

**EXPERT CONSULTATION
ON
AGRICULTURAL EXTENSION,
RESEARCH-EXTENSION-FARMER INTERFACE
AND TECHNOLOGY TRANSFER**



**16-19 July 2002
Bangkok, Thailand**



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Food and Agriculture Organization of the United Nations
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ACRONYMS

ACIAR	Australian Centre for Agricultural Research
AIDS	Acquired Immune Deficiency Syndrome
ATTC	Agricultural Technology Transfer and Service Centre
CATEC	Agro-Tech Extension Centre
CGIAR	Consultative Group on International Agricultural Research
DAE	Department of Agricultural Extension
FBCRD	Farmers Bayanihan Center for Rural Development
FAO	Food and Agriculture Organization
FSR	Farming systems research
FO	farmers' organization
GIS	geographic information system
HRD	human resource development
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	information and communications technology
IT-BT	information technology-biotechnology
ITCPH	International Training Centre on Pig Husbandry
KAU	Kerala Agricultural University
LGU	local government unit
M&E	Monitoring and evaluation
MIN	Mango Information Network
MoAC	Ministry of Agriculture and Cooperatives
NAEP	New Agricultural Extension Policy
NGO	non-government organization
PARC	Pakistan Agricultural Research Council
PCARRD	Philippines Council for Agriculture and Resources Research and Development
PTD	participatory technology development
RAP	Regional Office for Asia and the Pacific
R&D	research and development
SEAMEO-SEARCA	Southeast Asian Ministers of Education Organization – Regional Centre for Graduate Study and Research in Agriculture
SEARICE	Southeast Asia Regional Institute for Community Education
TATES	Township Agro-Technological Extension Station
T&V	training and visit system
WAICENT	World Agricultural Information Centre

EXECUTIVE SUMMARY

Numerable changes and forces shaping the world these days also are impacting or have the potential to affect what constitutes agricultural extension, as it is currently carried out. The effects are both positive and negative, especially as extension in some parts of the Asia and Pacific region has no clear identity or solid base; or where extension struggles to respond to the shifting world, new government dynamics and stakeholders' needs as a result of globalization, liberalization, decentralization, privatization, natural disasters, Acquired Immune Deficiency Syndrome (AIDS) and breakthroughs in information, communications, genetic engineering and biological technologies – to name a few of the “forces of change.”

Of particular concern is that extension's potential is unknown and unutilized in some areas and that in many places technology transfer and adoption has not met the needs of target beneficiaries – despite the efforts in research and development. Other concerns centre on the limited priority and resources, both at the international and national levels, accorded to extension, as well as the lack of gender understanding and equality in the content of research, in the staff of extension offices and in approaches to farmers. The forces of change – and the need for change – require greater investigation and implementation of new approaches to agriculture extension.

The Regional Office for Asia and the Pacific (RAP) of the Food and Agriculture Organization (FAO) last organized an expert consultation relating to agricultural extension in 1996. Because of the rapid challenges confronting the world and more specifically, the Asia and Pacific region, and in light of the recent recruitment of an officer to address agricultural extension concerns for FAO-RAP Office, the need for a contemporary meeting seemed paramount. Its purpose was to bring experts together to review the status of agricultural extension, examine problems, needs and opportunities and to discuss strategies to address these issues both nationally and regionally, including a possible role for FAO.

The *Expert consultation on agricultural extension, research-extension-farmer interface and technology transfer* took place at FAO Regional Office for Asia and the Pacific, Bangkok, from 16 to 19 July 2002. The consultation participants represented Bangladesh, Cambodia, China, India, Indonesia, Republic of Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka and Thailand, plus seven resource persons and four observers from the Southeast Asian Ministers of Education Organization–Regional Centre for Graduate Study and Research in Agriculture, the International Training Center on Pig Husbandry in the Philippines and Kasetsart University in Thailand.

Presentations and discussions during the three-day Consultation addressed i) globalization, liberalization and the changing demands and role for agricultural extension; ii) new horizons and extension modalities for research-extension-farmer-market-civil society linkages; iii) information and communication opportunities for technology transfer and linkages; iv) gender dimensions in agricultural extension and technology development and transfer; and iv) policy, institutional and human resources development.

The Consultation's participants drafted several recommendations for future direction, including: documenting participatory methods to better link farmers, extension personnel and researchers; documenting successful cases of farmers bringing about innovation and change; enhancing knowledge-based skills and developing professional human-centred and resource-based agricultural extension services. The recommendations all require a repositioning and retooling of extension professionals, especially in the ICT environment and which are also priorities. After dividing into groups to analyse the Consultation's themes, the participants identified the priorities and presented frameworks for projects that ultimately will address the recommendations coming out of the meeting, for which FAO should take leadership to ensure appropriate attention. These frameworks are included in the Annex of this report.

SUMMARY OF THE CONSULTATION

I. BACKGROUND

1. Delegates at the Food and Agriculture Organization of the United Nations (FAO) *Conference of Ministers of Agriculture for Asia and the Pacific* in Japan in 2000 recommended that FAO continue to provide assistance to member countries in the area of agricultural extension. This call on FAO was indeed opportune as there are many changes confronting the world today that have direct implications and impact on the operations and scope of what constitutes “agricultural extension” in today’s context. As a result, there is an increasing re-examination of the form and strategies being tried and adopted for agricultural extension globally with reforms implemented in many countries, including in the Asia and Pacific region. Of particular concern is that technology transfer and adoption has not met the needs of target beneficiaries – despite the efforts in research and development.

2. FAO Regional Office for Asia and the Pacific (RAP) last organized an expert consultation relating to agricultural extension in 1996. Because of the rapid changes and challenges confronting the world and more specifically, the Asia and Pacific region, and in light of the recent recruitment of an officer to address agricultural extension concerns for FAO/RAP Office, the need for a contemporary meeting seemed paramount. Its primary purpose was to bring experts together to review the status of agricultural extension, examine problems, needs and opportunities and to discuss strategies to address these issues both nationally and regionally, including a possible role for FAO.

Objectives of the Consultation

3. The Consultation’s objectives requested experts to:
- Review the status and developments in agricultural extension *vis-à-vis* the research-extension-farmer-marketing interface in the Asia and Pacific region.
 - Identify and examine modalities, strategies and lessons suitable for application to regional and national circumstances.
 - Identify gaps in extension and recommend areas for further attention by countries and by FAO.

II. INTRODUCTION

Opening ceremony

4. The *Expert consultation on agricultural extension, research-extension-farmer interface and technology transfer* took place at FAO Regional Office for Asia and the Pacific, Bangkok, from 16 to 19 July 2002. The Consultation participants represented: Bangladesh, Cambodia, China, India, Indonesia, the Republic of Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka and Thailand; seven resource persons and four observers, which included representatives from the Southeast Asian Ministers of Education Organization–Regional Centre for Graduate Study and Research in Agriculture (SEAMEO–SEARCA), International Training Center on Pig Husbandry in the Philippines and Kasetsart University, Thailand, also attended.

5. Dr Apichart Pongsrihadulchai, Director-General, Department of Agricultural Extension, Thailand, opened the Consultation with welcome remarks and highlighted changes for extension that

are being planned and implemented for Thailand. Dr Malcolm Hazelman, Senior Extension, Education and Communications Officer, FAO-RAP, made welcome remarks on behalf of FAO.

6. Dr R.B. Singh, Assistant Director-General and FAO Regional Representative for Asia and the Pacific, presented the keynote address. He highlighted the relevance of the Consultation's subject in the context of combating hunger and poverty in the Asia and Pacific region. He explained the trends and forces impacting FAO's work, corporate strategies of FAO for reducing food insecurity and rural poverty, ensuring enabling policy and regulatory frameworks, creating sustainable increases in the supply and availability of agricultural, fishery and forest products, conserving and enhancing sustainable use of natural resource bases and generating knowledge of food and agriculture, fisheries and forestry.

7. Dr Singh highlighted the agriculture and rural development scenario in the region, noting that Asia and the Pacific are home to 500 million malnourished and 800 million poor people, which represent two-thirds of the world's hungry and poor. The region accounts for 57 percent of the world's population (nearly 3.2 billion); and about half of that population will be younger than 25 by 2010. The region is highly diverse in size, economic development, agro-ecological settings, culture and weather regimes. Agriculturally, it involves 73 percent of the world's farming households and more than 80 percent of the world's smallholder farmers. More than 90 percent of the world's rice – the anchor of global food security, is produced and consumed in the region. Rice systems represent unique agro-ecological, biodiversity, social, cultural and economic regimes. In addition, the region produces 70 to 90 percent of the world's major industrial crops and similar levels of buffalo raising and aquaculture production. But stagnating yields of cereals and serious yield gaps have decelerated the total factor productivity growth. Consequently, as Dr Singh noted, the major challenge confronting the region is the need to increase the per-hectare yield of cereals by one tonne – at a time when production resources (land, water and biodiversity) are shrinking and continue to degrade.

8. Dr Singh emphasized several paradigm shifts in extension approaches that have been occurring, such as the shift from the green revolution to evergreen revolution, from commodity to integrated-systems, monodisciplinary to multi and interdisciplinary, technology to eco-technology (congruence of productivity, profitability, equity and sustainability), supply-driven to demand-driven, general to site specific, national to household and individual, self-sufficiency to self-reliance and farm employment to off-farm or non-farm employment.

9. In concluding, Dr Singh considered education, research and extension as the “trinity” in the “service of farmers with a human face”. Agricultural and rural extension, he emphasized, must be viewed as an expanded concept of knowledge and as an international system. It must capture various institutional reforms towards both market-oriented privatizing innovations and non-market decentralizing reforms. (See Appendix II for an expanded summary of Dr Singh's address.)

10. The Consultation participants elected by acclamation Dr Dato Ismail Bin Ibrahim, from Malaysia, as Chairperson and Dr N.F.C. Ranaweera, from Sri Lanka, as Vice Chairperson with Dr P. Das, from India, and Dr Belita A. Vega, from the Philippines, as rapporteurs for the Consultation.

11. The Consultation programme was adopted without change (see Appendix I).

III. PRESENTATIONS AND DISCUSSIONS

12. The following provides a summary of the Consultation's invited presentations and additional comments from representatives of selected countries on the theme of each session.

Session 1: Globalization, liberalization and the changing demands and role for agricultural extension

13. Dr M. Kalim Qamar, from FAO headquarters in Rome, enumerated various global forces of change in the context of globalization and market liberalization, including privatization, commercialization and agribusiness, democratization and participation, environment concerns, disasters and emergencies, breakthroughs in information technology, eradications of rural poverty and hunger and vulnerability of various groups, negative effects of AIDS on manpower, the need for sustainable development, issues of producing and consuming genetically modified food, the functioning of public extension services, and the overall need for integrated, multidisciplinary and holistic development.

14. Dr Qamar also identified various institutional responses to global forces at different levels: i) the *Neuchatel initiative*, which is an informal group of major European bilateral donors; ii) the joint effort of FAO and the World Bank in the form of a revised *Agricultural knowledge and information system for rural development* programme; and iii) FAO's *National agricultural extension systems reform initiative*. He further elaborated the broader role of extension, the need for decentralized extension services, the scope of privatized extension, the pluralistic extension system, client orientation, the application of electronic information technology, participatory extension and the need for unified extension service.

15. Dr Amrin Zakaria of the Ministry of Agriculture, Republic of Indonesia, indicated that as a result of globalization in the international trade of agricultural products, there is a need for improving production processes and the production of quality goods. Extension workers need to disseminate standardized information and farmers need to produce and process according to the standards, which independent institutions should assure.

16. Dr Nie Chuang, of the National Agro-Tech Extension and Service Centre, People's Republic of China, presented various case studies and illustrated some good extension practices, such as the establishing of the Ningxiang county Agro-Tech Extension Centre (CATEC) to promote whole-system development, mobilizing resources to make up the budget gap and multimethods to fulfil extension mission and decentralized extension objectives at various levels.

17. Dr Kailash N. Pyakuryal of Tribhuvan University, Nepal, indicated that cross-cutting issues such as globalization and gender have influenced the administration of extension services. The issues related to projectization and privatization of extension services are getting increased attention. The Women Farmers Development Division, for example, was working on women's issues to a limited extent until recently when its members realized the importance of gender perspective in agricultural development.

18. During the general discussion, the following issues and concerns were highlighted:

- The global forces of change are significant to consider in agricultural extension, especially in the context of globalization (as illustrated by China's experiences) and decentralization (as implemented in Indonesia and the Philippines). It is necessary to examine the experiences and problems in these countries regarding these dimensions.

- Is it necessary to expand the role of agricultural extension, for example, to address also healthcare, population growth, etc? When and how should extension services privatize? And will privatization legitimize or rationalize the “incompetence” of public sector extension? Focusing on agribusiness as a component of agricultural extension (as reported by Indonesia) is an example of an extension policy and strategy reform. Extension can no longer operate in isolation from factors associated with food, environment and nutritional security.
- Emerging technologies like agricultural biotechnology and genetic engineering are not yet reaching farmers. It is urgent for agricultural extension practitioners to begin addressing these technologies to enable farmers to prepare for and face the issues.
- Documenting and sharing “best practices” is necessary.
- That management of disasters and emergencies must be part of the extension system was underscored.
- How should extension services be developed, focused and organized to address the paradigm shifts?

Session 2: Research-extension-farmer-market-civil society linkages: New horizons and extension modalities

19. Dr Kenneth Menz of the Australian Centre for Agricultural Research, Australia, presented the ACIAR viewpoint on agricultural extension in the Asia and Pacific region. ACIAR is part of Australia’s development assistance programme, funded by the Australian Commonwealth Government. An independent review of ACIAR’s operations in 1998 suggested that a stronger emphasis should be placed upon ensuring that research conducted by the organization is matched with corresponding community impacts. Two primary considerations that led to this conclusion were: i) a perceived weakness in extension systems in the Asia and Pacific region (which is the geographical focus of ACIAR’s operations); and ii) the lack of sufficient pre-project diagnostics or situational analysis to better characterize research problems.

20. Dr Menz defined agricultural extension as a process of bringing about innovation and change. He mentioned project strategies for achieving research impact (including better extension), such as i) choosing research projects where extension is not an issue; ii) using private sector extension services; iii) building change processes (extension) into research projects, including farming systems research (and extension) principles and techniques; and iv) using participatory approaches to technology development, monitoring and evaluation. These strategies are not mutually exclusive, Dr Menz emphasized, as there is an inherent degree of overlap among them. However, the fundamental point is that they are all potentially useful in assisting, or substituting for, existing institutional extension services.

21. The example Dr Menz cited showed that different models will be suited to different situations (often due to particular historical institutional arrangements that are in place). It may be more practical to work within these constraints (practical realities) rather than trying to implement a whole new system. It was made clear from many of the models presented that research and extension are part of a continuum and not entirely distinguishable one from the other.

22. Mr Sing Var of the Department of Agriculture Extension, Cambodia, informed that at the present stage of development of agricultural research and extension services, the linkages between all stakeholders in Cambodia is very weak. It is essential that the development of improved linkages becomes part of the operational culture.

23. Dr Dato Ismail Ibrahim of the Department of Agriculture, Malaysia, discussed linkages developed for MS ISO 9002 Group Farming Extension Services where business plans are an integrated component. Management of a quality-control system under MS ISO 9000 emphasizes that

provision of any service or production of any product must address customers' satisfaction and follow documentation of international quality standards as outlined in the quality document of MS ISO 9000 of that organization. For establishment of a Permanent Food Park concept, in which zoning permanent areas solely for agrarian production, arrangements were made between the federal and state governments. At present, subdistrict Agricultural Technology Transfer and Service Centres have been established nationwide to be a core centre of agricultural development.

24. The general discussion highlighted the following issues and concerns:

- The shift towards globalization triggers the need for appropriate changes in policies and for reviewing extension. For example, agricultural extension in Malaysia utilizes the market-orientation approach instead of the training and visit system of extension. Young entrepreneurial farmers are given active part in this new agricultural system in collaboration with technical officers ("frontliners" who are graduates) in partnership with subject matter specialists.
- Success stories in Asia and the Pacific on extension-research-market linkages should be documented and shared emphasizing the strong points and positive outcomes to encourage other farmers and/or other countries. Malaysia's ISO 9002 accreditation is an excellent example.
- Other areas in extension for which greater attention is required include: i) research in extension, ii) policy research in extension and iii) linkages of agricultural extension with civil society and other development partners.

Session 3: Information and communication opportunities for technology transfer and linkages

25. In his opening presentation, Dr Alexander Flor of SEAMEO-SEARCA, Philippines, warned that throughout Asia, national agricultural extension systems have been severely hampered by four factors: abolition of the national agricultural extension system; decentralization or devolution of extension services; the top-down perception of agricultural extension; and rivalry between research and extension. These trends have also severely weakened the potential contributions of information and communication technology to agricultural extension. However, the existing information and communication environment poses new opportunities for agricultural extension.

26. The information and communication environment has elements of both the old and the new; the conventional and the sophisticated; the analogue and the digital. Conventional media includes analogue AM and FM radio, VHF and UHF television, the print media, video, cinema and indigenous communication methods. Digital media covers mobile phones, personal computers, the Internet, e-mail, imaging technology, digital audio-video, digital broadcasts and cable television. The agricultural sector has lagged behind in exploring and tapping the potentials that information and communication technology has to offer. These potentials range: from the sharing and re-use of data, research findings, lessons learned and best practices among research and extension institutions to developing quick-response mechanisms for agricultural and natural resources crisis situations; from permitting informed decision making among agricultural officials to sounder policy making among legislators; from improving the extension delivery systems in the rural areas to taking e-commerce to farmers.

27. Basically, ICT facilitates two elements critical in the research-extension-farmer-market interface and technology transfer process: information access and networking. The storage and retrieval of research results facilitates information access while telecommunications facilitates networking. In both elements, several strategies and approaches have been employed. These strategies include riding the tide of popular media, community-based or participatory media, capacity building of support agencies, knowledge management and employing a programmatic approach to information and communications technology undertaking. Technology transfer modalities include conventional and digital broadcasting, comic books, the use of low-end ICT, geographic information system (GIS)

and knowledge networks that tap a wide range of ICT products ranging from multimedia CD-ROMs to Web-based services.

28. The existing development assistance environment is most favourable for tapping information and communication technology for agricultural extension and technology transfer. The Okinawa Summit of G7/G8 nations has established the primacy of bridging the “digital divide” in the international development assistance agenda. The World Bank has maintained its Information Development Grants Programme while the European Community has established its own information technology fund for “a user-friendly information and knowledge society” with an Asian ICT programme. Furthermore, several bilateral aid agencies have also placed ICT issues in their priority list. The conditions are ripe for agricultural extension to reposition itself *vis-à-vis* the new information and communication environment.

29. Dr P. Das of the Indian Council of Agricultural Research, India, noted that the conventional interpersonal communications system for India had reached its limit due to insufficient extension staff and other facilities. He emphasized the judicious use of conventional information and communications technologies, prioritization of needs-based information and its development in different formats, taking into consideration the characteristics of the farmers, the nature of technical messages, physical infrastructure and the mode of communication to be used.

30. Dr Das cited the details of the Cyber Extension Services developed in the Ahmednagar district of India, including its connectivity, network, flow of information and type of information, such as crops, markets, weather, details of government programmes, etc. He also explained the impact of the programme in terms of the type of information used, frequency of farmers visited and distance covered by the farmers for information from IT centres.

31. Dr Waqar Hussain Malik of the PARC, Pakistan, explained that extension services in each province of Pakistan have developed communications support units that are equipped with audio visual equipment, with emphasis being given to the use of computer-based communications technology for diffusion of research information to farmers. He also noted that agricultural extension, which had operated at the provincial level, had been devolved to the newly elected district governments. Extension in Pakistan is now envisioned to function similar to the model in the US, with a greater accountability to the local government system.

32. Dr N.F.C. Ranaweera of the Ministry of Agriculture and Livestock, Sri Lanka, highlighted how Sri Lanka is looking towards a more interactive extension programme where the central, provincial and private sector extension activities will operate closely. This will ensure that both the small- and large-scale farmers benefit from new extension messages. The Government is also intending to make maximum use of the latest technology to keep farmers informed, particularly in relation to market prices at the farm gate level.

33. The general discussion highlighted the following issues and concerns:

- The need to use communication and information technologies as a goal to support agricultural extension, not to replace it (as reported for India and the Philippines). ICT is not only concerned with logistics; the human component is also important and non-replaceable, especially as many rural areas are still poor and farmers are still traditional in their behaviour and way of thinking. ICT is only a tool to reach a wider audience – it is the content that is most crucial.
- There is need to tailor information, including the technologies targeted to the needs of different clientele. Farmer-to-farmer interaction and farmer decision-making on important agricultural activities are relevant in carrying out effective extension services to rural households, e.g. the Republic of Korea and Pakistan.

- There is a need to consider the appropriate mix of communications and information technologies.
- Documenting and distributing examples of best practices, such as the “landcare” experiences in the Philippines. Currently, there are inadequate success stories regarding the use of ICT in extension services in Asia and the Pacific.
- What can be done or is needed to benefit from the positive climate currently available regarding funding possibilities from donors for ICT? Whether one likes it or not, highly industrialized countries like the United States strongly desire to put a computer in every farmer’s household in developing countries. ICT concerns should be how to make it beneficial for improving agricultural extension research and market linkages.
- There is a need to clarify what constitutes information. Do we have any mechanism to scan the environment and add value to the information?

Session 4: Panel presentation on gender dimensions in agricultural extension and technology development and transfer

34. Dr Revathi Balakrishnan of FAO-RAP, as Panel moderator presented an overview of the technology issue for Asian rural women. As well, she highlighted the importance given to gender concerns at international, regional and national levels including the links to various world summits, such as the *World Food Summit* and the resulting Plan of Action that was endorsed by FAO member countries. She emphasized the gaps relating to technology considerations from a gender prospective and discussed how the gaps developed. The reasons for the gaps, according to Dr Balakrishnan, include: the ignoring of rural women’s technological needs and their indigenous knowledge, and educational disparities between men and women, including issues relating to access (information, technology, training, etc.) Given this situation, special commitment and attention is therefore required to eliminate the gaps. The presentations from the panellists provided further information and guidance to address these concerns.

35. Dr Belita Vega of Leyte State University, Philippines, highlighted the historical underpinnings, the present and future perspectives of integrating women, and gender dimensions in agricultural development, particularly in extension and technology dissemination. Global initiatives towards food security and sustainable development may have produced encouraging results in some countries, but studies noted that in achieving agricultural development goals, efficiency, sustainability and equity are still hindered by the predominant practice of directing extension and training resources primarily to men. Considering that women represent two-thirds of the poor in the developing countries, providing them opportunities for access to productive resources and services is part of the women’s continuing struggle in bringing about agricultural progress in rural communities.

36. Dr Vega highlighted how gender as a cross-cutting variable is being incorporated in the agriculture extension and technology transfer programmes of the development agencies. She presented two successful projects to give insight on how gender dimensions are addressed in agricultural technology dissemination initiatives. The first case was on *Arrowroot production and processing: A project on women in agriculture in the Philippines*. Among the lessons drawn from the project’s success: i) the technologies suited the needs of women and motivated them; ii) the social preparations done at all levels and with relevant sectors resulted in cooperation and support for the project’s positive outcomes; iii) availability of resources and inputs, including technical assistance, contributed to the project’s success; and iv) peer teaching and on-the-spot learning approaches made the transfer of technologies easier.

37. The second case presented was on China’s *Songliao plain agricultural development project*. This is a project with the most explicit integration of gender in its objectives for the purpose of

addressing rural poverty and improving rural incomes. The project strengthens the traditional role of women in crop and livestock raising, aquaculture and fruit growing. It involves hiring female staff to deal both with women and men farmers. Specific processes and targets have been identified for women as well as men, and results are being monitored separately. The All China Women Federation took an active part in all phases of the project. Some of the outcomes included women's expanded social and economic networks for better access to information and services, and the project staff have become more aware of women's capabilities.

38. However, added Dr Vega, despite the inspiring cases, the implications from field experiences and reviews of the global policies still point to the need for an intensive campaign towards a more gender-responsive extension and technology dissemination, specifically in resource-poor and marginalized agricultural areas in developing countries. Conceptual and structural reconfigurations towards gender-sensitive agriculture extension are imperative.

39. Dr R. Padmaja of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India, highlighted the gender perspectives of the institute with special reference to participatory technology development and evaluation. Guided by the Consultative Group on International Agricultural Research's vision and strategy, ICRISAT's new vision for 2010 is "improved well-being of the poor of the semi-arid tropics through agricultural research for impact." ICRISAT's new mandate is "to enhance the livelihoods of the poor in semi-arid farming systems through integrated genetic and natural resource management strategies". ICRISAT's strategy, therefore, has a dual focus on scientific excellence and impact. It targets key opportunities for improving the well-being of the poor, with food security being fundamental. Above all, it recognizes greater integration and diversification of partnerships as a core methodology for engaging science and technology development.

40. Dr Padmaja talked about the analysis of gender in the development of groundnut variety and management technology. Differences in the priorities that men and women attach to alternative grain and plant traits were evaluated. It was found that women prefer red varieties that are easier to uproot and shell and that offer high grain yields and good taste. Men preferred varieties with better fodder yield and larger seeds that attract better market prices. This knowledge conveyed valuable feedback on farmers' needs, preferences and dislikes to plant breeders. This has helped ICRISAT researchers to shift or reorient research strategies. Participatory variety selection led to faster release and dissemination of *Okashana 1* variety in Namibia. It even allowed farmers to incorporate their own superior selections or landraces into new genetic material.

41. Based on a series of case studies related to adoption and non-adoption of technological innovations, it was observed that social capital plays a key role in enabling farmers – men and women – to take advantage of human capital resources that become available in the form of new cultivation practices and knowledge regarding technologies. The direct and indirect impacts of participatory technology development and evaluation involving women farmers are many: increased social benefits or empowerment, greater control of the decision-making process, increased economic benefits, employment opportunities, building of farmers capacity to identify problems and do research for their own benefit, and acceptance of technical improvements.

42. Dr P.S. Geethakutty of Kerala Agricultural University (KAU), India, emphasized the need for engendering agricultural education in view of women being indispensable stakeholders in the farming sector. The agricultural education system that overlooks the importance of gender considerations in the agricultural sector needs a paradigm shift and capacity development that are equitable for women and men. Engendering of agricultural education would create a culture and learning perspective that promotes human justice and gender-responsive agricultural development towards gender equality. Dr Geethakutty gave a detailed account of the establishment of the Centre for Studies on Gender Concerns in Agriculture at KAU to mainstream gender concerns for development of sustainable

agriculture. She also explained the KAU-FAO project to develop a gender approach in the curriculum of undergraduate courses at KAU. The project focuses on integrating gender concerns in the syllabus of relevant disciplines of the university, which includes crop management, livestock production and management, nutrition, post-harvest processing, fisheries, agricultural engineering, farm management and agricultural communication.

43. The general discussion on the Panel's presentation highlighted the following points:

- Success stories of achievement in improving women's access to resources should be shared in a meeting like this expert Consultation. FAO SEAGA programme should be shared.
- Lessons learned from the Pakistan study on financial decision-making for farm inputs by women should be recognized. Such facts make it important to include women in extension decision-making. There is need for the leadership from FAO representatives to work with national governments to actively involve women in extension programmes. Women-inclusive extension approaches should be part of a national system.
- The Indian Council of Agriculture Research sets the framework for agricultural university programmes and requires 20 to 25 percent of courses to be region-specific. Hence, these courses could approach gender-specific concerns.
- Society is patriarchal in nature and most systems are dominated by male perception. In this context, gender sensitizing curricula for graduate education is one approach. But more important would be training in gender at the grassroots level. FAO should also influence individual courses for gender responsiveness in higher secondary education. It is also important to undertake gender sensitization for adult men and women.
- The basic stumbling block for addressing gender dimension seems to be attitude. This applies to attitudes within the family and local government and gender bias among policy-makers. Malaysia's project for women is one approach.
- It is important to include social capital formation in extension courses and training. FAO should study and include gender dimensions in social capital.
- It would be important to review and rewrite FAO *Extension manual* to be responsive to gender specific-constraints and outreach approaches. The presentation of the current situation of women should assume a positive spin, reflecting the many exciting things that have happened in the gender sector.
- Women's participation among certain groups has increased in the Philippines.
- The social structure is the defining factor in allowing or denying women recognition and gender equality. Social attitudes and values are persistent barriers.
- In Nepal there is a provision for gender studies in graduate courses at the agricultural institute. Nepal would like to avail of technical assistance from Kerala Agriculture University to improve the prospects for engendering the agriculture curriculum. FAO global experience and programmes as well as country specific approaches in gender-integrated curriculum should be shared among countries.
- It is important to link gender dimension discussions in research, extension and education as relevant to the Consultation. FAO has a gender mainstreaming policy such as FAO Gender and Development Plan of Action, and SEAGA is a gender-sensitization tool. FAO-RAP has a task force in place for implementing the Plan of Action. In terms of gender aspects, the Asia and Pacific region is an exciting area to work in. But the region is ignoring the AIDS impact on the agriculture sector and on rural communities. A gender-disaggregated database is a priority. Congruence in gender mainstreaming approaches is required. The ICRISAT model illustrates an important approach to technology development. National systems should emulate and integrate the approach of participatory technology development (PTD) with links to

improvement in social, human and economic capital. Appropriate institutional mechanisms should be identified to achieve congruence in gender mainstreaming. National systems should adopt the PTD and social capital models for their programmes as well as in the programmes funded by the Asian Development Bank and by the World Bank.

- Despite local social and cultural constraints, as demonstrated in FAO extension project in the Philippines, decentralization may be an opportunity to build gender equality.

Group work on gender dimensions

44. The Consultation participants were divided into three groups to discuss gender issues in relation to agricultural extension.

Group I: Findings and recommendations

45. The group discussed the issues and concerns of the gender impact in agriculture, considered in the context of research-extension-markets, and suggested the following decisions to be taken up by the Consultation's participants:

- i) Potential gender-impact assessment with well-defined indicators should form compulsory criterion for selection, implementation and evaluation of projects and technologies.
- ii) Gender sensitization among the stakeholders from the farming community to the top level of administration in the agricultural system should be an important strategy for linking farmers to markets and civil society.
- iii) Practitioners in the agricultural development system should be equipped with the capacity for gender analysis and gender-responsive research and technology development.
- iv) National policy should be formulated before taking up a gender perspective in planned development. This policy requires a gender-disaggregated data system to be developed at the national level – location specific, activity data on gender roles in the major farming systems should be developed in the planned interventions. Examples: What percentage of rice farming systems are women-headed and male-headed? What percentage of women are engaged as hired labour in paddy cultivation? What percentage of men and women in a locality will benefit by any intervention?
- v) Engendering of curricula should be brought into agricultural education at the undergraduate level by introducing a basic course in gender concerns in agriculture.

Group II: Findings and recommendations

i) Mainstreaming gender into the research system

- All research organizations and groups should establish a gender and development cell. This cell will be primarily responsible for the sensitization of researchers towards gender to enable them to have a proper perspective on gender and to develop or design gender-friendly technologies. This can be location specific or situation specific. These objectives can be achieved through workshops, seminars, lectures, etc. Once this is done, gender issues will be the responsibility of all scientists in that organization. Gender needs to be considered as a component in all research activities, such as project planning, project monitoring and evaluation.

Researchable issues or topics of current interest:

- The gender dimensions of social capital.

Knowledge networking:

- It is recommended that research organizations establish a Web site or network on gender and development and post all information at this site.

ii) Gender actions needed at the extension services level

- Social capital formulation or mobilization should be part and parcel of extension work.
- National governments need to encourage the recruitment of female extension agents, both professional and paraprofessional (such as in Pakistan and Bangladesh).
- Agricultural training institutes need to have a programme and/or strengthen ongoing programmes on gender sensitization.
- Extension workers need to organize specific programmes, keeping in view the needs of women; women must be encouraged to participate in extension activities. Separate programmes for men and women are acceptable in areas where joint programmes are not possible (such as Pakistan).
- Extension programmes can be based on any burning issue confronting the farmers or issues that farmers need to be made aware of (such as HIV/AIDS and globalization).

iii) Gender actions needed at the national level

- Policy-makers need to be provided with a knowledge base on “gender in agriculture” to enable them to make policy decisions.

iv) Gender actions needed at the international level

- FAO should spearhead the regional initiatives for networking and coordination and organizing intercountry women and development projects in the region.
- FAO needs to work with central governments or international centres as focal points.

v) Gender actions needed for farmers

- Male farmers need to be made aware of and recognize the role of women in agriculture to facilitate attitudinal change.

Group III: Findings and recommendations

- To promote gender equity and equality, these elements should be included in the educational system:
 - Gender curriculum for schools and colleges
 - Gender curriculum for officers of government agencies: Induction and in-service training
 - Gender curriculum for adult farmers’ training programmes
- Gender issues should be part of the national agenda (including agricultural extension) as well as being a local concern.
- With farming becoming more feminized, extension and teaching methods should respond to these changes.
- Given that much labour-intensive work is usually undertaken by women (e.g. transplanting and harvesting), scientific innovation should also be oriented towards making women's jobs easier.
- Relevant market information must reach women farmers, given their involvement in agriculture.
- Disaggregated figures regarding the involvement of men and women in various steps for research and development in agriculture should be collected, with more gender balance sought.

- vii) Documentation of success stories in relation to gender considerations needs to be undertaken, collected and shared.
- viii) A women's unit should be located within ministries of agriculture, departments of agriculture and agricultural extension; and such units should design gender mainstreaming, gender audits and gender-sensitivity models of programmes and should conduct sensitization trainings.
- ix) A versatile database with inputs from multidisciplinary and multi-institutional sources should be established, and it should be easily accessed. Indigenous technical knowledge systems (including the knowledge of women) should also be an important source of information. Applications of ICT can be considered for this purpose.

Session 5: Policy, institutional and human resource development framework

46. Mohan Kanda of the Government of India emphasized the imperative need for a robust response to the challenges posed by the degradation of natural resources, largely via productivity increases in a diversified range of activities and backed up by a contemporary extension system capable of remaining tuned to the linkage-chain. There is a clear need for a break from the past, a paradigm shift that is focused in a “pocket-package” mode and transits into a pluralistic and contemporary regime equipped to resonate with the varying patterns and quality in demand by redefining its mandate.

47. Dr Kanda explained various policy as well as institutional issues in the context of restructuring extension services. In order to broaden the research-extension interface, comprehensive, holistic, contemporary and inclusive human resources development (HRD) strategies are called for, such as: i) one-time catch-up treatment for the extension system to turn it into a demand-driven mode, capable of delivering the new products; ii) a continuing HRD plan that looks at the needs of all stakeholders, including the user communities; and iii) infusion of the multi-actor system with the ability to shift from the “supply” mode to a “demand” regime. The policy should also include: i) identification of the Impact Shadow Matrices and addressing their needs through a “pocket-package”; ii) rationalization of subsidies by converting them into transparent, back-ended and targeted capsules; iii) allowances for acquiring the ability to carry on a continuous and meaningful dialogue with the fast-changing external environment and staying tuned to the dynamics of the outside world; iv) development of the expertise to “extract” information from the “noise” pervading the system, the ability to add value to it and dispatch it to destinations set in a region/sector/section mode; and v) development of early warning systems capable of proactive response by re-engineering the architecture of the scope and content of the whole system.

48. The first step would be to put in place a regional network. This could be achieved by a mutually reinforcing, synergetic effort that will: i) identify and deal with “extreme focus” areas through the piloting of emerging concepts and help scale up successful models; ii) create a backward loop between extension mandates and market-signals; and iii) undertake participatory institutional building. HRD strategies need to find a place in the proposed pluralistic and participatory systems. The exciting examples in India (group farming in Kerala State and Pani Panchayat in Maharashtra State), especially as part of the World Bank-funded *National agriculture technology project*, can serve as promising and path-breaking models.

49. Dr S. Kannaiyan of Tamil Nadu Agricultural University, India, focused his presentation on India and explained that the weak feedback system in the research-extension-farmer linkage is perceived as a major cause of concern. The extension system needs to be flexible and should include processing, storage, transport, marketing and value addition for the benefit of farmers. The delivery system is becoming increasingly costlier without any perceptible increase in reach or effectiveness. Moreover, the review mechanism of the state extension system is totally internal, and there is no

participation of institutions responsible for research and technology development or of farmers and NGOs. The HRD programmes of the public extension systems need to be put on a strong footing.

50. A partial privatization of the delivery system, with public funding and private delivery, should be promoted to enhance efficiency and partially to reduce costs. The Farm Science Centres also need to expand their services to include production and distribution of seeds, plants and animal breeds, value addition, promoting off-farm employment in agro-based industries and promoting effective feedback to address technological problems.

51. Dr Md. Monirul Islam of the Bangladesh Agricultural University, Bangladesh, emphasized the strengthening of supervision and monitoring components with appropriate logistical support, formulation of demand-led extension programmes with adequate budgetary provisions, human resource development, consideration for women perspectives and a coordinated approach for monitoring crops, livestock, fisheries, poultry, etc.

52. Dr Sung Soo Kim of the Seoul National University, Republic of Korea, mentioned that agricultural extension services have helped Korean farmers in achieving self-sufficiency in rice and year-round supply of green vegetables as well as upbringing rural youth through the guidance of 4-H club activities. It also has provided leadership guidance for the *Saemaul Undong* (new village movement). The Korean Government changed the status of extension educators from central government staff to county/city government staff following its democratization and localization efforts in 1997. This has brought about various problems, which include: i) decreased morale and fewer extension educators, thus weakening the extension education function; i) weakened linkages between national and local extension officers; iii) less opportunity for in-service education of extension educators; and iv) weakened linkages between agricultural research and extension.

53. Dr Patricio S. Faylon of the Philippines Council for Agriculture and Resources Research and Development presented a comprehensive view of important issues and concerns related to agricultural extension and technology transfer in the Philippines, especially within the context of the current challenges posed by the global trend towards free trade in agricultural products. Actions he recommended involve: i) disseminating information and developing opportunities; ii) determining areas of complementarity among different technology delivery modalities; iii) facilitating strategic thinking; and iv) harnessing the full potential of ICT as applied through farmer's information and technology services, such as Techno Pinoy and the Mango Information Network.

54. Dr Faylon strongly emphasized the need to incorporate gender concerns in extension and technology transfer, including the encouragement of women to join cooperatives and organizations, the upgrading of skills and knowledge of female agricultural extension workers, identifying the different needs of men and women farmers and involving women cooperators in the field testing of new technologies and women social scientists in project planning and implementation. There is a need for promotion of international coordination and collaboration through student exchange programmes, academic staff exchanges, joint research and development projects, formal link between RDE institutions and the international validation of standards.

55. The general discussion highlighted the following issues and concerns:

- Many extension programmes are donor-driven. Collaboration with the private sector should be explored since government is downsizing and funding from multilateral and bilateral agencies are becoming scarce. However, for orphan crops, governments must take financial responsibility for food security purposes.
- Human resource development in extension should not only focus on technology transfer but more importantly on management, group dynamics and governance, all aimed at social capital formation.

- When analysing the changing role of extension, the role of the state and civil societies should also be included.
- Coordination with other “enablers” or partners in development is generally difficult in practice. At the same time, communication on how to leverage with other sectors to get things mobilized, especially for lead agencies, is significant. This is a dynamic process in extension.

IV. THEMATIC GROUP WORK AND PRESENTATIONS

Session 6: Thematic group discussions

56. The Consultation participants were divided into four working groups (see Appendix V) to discuss issues, concerns and needs relating to the following four themes:

- Globalization, liberalization and the changing demands and role for agricultural extension
- Research-extension-farmer-market-civil society linkages: New horizons and extension modalities
- Information and communications opportunities for technology transfer and linkages
- Policy, institutional and human resources development framework

Session 7: Presentation of thematic group reports

57. Representatives of each of the four groups made presentations. Highlights of the presentations from each group included the following issues and priorities requiring attention:

Thematic group I: Globalization, liberalization and the changing demands and role for agricultural extension

i) Information and communications technology

- Establish a database.
- Link extension centres.
- Link research, extension, farmers and markets.
- Produce “desktop” publications, CD-Rom-based information materials, etc.

ii) Decentralization

Role of government – Train local government officers in agri-extension and agribusiness.

Role of NGOs and civil society – Organize farmers’ and producer’s associations; strengthen farmers’ organizations through training, organizing, etc.

iii) Promoting agribusiness to cope with global changes

- Involve agribusiness players in helping farmers.

iv) Formulation of national extension policies in response to globalization

- Develop separate strategies – one for commercial farmers and one for subsistence farmers

v) Organize a strong agriculture and rural extension lobby group, which could be called the Consultative Group in International Agricultural and Rural Extension

vi) Broaden the role of agricultural extension to include information on population growth, health

and natural disasters.

Thematic group II: Research-extension-farmer-market-civil society linkages: New horizons and extension modalities

- i) Markets are important components of the research-extension-farmer-market-civil society linkage change.
- ii) Extension and research should be conscious of the fact that farmers are market-driven.

Recommended actions:

- Upgrade the role of extension officers to be more than just *transfer agents* (including human capital development).
- Provide tools.
- Seek true participation (crop check, landcare, mobilizing social capital, etc.).
- Document success stories.
- Conduct research.
- Conduct gender-sensitization training, which is especially important for good linkages to take place.

Thematic group III: Information and communications opportunities for technology transfer and linkages

- i) ICT has a significant mode of communication. The magnitude of infusion of ICT varies among the countries, and regional countries differ among themselves in their level of development in IT and the communications sector. But the reality of advances in the ICT environment in the context of globalization and liberalization should be recognized to develop strategies to enhance the extension efforts in the region. ICT could be a tool to empower extension professionals and also farmers.
- ii) The challenge and focus in this new information environment should be one of repositioning agricultural extension and retooling extension professionals.
- iii) IT networking at the micro level is a major concern, though at the macro level, IT dissemination is not a problem. The poor rural infrastructure poses barriers to IT penetration, though communication infrastructure fares better in relative terms.
- iv) The need of the day is to use information and communications technologies to support agricultural extension, not to replace it. Recognizing this need, it is important to consider the approximate mix of information and communications technologies. Furthermore, ICT is not only concerned with logistics but is a tool to reach a wider audience.
- v) Even in the context of ICT-driven development, it is the human component aspects that are important and non-replaceable, especially as many rural areas are still poor and farmers are still traditional in their behaviour and way of thinking.
- vi) The emerging concerns in the ICT sector for agricultural extension should focus on content in the programmes.
- vii) Given the current situation of inadequate success stories and appropriate context, it is important to focus on:
 - Documenting and distributing examples of best practices of development and technology transfer.
 - Developing cases studies regarding the application of ICT in agricultural extension and rural development.
- viii) The database and content areas should be grouped under the broad framework of “environmental spanning”. This concept is defined as broad-based information content to meet the needs of the farmers, with a gender dimension.
- ix) In the preparation of content for ICT programmes for extension, the following should be attempted:
 - Involve community members in identifying the context.

- Set up an indigenous knowledge bank to preserve and pass the indigenous knowledge (including that of women).
 - Set up a gender-specific database for planning both policy and programmes.
 - Link with the World Agricultural Information Centre and the Consultative Group on International Agricultural Research for information.
 - Develop better resource management using the geographic information system, NRM, etc.
 - Develop technology for both farm and household production.
 - Generate and disseminate marketing information.
- x) ICT policies should be structured to fit the scale of the country and level of advancement of ICT. Strategies and programmes should be directed to improve extension personnel's access to ICT.
 - xi) The different clients' needs and clients' skills should direct ICT decisions. (See Annex V for a typology to assist the decision-making.)
 - xii) The training approach should also review the potential for training youth (girls and boys) and using them as peer group trainers. The training of trainers models can be used to train extension agents in scaling up or retooling skills in ICT.
 - xiii) From the institutional perspective, collaboration among NGOs, private sector and national information technology agencies should be identified and strengthened to address ICT-based extension approaches and retooling of extension agents' skills.
 - xiv) The open university system and distance learning modalities (both IT-based and communication-based) could partner in retooling extension professionals.
 - xv) Explore the possibility of identifying donor support to reposition and retool extension services, using ICT to empower them to effectively help farmers cope with global changes.

***Thematic group V: Policy, institutional and human resources development framework**

- i) Policy
 - Develop a clear-cut policy on extension for agricultural and rural development.
 - Agrarian policy should provide support and security to staple and orphan crops; Government should provide financial support to the farmers.
 - Policy-makers should be gender sensitized.
 - Government should provide food and shelter for people and extension should be the means.
 - A National Research Organization for Extension Education should be established.
 - Develop a coordinating agency to perform environmental scanning functions in the context of agricultural and rural development (data support on weather parameters, marketing intelligence, export/price information, natural disasters and crisis management, etc.)
- ii) Human resources development
 - Continuing needs assessment and capacity-building programmes for providers and clients.
 - Enhance the knowledge and credibility of extension agents and service.
 - Build capacity for gender-responsive extension work.
 - Prioritize training of trainers.
 - Address the need for a modality or a system for professional growth within the organization and the government bureaucracy as a whole (double-bladed).
 - Initiate a system for grassroots-level recruitment and manpower development planning (qualification standard).
 - Include agriculture in secondary school curriculum.
 - Revise or rework extension content in the undergraduate courses of agricultural universities.
 - Enhance training of NGOs, FOs and corporate and private extension providers.

*The fourth theme on gender dimensions was discussed in separate groups during mid-meeting.

- iii) Redefining the role of extension agents to meet the changing environment
 - Continue to provide appropriate information and messages.
 - Educate farmers and rural youth, including women, on resources management and decision-making (educator's role).
 - Provide a feedback system or demand from the research and development (R&D) system for appropriate technologies.
 - Provide market information and links.
 - Provide information demanded by consumers, such as regarding quality, safety, etc.
 - Provide information or technologies on value-addition of farm products.
 - Translate and disseminate ICT databases and provide a data collection for the same.
- iii) Role of civil organizations (local government, non-government and community-based)
 - Continue to organize, facilitate, support and advocate.
 - Participate in extension programmes.
 - Include gender-equity programmes.
 - Develop close field-level linkages.
- v) Coordination
 - Strengthen linkages through an agency with authority and a mandate.
 - Develop better coordination between and among departments of government.
 - Develop better coordination at the grassroots, provincial and regional levels.
 - Provide financial and manpower support.

V. RECOMMENDATIONS OF THE CONSULTATION

58. Based on the thematic groups' findings and presentations, the Consultation participants identified and recommended priorities to develop projects for which FAO should take leadership to ensure appropriate attention. The projects should relate to:

- i) Information and communications opportunities for technology transfer and linkages, which includes five interventions: policy, infrastructure, content, programme planning and development, and capacity building.
- ii) Decentralization of agricultural extension services and management at the local level: the Asia and Pacific experiences.
- iii) Institutionalization of an international body for agricultural and rural extension.
- iv) Capacity-building programmes in agricultural and rural extension for local government units in the Asia and Pacific region.
- v) Documenting participatory methods to better link farmers, extension personnel and researchers.
- vi) Documenting successful cases of farmers bringing about innovation and change.
- vii) Enhancement of knowledge-based skills and attitude orientation for professionalism towards human-centred and resource-based agricultural development.
- viii) Repositioning and retooling extension professionals in the ICT environment.

59. Each thematic group developed frameworks for specific projects, including a timeline, that are presented in Annex V.

Discussion and adoption of the draft consultation report

60. The draft Consultation report was endorsed with amendments.

Closing ceremony

61. On behalf of the Consultation delegates, Dr Waqar Hussain Malik, Pakistan, expressed appreciation and thanks to FAO, especially the management and staff, for organizing such an activity that enabled further learning and sharing among and between countries in Asia and the Pacific.

62. Dr Malcolm Hazelman, Consultation organizer, expressed appreciation to the resource persons, participants and observers for their contributions that made the meeting a success. He made special mention of the support and contributions of Dr R.B. Singh, Assistant Director-General and Regional Representative, as well as that of Mr Kalim Qamar, FAO-Rome, Dr Revathi Balakrishnan, FAO-RAP, and the assistance and support of the RAP secretarial staff.

63. Dr R.B. Singh expressed his profound appreciation to all the participants, resource persons and observers for the excellent inputs throughout the Consultation, the positive exchange of information and the initiative in proposing the elevation of extension to a more prominent level of importance – nationally, regionally and internationally – as an important mechanism for combating hunger and poverty. He also expressed appreciation to Dr Dato Ismail bin Ibrahim, Chairperson of the Consultation, for the excellent leadership he provided to the meeting and likewise to the facilitators and resource persons for their stimulating presentations and papers that provided the framework for the Consultation's exchanges.

64. Dr Dato Ismail bin Ibrahim, Chairperson of the Consultation, likewise expressed similar sentiments before bringing the meeting to a close.

CONSULTATION PROGRAMME**Tuesday 16 July 2002****Official opening**

08.00 – 09.00	Registration	
09.00 – 11.00	Inaugural session	
	Chairperson	Apichart Pongsrihadulchai, Director-General, Department of Agricultural Extension, Thailand
09.00 – 09.05	Welcome remarks	Malcolm Hazelman, Senior Extension, Education and Communications Officer, FAO
09.05 – 09.20	Chairperson's address	Apichart Pongsrihadulchai, Director-General, Department of Agricultural Extension, Thailand
09.20 – 09.30	Election of Consultation Chairperson and Vice Chairperson, plus rapporteurs	
09.30 – 09.35	Remarks by elected Chairperson	
09.35 – 09.50	Objectives and mode of the Consultation	Malcolm Hazelman, Senior Extension, Education and Communications Officer, FAO
09.50 – 10.00	Group photograph	
10.00 – 10.30	Tea	
10.30 – 11.00	<i>Research-extension-farmer- market linkages to combat hunger and poverty in the Asia and Pacific region</i>	R.B. Singh, Assistant Director- General and FAO Regional Representative FAO, Bangkok

Session I**Thematic presentation I: Globalization, liberalization and the changing demands and role for agricultural extension**

11.00 – 11.30	Presentation by Kalim Qamar, FAO, Italy
11.30 – 12.30	Presentations by China, Indonesia and Nepal
12.30 – 13.00	Discussion

13.00 – 14.00 Lunch

Session II

Thematic presentation II: Research-extension-farmer-market-civil society linkages: New horizons and extension modalities

14.00 – 14.30 Presentation by Ken Menz, ACIAR, Australia

14.30 – 15.30 Presentations by Cambodia, Malaysia and Thailand

15.30 – 16.00 Discussion

16.00 – 16.30 Tea

Session III

Thematic presentation III: Information and communications opportunities for technology transfer and linkages

16.30 – 17.00 Presentation by Alexander Flor, Communications Consultant, Philippines

17.00 – 18.00 Presentations by India, Pakistan and Sri Lanka

18.00 – 18.30 Discussion

19.30 Reception dinner hosted by ADG/RR FAO

Wednesday 17 July 2002

Session IV

Thematic Presentation IV: Gender dimensions in agricultural extension and technology development and transfer

09.00 – 10.20 Panel presentations:

Revathi Balakrishnan, FAO, Thailand (Moderator)

Overview statement: Technology for Asian women

Belitia A. Vega, Leyte State University, VISCA, Philippines (Panelist)

Gender mainstreaming in agricultural extension programmes: Constraints and strategies

Padmaja Kamtam, ICRISAT, India (Panelist)

Participatory technology development with women farmers

P. S. Geethakutty, Kerala Agricultural University, India (Panelist)

Gender responsive agricultural professionals: Agricultural curriculum approach

10.30 – 11.00 Tea

11.00 – 12.00 General discussion

12.00 – 13.00 Group work on theme IV

13.00 – 14.00 Lunch

Session V

Thematic presentation V: Policy, institutional and human resources development framework

14.00 – 14.30 Presentation by Mohan Kanda, Ministry of Rural Development, India

14.30 – 14.45 Presentation by S. Kannaiyan, Tamil Nadu Agricultural University, India

14.45 – 15.45 Presentations by Bangladesh, Korea and Philippines

15.45 – 16.30 Discussion

16.30 – 17.00 Tea

17.00 – 17.45 Meeting of thematic group facilitators and resource persons

Thursday 18 July 2002

Session VI

Addressing the needs: Thematic group discussions to identify needs and the strategy/strategies for addressing these needs

09.00 – 12.00 Separate group discussions (Resource persons for thematic group presentations under Theme IV will spread themselves among the groups for the other four themes)

10.30 – 10.50 Tea

Session VII

Presentation of thematic group reports*

12.00 – 12.10 Thematic group I: Globalization, liberalization and the changing demands and role for agricultural extension

12.10 – 12.20 Thematic group II: Research-extension-farmer-market-civil society linkages: New horizons and extension modalities

12.20 – 12.30 Thematic group III: Information and communications opportunities for technology transfer and linkages

12.30 – 12.40 Thematic group V: Policy, institutional and human resources development framework

*The fourth theme of gender dimensions in agricultural extension and technology development and transfer was handled separately earlier in the meeting.

12.40 – 13.00 General discussion

13.00 – 14.00	Lunch
14.00 – 15.00	Formulation of recommendations and preparation of programme ideas
15.30 – 16.00	Tea
16.00 – 17.00	Continuation

Friday 19 July 2002

Plenary session

09.00 – 10.00	Presentation of recommendations and programme ideas and the development of an action plans
10.00 – 10.30	Tea
10.30 – 11.30	Discussion/adoption of the draft Consultation report
11.30 – 12.00	Closing session

SYNOPSIS OF OPENING ADDRESS

Presented by R.B. Singh, Assistant Director-General and Regional Representative
FAO Regional Office for Asia and the Pacific

***Research-extension-farmer-market linkages to combat hunger
and poverty in the Asia and Pacific region***

FAO activity, as well as of other international and national systems, are being greatly impacted by the growing challenges presented by increasing populations, urbanization, economic disparities, urbanization, hunger and poverty. The changes and the challenges have forced, and will continue to force, many paradigm shifts in and around the work of FAO. Among the many trends and forces are the increased emphasis on the state's principal role as providing a policy and regulatory framework conducive to sustainable development, as well as liberalization of trade (food and agriculture), globalization, privatization, decentralization and urbanization. Others are the increased reliance on regional and subregional groupings, the persistence of poverty and widening income disparities, the continued risk of disaster-related emergencies, the inequality in access to benefits of research and technological developments and the changing demands on agriculture, fisheries and forestry.

The Asia and Pacific region accounts for 57 percent of the world's population (nearly 3.2 billion); about half of that population will be younger than 25 in 2010. More than 80 percent of the world's smallholder farmers and 73 percent of the total farming households live in the region. Perhaps that is why two-thirds of the world's hungry and poor are found here: 800 million people who are poor and 500 million of them who are malnourished. The per capita access to land and water is about one-fifth of that in the rest of the world. The region produces more than 90 percent of the world's rice and 70 to 90 percent of its major industrial crops and aquaculture.

There have been good trends along with the challenges: Over a three-decade period, food production in the region more than doubled and dietary intake increased by 30 percent, despite an addition of 1.4 billion people. And the percentages of hungry and poor were more than halved.

But the demand for food and agricultural production is going to increase by 60 percent in the next 30 years. Which is of major concern as the per hectare yield of cereals needs to increase by 1 tonne. As well, production resources, such as land, water and biodiversity, are shrinking and degrading. Total factor productivity growth has decelerated and yields of cereals are stagnating. And investments in agriculture are declining. The continuing high rate of illiteracy and the marginalization of rural women contribute, along with other significant factors, to the limited impact of the information revolution. The region is filled with technological, digital, genetic and ethical divides.

In reaction to the forces afoot, there has been poor policy response, formulation and implementation of regulatory measures and standards, including the Codes of Conduct for responsible fisheries, sustainable use of forestry resources, food safety and biosecurity.

In May 2002 at the 26th FAO regional conference, delegates strongly endorsed the "Global Alliance Against Hunger" and to build the region's capacity in biotechnology, paying special attention to human and environmental risks. Specifically, the delegates called for sustainable mountain development, livestock and fisheries development for household food and nutrition security and poverty alleviation and empowerment of the rural poor. FAO's corporate strategies support those objectives in helping governments to: target the reduction of food insecurity and rural poverty; ensure enabling policies and regulatory frameworks; create sustainable increases in the supply and

availability of agricultural, fishery and forest products; conserve and enhance sustainable use of natural resource bases; and generate knowledge of food and agriculture, fisheries and forestry.

Among the many recommendations made in conclusion of the regional conference was emphasis on improving marketing systems, partnerships, the region's and farmers' competitiveness and awareness and information dissemination to bridge the digital and technology gaps, as well as empowerment of the poor and gender mainstreaming.

Those goals cannot be reached without education, information and thus, extension. Agricultural extension is the function, the means to expand people's knowledge. It is part of the "trinity", along with research and education, of serving farmers. The multiple divides of the region may in part be products of the disarray among the links between research, extension, farmers, markets and civil society. These links require attention, mending and extensive strengthening.

A new vision is needed that captures the institutional reforms towards both market-oriented privatizing innovations and non-market decentralizing reforms. But a new vision must accommodate the many paradigms shifts taking place in the world: the Green Revolution, for instance, has shifted to the Evergreen Revolution; the commodity approach has moved to an integrated systems approach; monodisciplinary to multi and interdisciplinary approach. Thrusts in technology research have shifted to eco-technology, which is the congruence of productivity, profitability, equity and sustainability. The supply-driven approach has become demand-driven. Farm employment has shifted to off-farm and non-farm employment. The definition of food security is evolving, there is increasing importance on economic access, on self-reliance rather than self-sufficiency, and on non-formal education, skills, nutrition and health awareness.

The role of FAO-RAP is that of working with partners to address the new and changing demands from FAO member countries.

ABSTRACTS OF RESOURCE PAPERS

Global trends in agricultural extension: Challenges facing the Asia and Pacific region

Presented by Dr M. Kalim Qamar, Ph.D., Senior Officer,
Research, Extension and Training Division, Sustainable Development Department, FAO, Rome

The changes in the working environment within which an organization functions, force the organization to make necessary adjustments if it wants to continue functioning efficiently. Without such adjustments, the organization will either collapse or will keep working inefficiently, moving gradually toward eventual obsolescence. The changes in the working environment, which can be called “forces of change”, vary in nature and scope. They could be political, technical, economic or social. They could be location specific, regional, nation or global. The effects of these forces of change maybe immediate, medium-term or long-term, and they may be direct or indirect. In response, the organization may make adjustments internally, externally, or both. National agricultural extension systems are no exception to this rule. They are also directly or indirectly affected by the changes and, in response, must make internal and external adjustments in order to keep functioning at the same or at higher levels of efficiency.

Global forces of change

In current times, the main global forces of change that are affecting or are likely to affect the existing structure, mandate and practices of national agricultural extension systems in developing countries are globalization and market liberalization; privatization; commercialization and agribusiness; democratization and participation; environment concerns; disasters and emergencies; information technology breakthroughs; rural poverty, hunger and vulnerability; the HIV/AIDS epidemic; sustainable development; biotechnology and genetic engineering; criticism of public extension services; and integrated, multidisciplinary and holistic development.

The institutional response to the global forces

Several countries as well as bilateral and multilateral donors have seen a need to reform national agricultural extension systems in response to the global forces of change. Currently, there are three international initiatives aimed at reforms:

- i) *Neuchatel initiative* (NI). The NI started in 1995 and is an informal group of major European bilateral donors, the World Bank, the International Fund for Agricultural Development, United States Agency for International Development and FAO that meets every year to discuss possible reforms in national agricultural extension systems.
- ii) *Revised agricultural knowledge and information systems for rural development*. A joint initiative between FAO and the World Bank.
- iii) *National agricultural extension systems reform initiative*. From FAO to encourage institutions to produce publications containing principles that can be used as guidelines for national reforms.

Within countries, agricultural extension is being redefined, reshaped and recharged in response to the various forces of changes. The following briefly highlights changes taking place:

Broader role of extension. The very definition, scope and technical focus of agricultural extension is under scrutiny. A question being raised is why should extension services focus just on the transfer of agricultural technology, which is passive and utilizes a top-down approach? More emphasis is being laid on human resources development, such as on developing the capabilities and capacities of farmers in terms of problem solving, management and decision-making. Another question is whether extension should address other aspects of rural and agricultural development.

Decentralized extension services. The new emphasis is on having a small unit at the national level to handle functions of policy, coordination and training and delegating the tasks of programme planning, implementation and even fiscal authority to the provincial or district or municipality government.

Fully or partially privatized extension. New terms, such as outsourcing extension, cost-recovery for extension services and contracting out extension are related to the drive for privatization. Advocates believe that farmers should pay for extension advice. There is genuine fear that cost-recovery would deprive small farmers of services.

Pluralistic extension systems. Combining public and non-public institutions for delivering extension pools resources in order to reduce unhealthy competition, delete redundancy of services and compensate for low budgets of ministries of agriculture. Coordination becomes a challenge in this type of system.

Client-orientation. The extension clientele include subsistence farmers, commercial farmers, rural youth, women, rural poor, physically disabled and AIDS-affected farmers' families – and they all have different extension needs. Client-focused approaches, such as gender-sensitive extension, are taking over the delivery of the same technical messages using the same methodology. Urban agriculture is another budding concern.

Application of electronic information technology. Telecentres, virtual linkages such as the virtual extension, research and communication network (VERCON) and expert systems are being developed to harness the advances in information technology for the benefit of both extension agents and farmers.

Participatory extension. This empowering trend involves farmers in decision-making and has led to modalities such as participatory farmer group extension, client-oriented extension, gender-sensitive extension and research-extension-farmers linkages and tools such as the participatory rural appraisal and the knowledge, attitude and practice survey (KAP).

Unified extension service. In the interest of optimum utilization of resources and an efficient bureaucracy, services are being unified to avoid individual visits by extension agents representing different disciplines to farmers.

Challenges facing Asia and the Pacific

While the global forces are shaping future agricultural extension worldwide, national systems in parts of the Asia and Pacific region are experiencing institutional reform. The region faces the following enormous challenges in making the extension services effective and meaningful:

- Giving the extension profession a proper status
- Improving pre-service education in extension
- Creating meaningful extension policy
- Finding a proper place for extension after decentralization
- Assessing the impact of extension
- Educating farmers in globalization, liberalization and biotechnology issues
- Developing situation-specific extension methodologies
- Establishing inter-institution linkages for integrated approach

- Unifying and integrating extension service
- Creating extension advisory services for Central Asia
- Educating farmers in sustainable development
- Looking beyond technology transfer focus
- Putting information technology in service of extension
- Promoting pluralistic and participatory extension
- Tackling extension privatization issues
- Finding extension's role in disasters

Asia and the Pacific have made recorded progress in developing agricultural technologies. The green revolution brought wide prosperity to the region. More recently, research institutes like INTERNATIONAL RICE RESEARCH INSTITUTE and ICRISAT, which are engaged in biotechnology, are expected to produce additional technologies. However, these new technologies do not mean much if they remain confined to research stations and laboratories and do not reach their real users – the farmers. Of a total two billion rural Asians, 670 million people still live in poverty. Strong national extension systems, with a broader mandate beyond technology transfer, are needed to develop the human capabilities and capacities of men and women farmers.

The organization, mandate and practices of agricultural and rural extension systems are changing worldwide, and it is vital that this region keep pace with the latest developments. The challenge of introducing appropriate institutional measures must be accepted by the Asian and Pacific governments in order to reform the national agricultural extension systems in response to the global changes. Otherwise the extension services will become obsolete. It is necessary to reiterate, however, that efficient extension systems alone will not be sufficient for bringing about something like “green plus revolution”. The governments will have to guarantee the availability of additional ingredients, such as environment-friendly technologies, farm inputs, marketing and storage facilities and appropriate pricing policies until that globalization stage is reached when open markets will determine the demand and price of various agricultural commodities.

Agricultural extension in the Asia and Pacific region – The viewpoint of an international research collaborator

Presented by Dr Kenneth Menz, Australian Centre for Agricultural Research

The Australian Centre for Agricultural Research (ACIAR) is a government agency created in 1982 to formulate programmes and policies for identifying and/or finding solutions to agricultural problems in developing countries. Integral to all ACIAR projects is collaboration with researchers in developing countries. ACIAR has coordinated and managed many hundreds of research projects in some 30 countries in Asia, the South Pacific, Africa and the Indian subcontinent. This involved more than 150 overseas organizations working in collaboration with more than 50 Australian research bodies.

An independent review of ACIAR's operations in 1998 suggested that a stronger emphasis should be placed upon ensuring that its research was matched with corresponding community impacts. There seemed to be two primary factors that led to this conclusion: i) a perceived weakness in extension systems in the Asia and Pacific region (the geographical focus of ACIAR's operations) and ii) a lack of sufficient pre-project diagnostics or situational analysis to better characterize research problems.

As a result of the review, ACIAR has sought to change its own culture to become more "outcome-oriented". Its current strategies contain the following objectives:

- Strengthen and support an organizational culture in which the delivery of benefits to end-users of research output is highly valued.
- Build dissemination and future development pathways into project design and execution; look for opportunities to implement research outcomes and for spill-over to other countries.
- Work with agencies that are committed to delivering benefits.
- Maintain an expert evaluation programme to measure impacts; monitor impacts of current and completed projects; maintain a project impact database and utilize it to promote awareness of the impacts of ACIAR's projects and to aid planning.

A framework has been developed within ACIAR to prioritize research resources. A multiregional international trade model using concepts of economic surplus is employed to derive *ex ante* measures of the relative economic benefits of alternative commodity and regional research portfolios and the distribution of these benefits among consumers, producers, importers and exporters (David *et al.* 1987). The measures include objective data and scientific judgement. Research domains are required to assess the likely spill-over effects of commodity research to environments; these spill-over effects are considered in estimating economic benefits.

ACIAR formed an alliance with the International Food Policy Research Institute initially for use of its database on production and consumption. In those discussions, it became apparent that both organizations would gain from instituting common working protocols on areas of mutual interest, such as analytical methods and databases. A key feature of that alliance has been the updating and enhancement of an impact assessment model (DREAM), which also is effective as a capacity-building exercise for research analysts outside both agencies.

Project level strategies for achieving research impact (better extension)

As ACIAR is restricted to research, it has to either work around perceived extension inefficiencies or try to include extension elements into its research projects. These approaches can be

categorized as follows: i) seek projects that are broadly applicable throughout large geographic regions; ii) choose research projects where extension is not an issue; iii) use private sector extension services; iv) apply farming systems research (and extension) principles and techniques; v) use participatory approaches to technology development, monitoring and evaluation; vi) apply the landcare, or group development, approach. These approaches are not mutually exclusive – there is certainly an inherent degree of overlap between some of them. However, they are all potentially useful in assisting or substituting for existing institutional extensions services.

ACIAR uses these approaches within its projects, and there is some matching of the approaches to the circumstances prevailing within particular countries. However, it would be overstatement to say that ACIAR specifically tailors each approach in an attempt to directly match individual country circumstances. Other issues are also given a strong weighting in the choice of projects, such as the ability and willingness of partner country scientists to participate, research imperatives as seen by partner country governments, etc. Each strategy has a role in bringing providers and users of information into a closer congruence.

For example, a biological control programme in Papua New Guinea focused on the damaging effects of *Erionota thrax* on bananas, the country's staple food crop. Through ACIAR's research, the pest was controlled at no added production costs and its own projects costs were extremely low, with the project able to spin off successful research and experience in banana skipper control in other countries. This is a rare case of a research project requiring no extension to have an impact but similar situations could be sought.

Three approaches can be effective in terms of building change processes (extension) into research projects: i) farming systems research, ii) participatory technology development, monitoring and evaluation and iii) the group development model.

Farming systems research (FSR). The term seems to have fallen out of favour these days. Yet, its original rationale was to substitute for the perceived lack of resources available to extension systems for linking farmers and researchers. Although FSR can be characterized by words such as applied, adaptive, participatory, promotive, etc., its underlying and most pervasive feature is to link researchers with farmers and thus be compatible with or substitute for extension. ACIAR has implemented many projects in Indonesia under a “farming systems” umbrella to enhance the probability of successful impact.

Participatory technology development, monitoring and evaluation. A paradigm shift took place in the 1990s from FSR to farmer-led “participatory methods” for farmers' own use (Chambers 1993). These methods include participatory technology assessment as well, with emphasis on exposing farmers to a range of technological possibilities and encouraging them to experiment. Some people with experience in this approach maintain that farmer participatory research has not lived up to its promise, based on little evidence in the literature of technology invented by formal scientist-farmer interaction (Bentley 1994, pg. 142). According to Bentley (1994, pg. 143) the only standard to judge farmer participatory research is its ability to generate useful new techniques for rural people. This highlights the need for careful monitoring and evaluation of participatory research projects and programmes to ensure quality control and to document and evaluate impacts.

Participatory monitoring and evaluation have conceptually the same objectives as extension – to bring about innovation and change. Thus participatory technology development as the extension “medium” can improve extension services. Monitoring and evaluation (M&E) are integral parts of participatory research though in practice it has not always been given sufficient attention. In the present context, the primary concern is not with routine monitoring of project activities, such as employment of staff or acquisition and disbursement of inputs, but with the continuous or periodic assessment of project impacts as well as evaluation beyond the project's life and focus area. The scope

for M&E activities in projects such as the *Forages for smallholder project* that started in 1995 is potentially enormous. The project aims to develop forage technologies in partnership with smallholder farmers in upland areas to improve livestock feeding and management of natural resources. The project involves a network of smallholder farmers, development workers and researchers in Indonesia, Lao PDR, Malaysia, Philippines, Thailand, Viet Nam and southern China.

M&E can be accomplished through conventional or participatory means. If the objective is to establish whether a change is due to the project's activities, it may be better to use participatory techniques that draw on the detailed local knowledge and experience of farmers and field workers within the project area. Using farmer focus groups and farmer case studies involving semi-structured interviews can provide in-depth understanding of the reasons for observed impacts that conventional methods don't provide. Participatory techniques also empower local people to initiate, control and take corrective action.

Group development model. Groups are encouraged to form around an issue or entry point, which all group members have in common. Extension first address the immediate simple skills of the entry point, later exploring related issues such as health, group solidarity or farm management. This model forms the basis of the landcare movement worldwide. ACIAR is currently conducting a landcare project, now in its third year, in the Philippines with impressive results and achievements so far. Devolution of the function of agricultural extension to local government units in the Philippines is seen as a major weakness on one hand, but it provides the opportunity for a close linkage between the community and government. The landcare model seeks to add technology to that linkage.

The benefits of the group model are considerable and the drawbacks are mostly in the areas of leadership and management of the groups (poor leaders can discourage the rest of the group). Extension workers also need considerable retooling to work as facilitators.

The examples show that different models will be suited to different situations (often due to the particular historical institutional arrangements that are in place). It may often be more practical to work within those constraints (practical realities) rather than trying to implement a whole new system. In all cases, the bureaucratic separation of research and extension would seem to be a hindrance, since it is clear from many of the models presented that research and extension are part of a continuum and not entirely distinguishable one from the other. Many of the strategies undertaken are really models for "breaking down" the "artificial" separation of research and extension.

ACIAR proposes to continue or expand activities in this sphere of work. However, ACIAR's funding base is restricted to catalytic research rather than sponsoring major institutional reform. ACIAR thus emphasizes ensuring that pathways to adoption (or extension) linkages are either available to its projects or can be integrated within them.

Information and communications opportunities for technology transfer and linkages

Presented by Dr Alexander G. Flor, Programme Officer, SEAMEO-SEARCA
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Moving beyond the Agricultural Age and the Industrial Age, the world is now into the Information Age. The main engine of this age is information and communications technology.

ICT usually refers to new-generation technologies spawned by the marriage of computers and telecommunications. But it is also the product of the convergence of digital technologies encompassing computers, telecommunications, audio-video and publishing. It covers mobile phones, personal computers, the Internet, e-mail, imaging technology, digital video, even cable television. ICT types range from Web-enabled, network and stand-alone technologies.

The agricultural sector has lagged behind in exploring and tapping the potentials that ICT has to offer. These potentials range from the sharing and re-use of data, research finds, lessons learned and best practices among research and extension institutions to developing quick response mechanisms for agricultural and natural resources crises situations; from permitting informed decision-making among agricultural officials to sounder policy-making among legislators; from improving the extension delivery systems in the rural areas to bringing e-commerce to farmers.

By definition, ICT relates to the convergence or the process of increasing the interface between two systems. Convergence in agricultural extension is finding a common platform for the research, extension and production systems for sharing and re-use of knowledge. That platform has been made possible by digital technology. In more concrete terms, ICT allows information generated by the researcher to be more efficiently accessed by the extension worker so that it can be more effectively transferred to and applied by the farmer. A case in point is the United Nations Development Programme-funded Mango Information Network (MIN) that SEAMEO-SEARCA established at the Philippine Council for Agriculture and Resources Research and Development in 1997. Research results on mango production, mango pests and disease and post-harvest technology were made available on the Internet, specifically for extension workers based in strategic mango producing areas. The extension workers, in turn, transmitted the results to the farmers. At times, the interface was so substantive that the roles between the researcher and the extension worker, and the farmer, began to blur. Traditionally, the researcher is considered the source of information, the extension worker is the channel and the farmer the receiver. However, in the MIN, boundaries between those traditional roles at times dissolved. More progressive farmers accessed research information themselves through the Web without going through the extension workers. Occasionally, the farmers become sources of local information for the researchers.

Basically, ICT facilitate two elements critical in the research-extension-farmer interface and technology transfer process: information access and networking. The storage and retrieval of research results facilitates information access while telecommunications facilitates networking. In both elements, several strategies and approaches have been employed

Strategies and approaches

Capacity building of support agencies. Increasing the institutional capability involves system design and development; hardware and software procurement and staff development. The approach does not directly target the ultimate beneficiary but the service that provides support to the farmer.

Knowledge management. This is a newly emerging discipline that combines organizational dynamics, knowledge engineering and ICT to manage the intellectual assets of an organization or, as in the case of development projects, a system. The goal is the sharing and re-use of knowledge and makes available to the farmer both documented and tacit knowledge of subject matter specialists in agriculture. Knowledge management offers vast potential to the research-extension-farmer interface. And though it may be Web-based or stand alone, extension workers and farmers in areas that have minimum Internet penetration can tap into it through a system of exchange of multimedia products stored on CD-ROMs, removable hard drives, zip drives or even diskettes.

Programmatic ICT strategy. The ideal approach is using ICT directly to improve farmers' access to information and secure their linkage with research, extension and market subsystems. Critics of this approach find it difficult, if not impossible, because i) farmers are not computer literate and many of them are not even functionally literate; ii) ICT is very expensive and farmers would rather spend on basic necessities; and iii) the unavailability of cellular phone and Internet service providers in rural areas.

But proponents argue in response that employing low-end, low-cost ICT, achieving economies of scale and using a programmatic instead of a technologic approach can address the problematic issues. A programmatic intervention with a comprehensive set of attendant services would include pre-financing, market linkages and technical assistance.

Technology transfer modalities

Using low-end ICT in rural areas. Small independent initiatives are being undertaken the world over to employ ICT in rural development. The most common are the introduction of mobile phone, PCs, the Web and Internet kiosks to impoverished communities.

For example, Grameen Bank founder and director, Professor Muhammad Yunus, has embarked on innovative projects to spread ICT access. The first is a Grameen Bank-initiated cellular phone project, dubbed the Grameen Phone Company, that is putting a mobile phone in some 45,000 villages to give residents access to ICT. Each phone is acquired by an individual through a small loan from the bank. The phone then becomes a community telephone service provider and earns income for the owner.

Professor Yunus is following up with an experimental *Village computer Internet programme* that can provide an e-mail and Internet service to villagers. Instead of paying for phone calls to contact relatives in cities or abroad, villagers now can e-mail for a fraction of the phone call cost. Farmers will be able to check market prices and wholesalers in Dhaka by exploring the Web.

Geographic information system. Another potential modality for agricultural extension and technology transfer is the GIS output map. According to Fisher and Nijkamp (1992), GIS is a computer-based information system that attempts to capture, store, manipulate, analyse and display spatially referenced and associated tabular attribute data for solving complex research, planning and management problems. ESRI, the software producer, (2000) described it as a computer-based tool for mapping and analysing things that exist and events that happen on earth. GIS technology integrates common database operations, such as query and statistical analysis, with the unique visualization and

geographic analysis benefits offered by maps. In other words, GIS is a system that adds a spatial dimension to traditional databases by incorporating geo-referenced data.

Applied to agricultural research, GIS becomes a powerful tool for the analysis, interpretation, presentation and application of research results in on-farm trials or even farmers' fields. It produces accurate and contextualized, visual and location representations of relationships between climate and commodities, soil type and recommended crops, productivity and cropping patterns, nutrition and land-use, agricultural technology and poverty. GIS provides a value-added service to research data by bringing in visual and contextual elements that bring to life concrete abstract concepts. An extension worker can better appreciate research results when seen in GIS output maps, can easily arrive at its implications and is better able to relay it to farmer-clients.

Knowledge networks. A knowledge network is a complete Intranet system. Its main function is to facilitate the sharing and re-use of information and knowledge between and among the nodes of the network. Currently, SEAMEO-SEARCA hosts two knowledge networks: the ASEAN Integrated Pest Management Knowledge Network, established in 1998, and the Biotechnology Information Centre, established in 2000. A third knowledge network known as the Southeast Asian Sustainable Agriculture Knowledge Network is being proposed.

Opportunities and prospects

The existing development assistance environment is most favourable for tapping ICT for agricultural extension and technology transfer. The Okinawa Summit of G7/G8 nations established the primacy of bridging the "digital divide" in the international development assistance agenda. Japan is fine-tuning its US\$15 billion *ICT financial and technical assistance programme*, to be partly administered by the Asian Development Bank with Cambodia, Lao PDR and Viet Nam identified as priority recipients. The World Bank has maintained its *Information development grants programme* that makes up to US\$250,000 per grant available to deserving projects. And the European Community has established its own IT fund for "A User-Friendly Information and Knowledge Society" with an Asia ICT component programme. Several bilateral aid agencies have also prioritized ICT issues.

The conditions are ripe for agricultural extension and technology transfer to reposition themselves *vis-à-vis* the new information and communications environment.

Policy, institutional and human resources development framework

Presented by Dr Mohan Kanda, Additional Secretary, Ministry of Rural Development,
Department of Land Resources, India

The preceding 50 years have been a period of unprecedented progress on many fronts. A half century of food and agriculture has not only been a long period but also an extraordinary eventful one. Indeed, no other such 50-year period in history has perhaps seen such wide-ranging and rapid changes in world agriculture. Yet these very years have left in their wake a host of unresolved problems, new challenges, risks and uncertainties. In the era of globalization, disparities and inequities are as striking as they are unjustified. The poorest 20 percent of the population accounts for slightly more than 1 percent of global income while the richest 20 percent enjoys 86 percent.

Despite considerable advances in agriculture, most of the world's farmers have been using inefficient manual tools and their plants and domestic animals have benefited very little from the advancement in the techniques of breeding and selection. Moreover, these under-equipped farmers, with insufficient resources and inefficient production methods are exposed increasingly to fierce competition from better-equipped and more productive farmers as well as to the strong trend of decline in agricultural prices. The ongoing process of globalization and market liberalization may unleash opportunities for all, but access to them will be by those who have the requisite resources, information and expertise.

Issues

Policy. Most countries do not have in place transparent and clearly enunciated agricultural extension policies. Consequently, research is not driven by demand – of the farmer through the extension system. As well, extensions systems are monolithic institutions and not sufficiently pluralistic. And ownership of information, knowledge and skills still remains an unresolved problem.

Many weaknesses and gaps have been attributed to weaknesses or deficiencies in the structure and organization of conventional technology-transfer systems. Some of the most basic or common causes are structural gaps, linkage work assigned to inappropriate units, insufficient authority to ensure coordination of activities, highly centralized systems and differences in legal status.

Human resource development. While the extension system has been adequate to the tasks demanded from it over the past 50 years, the fast-changing external environment and variations in demand has caused it to lose its relevance, credibility and self-esteem. It is necessary for the top-down, uniform and rigid characteristics to transit to a participatory, bottom-up and demand-driven syndrome.

Farming systems approaches. Policy reforms in agriculture extension envisage the replacement of the old single discipline-based, commodity-oriented approach of the training and visit system by the farming systems approach. This approach considers the farm, the farm-household and off-farm activities in a holistic way to take care not only of farming but also aspects of nutrition, food security, sustainability, risk minimization, income and employment generation that make up the multiple needs of farm-households.

Knowledge-intensive agriculture. It is expected that future agricultural growth will largely accrue from improvements in productivity of diversified farming systems with regional specialization and sustainable management of natural resources, especially land and water. Increases in productivity are likely to come from the more efficient use of inputs. To achieve this, more knowledge and information inputs are required from extension services. Extension will have to respond to specific farmers' requests for information in a demand-driven mode rather than pushing pre-determined

technology packages. It must provide situation-specific recommendations rather than technology messages marketed across large recommendation domains.

Expanding research agenda. Research and extension are being forced to embrace a broadened mandate. Local organization development, mobilization of farmers into groups, watershed management, micro-enterprise, marketing linkages, post-harvest technologies and value addition, access to credit, risk management, management of agribusinesses, together with environmental and natural resource management issues, rural infrastructure and other non-agricultural issues are all areas that need to be factored into this relationship in a productive and pro-active mode.

The Asia and Pacific region

Asia and the Pacific is a vast region with a varied range of agro-climatic conditions that provide a congenial environment for success of an equally diverse range of agricultural activities, be it crops, livestock or fisheries. About 6 percent of the labour force in Asia is in agriculture. There is need to synergize the strength of natural resources and human capital. Effective partnership among those countries would help in the prioritization of their extension needs at the regional level and initiation of appropriate activities for the benefit required by all of them. There is an urgent need for institution support to regional publications, such as newsletters, technical reports, success stories, case studies, etc. and support for the establishment of a Regional Information Network. Development of a consortium approach for the basic and strategic extension work on a pilot scale in some highly relevant and priority areas also needs to be taken up.

Pooling and sharing of information is an overriding priority. Lessons need to be learned from individual cases and mainstreamed into country programmes and policies. Several successful initiatives have been taken across countries in the region. These success stories need to be adopted and replicated wherever possible.

The road ahead

Holistic, contemporary, forward-looking and equity-driven policy statements need to be made by all nations loudly and clearly in regard to the agricultural sector. The generation of assessment, refining and transfer of technology will then have to follow in the shape of action plans whose implementation would need to be closely monitored.

Farmers need up-to-date information on sources, quality and cost of agricultural inputs and also on the potential of different techniques and technologies used for production and processing of agricultural growth. They also require information relevant to strategies that can enhance the quality of their livelihood. It is important that this information is available in an appropriate format and language and that farmers have the capacity to access and analyse it and the ability to act on it.

With the winds of liberalization blowing and the withdrawal of trade barriers under the new World Trade Organization rules, there is a major shift from production-driven agriculture to market-driven farming. To enable the farming community, especially the resource-poor farmers, to reap the fruits of liberalization and globalization, agricultural extension must play a pro-active role in empowering them to take advantage of the arising opportunities. Extension services will need to be radically restructured to make technology dissemination responsive to needs of farmers. Innovative institutional arrangements need to evolve to make the extension system farmer-driven and farmer-accountable.

Experiences show that strength of small farmers lies in group mobilization. Strong farmers' organizations can effectively stimulate a client-driven response from agricultural research and extension systems and can be an important mechanism in articulating specific research and extension

needs, accelerating technology dissemination and in developing the technical and managerial skills of member farmers. There is thus need to support the effort to organize farmers into functional groups.

In the emerging pluralistic scenario, the role of the public extension agencies would need to be redefined. From being solely providers of service, they need to graduate to an approximate mix of the roles of provider, coordinator, facilitator, enabler and regulator.

A suggestive futuristic framework. A framework of the building blocks that could form the structure of future strategy could perhaps take the following steps, among others:

- The extension system should be participatory, bottom-up and demand driven.
- Recognition of the need for re-orientation of the philosophy of extension-farm technology transfer mode to technology application.
- Recognition of the need for private-public partnership in agriculture extension management.
- Extension to be broad-based in its programmes by utilizing a farming systems approach.
- Adopt pluralistic research extension approaches that explicitly underscore the need for an integrating mechanism.
- Aggressive privatization of extension systems transiting to a demand-driven and user charge regime.
- Promoting agri-entrepreneurship through agri-clinics and agribusiness centres.
- Recognition of the need for strong research-extension-farmer and marketing linkages.
- An increasingly gender-sensitized extension strategy.
- One-time catch-up exercise for training infrastructure to develop extension professionalism in a cost-effective manner.
- Focussed monitoring and evaluation to improve research extension linkage
- Single window services at decentralized levels using the Agriculture Technology Management Agency (ATMA), India model.
- Extension services to be strengthened to adopt the “pocket-package mode” and target “Impact Shadow Matrices” created by three-dimensional matrices.
- Imperative need for the extension system to achieve “sync” with the outside world. Especially as we enter the “knowledge millennium”, the ability to stay tuned to one’s surroundings assumes increased importance.

SUMMARIES OF COUNTRY PAPERS

Bangladesh

The first agricultural extension work started in pre-independence times in 1914 and spread into wider coverage through the Directorate of Agriculture that was created in 1950. Alongside independence, agricultural extension services in Bangladesh gained momentum but lacked coordination in the 1970s. Better unity and organization came about in the 1980s when six agencies merged into the Department of Agricultural Extension (DAE) and all districts operated under the training and visit system (T&V). Reforms were initiated in the DAE in 1992 to address weaknesses in the T&V system and to introduce the participatory approach in extension delivery. The *Agricultural services and innovation reform project* now conducts extension activities of the DAE.

The DAE is committed, as its mission statement declares, to providing effective, demand-led, decentralized and efficient services “to all categories of farmers, to enable them to optimize their use of resources, in order to promote sustainable agricultural and socio-economic development”.

In line with the Government’s agricultural policy, a New Agricultural Extension Policy (NAEP) was formulated and adopted in 1996. The goal of the NAEP is to “encourage the various partners and agencies with the national extension system to provide efficient and effective services that complement and reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh”.

The current extension approach has six basic features: decentralization, responsiveness to farmers’ needs, working with farmer groups, targeting, use of a range of extension methods and partnership with other extension providers.

Poor links between research and extension are major constraints in the technology flow in Bangladesh. The major research-extension linkages take place through various agencies, such as the National Agricultural Technical Coordination Committee, the Research Institute Coordination Committee and the Agricultural Technical Committee and research institutes’ reports.

The research-farmer linkages are maintained through on-farm demonstrations of regional agricultural research stations, training programmes, field days and distribution of printed materials. The farmers of Bangladesh have yet to enjoy the benefits of the substantial generation of technology for agriculture; the key problem is the diffusion of that technology. There is need to improve information dissemination utilizing all relevant technologies and channels.

The involvement of women is quite important in the country’s agriculture but is not recognized. Under the scope of the 1999 National Agriculture Policy, several programmes aim to enhance women’s greater involvement in agriculture, such as separate extension programmes, trainings and capital support and research to identify constraints to women’s participation in agricultural activities. The DAE, however, does not have an explicit statement of intent that focuses on gender, except its mission statement commitment to address the needs of all categories of farmers, which could imply mainstreaming of gender. Most of the DAE’s projects have been designed to include women farmers as beneficiaries. And to address women’s needs, the DAE has employed about 500 female block supervisors. But most of them end up engaged in official work and perform little extension activity.

Cambodia

Agriculture is an important sector in Cambodia as 85 percent of its population are farmers. The Government's basic goals for the sector are to improve food security through expansion of rice and other food crop production, improve income opportunities for farm households, particularly those headed by women, by diversifying crop production and to add value to crop and livestock production by developing agro-processing industries.

Extension activities began in 1957 when the agriculture ministry set up an Extension Unit that used TV, radio and publications to disseminate information to farmers. All extension infrastructure was destroyed in the 1970s. It returned in 1986 with an extension office within the agriculture ministry and then the Department of Agriculture Extension (DAE) was established in 1995.

The goals of the DAE are to enhance stable farm occupations and improve the quality of rural life in both economic and social aspects for farm and rural populations. With Australian assistance, the DAE developed national extension guidelines using a farming systems development approach rather than an emphasis on extension service. This requires having small agriculture teams with a range of skills in district offices; the main activities involve setting provincial, district and commune farming systems research and extension priorities, including close links between research, extension and farmers; development and implementation of extension programme packages, which are currently in the forming stages; conducting training for staff of different categories and key farmers (via farmer field schools and field days) as well as farm demonstrations and the production of extension materials.

At present, agricultural research and extension services and systems in Cambodia have very weak linkages among the stakeholders, and there are few effective mechanisms in place to foster these links, as most occur on an ad hoc basis. The DAE has tried to develop strong formal linkages at national level with key government agencies, such as the Departments of Agronomy and Land Improvement, Animal Health and Production, Fisheries and of Forestry, the Agricultural college, the Ministry of Women's Affairs and other lead agencies.

China

Feudal ownership of land was abolished 52 years ago with the creation of the People's Republic of China. A new land-reform movement aimed to develop self-reliance and the spread of new scientific technologies. Ensuing political mistakes nearly destroyed the nation's economy and the agriculture sector suffered severely. More reforms and open-door policies followed in the late 1970s, including the family responsibility system that gave farmers their right to make decisions about their land. China now feeds its 1.3 billion people using about 10 percent of the world's cultivated land. China also ranks first in total grain output in the world.

Agricultural extension dates back to ancient times, but links with research and education began at the turn of the nineteenth century. With the adoption of the commune system in the late 1950s, a state extension service was set up at four levels (central, provincial, county and commune). The current Chinese extension system operates at five levels (central, provincial, municipal, county and township) and involves 49,000 extension units, about 400,000 village service groups, 1.03 million farmer technicians and 6.6 million demonstrating households.

Generally, the links among education, research and extension are strong. This paper highlighted findings from two case studies of best practices relating to agricultural extension in China under FAO sponsorship through the Ningxiang county Agro-Tech Extension Centre (CATEC) in Hunan province and the Wuqing CATEC, in Tianjin municipality. Each CATEC includes Township Agro-Technological Extension Stations (TATESs). The studies examined the philosophy, process and

rationale that led to the creation and establishment of the present institutional structure and functions and how these systems follow the principles of client participation, public and private partnerships and decentralization.

General information about Chinese agriculture, agro-research, education and extension, as well as some best extension practices, such as setting up the CATEC to promote the whole system development, generating income to make up budget gaps, adopting multiple methods to fulfil extension's mission and for decentralizing extension to meet the market-oriented economy are summarized and illustrated in the paper.

The paper also noted that both the CATECs and TATESs are facing new challenges since China's entry to the World Trade Organization and in changing from traditional farming to modern farming and from self-sufficient production to commodity production.

India

India's agriculture sector employs 61 percent of its economically active population, which is 15 percent higher than the world average (46 percent). India contains 2.4 percent of the world's total area and 2.3 percent of all irrigated areas that support 16.4 percent of the global population. Although the Indian agriculture sector has made rapid strides in food production that created self sufficiency and avoided food shortages in the country, the pattern of growth across regions and crops and also across different sections of the farming community has been uneven.

The paper highlighted the evolution of the agricultural extension system in both pre-independence as well as post-independence India, including the strategies initiated through community development and technology development programmes and development initiatives with social justice. At present there are four major agricultural extension systems in India: those of the Indian Council of Agricultural Research, the Ministry of Agriculture and state departments of agriculture, the Ministry of Rural Development and state development departments and of NGOs and the private sector.

The challenges facing agricultural extension are fourfold – enhanced production and productivity, equality and uneven development, sustainability and enhanced profitability, which calls for developing alternative viable and sustainable extension modalities. The extension services in the public and private sectors work without clear policy direction and are characterized by uniformity rather than specificity. The key questions needing to be considered are what changes in the role of public extension are required and what policy direction is necessary to develop other viable and sustainable sources of extension to farmers?

To address those challenges, a broad framework of extension modalities has been suggested that are based on the analysis of the frontline extension system of state agricultural universities, as well as experiences in working with self-help groups, the federation of farmers' groups, the quality-upgrading programme of small tea growers and in public-private partnerships.

The primary features of the framework are farmer-centred and farmer-led, reducing the function of the main extension system to a facilitating role that provides technology assessment and refinement through innovative Farmers' Clubs. As well, there is emphasis on micro-level dissemination of technology through homogenous self-help groups and use of IT for providing market intelligence and weather forecasting. The framework includes emphasis on quality upgrading, training through farmer schools, gender perspectives in the formation of farmers' organizations, flexibility in planning, programming and funding through resource interdependence, collaborative professional activities and plurality of information providers.

Indonesia

Agriculture extension is defined as non-formal education for farmers and their families (men and women) and aims at, among several issues, their self-reliance in managing farming, business and living. Different extension methodology and approaches are implemented in each region. Overall, the promotion of client participation, community empowerment, partnerships and decentralization concepts and methodologies have been at the core of agricultural extension reforms.

The research, extension and farmer links in technology development and transfer is based largely on the implementation of participatory and partnership concepts. In developed regions, however, where farmers are better educated and experienced, participatory approaches are more appropriate than in less developed regions. Partnership models commonly implemented in the extension programmes are standard: central and local government; government and private sector; local government and farmers; private sector and farmers. They also include cost and technical sharing.

The skills of extension personnel are improved continuously, in theory, through various technical training and formal education, such as distance learning, in order to meet the various needs of farmers. However, these programmes have not been adequate to meet the increased needs of farmers. Decentralized agricultural extension has provided an environment for improved operations in the linkages between research, extension and farmers. Instead of being end users of research, farmers now are regarded as partners in the research and extension process. It is also recognized that needs and problems encountered by farming families are social and economic issues as well as technological and should be addressed by researchers and extension workers in helping them. This interactive model in agricultural technology development has resulted in higher rates of technology adoption by farmers. A case study in one district in Yogyakarta indicates that collaborative activities led to 92 percent of participating farmers applying the recommended technology.

Among the continuing challenges is the attitude, or trust, of extension workers and researchers towards farmers' capability in managing farming as well as research and extension activities, which ultimately discourages farmers' participation. The trust of farmers towards extension workers and researchers is another issue.

As Indonesia looks to develop a technology-based agribusiness industry, it is recommended that there be greater focus on national research, the flow of information in society to meet diverse as well as specific demands, building strategies for participatory agricultural technology transfer, farmer empowerment and strengthening farmers' problem-solving skills, among other issues. Regarding the international trade of agricultural products under globalization, extension workers will disseminate only standardized information and the farmers will produce and process these products according to set standards. Independent institutions will assess the application of standards to ensure cost-effective linkages.

Republic of Korea

Agricultural research-extension-farmer interfacing and technology transfer, commonly called extension services, have helped Korean farmers in achieving self-sufficiency in rice and the year-round supply of green vegetables. It also has helped in the upbringing of rural youth through the guidance of 4-H club activities and in providing leadership for *Saemaul Undong* (new village movement).

Agricultural research and extension services are organized through the Rural Development Administration. The Government of the Republic of Korea changed the status of extension educators from central government staff to county/city government staff in 1997, following its democratization

and localization efforts. The National Institute of Agricultural Biotechnology, attached to the National Rural Living Science Institute, was established in 2002.

The decentralizing extension services brought about various problems, such as: 1) decreased morale and number of extension educators, thus weakening the extension education function; 2) weakened linkages between national and local extension offices, 3) less opportunity for in-service education of extension educators, and 4) weakened linkages between agricultural research and extension, etc. Also, extension services need more funding and manpower to meet the emerging needs of environmentalists, agriculturists and consumers, but the national extension budget has not reflected these needs.

Among the many recommendations for integrating knowledge and assuring food security are the needs to recognize extension educators as high-calibre professionals and to restore the morale of extension educators. Also, the lack of access to agricultural resources and services, including research and extension, poses a fundamental constraint to farmers. Successful models for research-extension links in a decentralized system are still needed. It should be recognized, however, that some functions are best provided centrally due to economies of scope or scale, such as extension service training and production of materials. Support systems for Web development and information and long-term education and training systems for technology are needed. Recognizing gender dimensions in all community development programmes as well as in extension and technology development and transfer is also recommended.

The paper emphasized that because of the critical importance of diffusing innovations to agricultural producers in order to ensure quality and steady food supply, it is crucial that these issues be addressed before the extension service further deteriorates. Further research activities on agricultural extension should also be conducted to make the extension system in Korea far more effective.

Malaysia

Malaysia's agriculture is in a process of rapid transformation, in line with the country's shift in paradigm from a production economy to a knowledge economy. Around 19 percent of its total land area is devoted to agriculture and is dominated by two major industrial crops: oil palm and rubber. The agricultural sector contains highly commercialized and efficiently managed estates, which are mostly owned by private companies, corporate entities or public land development agencies, and comparatively less efficiently managed small farm holdings. The average size of a small farm holding is about 1.45 ha. In the past few decades, a group of commercial producers involved in high-value crop production, especially fruit and vegetables, have emerged to play an important role in market-oriented agriculture.

Extension services were introduced into Malaysia with the formation of the Department of Agriculture (DoA) in 1905, and for the small farm holders involved the training and visit system. But the former target groups are being replaced with younger, well trained and more entrepreneurial groups, including commercial farms and investors and women's groups. Modalities have been modified so that the small farmers will benefit through their share of land with the young entrepreneurs managing farms. The current model is an adapted version of the T&V system and has achieved MS ISO 9002 certification in its Group Farming Extension Service.

Group farming was introduced as way to overcome problems of economies of scale in the commercialization process. In providing the extension service, the technical and other requirements of the group farm project replace the impact points under the previous T&V system. Farm visits are scheduled and focus on solving problems at the project level as well for obtaining farmers' feedback.

About 4,500 group farm projects have been implemented. Currently, the focus of extension work is to develop a business approach in managing the group farms to be competitive and involves developing business plans, crop check, farm records and farm performance evaluation.

Precision in group farming in the context of MS ISO 9002 is to ensure that the agronomic practices related to achieving the potential yield is practised by the farmers. The human resource programme thus focuses on the extension officers to enable them to transfer the required technology for the farmers to practise and on the necessary preparations to ensure timely execution of the crop schedule. The DoA provides various advisory and consultation services that cover the areas of financial feasibility study, soil management, crop package technologies and control of crop pest and diseases.

Land use priorities and ageing human resources who consider agriculture a way of life rather than as a business are issues confronting extension service. Flagship, or model, programmes include a 10 ton rice project, nucleus farms, permanent food-production park, satellite farm, idle land development project and coconut replanting project. Making available opportunities for trained skilled manpower – the young farmers – to be utilized in agricultural production/development is seen as an important strategy towards sustainable modern agriculture in the country.

Nepal

Nepal contains a diverse agro-ecological setting and a myriad of cultures. With its 40 percent contribution to GDP, agriculture is the main occupation for the majority of Nepalese. But the majority of farmers have a very small land holding – less than 1 ha per family. Land distribution is skewed and only one-third of the total cultivated area is under irrigation.

It was only after the 1950s that planned development began in Nepal and agricultural extension activities were started with American assistance. There have been frequent changes in the organizational structure; a Department of Agricultural Extension was established in 1966, which continued until 1972 when it was merged into the Department of Agriculture, within the Ministry of Agriculture and Cooperatives (MoAC). The consolidation detracted from the status of extension work and has resulted in a lack of professionalism, absence of appropriate perspective and hence a gradual decline in organizational productivity.

Currently there are agricultural development offices in all 75 districts; each is headed by an agricultural graduate of any discipline of agriculture and supported by a few subject-matter specialists. There are 932 agricultural service centres and agricultural service subcentres within the districts. However, extension is detached from research and education: The Nepal Agricultural Research Council is an autonomous research organization. Similarly, agricultural education is within the university system. This separation has created weak linkages and research has limited contact with farmers. No research in extension is undertaken at all. And though Nepal is socially, culturally and ecologically a diverse country, extension teaching methods and approaches are stereotyped. Agricultural development efforts are target-oriented and based narrowly on increasing production, without due attention to market potential. And grassroots level extension agents are technically ill prepared to help farmers.

Some cross-cutting issues such as globalization (particularly as it relates to genetic material and the rights of farmers) and gender have influenced extension administration. Concepts like projectization and privatization of extension are of recent origin and still are being closely monitored. Similarly, the Women Farmers Development Division of the MoAC has mostly been working on women issues to a limited extent but there is a realization that a more visible gender perspective in agricultural development is needed. Among the constraints confronting the progress are the weak links

among institutions and the regard for women farmers as a homogeneous group though they differ substantially in social, cultural and economic behaviour across ecological zones of the country.

The agricultural communication media and training methods need to be sensitive to the diverse ethnic mix of the nation and serious thought should be given to creating a unified extension service organization to revitalize and strengthen extension performance.

Pakistan

Pakistan is a federation of four provinces where, until recently, the provincial governments were responsible for agricultural extension and research functions. Each province is divided into various commodity-specific zones. An agricultural research institution, the Pakistan Agricultural Research Council (PARC), was established in the late 1970s. Each province has a Directorate-General of agricultural extension that administers the extension network down to the union council level, the lowest tier of local government and composed of three to five villages.

The current Government recently devolved agricultural extension from the provincial level to the newly elected district governments, which puts it more similar to the American system of county extension. All agricultural and sister organizations, such as fisheries and livestock, are under one manager known as the executive district officer of agriculture. Despite many resources and other constraints, its agricultural extension is perceived as having performed adequately well. Pakistan recently switched from being a net food-importing country to a food-exporter. Agricultural extension figures prominently in that achievement.

Pakistan has embarked upon some national and some donor-driven initiatives in rural and agricultural development. A major impediment is the lack of effective systems of management and coordination among the various actors involved in the process and coherence among the programmes. The role of marketing principal commodities has recently shifted to the private sector. Pakistan is currently faced with the dilemma that technologies developed by the National Agricultural Research System are lying untapped. The PARC launched a technology transfer programme in all provinces in 2002 using the traditional communication support system and backed with IT-based means of dissemination.

While the women's role in agriculture is widely recognized, little research and development work has been done to corroborate the findings and to orchestrate gender-specific technologies that alleviate the drudgery they undergo in farm operation. Most of the farm technologies designed are male-focused.

The country report analysed Pakistan's agricultural extension system relevant to research-extension-farmer interface and technology transfer. The analysis included the historical evolution of, and a description of the current, extension systems and programmes, organizational structure and reasons for success and failure of various approaches and programmes. Emphasis is being placed on developing and upgrading extension personnel's skills, particularly in IT to manage the demands presented by globalization and trade liberalization. In-service training institutes and agricultural universities are being revamped. Various policy measures to be instituted by the Government in order to improve the effective functioning of agricultural extension system in Pakistan were outlined.

Philippines

The Philippines not only has a long history with agricultural extension, it also has a decade of experience with decentralization in which local government units (LGUs) took responsibility for extension services, shifting delivery from top-down to participatory strategies.

Generally, Philippine agriculture struggles with the challenges posed by the global trend toward free trade. However, the shift towards decentralization, that took place with the Local Government Act of 1991, resulted in various problems such as poor linkage between research/development and extension, lack of clear-cut agricultural extension objectives and mission, and inadequate financial and communication support (although the current ratio of farmers to extension agents is very low at 732 to 231).

To address those and other challenges, the Philippine extension system uses a variety of innovative technology delivery modalities. Among others, there is the *Techno Gabay* programme of the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development and its regional R&D consortia and farmer field schools and a farmer-scientist training programme, both within the Department of Agriculture. The farmers' information and technology service, or *Techno Pinoy*, a kind of one-stop information and technology service, a Farmer Scientist Bureau, the Farmers Bayanihan Center for Rural Development (FBCRD) of the Department of Agrarian Reform (DAR), the Technology Promotion Centre of the Land Bank of the Philippines and information, education and communication strategies in incorporated into the delivery modalities.

Support programmes to sustain and evolve the systems needed are ICT modalities and gender-responsive human resource development programmes. There is a need for greater harmony of all modalities and stronger linkages among the producers and users of information and knowledge and for more effective and efficient extension service that is able to actively support local enterprise development.

Sri Lanka

While playing an import role in the economic development of Sri Lanka, agriculture has also been facing challenges that have prompted decreases since 1990 in its contribution to the GDP and employment. And at the same time, agriculture involves almost 70 percent of the population directly or indirectly in the agricultural sector. Foreign exchange earnings depend upon the export of namely tea, rubber and coconut. Sri Lanka's main food crop is paddy rice.

Some of the challenges facing the sector are decreasing productivity, stagnating yields, increases in the costs of production and decreases in farm income. This has resulted in migration of farmers to urban areas, reluctance of the second generation to take to farming and above all the decrease in labour force in the rural sector.

The agricultural extension system in Sri Lanka over time has used mainly generalized methodologies with marginal success. The Department of Agriculture introduced the training and visits system in the late 1970s through a World Bank-funded extension and adaptive research project. The extension system has been entirely the responsibility of the public sector with very little input from the private sector and NGO community. With a new Constitution in 1987, agricultural extension came under the purview of the Provincial Councils. After 1998, however, there was no formal extension methodology practised in the field.

Currently, the agricultural environment in Sri Lanka is in transition; the country is on the verge of self-reliance in rice, but there is an increased rate of abandoning rice cultivation that began in

the 1980s. Demand for high-quality food commodities in the domestic market is increasing. In the past few years there has been increasing investment in high-value crops with improved and sophisticated requirements and increasing demand in new crop varieties. The use of micro irrigation techniques in protected and open environments is also increasing.

In view of the need for diversification and the introduction of new technologies to the agricultural sector, Sri Lanka has embarked on a new approach of cooperation between the public and private sector to provide extension services to the farming community. This process is now in its pilot stage and does also keep in mind the need to service the pro-poor farming community as well.

Thailand

Agriculture is the foundation of Thailand's economy. It engages 56 percent of population and uses 41 percent of land. The Government's national and economic social development plans have encouraged the commercialization of agriculture, moving away from subsistence farming towards intensive monocrop production for export. The continued high growth rate of the non-agricultural sector has had adverse impacts on the agricultural sector. Production efficiency remains relatively low because only 24 percent of the total cultivated land is under irrigation. Small farmers have farm holdings of less than 2.4 ha, which is usually in non-irrigated areas.

Since 1967, Thailand has initiated formal Agricultural Extension approach by establishing the Department of Agricultural Extension. Due to significant the changes in rural social and economic conditions, the agricultural extension approach has been adjusted in order to provide proper services and effective ways of working with farmers.

Beginning in 1993, extension officers as well as the personnel of other agencies under the Ministry of Agriculture and Cooperatives (MoAC) have worked with farmers in a more participatory way. Extension officials increasingly have learned to respect farmers' indigenous knowledge and capability. In 1999, the MoAC established subdistrict Agricultural Technology Transfer and Service Centres (ATTCs) nationwide with the aim to transfer agricultural knowledge and provide one-stop service of MoAC agencies' services to local farmers. The concept also relies on farmers' participation in the process of thinking, making decisions and formulating and managing farm plans. Activities considered success are promoted throughout the subdistricts. The centres are run and managed by representatives of community members.

Currently the ATTCs' strategies and aims to develop the capacities of communities are being integrated in a *Capacity building in sustainable agriculture project*. Each community has to identify its own capacity and assets and mutually develop its own project with assistance from the extension agents whose role is changing to that of "facilitators".

Viet Nam

Agriculture extension began in the Mekong Delta between 1988 and 1993 with the establishment of provincial agricultural extension centres and district agricultural extension stations.

The Mekong Delta is Viet Nam's major rice production region; it occupies about half the total rice-sown area and produces more than half the total rice of the country. The general objectives of the extension service is to improve rural life and develop the rural communities by increasing total farm productivities and produce quality seeds, particularly rice, for export.

In recent years, Viet Nam's agriculture extension has expanded with the extension of worker networks at the village level and with the creation of thousands of farmers' clubs/groups containing total membership of more than 46,000 members. Advanced technologies are transferred through the network.

But there are constraints on the extension personnel: Most extension agents are agricultural technical workers and only a few have any formal training in extension. As well, equipment for agricultural extension activities are inadequate, particularly at the district level and almost not available yet at the village level. Investment in agricultural extension is also inadequate, particularly for salaries for the village extension workers. The farmer-extension worker ratio in the delta area is quite high, at about 1,000. The selection of suitable agricultural extension and technology transfer methods is limited. Extension programme planning is quite top-down in focus. And monitoring and evaluation of agricultural extension activities is rarely done, resulting in limited effectiveness.

Thus, training in extension, strengthening equipment systems for activities, developing the network continuously at the village and district levels, improving salaries and planning and strengthening monitoring and evaluation of activities are needed to increase efficiency.

THEMATIC GROUPS' FRAMEWORKS FOR PROJECTS TO ADDRESS THE CONSULTATION'S RECOMMENDATIONS

Thematic group I: Globalization, liberalization and the changing demands and role for agricultural extension

Members: Amrin Zakaria, Nie Chuang, Kailash N. Pyakural, Kalim Qamar, Alexander C. Castillo
and Belitia A. Vega

Project A title: *The institutionalization of an international body for agricultural and
rural extension*

Objectives:

- To improve the capacity of the extension discipline to generate international funding support.
- To promote extension objectives.
- To professionalize extension.
- To provide a forum and promote networking among extension practitioners by sharing experiences, information, etc.
- To conduct comparative studies on extension and its linkages with relevant institutions.

Output:

- A strong lobby group or forum created for financial and technical assistance and for promotion of extension services.
- More professionalized extension managers and support staff.
- Wider opportunities and venues for regional consultations and sharing of information.

Activity 1: Consultation with bilateral and multilateral agencies and extension-related national, regional and international organizations on the concept of an international body for agricultural and rural extension.

Who: FAO HQ and regional office
Timeline: six months

Activity 2: Outlining of the strategy to create the forum, including its structure and terms of reference.

Who: FAO
Timeline: three months

Activity 3: Further action by the forum.

Who: to be determined
Timeline: to be determined

Project B title: *Capacity-building programme in agriculture and rural extension for LGUs in Asia and the Pacific*

Objectives:

- To prepare LGUs in planning and implementing participatory extension programmes.
- To build up the capacity of LGUs to establish linkages to promote financial and technical (including markets) partnerships.
- To familiarize LGUs on the impacts of globalization and prepare them for changes.

Outputs:

- Increased awareness among LGUs and various stakeholders on the changes and opportunities of globalization and trade liberalization.
- Improved participatory planning and implementation capabilities of the LGUs and other stakeholders.
- Extension training materials to promote participatory approaches.

Activity 1: Selection of pilot countries (three to four countries).

Who: FAO

Timeline: three months

Activity 2: Conduct needs-assessment studies for each selected country.

Who: FAO consultant

Timeline: six months

Activity 3: Drafting of the detailed proposal.

Who: FAO consultant

Timeline: three months

Thematic group II: Research-extension-farmer-market-civil society linkages: New horizons and extension modalities

Members: Dato Ismail Bin Inbrahim, Sing Var, Sugunya Athipanam, Kenneth Menz, R, Padmaja and R. B. Singh

Project A title: *Improving farmer-extension-research linkage*

OBJECTIVE	OUTPUT	ACTIVITIES	RESPONSIBILITY	TIME FRAME
Document and use participatory methods to better link farmers, extension personnel and researchers	Compendium of available methods developed	Landscape available methods	FAO	5 years
			Countries	
	New methods developed	Choose the best fitting method(s) for the country	FAO/countries	
			FAO/countries	
	Human capital enhanced	Develop new methods	FAO/countries	
		Build human capital of all participants, especially extension personnel	FAO/countries FAO/countries	
	Adoption of participatory methods enhanced			
	Publication (print, Web)	Implement new methods		
		Monitor and evaluate the process		
		Share findings with a wider audience		

Project B title: *Sharing success stories*

OBJECTIVE	OUTPUT	ACTIVITIES	RESPONSIBILITY	TIME FRAME
Document successful cases of bringing about innovation and change by farmers	Indicators of success developed	Define criteria of success	FAO	1 year
	Publication (print, Web)	Search for successful cases	FAO/ individual countries	
			FAO/ individual countries	
		Analyse reasons for success and possibilities for extrapolation	FAO/ individual countries	
		Documentation for wider dissemination		

Thematic group III: Information and communications opportunities for technology transfer and linkages

Members: N. F. C. Ranaweera, Waqar Hussain Malik, P. Das, Alexander G. Flor, Kamolrat Intaratat and R. Balakrishnan

Rationale

Information and communications technology constitutes a significant mode of agricultural communication. The magnitude of ICT penetration varies among countries, and regional countries differ among themselves in their level of development in the IT and communications sectors. But the reality of advances in the ICT environment in the context of globalization and liberalization should be recognized to develop strategies to enhance the extension efforts in the region. ICT could be a tool to empower extension professionals and also farmers.

The need of the day is to use information and communications technologies to support agricultural extension, not to replace it. Recognizing this need, it is important to consider the approximate mix of information and communications technology. Furthermore, ICT is not only concerned with logistics but is a tool to reach a wider audience. Networking at the micro level is a major concern; at the macro level, IT dissemination is not a problem. The poor rural infrastructure poses barriers to IT penetration though communications infrastructure fares better in relative terms.

The challenge and focus in this new information environment should be one of repositioning agricultural extension and retooling extension professionals. How should agricultural extension reposition itself given the new information and communications environment? How should agricultural extension workers retool themselves given the new information and communications technology?

Four interventions

1. Policy

- a. ICT policies should be structured to fit the scale of country and level of advancement of ICT. Such strategies and programmes should be directed to improve access ICT among extension personnel.
- b. From the institutional perspective, collaboration among NGOs, the private sector and national information technology agencies should be identified and strengthened to address ICT-based extension approaches and retooling extension agents.

2. Infrastructure

The hardware, software and network infrastructure for extension should be upgraded.

3. Content

- a. The emerging concerns in the ICT sector for agricultural extension should focus on content in the programmes.
- b. Given the current situation of inadequate success stories and appropriate content, it is important to focus on:
 - i) Documenting and distributing examples of best practices of technology transfer.
 - ii) Producing cases studies regarding application of ICT for agricultural extension and rural development.
 - iii) Grouping the database and content areas under the broad framework of “Environmental Spanning”, which is defined as “broad-based information content to meet the needs of farmers” and includes a gender dimension.

- c. In preparation of content for the ICT programmes for extension, the following should be included:
 - i) Involve community members in identifying the content.
 - ii) An indigenous knowledge bank to preserve and pass on indigenous knowledge (including that of women).
 - iii) A gender-specific database for planning both policy and programmes.
 - iv) Links with WAICENT and CGIAR agriculture information.
 - v) Resource management: GIS, NRM, etc.
 - vi) Technology for both farm and household production.
 - vii) Marketing information.
- 4. Programme planning and development**
- a. Explore the possibility of identifying donor support to reposition and retool extension service in the ICT environment to empower extension agents to serve farmers effectively in coping with global changes.
 - b. Open university system and distance-learning programme modalities (both ICT-based and communication-based) could also be used in retooling extension professionals.
- 5. Capacity building**
- a. Even in the context of ICT-driven development, it is the human component aspects that are important and non-replaceable, especially as many rural areas are still poor and farmers are still traditional in their behaviour and way of thinking.
 - b. The training approach should also review the potential for training youth (girls and boys) and using them as peer group trainers. The training of trainers models can be applied in training extension agents in scaling up or retooling skills.
 - c. The different client needs and client skills should direct ICT decision-making. A typology of tools should be assembled, similar to that which follows.

TYPOLOGY OF INFORMATION AND COMMUNICATIONS TOOLS FOR AGRICULTURAL EXTENSION

INFORMATION AND COMMUNICATIONS TOOLS	CONTENT			
	Research-extension	Extension-farmer	Extension-market	Farmer-market
Knowledge networks	Experts network			
Knowledge bases	On-line publications Research results	Research results Technology packages	Pricing policy	
GIS output maps	Agro-ecosystem Demographics	Precision farming		
Community telecentres			Technology Market information	Market prices Potential markets
Digital broadcasts		Agricultural technology	Prices and markets	Prices and markets
Digital audio-video Desktop publishing	Documentation of best practices and success stories	Documentation of best practices and success stories	Documentation of best practices and success stories	Documentation of best practices and success stories
Databases	Research Data			
VHF/UHF TV		Agricultural technology Market information	Agricultural technology Market information	Market prices Potential markets
AM/FM radio		Agricultural technology Market information	Agricultural technology Market information	Market prices Potential markets
Audio-video	Documentation of best practices and success stories	Documentation of best practices and success stories	Documentation of best practices and success stories	Documentation of best practices and success stories
Print media		Agricultural technology	Agricultural technology	Market prices Potential markets
Folk media		Agricultural technology	Agricultural technology	Market prices Potential markets

THEMATIC GROUP III: LOGICAL FRAMEWORK

OBJECTIVES	OUTPUT/ INDICATORS FOR SUCCESS	ACTIVITIES	RESPONSIBILITY CENTRES	TIME FRAME
1. To provide the appropriate policy environment for ICT in agricultural extension through advocacy	<p>An approved national policy in the form of an administrative order that provides for the formation of a national extension workers network</p> <p>An approved national policy in the form of an administrative order that provides for the use of appropriate ICT in agricultural extension</p> <p>Provision of ICT hardware, software and networks to the national extension agencies of the three pilot countries</p>	<p>Policy workshops Policy formulation Policy advocacy</p> <p>Policy workshops Policy formulation Policy advocacy</p> <p>Needs assessment Infra design Installation</p>	<p>FAO-RAP FAO/ National Extension Agency National Extension Agency</p> <p>FAO-RAP FAO/ National Extension Agency National Extension Agency</p>	
2. To provide the appropriate hardware, software and network infrastructure to agricultural extension systems in India, Pakistan, Sri Lanka, Thailand and the Philippines	<p>Pretested prototypes for each conventional and digital media</p> <p>National master plans in agricultural extension employing ICT</p> <p>National and local training programmes on ICT utilization for extension workers and other stakeholders</p>	<p>Needs assessment Materials design Production Planning workshops Design of master plan</p> <p>Needs assessment Training design Implementation</p>		
3. To design and develop appropriate content prototypes using conventional digital media	<p>National and local training programmes on communication materials production for extension workers and other stakeholders</p>	<p>Needs assessment Training design Implementation</p>		
4. To develop national extension programme plans using ICT				
5. To build the capability of extension workers and other stakeholders in ICT				

***Thematic group V: Policy, institutional and human resources development framework**

Members: Patricio S. Faylon, Muhammad Monirul Islam, Sung Soo Kim, Mohan Kanda, S. Kannaiyan and P. S. Geethakutty

PROGRAMME/ PROJECT TITLE	OBJECTIVES	OUTPUT	ACTIVITIES	RESPONSIBLE ORGANIZATION	TIME FRAME
<u>Agriculture extension support programme</u> : Meeting the Knowledge and Technology (K&T) Demand of the Liberalized Markets	1. To develop the capacity building of extension systems/ focusing on knowledge and skill development	Competent and professional extension human power <ul style="list-style-type: none"> • Training for selected SUCs • Selected CSOs (NGOs, FOs, etc.) 			
<u>Rationale/problems</u> There is an urgent need to meet the knowledge (K) and technology (T) needs of extension systems (ES) in the liberalized markets and environment	2. To strengthen the institutional structure and infrastructure in extension systems	Network of centres of excellence in extension systems <ul style="list-style-type: none"> • Curriculum • Training & management modules • Extension infrastructure/facilities in all levels 			
<u>Causes</u> <ul style="list-style-type: none"> • Lack of appropriate policy support to the ES • Lack of appropriate institutional structure and infrastructure • Low level of K and skills (SK among agents • Inadequate/non-availability of training materials/extension tools to meet the demand of the ES 	3. To create an enabling policy environment and framework for ES	Extension policy <ul style="list-style-type: none"> • Recruitment policy • Career development • Extension framework • Gender perspective approach Laws, rules, regulations affecting extension systems			

*The fourth theme of gender dimensions in agricultural extension and technology development and transfer was discussed in separate groups in mid-meeting and was presented in the main body of this report.

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