts and practices" draws on the experience of farmers, community workers, non-govt org, researchers and policy makers in several countries. Focuses on challenges to agricultural extension; extension experiences, origins and examples of farmer to farmer extension in Latin America, Indonesia, India, Philippines and Vietnam; principles and methods in farmer to farmer extension; roles and responsibilities, issues and problems; NGO-Govt collaboration; other approaches to farmer led extension; impact assessment and evaluation and scaling up. Some extracts from this book relating to experiences, principles and methods etc. are documented in the following pages. (Scarborough V et al. *Farmer led extension: concepts and practices*. London, Intermediate Technology Publications, 1997)

Models

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Participative Action Model

The Participative Action Management (PAM) model, developed by Prof. Shankariah Chamala, of the University of Queensland is a major paradigm shift in the way technology is developed and adopted by stakeholders. Adults learn collaboratively using adult-learning principles and action-learning processes.

In the traditional linear model, the development of scientific research and technology is seen as a top-down, centralised, mostly government run and technocratic approach to solving the agricultural production needs of clients. Technology transfer or extension is simply to tell or sell the technology. The client is viewed as passive. Extension agents use the "trickle down" approach to promote the spread of technology. Many technologies promoted under this model have not been readily adopted with reasons for lack of adoption being unclear. This approach suits research of a general nature, but may be of little use in specific practical situations.

PAM model is a management model where all relevant agencies, groups and individuals with a common interest in development or R & D come together. They form a platform to facilitate joint industry problem solving. The group works for the mutual benefit of the partners.

Figure

The PAM model is a working-together (or convergence) model where stakeholders' interests are focused on a specific issue, problem or opportunity. This convergence creates energy and the group plans and guides how this new energy is diverted. The group thus acts as a lens for the collection (convergence) of weak energy and distribution (divergence) of stronger energy.

The philosophy of the PAM model comprises of 10 principles:

- 1. PAM starts with a systems approach.*
- 2. Principle of stakeholders' involvement.*
- 3. Principle of convergence and directed divergence.*
- 4. Empowerment is the cornerstone of the PAM model.*
- 5. Individual rights and responsibilities.*
- 6. Building empowering structures.*
- 7. Networking with other agencies.*
- 8. Encouraging action learning among groups.*
- 9. Building group management capacities.*
- 10. Sharing the credit/profits in a fair way between the project members.*

Do Our Own Research (DOOR) Approach for Plant Nurseries

The test of a model is in utility. The PAM model has been used in the DOOR approach and has provided the underlying philosophy for the approach and shaped its management.

DOOR advocates a significant paradigm shift in technology transfer in horticultural research.

In Queensland dependence on the public sector for research solutions to Agriculture and Horticulture industry problems has proved useful for many of the single commodity industries, however less so for the nursery industry. In the nursery industry, generic research conducted by government institutions is often not specific enough to be adopted by the individual operator. Operators need practical solutions to particular problems. This uniqueness reflects the variation of options available in terms of species grown, media used, fertiliser, amendments and chemicals applied and the way water is supplied.

The Queensland Government is strongly advocating increasing industry self-reliance in many aspects of agriculture. The Do-Our-Own-Research (DOOR)-approach which enhances the capacity of nursery operators to do their own research has been found to be the only cost-effective way to find solutions or to develop new opportunities.

DOOR promotes a major move away from the old way of providing research information, away from its dependency on externally generated research, to a new way of self-reliance with industry generating its own research information. This empowers nursery operators to conduct relevant and self-generated research. Operators own the research and so are more likely to adopt any solutions that are generated.

Relationship between the operator and the consultant is that of equal partners the common goal being resolution of an issue with emphasis on skill development in the operator without detracting from the supportive role of the consultant.

The DOOR implementation cycle starts with the recognition of a problem or opportunity. To find a solution or exploit that opportunity, the operator needs to undertake a number of activities.

Some of these activities can be the operator's responsibility: identifying the problem or opportunity, obtaining information, providing resources, implementing the trial, collecting data, validating recommendations. Designing experiments, analysing and interpreting data may be carried out by the DOOR consultant: Together, the operator and the consultant can carry out the remaining tasks: like clarifying the issue and selecting keywords, evaluating and making decisions, calculating cost-benefits, and formulating recommendations.

Certain paradigm shifts among DOOR participants are essential to the success of the DOOR project.

- from industry dependency on service agencies to inter-dependency*

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- from industry dependency on service agencies to inter-dependency.
- from passive learning to active learning.
- from competition amongst members to collective action and competition for the common good.
- from complete secrecy to sharing information for mutual benefit.
- from a one-to-one mode of action to collective/collaborative action.
- from win-lose approach to win-win approach.
- from individual problem solving to collaborative problem solving.
- from a personal efficiency perspective to industry bench marking.
- from competing with each other in Australia to complementing each other in overseas market development.
- from a limited market to an unlimited international market outlook.
- from closing the door on inhouse research to active participation in DOOR projects.
- from just taking actions to action learning mode.

(Department of Primary Industries, Queensland. The DOOR manual for Plant Nurseries)

Strategic Extension Campaign

The "strategic extension campaign" (SEC) approach has been developed and introduced by FAO in Africa, the Near East, Asia and Latin America. The approach is designed to improve the impact, with farmers, of an existing organised extension service. This methodology emphasises the importance of people's participation in identification of needs, strategic planning, systematic management and field implementation of agricultural extension and training programmes. Its extension strategies and messages are specifically tailored based on the results of a participatory problem identification process on the causes or reasons of farmers' non-adoption, or inappropriate practice, of a given recommended agricultural technology or innovation. The SEC technology transfer and application approach is need-based, demand driven, and has a problem-solving orientation. The programme follows a systems-approach which starts with a farmers' Knowledge, Attitude and Practice (KAP) survey. Using the KAP survey, the SEC functionally links extension with research and local media. It also demonstrates the impact of extension in terms of changes in knowledge level, attitude change, farming practices and productivity. One of the strengths of this approach is in orienting and training relevant extension personnel to apply a systematic, rational, and pragmatic approach to planning, implementing, managing, monitoring and evaluating the routine programmes of an agricultural extension service.

Studies of SEC methods applied to specific FAO-supported extension activities have reported positive changes in farmers' knowledge, attitudes and practices vis-a-v. is the recommended technologies as well as significant economic benefits.

Contributions of SEC to the improvement of the extension system, programme and its performance identified by Contado are:

1. enhancing the agricultural extension planning process
2. building cadres of extension programme planners and trainers;
3. improving extension linkage with research;
4. SEC is needed most by small, resource-poor farmers;
5. improving extension linkage with training;
6. SEC reduces extension system's workload and increases its coverage;
7. encouraging partnership with and participation of local leaders and community based organisations,
8. supports the revitalization of extension workers' professionalism;
9. SEC proves that extension programmes can be strategically planned, efficiently managed, and systematically monitored and evaluated;
10. SEC can contribute to improving and strengthening agricultural extension systems and programmes.

(Adhikarya, Ronny. Strategic Extension Campaign: Increasing Cost-Effectiveness and Farmers' Participation in Applying Agricultural Technologies

Contado, Tito E. The Strategic Extension Campaign: an FAO Agricultural Extension Approach .)

Extension Management

This article is written with a view to build a theoretical base for empirical research on management issues with special reference to extension systems.

Eight components found relevant in this direction are given here. First, authority structure which has been viewed from three angles; classical view, zone of acceptance view, and amount of authority used and freedom granted to subordinate workers. Second, delegation of authority for carrying out specific activities. Third, decentralization of authorities power downward to lower levels of organization. Fourth, control systems used in administering human resources. Fifth, participative management approach the authorities need to use in decision making. Sixth, authority with humility to speak on "people-friendly" hospitality and courtesy. Seventh, responsibility which says that it can neither be delegated nor shared. Eighth, accountability which states that authorities are solely accountable not only of their own deeds but also of their subordinates. These are some of the of management issues which if applied properly can make authorities effective in their administration. (Verma, O.S. Management of Extension Systems Authority, Responsibility, and Accountability. JOURNAL OF EXTENSION SYSTEMS, Vol.13, No.2, Dec 1997)

Extension Training via the Internet

Distance learning has become a popular method of instruction, especially for those with demanding full-time jobs or who find it difficult to invest time and expense in travel. Universities have progressed from correspondence course and films to videos, satellite linking, cable TV, computer aided instruction, and, most recently, Internet conferencing via the computer.

One of the most recent forms of distance education to be explored is interactive instruction exclusively via the Internet. Compared to other methods of distance learning such as video courses or live satellite instruction, Internet courses provide the following advantages:

- allows for constant personal interaction between the students and instructors

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- *greater time flexibility than a televised real-time instruction where students must meet at a designated facility for scheduled instruction.*
- *Finally, it expands resource opportunities through access to the World Wide Web and the potential to communicate with specialists throughout the world.*

The Internet approach to instruction has tremendous potential for training county Extension agents. Agents can log-on to the computer as their schedule permits. Internet training eliminates the need to travel to another location in a state or region, thus saving time and money.

A two-week Internet training course was offered to county Extension agents in South Carolina and Georgia on land application of animal waste which was the preferred topic.

Almost all agents replied that they liked the flexibility in learning time, not having to travel, the subsequent saving, and being able to share ideas with many people over a large geographic area. (Lippert, Robert M. et al Owen Plank, Jim Camberato, John Chastain

(Lippert, Robert M. et al Owen Plank, Jim Camberato, John Chastain

In-Service Extension Training via the Internet. Journal of Extension .(Journal of Extension is only accessible on the Internet at <http://www.joe.org>)

How Systems Change

Ueli Scheurmeier and Peter Schmidt highlight how system change can be achieved through following some steps. A story "The woman and the river" wherein the protagonist places "one basket after another into the water" till the river system changes its course, provides the framework for structuring the process of system change into the following steps.

1. *Small beginnings: Begin with very small, concrete changes in behaviour. The approach should be peripheral, so as to avoid a destructive defensive reaction by the system.*
2. *Apply gentle obstinacy: Do not implement small changes only a few times, but again, and again, and again. The are of gentle and persuasive obstinacy leads to success.*
3. *Tolerate defensive reactions: Some troublesome defensive reaction is unavoidable. It has nothing to do with the actual people who are reacting, but with the system itself. Every person reacts " on behalf of" a system.*
4. *Survive resistance: Resistance means that innovation is no longer being ignored by the system, but is recognised as such. The system begins to concern itself with innovation. Despite resistance and set-backs, the system changer must continue to persistently uphold the new behaviour.*
5. *Build on concrete examples from experience: Resistance is positive. A system needs convincing reasons why it should change.. A system is convinced particularly by concrete experiences, and not only by the intellectual insight into the necessity for innovation.*
6. *Utilise the forces of the system: Resistance can be used as a supporting force for change. For this the mechanisms of the system must be explored and then those should be applied which would aid in supporting and consolidating the changes.*
7. *Break the limits: The moment will come when the system has to change its functioning and its defining structures, so as to come to terms with the innovation. This is the breakthrough when the system develops its own strength to implement the innovation on a large scale.*
8. *Consolidate changes: The best, most sustainable and most effective system changes are brought about by the system itself with its own means and approaches. In this way the system acknowledges changes as its "own" and takes the necessary measures to consolidate them.*

(Scheurmeier, Ueli and Schmidt, Peter. Gentle obstinacy or How Systems Change. BeraterInnen News, 2/1997)

Promoting Pluralism

Zijp presents his view on the future of agricultural extension. In order to meet farmers' needs he proposes some changes which will lead to more pluralism in the services offered and the organizations providing these services.

Five suggestions given to shift our thinking:

From	To
Looking at extension as national government service	Seeing extension as a set of functions, to be performed by a variety of players, at different levels
Looking at extension to transfer technologies	Seeing a wider mandate for extension, that also includes farmer mobilization, organization and education
Looking at extension as a distinct, separate institution	Seeing a coherent, comprehensive knowledge system for the generation, transfer and uptake of knowledge and technology, that includes the farmers, research, extension and education

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Using a linear, sequential and one-directional model of technology transfer	A more realistic, cyclical and dynamic model of information exchange and knowledge dissemination whereby farmers, researchers, educators and extensionists are all engaged in the generation of new knowledge, and in its transfer, and in its use
Designing projects from a teaching perspective, and budgeting for teaching efforts	Allowing projects to develop a learning mode, engaging all major stakeholders.
Paying lip service to the potential of information technology for rural development	Taking some risks by including experimental information technologies in projects to link research institutes, extension managers, farmer organizations and others to each other and to the rest of the world.

Five innovative approaches highlighted to make extension more efficient and effective in helping farmers to be more productive, profitable and sustainable are

-delinking public funding for extension from private delivery

-empowering farmers

-decentralizing government

-involving the private sector

-interconnecting rural people

Zijp proposes five ways to improve support to extension:

Help FARMERS to mobilize themselves and get organized to: i) formulate demand for advice, technology and skills; ii) commit themselves to action; and iii) hold public extension accountable and increase its relevance

Help GOVERNMENTS shrink to their core functions, decentralize most of their remaining services, use impact and performance indicators, and improve their capacity to get extension done, rather than doing it themselves.

Increase the FINANCIAL SUSTAINABILITY of public extension by delinking public funding from private funding, by piloting, demonstrating and mainstreaming alternative funding mechanisms, by creating the enabling environment for private providers, by providing a legal framework for public/private partnering, and by demonstrating the benefits of extension to decision makers more effectively.

REACH FARMERS AND OTHER RURAL PEOPLE, by better, and increased use of local media, and by extending the information superhighway

Establish and develop a public/private partnership to facilitate access to information, and assist in designing responsive, affordable extension systems. (Zijp, W. Promoting Pluralism. The Journal of Agricultural Education and Extension Vol.5, No.1, June 98).

Research and extension: a gender perspective

FAO's Plan of Action for Women in Development, which outlines the framework for integrating a gender perspective in all FAO programmes and activities for the years 1996-2001, identifies three strategic objectives to be pursued in order to "address the root causes of persistent poverty and food insecurity among rural women and the families they support as well as the factors contributing to the degradation of the environment".

- *Promoting gender-based equity in the access to, and control of, productive resources*
- *Enhancing women's participation in decision and policy-making processes at all levels*
- *Reducing rural women's workload and enhancing their opportunities for remunerated employment and income.*

The promotion of gender-based equity in access to research and extension services benefits is an integral component of these objectives.

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The promotion of gender-based equity in access to research and extension service benefits is an integrated component of these objectives.

Studies on agricultural extension have highlighted that women's marginalization from these services is closely inter-related to their lack of access to land and credit. Other constraints women farmers face: less mobility and time availability as men; lack of formal education which hampers them from taking part in extension activities requiring formal reading and arithmetic skills.

Improving women's participation in extension and research

Women's access to land use, control and entitlement is important to improve their participation in extension services. Yet extension strategies themselves need to be gender focused.

According to FAO studies, extension staff should be able to appropriately identify women's needs and constraints, priorities and opportunities and ensure that extension services meet their requirements.

One of the main tools to achieve these objectives will be to train extension staff to unveil misperceptions and prejudices about women's actual and ideal roles and avoid their exclusion from the areas in which they play major roles, namely food production. Gender awareness approaches and participatory techniques and methods for the collection of gender disaggregated data can help identify women's actual roles and specific needs.

Women's participation in extension activities will strengthen rural development strategies and food security at national and world levels.

In the future, research strategies must take into account the needs of landless women; the delivery of appropriate and economically viable technical advice for improving women's efficiency to produce food crops; cash crops; animal health and processing methods of farm products. Extension programmes should acknowledge the important role of women as natural resource managers. Therefore, there is a need to train extension workers in the roles and responsibilities of women in natural resources conservation, as part of a global framework of a gender responsive environmental planning towards improved food security.

It is equally important to identify environmental problems affecting both women and men in the context of their roles in food production and natural resource use, as well as collecting gender disaggregated local knowledge about possible solutions to environmental problems.

*(Prepared by the Women in Development Service (SDWW)
FAO Women and Population Division).*

Selected Abstracts

Challenges to Extension

Rivera, WM.. Agricultural extension into the next decade . European Journal of agricultural education and extension Vol.4 No.1 June 97

Agriculture and farming, information technology, government, -all are in the process of change. These socioeconomic, political, and technical changes inevitably impact the institution of agricultural extension, says Rivera.

The next decade presents a number of challenges to every aspect of agricultural extension; with regard to the advice to be provided now and in future, the involvement of community stakeholders, the use of more inclusive sources of information, the role of telecommunications and expert systems, the shift from performance to results oriented evaluation, the move to an interactive model of technology transfer and, the ways of funding the service.

Agricultural extension is being recognized as a service for providing information, advice and education, and not just agrotechnology transfer. This paper suggests that three current trends will continue into the next decade viz. Privatization, revitalization and; decentralization. The author makes a distinction between developed and developing countries with regard to impact of these trends.

Extension policy

Coutts J. A. Agricultural extension policy as a framework for change. European Journal of agricultural education and extension Vol.2 No.1 June 1995 pp 17-28

The debate on the role of public sector extension has resulted in a proliferation of formal extension policy. It has been contended, however, that the notion of extension policy lacked clarity and hence an adequate framework. The impact of formal extension policy on the ongoing change process affecting the extension function and its stakeholders has therefore been poorly understood and developed. A case study of the introduction of a formal extension policy in Queensland Australia was conducted to better understand the role of formal policy in contributing to the change process. As a result of the research, recommendations were made to guide the process and content of formal extension policy. These included an emphasis on the content of formal policy as supporting the process of negotiation rather than vice versa; the avoidance of prescriptive solutions in policy formulation; and the securing of resources needed for the extension community to move in the negotiated direction of change. It was argued that formal policy should be seen as an iterative step in the change processes rather than the enforcer of change

Learning skills

Paine M.S. Learning in farm management: a New Zealand experience.

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Paine M.S. *Learning in farm management: a New Zealand experience. European Journal Agricultural Education and Extension, 2(1), 1995, pp 29-36*

Attainment of voluntary behaviour change in clients is a goal of extension agents. This paper reports on a study that estimated the cognitive changes occurring among a group of farmers, consultants and scientists in New Zealand.

This paper draws attention to learning and beliefs as factors influencing the use of technology in farm practice. It contends that goal-directed extension programmes can benefit from communication strategies using information about clients' learning preferences. A model of the learning process directed the research. This model identifies two components to learning: grasping information through conceptualization or experience and transformation of information into knowledge through reflection or experimentation. Individual clients are grouped into one of the four distinct learning styles depending on the way they grasp information and transform it into knowledge. Research results detected learning preference and belief differences among the farmers, consultants and scientists in the group. The study suggests that learning research methods assist extension agents plan and negotiate the specific behavior changes that clients seek by implementing strategies that use learning preferences and belief data. Researchers can improve approaches to technology development by exploring client needs using communication methods compatible with client learning preferences.

Participatory Extension

Duvel, G.H. *In Search of institutional linkages for participatory extension in agricultural and rural development European Journal of agricultural education and extension Duvel, G.H. In Search of institutional linkages for participatory extension in agricultural and rural development European Journal of agricultural education and extension Vol.2 No.3 Dec 1995)*

The shift of emphasis in extension from a technology transfer model to a more facilitative approach calls for appropriate institutional structures in order to be effective.

This article suggests an organisational framework that can serve as linkage system at the interface between the target community and the development organization(s) so as to facilitate the interaction between the various role players involved and to provide a basis for self responsibility, self-determination and ownership on the part of the community.

Essential aspects of this organizational model are that the community or sub-communities are represented in a single mouthpiece functioning as an overarching umbrella organization and taking responsibility for development, initiating and commissioning programs/ development activities and coordinating them. Subordinate to this coordinating body, are the programme committees commissioned by the central council to plan and carry out identified development priorities.

The implementation of this model, designed for both commercial and subsistence farming situations, requires adaptation to situation-specific circumstances, in terms of the compromise to be found between, the service area of the development organization and, the number of sub-communities that can be effectively consolidated into a cohesive community. Other aspects include the degree to which existing institutions can be used, the direction of institution building and the nature of community representation and participation.

Communication

Velasco, M.R. et al. *Technology transfer Materials – Are we Learning the Technology of Transfer? European Journal of agricultural education and extension Vol.3 No.1 June 1996*

The author reviews the process of producing written documents for use in technology transfer or extension and gives a series of recommendations for improving the process. These emphasize (1) focusing upon the purpose of each document, (2) redressing the perceptions of the technologists involved and raising their awareness of the design aspects of good communication by using a checklist, and (3) engaging in evaluation at all stages of the production process with the participation of the target group

Farmer Knowledge

Millar J. and Curtis A. *.Moving farmer knowledge beyond the farm gate; an Australian study of farmer knowledge in group learning. European Journal of Agricultural Education and Extension Vol 4(2), September, 1997.*

In Australia, attempts are being to incorporate participatory processes into natural resource-management programs and research and development for specific agricultural industries. Participatory programs are increasingly recognised as effective in assisting rural communities identify issues of concern, determine their needs, and draw in resources to enact social and environmental change. A fundamental assumption of these participatory programs is that farmer knowledge is drawn upon and enhanced by social learning in-groups. When farmers come together and exchange information amongst themselves and with scientists or extension agents, the interchange of knowledge has a synergistic effect. It allows local knowledge to be broadened and strengthened and scientific knowledge to be adapted and moulded to local situations, providing greater rewards and outcomes than if each knowledge system were to remain independent.

This paper explores the role of farmer knowledge in group learning in Australia where group activity was focused upon building knowledge and skills for sustainable pasture management. The case studies used included Prograze, a short term, agency-led, pasture and livestock management course and Landcare, a stage-sponsored community-based program dealing with a broader range of land-management issues.. In both case studies, group activity focused upon building landholder knowledge and skills for sustainable pasture management. According to research findings farmer knowledge can remain dormant unless critical factors in group learning and development are addressed. These include experiential learning, integrating information, effective facilitation, group autonomy and building ongoing relationships and learning opportunities.

Agricultural extension and research

Trends in Agricultural Extension

PURCEL, D.L.: ANDERSON, J.R. *Agricultural extension and research: achievements and problems in national systems*. Washington, D.C USA; World Bank (1997)

This report reviews the World Bank's experience in supporting the development of national agricultural research and extension systems in developing countries in the 1980s and early 1990s and makes recommendations for future Bank support for this agricultural subsector. The review concludes that Bank interventions have had a significant positive impact, but also maintains that serious deficiencies persist in most of the supported national systems which could have been reduced through better planning and appropriate guidance during implementation. The sustainability of institutions and systems developed under Bank projects is of particular concern. This demands that future projects be more cognizant of the circumstances of each country in supporting a particular scale and mode of operation, as these projects are essentially of an institution-building nature and must be considered long-term investments. There will continue to be a need for public spending on research and extension services and for external support of implementing institutions, but fiscal resources will need to be used more efficiently.

Major thrust of recommendations for Bank's intervention in agricultural extension:

More attention to pre-project analysis and giving adequate help to borrowers with project preparation. Recommended project design would prioritize target groups; take account of public and private sectoral services; incorporate traditional mass media and modern IT as appropriate; define the scale, type and intensity of face to face services in particular areas acc to needs and resources; consider needs of all socio-eco groups including women in farm households; and develop a need based staff training program focusing not only on technology but also on methods of interacting with farmer groups to maximize their participation in problem definition, resolution and their support for the extension process.

Extension Services

UMALI-DEININGER, D. *Public and private agricultural extension: partners or rivals?* World Bank Research Observer (1997) 12 (2)

The roles of the public and private sectors in agricultural extension are examined. Extension services are classified according to their economic characteristics to identify areas where opportunities for private (for-profit and non-profit) participation will arise. It is found that commercialisation of farm operations gives rise to demand for specialised client- and location-specific extension services that can be provided by private for-profit firms, although the main buyers are likely to be market-oriented medium and large farmers. Because of market failures, some types of extension services will require public funding, although not necessarily public delivery. Brief illustrative examples are drawn from some developing countries.

Extension services

GILL, D. S. *Reframing agricultural extension education services: Canadian*

Reframing agricultural extension education services: Canadian
Reframing agricultural extension education services: Canadian

Perspective. Perspective. Reframing agricultural extension education services: Canadian

Reframing agricultural extension education services: Canadian

Perspective. Perspective. Perspective. Journal of Extension Systems (1996)

Observations are made about the role, identity, clientele and programmes of the Canadian agricultural extension system with the purpose of looking at the possible role of extension in the future. It is concluded that public extension services will have to find a balance between the farmer's needs (agricultural production) and those of society (resource conservation, pollution and the environment, food quality and safety and animal rights).

Agricultural Extension

SWANSON, B. E.: BENI'Z, R. P.: SOFRANKO, A. J. *Improving agricultural extension: a reference manual*. Rome, Italy; Food and Agriculture Organization (FAO) (1997)

This manual offers a critical review and inventory-analysis of agricultural extension theory and best practices. Around 38 authors from 15 countries contributed to the publication, providing broad international perspectives on both theory and practice as well as micro and macro issues related to agricultural extension. Aimed at agricultural extension planners, managers, trainers, educators and field practitioners, the manual provides suggestions for developing and improving the conceptual, technical and operational methods and tools for strategic planning, efficient management and scientific evaluation of problem-solving, demand-driven and needs-based agricultural extension programmes.

Extension approaches

BAUER, E.; HOFFMANN, V.; KELLER, P. *Agricultural extension down the ages*. Agriculture + Rural Development (1998) 5 (1)

The paper documents approaches to agricultural extension and discusses the rise and fall of the training and visit (T&V) system and the new trend in target group participation and the knowledge system perspective. It is suggested that in developing countries, the age-old 'top-down' model of extension, which served the interests of first the colonial power and then the nation state, still dominate. More participatory approaches, geared exclusively to the well being of the client, are still struggling. Dialogue. participation. customer orientation. farmer first and last. valuing indigenous

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knowledge have become the new key concepts.

KIDD, A.; LAMERS, J.; HOFFMANN, V. *Towards pluralism in agricultural extension - a growing challenge to the public and private sectors. Agriculture + Rural Development (1998) 5(1)*

The paper first discusses the driving forces behind moves to increase the level of private sector involvement in agricultural extension globally. It then reviews experience with privatization and public-private interaction, which suggests a rapid evolution of the institutional framework of agricultural extension in many parts of the world. Mixed strategies of public and private sector involvement in financing and providing extension are highlighted. The importance of strengthening farmers' groups, federations and other community-based organizations is stressed. It is suggested that the necessary preconditions for enhancing the role of the private sector are frequently lacking in developing countries. Change is necessary, but unless clear strategies are developed that are gradual and multi-dimensional resource-poor farmers will remain poorly served. According to the authors any change proposed should be tested through pilot programs. A challenge is to find a strategy with mechanisms to finance and provide extension which can help a rigid public extension system to evolve in a flexible manner. In the short term steps must be taken to improve in priority setting, financial mgmt and user orientation in public sector and decentralize where possible, conclude the authors.

Challenges for a New Extension Paradigm (R-E/see abstract)

Collaborations between researchers and Extension agents have traditionally respected a division of labor, which distances Extension agents from the research process and researchers from Extension practice. As communities become more complex extension has to address new challenges. To meet new demands extension has taken its role as educator and facilitator towards building community coalitions to engage in res for community problem solving. Extension's role in creating knowledge to be used in policy and programme design is recognised. If extension can effectively partner with communities leading to community change question arises whether a similar collaborative model can be applied to researchers working with ext agents to test and elaborate theory. Beyond extension's contribution in setting agendas for future research, this movement recognises extension's capacity to participate as a partner in the research process.

A project tested a new approach where Extension agents were brought in as full partners, co-authors, in the research process. This new approach brought new challenges - to research design and methodology, to Extension practice, and to organizational style and culture - which must be addressed to successfully promote more participatory research collaborations in the future. This article explores the challenges and limitations to involving Extension agents as partners in research projects. (Warner, Mildred E and Hinrichs, Claire. From knowledge extended to knowledge created: Challenges for a New Extension Paradigm. *Journal of Extension Vol36(4) 1998*)

Improving effectiveness of agricultural research and extension. NCAP Policy paper 8. National Centre for Agricultural Economics and Policy research (NCAP), New Delhi and Overseas Development Institute (ODI), London, 1998.

A study on improving the effective ness of agricultural research and extension in India by John Farrington, Rasheed Sulaiman and Suresh Pal examines the issues facing agricultural research and extension and draws out issues relating to research extension linkages. The study is a part of the component on improved watershed and Area Development Strategies in rainfed areas (managed by IFPRI, Washington), of an ICAR Research project on sustainable rainfed agriculture Development. The paper examines research and extension from implementation perspectives, identifies constraints that can be removed and how. The emphasis is on bringing forth recommendations that can be put into effect in the face of these constraints. Strategies are suggested on how needed change in research and extension systems could be implemented. Some of the issues related to agricultural extension and the recommendations are given below.

Kilpatrick, S and Rosenblatt, T. *Information vs Training: Issues in farmer learning. Journal of Agricultural Education and Extension Vol 5(1), June, 1998.*

Kilpatrick and Rosenblatt elaborate their ideas on farmer learning. If farmers resist the idea of training and prefer 'information seeking opportunities' then they should be given more space to be in control of training programmes, suggest the authors..

It is observed that seeking information is universally regarded as acceptable behaviour in the Australian farming community, but training is often regarded with suspicion. Those who train are more likely to make successful changes to their farm management practices. Drawing on data gathered for a number of studies of farmer education and training the authors suggest five reasons why farmers might prefer to learn by seeking information rather than training. These are: a preference for independence, familiarity with a highly contextual learning mode, lack of confidence in working in training settings a preference for information from known sources, and a fear of being exposed to new knowledge and skills. The authors recommend that farmers be in control of their training and be encouraged to learn within a wider learning community, which facilitates participative research and joint enquiry. This approach is consistent with the ways farmers prefer to learn.

Group based Extension

By

Agricultural extension in Indonesia is concerned not only with transferring technology, but to facilitate farmers' learning. Its basic goal is to assist farmers to help themselves in solving their problems

As a result of the large number of farm families in Indonesia and the limited number of extension workers a group approach is used as the basic extension strategy.. Extension agents help farmer groups to develop group actions, set objectives, plan programmes and provide information for decision-making.

The spirit of gotong royong (the traditional spirit of mutual help) expressed by farmer groups functions as a strong internal motivation in promoting the collective action needed in natural resource conservation programmes

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In lowland watershed projects, farmer groups are organized on the basis of irrigation blocks into water users' associations, of 20 to 30 farmers each and are organized by and for the farmers to regulate equitable distribution of irrigation water and to secure proper maintenance of the irrigation system.

In the upland watershed projects, farmer groups (10 to 20 farmers) are organized based on microwatershed areas. The main group activity is directed at improving terraces and other appropriate conservation techniques.

Under the IPM Project, farmer groups of about 25 members each are organized on the basis of farm locations. The group members are divided into subgroups of five members. Which observe field conditions such as insect densities, predator availability and plant vigour. Based on the subgroup's observations, members discuss problems encountered and seek solutions.

The strategy used is a participatory planning approach involving farmers in the complete process of programme formulation and implementation. Training covering technical expertise, group dynamics and leadership skills is given to both farmers and field extension workers.

To evaluate programme activities, the farmer groups meet every week to discuss progress made, problems encountered and plans for the following season. The field extension workers provide advice and administrative and technical support to the farmers during the meetings.

*Concludes that Extension strategies are more effective when based on farmers' needs and when farmer groups are the basis for cooperative works supported by appropriate research-based technology and intensive field-level training. Indonesia's experience with field schools shows that it is an effective method for promoting farmers' learning and participation in agricultural development. (Martaamidjaja, A.S
Group-based Extension Programmes for Natural Resource Conservation in Java*