Proceedings

Sub-Regional Workshop on Application of ICT for Enhancement of Extension Linkages, Coordination and Services

Hammamet - Tunisia, 22 - 24 November, 2004

Food and Agriculture Organization of the United Nations
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Sub-Regional Workshop on Application of ICT for Enhancement of Extension Linkages, Coordination and Services

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<td>Agricultural Extension and Rural Development Research Institute</td>
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<td>AKIS/RD</td>
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<td>ICARDA</td>
<td>International Centre for Agricultural Research in the Dry Areas</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IRESA</td>
<td>Instituts de Recherche et d’Enseignement Supérieur Agricoles</td>
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<td>JICA</td>
<td>Japanese International Cooperation Agency</td>
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<td>Programme d’Appui aux Organisations de base en Tunisie d’Inter Coopération (Fondation Suisse)</td>
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<td>FAO Sub-regional Representative</td>
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<td>UTAP</td>
<td>Union Tunisienne de l’Agriculture et de la Pêche</td>
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Foreword

Global and regional changes affecting the agricultural sector in general and farmers’ livelihoods and food security in particular, are reshaping agricultural extension worldwide. Globalization; market liberalization; increased decentralization; growing role of the private sector; deterioration of the natural resource base coupled with persistent population growth and increased rural poverty, pose tremendous challenges for extension institutions to readjust their strategies and services. Whereas rapid advances in science and technology; developments in communication methods and tools; and increased access to information provide opportunities that can assist extension and other agricultural knowledge institutions in facing emerging challenges and contributing effectively to sustainable development in their countries.

In this context, Communication for Development is examined as a potential area for strengthening extension and research for development in support of small-scale and resource-poor farmers. Communication for Development, including ICTs, provides a potential tool for building partnerships and enhancing coordination among extension, research, education and other actors in rural development, such as farmers’ organizations, NGOs, private sector, and market information agencies.

Convergence of traditional communication practices and media with new communication technologies such as the Internet and mobile phones can greatly enhance people’s ability to share experiences and knowledge in support of agriculture and rural development. There are some unique attributes offered by ICTs such as for reducing isolation, facilitating dialogue, participation and fostering interactive networks. FAO pilot project: ‘Virtual Extension-Research Communication Network’ (VERCON) in Egypt is one of many good examples.

In light of the above, the FAO Regional Office for the Near East and Sub-regional Office for North Africa jointly organized a sub-regional workshop on “Application of ICT for Enhancement of Extension Linkages, Coordination and Services”, in Hammamet, Tunisia, from 22 - 24 November, 2004. The meeting brought together senior officials of extension and research from countries of North Africa to share views and experiences, and to help identify future steps towards the adoption of appropriate communication for development tools for effective linkages and coordination among their respective institutions and other public and private bodies active in rural development.
SECTION ONE
WORKSHOP REPORT
Sub-regional Workshop on Application of ICT for Enhancement of Extension Linkages, Coordination and Services

Hammamet, Tunisia, 22 - 24 November, 2004,

Workshop Report

I- ORGANIZATION OF THE MEETING:


Objectives of the workshop were to:

- Discuss challenges and opportunities facing agricultural extension;
- Assess the role and potential of communication and modern ICTs in the context of agric extension;
- Share experiences from the region;
- Identify implications for FAO’s and member states’ priorities and future interventions;
- Identify challenges and constraints to the greater use of Communication /ICTs in agric extension and show ways of overcoming these constraints;
- Identify common principles and develop a framework for applying ICTs for improved pro-poor extension.

The meeting was attended by 20 participants representing extension and research institutions from Algeria, Libya, Mauritania, Morocco and Tunisia, as well as ICARDA, JICA, PAOTIC, and UTAP. List of participants attached as Annex II. Language of the workshop was English with simultaneous interpretation provided in French.

II- OPENING SESSION:

The workshop was inaugurated at 09:30 on 22 November 2004, by Mr. Mustapha Sinaceur, FAO Subregional Representative for North Africa (SRR) and Mr. AbdelAziz Mougou, President of IRESA, as representative of the Ministry of Agriculture and Water Resources in Tunisia.

In his opening statement, Mr. Sinaceur welcomed the participants on behalf of FAO. He indicated that Extension and Research were essential elements for improved productivity, rural poverty alleviation and sustainable development. Effective linkages and coordination between extension and research institutions on the one hand, and other actors in knowledge and information systems on the other, would have significant effect on the relative success or failure of these systems in achieving their objectives and contributing effectively to sustainable development in their countries.

Mr. Sinaceur referred to global changes and challenges shaping the agricultural sector throughout the world and their impact and implications on agricultural extension institutions, such as increased and diversified farmer needs for information and services, multiple information sources and service providers, and emerging partnerships.

He underlined that in the context of increased decentralization, emergence of pluralistic systems of extension and diversified information needs and sources in the rural sector, communication for development, including new ICTs were recognized as a crucial tool for effective and efficient coordination at all levels.
He further invited participants, as leaders in extension and research to share views and experiences and help identify future steps towards the adoption of appropriate communication for development tools and approaches for effective linkages and efficient coordination among their respective institutions and other public and private bodies active in rural development.

The Sub-regional Representative concluded by thanking the Government of Tunisia for hosting the workshop in the beautiful city of Hammamet, and for the hospitality and continued support to FAO programmes. He also thanked the participants, resource persons and staff who assisted in organizing the workshop.

Mr. M. AbdelAziz Mougou, President of IRESA, addressed the meeting on behalf of H. E. the Minister of Agriculture and Water Resources. He welcomed the participants as well as the organizers, and thanked FAO for organizing this meeting in Tunisia. He also expressed his appreciation for FAO for handling the important subject of communication and ICT in Extension, and for its continued efforts in enhancing coordination and services in the agricultural sector.

The speaker reviewed the main challenges facing agriculture in many fields, namely desertification, depletion and degradation of the eco-system, free trade and access to export markets. He noted implications of the new trade agreements (standardization, dismantling of tariff barriers) that compel countries to elaborate information, communication and extension strategies, and to integrate the marketing approach within their programmes, to alert and prepare farmers for the changes occurring in these fields.

Mr. Mougou highlighted experiences of Tunisia in research and sustainable agricultural development, underscoring the country’s efforts for establishing synergy between research and extension institutes on the one hand and farmers on the other. He stressed the need to invest in knowledge and to reach farmers with relevant information and packages; and noted that required technologies and channels often existed, but the question remained of coordination and how those channels are used to make research results and viable information available to farmers. This can only be achieved through setting up gateways and linkages between farmers, extensionists and researchers as well as other stakeholders in agricultural development. He concluded by reiterating his appreciation to FAO and also ICARDA for working to place information at the service of all users.

III- SESSION I:

The session was chaired by Mr. M. Sinaceur, SRR. The chairperson started the session by requesting the participants to introduce themselves indicating their position, organization, main interests and expectations from the workshop. He then requested the meeting to appoint a reporter, to work with the secretariat in preparing the workshop report.

The meeting appointed Mr. A. Lakhdar (Algeria) and Ms. D. Azzouz (Tunisia) as reporters.

Ms. Clare OFarrell, Communication for Development Officer, SDRE, briefed the participants on the organization of the meeting, objectives, process and expected outputs. She outlined the meeting’s expected outputs as follows:

- ‘Lessons Learned’ for Communication approaches & ICT applications in extension;
- Better understanding of actors and partnerships including FAO role;
- Recommendations for appropriate communication approaches and ICT applications at national and regional levels;
- Identify regional priorities for project formulation;
- A framework or set of common principles for the use of Communication and ICT in agricultural extension;
- A published report.
The participants commended FAO for taking the initiative in organizing this workshop and stressed the importance and relevance of the topic in light of current developments in the global environment. They regarded the workshop as a good starting point providing an opportunity for sharing experiences and learning about developments in other countries, in order to come up with doable recommendations towards adoption of appropriate communication for development and ICT tools in support of extension reform in countries of North Africa.

**i- Agricultural Extension in the Near East and North Africa: expanded scope, changing structures and emerging partnerships:**

Ms. May Hani⁰, FAO, presented the subject. Salient points of her presentation were as follows:

Several challenges face the agricultural sector in the Near East with consequences on farmers’ livelihoods and food security, and eventual implications for agricultural extension. National agricultural extension systems are faced by changes brought about by globalization; free trade agreements and market liberalization; increased decentralization; and the growing role of the private sector. Climate change; environmental degradation; deterioration of the natural resource base coupled with persistent population growth; and increased rural poverty pose additional challenges to extension institutions to readjust their strategies and services. Whereas rapid advances in science and technology; developments in communication methods and tools; and increased access to information provide opportunities that can assist extension and other agricultural knowledge institutions in facing emerging challenges and contributing effectively to sustainable development in their countries.

In response to global changes, a number of institutional reform initiatives are triggered throughout the world. These include, but not limited to the revised Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) initiative, put forward by FAO and the World Bank; and the National Agricultural Extension Systems Reform Initiative (NAESRI), from FAO. Key trends in agricultural extension emerging in the Region include among others: a broader scope for extension; decentralization of government structures; emergence of pluralistic extension systems; new partnerships; and eventually, new roles for public extension institutions.

In this context, there is a marked need for coordination, participatory planning; networking; information/experience sharing; evaluation and dissemination of lessons learnt; monitoring; and of course, quality control. All are clearly public roles that should be assumed by a high-capacity public institution, evidently the extension institution, with reviewed mandate and well trained staff to undertake the new tasks. Failure to do this, results in lack of coordination, causing extensive overlap, sometimes contradiction and confusion to rural communities and always leaving technical, geographical and social gaps, with most probably the poor and illiterates left behind. Communication for development, including new ICTs is recognized as a crucial tool for effective and efficient coordination at all levels. Communication methods and tools provide powerful means for fostering strong collaboration in agricultural research, training, extension and education interventions.

Notwithstanding significant developments, contributions and achievements of national extension institutions in North Africa, most of them nowadays are faced with constraints that have considerable impact on their performance and effectiveness. A recent FAO study on agricultural extension systems in the Near East revealed several constraints affecting extension in the Region. In North Africa, responses received from Algeria, Morocco and Tunisia identified a number of constraints facing public extension institutions and affecting their functions to differing extents. Those include: shortages in human and financial resources, weak linkages with research, education and other relevant actors; lack of coordination and absence of a

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⁰ May HANI, Regional Extension, Education and Communication Officer, FAO Regional Office for the Near East

¹ The Near East Region according to FAO classification consists of 32 member countries, extending from Mauritania and Morocco on the Atlantic coast in the west to Central Asia, Pakistan and Kyrgyzstan in the east

² North Africa according to FAO classification consists of five countries, namely, Algeria, Libya, Mauritania, Morocco and Tunisia
common integrated vision for research, extension and education within the rural development policy framework, as well as limited coverage and low capacity in production of extension messages and materials.

Agricultural extension is evidently an area where ICTs has a potential impact in overcoming several constraints related to institutional linkages and coordination as well as issues of staff reduction and physical isolation in rural areas. New ICT initiatives when integrated with communication for development approaches enable extension and research institutions to address farmer needs timely and effectively towards sustainable agricultural development and food security. In addition, well-planned communication networks provide viable tools for linking partners, enhancing coordination and facilitating documentation and sharing of experiences and lessons learnt among physically remote partners at national and regional levels.

Countries of North Africa share a number of similar characteristics in socio-cultural and agro-climatic conditions that provide fertile grounds for regional cooperation and partnerships in research and extension, which would ensure complementarities in efforts and better utilization of natural resources towards sustainable development and food security. Communication tools and approaches can provide feasible linkages in support of regional cooperation and partnerships, linking relevant institutions and organizations to facilitate information access and sharing.

**ii- Research for Development: Experiences of ICARDA in the Maghreb:**

Mr. Mohamed El-Mourid, Regional Coordinator for Maghreb, ICARDA, informed the meeting on ICARDA’s experience on Research for Development in the Maghreb Region. In his presentation he underlined key challenges that face sustainable development and food security in the region, namely, global climate change and droughts, water scarcity, land degradation and desertification, and low adoption of new technologies at large scale in rainfed agriculture. Poverty is still high mainly in the rural areas where 60-70% of the poor are concentrated. Factors contributing to poverty in rural areas include high unemployment among women and youth, high illiteracy rates, and low productivity per unit of land, water and labour.

The evolving Strategy of ICARDA, embodied in its Medium-Term Plan 1998-2000, and approved by TAC, outlines the organization's revised mission and mandate as follows:

*ICARDA’s mission is to improve the welfare of people through research and training in the dry areas of the developing world, by increasing the production, productivity and nutritional quality of food, while preserving and enhancing the natural resource base.*

Poverty Alleviation has been the key driver for evolvement in ICARDA. Other factors include: Water scarcity; Desertification; Biodiversity loss; Diversification; New Science; as well as an internal call for integration.

Main themes for ICARDA's Research Program are: Germplasm Enhancement; Production Systems Management; Institutional Strengthening: Socioeconomics and Policy; and natural resource management as a cross-cutting issue.

The organization adopts four strategic approaches in agric. research to alleviate poverty, mainly through:

- Improved technologies: Improve productivity (particularly per unit of water); and sustain resource use through technologies that are applicable by resource-poor farmers.
- Resource management practices: Conserve natural resources without decreasing productivity.
- Diversified farming systems: Reduce risk; Increase resource-use efficiency; and improve returns to farm labour.
- Improved vertical integration from producer to consumer; Added value to product; and improved quality

Development projects implemented by the organization can be grouped into two categories, thematic and cross-cutting.

- Thematic projects: Management of Scarce Water Resources and Mitigation of Drought in Dry Areas; Integrated Gene Management: Conservation, Enhancement and Sustainable Use of Agro-biodiversity in
Dry Areas; Improved land management to combat desertification; and Diversification and Sustainable Improvement of Rural Livelihoods in Dry Areas.
- Cross-cutting projects; Poverty and livelihood analysis in Dry Areas; and Knowledge management and dissemination for sustainable development in Dry Areas

Main research domains and activities implemented by ICARDA in North Africa include:
- Genetic Resources and Germplasm enhancement.
- Production systems: cropping systems and livestock systems.
- Integrated Natural Resources Management (INRM): Water, rangeland, mountains, medicinal plants, watershed.
- Diversification: livestock products added value, cactus, medicinal plants.
- Community development: sustainable livelihoods approach, community approach, participatory approach.
- Human resources development in new sciences: biotechnology, GIS, ICT, participatory approaches.
- Backstopping to development projects.
- Dissemination of information: workshops, documentation, networking, and Websites (ICARDA, LRKB).
- Building partnerships

ICARDA has several partnership initiatives with FAO in North Africa/Maghreb sub-region. Those include:
- Food legumes rehabilitation in the Maghreb countries.
- IPM: orobanche and food legumes.
- Forage production: REMAV.
- Barley for food.
- Policy for accelerating technology uptake by small and medium farmers in the Maghreb.
- On-farm research in wheat based systems in the Maghreb countries.
- Exchange of information and coordination

**iii- Discussion:**

In the discussion that followed, participants highlighted the need to review and reflect on previous experiences, current situation and future prospects in agricultural extension. They also indicated the need for participatory planning of extension approaches involving farmers and other actors in rural development, with special consideration to the needs of resource-poor farmers.

The meeting acknowledged that Communication for Development including ICTs provided a potential tool for building partnerships and enhancing coordination among extension, research, education, farmers and other actors in rural development. It indicated the importance of building national as well as regional partnerships and cooperation towards sustainable agricultural development in North Africa, especially in light of global developments in economic and trade aspects.

Countries in North Africa had significant agro-climatic and socio-economic similarities that make regional cooperation of considerable benefits for agricultural extension and research institutions. Political will and support are essential for building viable partnerships at national and regional level.

**IV- SESSION II:**

The session was chaired by Mr. M. El-Mourid, ICARDA. It included two case studies from the Region, and a presentation on successful initiatives in Communication for Development and ICT application in extension.

**i- Agricultural knowledge and Information Systems for rural development (AKIS/RD): case study from Morocco:**

Mr. Abdallah Gaaya\(^4\) introduced the concept of AKIS/RD which links people and institutions to promote mutual learning and generate, share and utilize agriculture-related technology, knowledge and information. The concept

\(^4\)Abdallah GAAYA, former SDRE Agricultural Training and Extension Officer, FAO
as shown in the diagram below, links farmers, agricultural education, extension and research in order to harness knowledge and information from various sources for better farming and improved livelihoods.

“The Knowledge Triangle”

The speaker noted that over the years agricultural technology solutions have benefited farmers’ agricultural productivity and global food production has increased, however, many farmers fail to benefit from technological and other advances. AKIS/RD institutions have not been responsive enough in addressing the problems and opportunities facing farmers. Farmers have a variety of needs which exceed the traditional requirements for agricultural technologies as farmers now have a number of information and support needs to enable them to operate in competitive environments. This poses new challenges for extension services. New approaches to AKIS/RD exist to overcome these issues and new concepts are emerging for participation, learning and problem solving between the key players in an AKIS. New Information and Communication Technologies (ICTs) are advancing rapidly and when combined with traditional media they offer the potential for increasing interaction between the players in an AKIS.

Mr. Gaaya discussed a case study on AKIS/RD in Morocco to illustrate the above concepts. The agricultural sector in Morocco is characterized by a great many players in research, education and extension as well as farmers and farmers’ organizations. This environment is complex and at present there are few coordination activities linking these key actors. There are also insufficient, unequally distributed and under valorised human resources as well as low financial resources leading to an alarming deterioration of facilities and infrastructures. The case study also found that management of resources and coercive procedures was inefficient.

As a result of the AKIS case study undertaken by FAO, 2 projects were formulated in Morocco and a third one based on the AKIS concept in Tunisia, namely:

- Étude sur la configuration structurelle et les mécanismes de liaison des composantes de la filière technologique agricole (Morocco).
- Appui à la vulgarisation et à la formation participatives pour le développement de la production du blé dans les périmètres irrigués du Gharb (Morocco).
- Appui à la vulgarisation et à la formation participatives pour le développement de la production de Ble’ (Tunisia).

The presentation concluded with potential activities which could be taken forward by the participants and FAO. These were:

- Support of AKIS/RD viable development projects by FAO and/or the World Bank.
- FAO Technical Assistance during field project preparation, implementation, monitoring and evaluation.
- A Forum for further and extensive discussions on pilot application of AKIS/RD (eventually a Global Expert Consultation on AKIS/RD could be organized by FAO).
Communication for Development and ICT application in Extension: successful initiatives:

Ms. Clare OFarrell, FAO, introduced the concept of Communication for Development and ICT, and discussed its application in agricultural extension. Salient points of her presentation can be summarized as follows:

Knowledge and information are essential for empowering rural communities. Communication is central to this process. Indeed without effective communication there can be no development. The convergence of traditional communication practices and media with new communication technologies such as the Internet and mobile phones can greatly enhance people’s ability to share experiences and knowledge in support of agriculture and rural development. There are new actors who need to communicate not only extension, but farmers’ organizations, NGOs and private sector providers, market information organizations and let’s not forget the role of telecommunication and broadcasting organizations. These intermediaries play an important role in enabling rural communities to identify and articulate their needs and to access relevant information for the co-creation of knowledge.

The Communication for Development Group within FAO provides technical assistance to member states to develop communication policies, methodologies and to apply a variety of media in support of agriculture and food security (www.fao.org/sd/kn1_en.htm). The objective for using communication approaches (such as participatory approaches, community planning, etc) and traditional and new media (such as pamphlets, theatre, radio, video and the Internet) is to enable rural people, development workers, local authorities and national decision-makers to come together to identify issues and priorities and to jointly develop strategies and actions to address their needs.

The revolution in digital communications are fast transforming the way production is organised, the way governments provide services to their citizens and how people all over the world interact with each other. There are some unique attributes offered by ICTs such as for reducing isolation, facilitating dialogue, participation and fostering interactive networks. For the first time those using ICTs can be producers of their own information, not just passive recipients. However, this growth in networking calls into questions our understanding of information and knowledge and raises questions of ownership of knowledge.

At the same time the agricultural sector is experiencing many challenges especially during the transition towards more market orientated sectors. The traditional role for extension as the intermediary in ‘technology transfer’ has not delivered the intended impact, and extension services are under increased pressure to respond to wider agricultural issues such as marketing and livelihood diversification. There is now a shift towards more participatory development which includes wider stakeholders such as community members, research teams and development agents who come together to identify research parameters, market viability and livelihoods strategies. New demands for agricultural extension opens the door for examining how communication can be addressed more effectively using new ICTs. However technological challenges have still to be addressed such as the lack of trained communicators, poor ICT infrastructures, high costs and limited access to ICTs and lack of relevant content. Overriding this is also the low literacy rates throughout developing countries.

FAO is faced with the challenge of ensuring that its members engaged in agricultural and rural development are best equipped to organise in the global economy. Working to redress the rural digital divide (www.fao.org/rdd), FAO has identified key determinants for appropriate application of ICTs in communication projects and works with partners to provide technical assistance in the following ways:

Rural communities and households:
Participatory Communication, Community Radio and FarmNet.

5 Clare OFARRELL, Communication for Development Officer, SDRE, FAO, Rome
Rural institutions:
Virtual Extension and Research Communication network (VERCON),
Market Information Systems (MIS) and ICTs for Distance Education

Policy-makers and their advisers:
Food and Vulnerability Information Mapping System (FIVIMS)

Global information Services:
The World Agriculture Information Centre (WAICENT)

iii- Virtual Extension-Research Communication Network (VERCON): Case study from Egypt

Mr. Mohamed Shaker informed the meeting on the experiences of Egypt in implementing the FAO initiative of Virtual Extension-Research Communication Network (VERCON). Salient points of his presentation were the following:

VERCON is a conceptual model that employs internet-based ICTs to strengthen linkages among agricultural policy, research, and extension institutions and individuals. The VERCON innovative nature is its capability to achieve effective linkages by connecting geographically dispersed people and enhance two-way communication, managing large volumes of data and rapidly collecting, processing and dispersing information in a variety of forms.

VERCON stakeholders in Egypt are farmers, farmer organizations, extension centres, directorates of agriculture, regional research stations, the Central Administration for Agricultural Extension Services (CAAES), the Agricultural Extension and Rural Development Research Institute (AERDRI), the Central Lab for Agricultural Expert Systems (CLAES), the Economic Sector/Ministry of Agriculture and Land Reclamation, and the Central Administration for Research Stations.

The VERCON components/sub-systems include the Economic Statistics Database; Extension Bulletin Review; Agricultural News System; Agricultural Expert System; Farmers’ Problem Tracking; VERCON Forum; and a Monitoring System.

VERCON users as of March 2002 consisted of 43% researchers, 29% extensionists, 10.5% farmers, and the remainder unspecified. Since its establishment, VERCON provided advice and solutions for over 2490 problems, 2281 of which were related to production of various commodities.

VERCON is now evolving and expanding into a Rural and Agricultural Development Communication Network (RADCON). RADCON is a three year project launched in April 2004 supported by the Italian Cooperation with FAO technical assistance. The project aims at enhancing coordination of all stakeholders in agricultural and rural development in support of farmers.

iv- Discussion:

Presentations and proposed initiatives generated considerable interest which was reflected in the discussion that followed. The meeting pointed out the need to take into consideration all actors in the AKIS/RD, including new partners from the private sector, producer organizations and service providers. Farmers and their

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6 Mohamed SHAKER, Director, Agricultural Extension and Rural Development Research Institute (AERDRI), Cairo, Egypt
representatives are at the centre of the system. Farmer knowledge, which is based on experience, intuition and innovation is recognized as an important component of the AKIS.

The meeting acknowledged that in any successful communication intervention, information needs to be relevant and appropriate in language and content. With the current developments in communication/ICTs and proliferation of private information sources/media in rural areas through radio, TV, newspapers, bulletins, etc, the flood and sometimes contradiction of information, may cause considerable confusion. Extension would need to play a role of communication filter of information received through different media.

The meeting appreciated the potentials of communication and ICTs in bringing actors together, linking people and institutions, networking and learning together. The VERCON concept provides a good example; however, it is important to establish a system for evaluation of VERCON effectiveness and impact at farmer level, including baseline criteria. An important aim to keep in mind is: how to share the benefits of new ICTs and the wealth of information it gives access to, with farmers especially resource-poor and illiterates, for better services and improved livelihoods.

V. COUNTRY REPORTS:

Country representatives presented an overview of extension and research in their respective countries. This included general information on the agricultural sector; the structure of extension; national and local objectives; policies, priorities and linkages between the institutions of research and extension; as well as the range of communication channels and media used, including ICTs. The participants also highlighted the constraints and challenges facing agricultural extension particularly in light of shifts towards more market orientated agricultural sectors.

From the presentations it was evident that countries in the region have different mechanisms for the provision of agricultural extension services, some are publicly funded, some private and some have a mixture of the two. Despite the different structures there were a number of common constraints facing the five countries particularly relating to: weak coordination between research and extension institutions; difficulties in attracting and training new extension workers and providing ongoing training for existing extensionists who have now to respond to a complexity of demands from farming communities; and lastly, the role of communication media and how it is financed.

The country representatives noted with concern that extension components were often overlooked in agricultural development plans and projects. They commended FAO for its efforts in this field, and suggested including a substantial extension component in agricultural projects, where applicable.

The following unique points are highlighted from the presentations:

i- Algeria:

As of 1988, Algeria has opted for the democratization of public life. In the economic sphere, the passage from a planned economy to a market economy and its corollaries in terms of responsibility, liberalization, autonomy and effectiveness induced a major reorganization of the economic sectors mainly translated in structural readjustment of companies and redeployment of the national economic apparatus. On the instigation of the Breton Woods institutions, Algeria has launched structural adjustment programs and adopted economic reform programmes consisting mainly in correcting structural imbalances in order to optimize the use of available resources.

The Governmental agricultural extension system was adopted in 1985, along the lines of an interventionist approach meeting the requirements of a planned economy. This system has been revised in the few past years to fit in the new environment characterised by the recent reforms introduced in the agricultural field.
so as to promote participatory approaches in the implementation of any development program or project. In the past ten years, extension has tried to tune in with the new agricultural and rural institutional landscape. Today, re-energising extension will have to go through:

- Readjustment of the current national extension apparatus compared to the new PNDAR requirements and the adoption of an extension strategy so as to define both the specific and general objectives to reach;
- The vital necessity to develop linkages between research and extension by the installation of an Intranet network between research institutions (INRAA, INRF, Technical Institutes) and development institutions (DSA and CAW, INVA, training institutions);
- Financing of proximity and mass extension programs: up to now, extension activities have always been funded either within the framework of projects, or indirectly within the framework of the operational budgets of the structures concerned. Never has a specific financing plan or a special extension budget been drawn up;
- Enhancement of extension activities through management, follow-up and evaluation at the various levels of intervention (CAW, DSA, Subdivisions and communities), in particular with regard to the harmonisation of extension tools;
- Enhancement of the partnership with the national media (radio and television) by means of conventions and agreements to consolidate the current organization (implemented since 1995 with ENRS and ENTV) and to reinforce communication in the field of agricultural and rural development;
- Upgrading the level of extension staffing both at the national and local levels, in order to improve their intervention through the creation of a graduate or post graduate higher education structure specialized in extension/development within the structures of higher education (INA, INES, etc);

**ii- Libya:**

The Department of Agricultural and Rangeland Development supervises all agricultural and production projects, agricultural training institutions and specialised agricultural companies. At the level of each “administrative division” is a Popular Committee in charge of supervising and implementing agriculture and animal and marine wealth policies. Agricultural extension is used as a means to link with the farmers, in so far as it is considered as an informal, unofficial educational process, based on persuasion and conviction, aiming to promote changes in the farmers’ attitudes for the management of their land. Main obstacles facing agricultural extension are the following:

- Inexistence or instability of the administrative structure of the agricultural extension services;
- Weakness of the communication channels between the agricultural extension services and scientific research institutions, leading on the one hand to the inability to convey the research outputs to the farmers and, on the other hand, to the impossibility for research institutions to know the implementation results and the point of view of farmers. They can thus have no feedback to orient or enrich their studies;
- Inability of agricultural extensionists to fully devote themselves to extension work;
- Inexistence of full-time farmers and illiteracy among some of them constitute social obstacles for extensionists and prevent farmers from comprehending the importance of agricultural extension and getting familiar with innovative technologies;
- Absence of a regulatory framework governing the relationships between agricultural extension organs, research centres and the parties funding agricultural extension programmes leading to the weakness of the tripartite communication channels between research, agricultural extension organs and the agriculturalists;
- Absence of international and regional efforts in the fields of consultancy and of transfer of technology projects related to agricultural extension has had a negative impact on the promotion of agricultural extension, in comparison with other agricultural activities;
- Need for enhancement and support of rural development by competent agriculture staff in the field of agricultural extension in order to train rural women in the agricultural and economic sectors.
iii- Mauritania:

In Mauritania 80% of the land is desert. The country applied the extension model of Train & Visit (T&V) introduced by the World Bank (WB), which they found to be restrictive and required a lot of resources. In 1998 the country and the initiators within the WB began to recognise the shortfalls of the system and the extension department was left to develop its own devises. With training from FAO, participatory approaches were introduced which apparently gave good results, providing an opportunity for research and extension to collaborate. Prospects in the field of training and extension are the following:

- Provide technical support and advice to producers and foster the creation of socio-professional organizations, so as to improve their production techniques and their productivity, to have easier access to the goods and services necessary to achieve and optimise their production targets;
- Draw a national training plan for the Ministry for Rural Development and the Environment;
- ENPVA plans to take up the training in 2006 of junior staff to remedy for the lack of staff in the fields of supervision and follow-up of development programmes, caused by the structural adjustment;
- Enhancement of linkages between Research - Training - Extension through periodic training sessions of grassroots extensionists (AVB), AMRT, EMP followed by AVB, re-energising the regional development committees.

iv- Morocco:

Trade globalisation impacts the Moroccan agricultural policy. The conventions with the United States, Turkey, Egypt and Tunisia, as well as the association convention with the EU on agricultural trade, urge Morocco to engage in deep reforms for a better optimisation of its production, its agricultural potentials and commercial opportunities, thus allowing it to meet the requirements of competitiveness.

As a matter of fact, the latest developments at the economic and scientific level, the social demand for technologies and the sustainable management of natural resources constitute key elements in the agricultural and rural development policy, such as defined for its orientations, in the 2020 rural development strategy document and in the long-term agricultural development strategy.

Planning extension activities is governed by a process based on a bottom-up approach. Extension programmes are more and more diversified, integrating the various components of rural development. They are managed, coordinated and supervised by the Agricultural Extension Services Division (DVA)/DERD, which is in charge, *inter alia*, of supporting the devolved services for technical conception and the identification of extension means and methods. The objectives and orientations for future strategy in agricultural extension can be summed up as follows:

- Reinforcement of the extension decentralized and ascending approach, taking into account farmers’ demands;
- Reinforcement of proximity extension by the involvement of the civil society and subcontracting of extension activities to “consulting engineers”;
- Targeting extension actions in relation to tracks and ecosystem;
- Reinforcement of linkages with research and training;
- Training of staff in coordination with the higher education and research institutions;
- Enhancement of linkages with Agricultural NGOs and professional Organizations;
- Development of communication;
- Upgrading the structures of proximity.

v- Tunisia:

As of the mid-eighties, the agricultural sector has gained new momentum with subsequent positive results in the fields of food security, self-sufficiency and the promotion of production, in such a significant and continuous way that resulted in production surpluses for several products. On the other hand, investments in the sector were consolidated and the situation of food trade balance clearly improved with the generation of positive surpluses. Thus, the contribution of the sector in the achievement of national development objectives has made a qualitative stride forward.
Research: The seven regional and central institutes and centres are all connected to the Internet and have virtual libraries. The regional centres are connected via AgriNet Network provided by IRESA which is an internet provider for the agricultural sector. Research strategy focuses on: national priority setting, bulletins made and sent electronically, and library resources widely available.

Extension: Extension in Tunisia is state-run at central and regional levels. Regional teams plan and implement extension activities. The Tunisian union of farmers and co-operatives are also emerging so there are other players. CRTA discuss research themes and feedback farmers’ concerns as well as training and meetings with farmers to identify research problems. Information is delivered via workshops and demonstration plots, while FAO programmes have helped introduce participatory approaches. Public extension does not achieve the desired impact especially with small farmers. Human resources are lacking at field level and extension agents are burdened with many other non-extension tasks.

In order to ensure the development of agricultural extension in Tunisia, it is recommended to:

- Ensure the re-training and continuous education of extensionists in terms of communication and organizational aspects;
- Reinforce CRDAs (CTV, CRA) with human and material resources;
- Ensure that extension themes are proportional to available resources and orientate extension programmes along the regional priorities;
- Further develop professional and private agricultural extension through the supervision of agricultural extensionists via the Agricultural Extension and Training Agency and the research institution;
- Carry on the awareness-raising of producers so that they get together into operative groups with a view to facilitate agricultural extension activities;
- Associate the private sector to the production of written and audiovisual supports;
- Enhance the research-extension links.

vi- Discussion:

The meeting noted that whether the structure is public, private or a mix, extension and research institutions shared similar challenges in the region. Extension is called to take up duties it were not called to do before; research and extension still not well coordinated; and the private sector isn’t well developed in many areas. There was a need to develop a strategy for regional partnerships as well as national initiatives.

The meeting pointed to developed countries’ experiences in agricultural extension, noting that some countries had revolutionised their extension structures and got rid of universal methods like T&V. New approaches are adopted including establishing training and research centres of excellence closer to the field. Now researchers work directly with farmers and farmers can actively participate in research programmes.

The meeting discussed that extension institutions, more often than not, still deliver information to farmers without training them on application of new technologies. There is a pressing need to evolve and change the conventional interventions, strategies and approaches.

The need for localised research projects which involve all stakeholders was also highlighted. Instead of pushing information onto farmers, it was important to develop the knowledge with farmers. In some countries there was an overall lack of expertise trained to work in the field with local farmers. The meeting reiterated the need to launch regional programmes with clearly defined targets and objectives in which all actors were involved. Partnering with farmers need to be taken seriously, but equally extension workers need to be trained to carry out a new and complex role in agriculture and rural development. Extension was often conceived as ‘injecting technological solutions’ to farmers and instead extension workers needed to develop the capacity to work with farmers as partners.
A final comment warned that because the top-down approach failed, participation and grassroots level were advocated. However, there were immense problems of scaling up and multiplication of bottom up approaches. It was important to develop an integrated approach that takes into consideration needs, capacities, resources and requirements at all levels.

One commentator noted that in light of previous inefficiency of fixed extension models imposed by donors and development agencies, it is important to avoid adoption of universal models that may not be appropriate for all situations. It was worth noting that rather than proposing universal methods, FAO placed a variety of approaches at the disposal of member countries for them to assess and adapt what was appropriate for the specific context.

VI- WORKING GROUPS:

Participants were distributed into two working groups with a balanced composition in terms of technical fields (extension and research) and country representation. The two groups worked in three sessions to discuss previous presentations; exchange experiences; identify priorities; propose recommendations; and discuss project ideas. The sessions were organized as follows:

**Group Activity 1: Situation, needs and potentials**

- How would you set up a pro-poor agricultural extension system?
  *Principles, structure, actors, mechanism and functions*
- What would be the potential role of Communication (vertical vs. horizontal)?
- What would be the role of ICTs in the system?
- What policies would you recommend?

**Group Activity 2: Partnerships, resources & methods**

- What are the national and regional priorities?
- What resources are available, what else is needed?
- What needs to be done to address these priorities?
- Which 3 factors do you think most influence the take up and application of these recommendations?

Groups reported back in plenary using a table that was provided by the organizers. When discussing partnerships, resources and actions, participants agreed to categorize priorities into three groups, institutional, organizational and methodological. Synthesis of the two groups’ results is provided in table format on page 15.

**Group Activity 3: Development of Project Profiles**

Based on the discussions and recommendations of the previous activities, the groups discussed project ideas and proposed concept, objectives, and expected outputs. The meeting endorsed two project ideas, national and regional, attached in Annex III.

Four participants volunteered to consolidate the results of work groups A and B, namely, Ms. D. Azzouz, Mr. S. Kradi, Mr. A. Lakhdar, and Mr. M. Shaker. The consolidated results from the two working groups were the following:

1- How to set up an agricultural extension system that is responsive to the needs of farmers.

**Main guidelines:**

- Identification of households bearing in mind their socio-economic environment and local knowledge
- Men, women and children are taken into consideration for target messages in terms of awareness-raising and mobilization
Structures:
- Extension, research and training services
- Civil societies - NGOs, professional associations
- Schools in rural areas

Mechanisms:
- Deliberation workshops – feedback, validation for the setting up of action plans and follow up-assessment
- Networks for exchange of experiences between the different actors and between the regions
- Contests, exhibitions and fairs

Functions:
- Role of extensionists and facilitators relies on technical support/backstopping from resource persons

2- Potential Role of Communication:
- Fundamental role in the development process
- Facilitate access to information and sharing information on the needs, potentials and achievements

In this regard two communication aspects are identified:
- Vertical - bottom-up / top-down communication
- Horizontal - intra-and inter-group communication

3- ICT Role in the System:
- Awareness raising
- Information
- Valuation
- Training
- Motivation
- Decision-making help tools

Therefore, there is a need to understand the conventional means of communication, such as:
- Drama and folk media
- Local radio stations
- Printed and audio visual means
- Agricultural extension supports
- Demonstration trials

4- Recommended Policies:

Review and assess past and present extension situation, experiences, achievements, and constraints, to formulate national extension policies taking into consideration needs, priorities, capacity, roles and resources at all levels. Options like restructuring, decentralization, privatization, pluralism, partnerships would be considered in the context of each country to identify appropriate policies and strategies for reform.

Partnerships, resources & methods:

Participants agreed to categorize priorities into three groups, institutional, organizational and methodological. Synthesis of the groups’ results is provided in the following table.
### Group activity 2 - Partnerships, resources and methods:

**Priorities**

| To formulate national extension policies, defining new roles and tasks for agricultural extension |
| To create a favourable environment for poor farmers to participate in their own development |

**Resources**

| Political support; Infrastructure; Human capacities; Qualified and motivated extensionists; |
| Training modules and manuals on participatory and communication skills; Infrastructure; |

**Actions**

| Extension review; Needs assessment; Workshops involving the main stakeholders in the field of extension |
| Participatory needs assessment; Impact assessment; Farmer empowerment to be able to articulate their demands; Capacity building for farmers and extensionists; |

**Influential Factors**

| Political will and commitment; Availability of funds |
| Political support; Availability of inputs; Motivation and incentives |

**Key partners - national/regional**

| Extension, research and teaching staff, NGOs, farmers’ unions and private sector |

### Institutional Priorities

| To enhance synergies and linkages between research, extension and training institutions |
| Enhancement of communication for development skills and channels |

**Resources**

| To create joint committees between research, farmers and extension and to provide appropriate communication facilities |
| Trained personnel; Appropriate infrastructure to extend rural radio networks; Resources to mobilize other media |

**Actions**

| Synchronized review, reform and restructuring of relevant institutions; Develop a clear integrated vision for extension and research in agricultural policies; Adopt appropriate legal and regulatory framework; Create an agenda of events and meetings which provide opportunities for productive dialogue; Exchange of information and experiences through thematic networks; |
| Increase the number and quality of radio and TV programmes addressing rural concerns; Explore other potential communication media and approaches; Capacity building in communication skills and approaches; |

**Influential Factors**

| Political will and commitment; Availability of funds |
| Availability of resources; Functional gateways between institutions and society; Attitude of institutions to adopt new partnerships and practices; Illiteracy level and availability of resources; |

**Key partners - national/regional**

| Research and extension institutes NGOs and professional trainers |
Group activity 2 - Partnerships, resources and methods:

<table>
<thead>
<tr>
<th>Priorities</th>
<th>Resources</th>
<th>Actions</th>
<th>Influential Factors</th>
<th>Key partners - national/regional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development and application of ICTs at national and regional levels</td>
<td>Mobilisation of financial and human resources; Development of Human resources</td>
<td>Workshops at national and international level; Situation analysis and needs assessment; Identify the appropriate tools and applications; Capacity building</td>
<td>Favourable environment; Appropriate infrastructure; Trained personnel</td>
<td>Research, Education and Extension Institutes, Development agencies and NGOs</td>
</tr>
<tr>
<td>To create research and extension programmes to meet the needs of the poorest farmers; To set up a monitoring and evaluation system for research, extension and training programmes</td>
<td>Relevance of human and financial resources and to strike a balance between human and financial resources</td>
<td>Socio economic studies; Participatory planning; Needs assessment; Impact assessment; Joint committees for priority setting and programming</td>
<td>To address situation specific problems; Openness of research institutions to accepting new ways of working; Clear priorities and objectives</td>
<td></td>
</tr>
</tbody>
</table>
VII- RECOMMENDATIONS:

In addition to the above framework, the meeting raised the following recommendations:

- Review and reflect on previous experiences, current situation and future prospects in agricultural extension to build on previous experience and develop a strategy for strengthening extension systems and enhancing their capacity;
- Extension should no longer be conceived as ‘injecting technological solutions’ to farmers. Instead, extension institutions need to develop the capacity to undertake new and complex roles in rural development;
- Formulate national agricultural extension policies defining the mandate, objectives, roles, structure, and actors in extension and farmers training, taking into consideration the needs of women and resource-poor farmers;
- Communication for Development including ICTs provides a potential tool for building partnerships and enhancing coordination among extension, research, education, farmers and other actors in rural development. Examine how extension and research can be made more effective using appropriate communication for development tools and approaches, including ICTs;
- Develop a clear integrated vision for agricultural extension, education and research in national agricultural policies, and build national partnerships taking into consideration needs and interests of all actors in rural development at all levels.
- Countries in North Africa have significant agro-climatic and socio-economic similarities that make regional cooperation of considerable benefits for agricultural extension and research institutions. Build regional partnerships and cooperation towards sustainable development and launch regional programmes with clearly defined targets and objectives involving all concerned institutions and organizations.
- Avoid imposing and adopting universal ‘Ready-made’ models. Take account of other countries’ experiences and successful initiatives, to adapt appropriate approaches and develop tools and methods suitable for the context of the country.

VIII- CLOSING OF THE MEETING:

Several participants made short statements of thanks and appreciation to FAO. Mr. M. El-Mourid, ICARDA, commended FAO efforts and confirmed that ICARDA was interested and ready to work with FAO on a feasible and practical project towards strengthened collaboration and cooperation in the Region.

Mr. M. Sinaceur, SRR, thanked the participants for the high level of enthusiasm, dedication and commitment expressed throughout the workshop, and reiterated FAO readiness to provide technical support in follow-up and implementation of workshop recommendations within available time and resources.

Tribute was also paid to the interpreters, the workshop secretary and Diar El Medina management for their support and availability.

The meeting closed at 13:45 on November 24, 2004
I- FAO STATEMENT

Mustafa SINACEUR,  
SubRegional Representative, FAOSNE

Excellencies, distinguished guests, participants, ladies and gentlemen

It gives me great pleasure to welcome you here today to this workshop on “Application of ICT for Enhancement of Extension Linkages, Coordination and Services”. Extension and Research are essential elements for improved productivity, rural poverty alleviation and sustainable development. Effective linkages and coordination between extension and research institutions on the one hand, and other actors in knowledge and information systems on the other, may have significant effect on the relative success or failure of these systems in achieving their objectives and contributing effectively to sustainable development in their countries.

At present, global forces are shaping the agricultural sector in general with specific impact on the extension and research institutions. A lot has been said on the challenges of globalization, free trade, decentralization, privatization, pluralism, global warming, environmental and natural resource degradation, increased rural poverty and their eventual impact on the agricultural sector, particularly farmers worldwide.

I will not elaborate on these changes as you are all well aware of. Instead, I will pose a simple question: What are the implications of these changes on agricultural extension and farmer knowledge and advisory services?

The answer includes multiple aspects including financial, institutional and technical. Prominent implications relevant to our meeting include increased and diversified farmer needs for information and services, multiple information and service providers, and emerging partnerships. These facts are calling for transformation in agricultural extension institutions to adopt new structures, expanded scope, and foster new partnerships with a broad range of actors from both public and private sectors.

In the context of increased decentralization of government structures, emergence of pluralistic systems of extension service delivery and diversified knowledge and information needs and resources in the rural sector, communication for development, including new ICTs are recognized as a crucial tool for effective and efficient coordination at all levels.

When used appropriately ICTs can overcome several constrains in institutional linkages and coordination, as well as issues of physical isolation in rural areas. FAO promotes two internet based communication initiatives:

- The Virtual Extension-Research and Communication Network (VERCON) linking up research and extension institutions.
- FARMNET - linking up internet based networks with conventional communication channels to respond to farmer information needs.

These and similar initiatives when integrated with communication for development methods and tools enable extension and research institutions to address farmer needs timely and effectively. Experiences gained through implementation of both initiatives will be presented during this workshop.

As leaders in Extension and Research in your respective countries, I invite you to share your views and experiences to help identify future steps towards the adoption of appropriate communication for development tools and approaches for effective linkages and efficient coordination among your institutions and other public and private bodies active in rural development.

At FAO we look forward to the outcome of this workshop and expect you to help develop a set of recommended actions for application of new information and communication technologies towards enhancing linkages and coordination among concerned institutions at national and regional level.
On behalf of FAO, I wish to thank the Government of Tunisia for hosting this workshop in the city of Hamammet, and for the warm hospitality and continued support to FAO programmes.

I wish to conclude by thanking the participants from member countries and development organizations for taking the time to participate in this meeting. Success of the workshop in achieving its goals depends on your valuable contributions.

II- AGRICULTURAL EXTENSION IN THE NEAR EAST AND NORTH AFRICA: Expanded scope, changing structures and emerging partnerships

May A. HANI
Extension, Education and Communication Officer,
FAO Regional Office for the Near East

Introduction:

Global developments are having direct impact on the agricultural sector worldwide, creating challenges for public agricultural institutions, especially, agricultural extension. Public agricultural extension in most developing countries are faced by generally similar challenges brought about by globalization; free trade agreements and market liberalization; increased decentralization; and the growing role of the private sector. Climate change; environmental degradation; deterioration of the natural resource base coupled with persistent population growth; and consequently increased rural poverty pose additional challenges not only to extension institutions, but also to all actors in the agricultural sector, to readjust their strategies and services towards issues of sustainable agricultural and rural development, poverty reduction and food security.

On the other hand, rapid advances in science and technology; developments in communication methods and tools; and increased access to information provide opportunities that when invested properly, can assist extension and other agricultural knowledge institutions in facing emerging challenges and contributing effectively to sustainable development in their countries.

Sustainable agricultural development, essential to economic growth in North Africa, faces two main challenges: increasing agricultural productivity to achieve food security; and reversing the trend of natural resource degradation. Constraints to meeting these challenges include scarce water resources, persistent drought, limited land resources, insufficient investment in science and technology (S&T), a wide gap between research and farm practice, inadequate policy, and weak infrastructure.

Extension and research institutions continue to be key players in sustainable agricultural development in the Region. Effective linkages and coordination between extension and research institutions on the one hand, and other actors in knowledge and information systems on the other, may have significant effect on the relative success or failure of these systems in achieving their objectives and contributing effectively to sustainable development in their countries. Whereas effective use of available human and physical resources calls for enhancing regional cooperation and strengthening partnerships to ensure complementarities in efforts and better utilization of natural resources, towards sustainable development and food security.

Challenges facing Agricultural Extension in the Near East:

Main challenges facing the agricultural sector in the Near East (Middle East and North Africa) with consequences on farmers’ livelihoods and eventual implications on agricultural extension can be summarized as follows:

8 Based on Regional Highlights outlined by the FAO Regional Office for the Near East (FAO/RNE); and the FAO 27th Regional Conference for the Near East, Doha 2004 (27th NERC)
- Depleted natural resources: The Region is mostly characterized by aridity, covering about 14% of the total area of the world, with only 2% of the world’s renewable water resources. Drought, water scarcity, depletion of existing water resources, and decline in water quality continue to be the most important single factor affecting agricultural production and food security in many countries of the Region. Rain-fed areas, which cover the majority of arable and rangeland in the Region, marginalized by extension and research programmes over the years, suffer from increasing rate of deforestation and desertification, widely affecting farmers’ livelihoods especially in marginal areas.

- The Region is also characterized by high population growth rates reaching (3.7%) in some countries, coupled with scarce and often depleted natural resources, it creates a challenge for meeting the food needs of an increasing population while preserving the fragile natural resource base for future generations. Farmers and rural populations, without appropriate education and awareness, largely contribute to both population growth, and unsustainable use of natural resources. Extension has a recognized role to play in promoting population and environmental education as well as improving natural resource management in rural areas.

- Large pockets of chronic food insecurity exist in the Region, with malnutrition in the form of under nutrition and over weight evident to different degrees in many countries, largely affecting rural people’s health and eventually productivity. Extension being a key institution in direct contact with farmers, and main source of non-formal education in rural areas, needs to play a proactive role in addressing this vital issue.

- Although most countries in the Region depend largely on imports to cover their food needs, many countries have the capacity to increase their exports of crops for which they have a significant comparative advantage. However, lack of awareness on, and failure to comply with international food standards, have proved to be serious obstacles for farmers and their access to export markets. An area that is not yet tackled by most national extension services.

- Implementation of major programmes for economic liberalization; WTO agreements; and adoption of intellectual property rights in agriculture would have tremendous impact on farming communities, especially resource-poor farmers. Extension services would have prime responsibility for advice to farmers on implications of these international agreements on agricultural inputs, production, marketing and farmers livelihoods in general.

- New division of labour between public and private sectors; redefinition of the role of the state in rural and agricultural development; and emerging public-private partnerships call for enhancing institutional and staff capacity to assume new roles and build effective partnerships.

- Many countries in the Region are facing emergencies for a variety of reasons, including adverse climatic conditions, natural disasters, droughts and man-made disorders, including civil strife and war. In most cases, resource-poor farmers and marginalized groups and rural communities are the first affected by such disruptions. Extension institutions in these countries, although severely affected themselves, would be expected to assist farmers in coping with consequences.

**Major Trends Reshaping Agricultural Extension:**

In response to global changes, a number of institutional reform initiatives are triggered throughout the world. These include, but not limited to the revised Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) initiative, put forward by FAO and the World Bank; and the National Agricultural Extension Systems Reform Initiative (NAESRI), from FAO. Key trends in agricultural extension emerging in the Region include among others:

**A broader scope for extension:** Agricultural extension has come a long way from linear, top-down transfer of technology focusing on improving production practices to an interactive, participatory process expected
to respond to farmers’ diverse needs for information on issues related to production, post-harvest handling, market information, and protection of natural resources.

**Decentralization of government structures:** most countries are delegating increased responsibility for extension programme planning and implementation to district and local authorities, for increased involvement and participation of farmers and local communities in planning and implementation of extension interventions.

**Emergence of pluralistic extension systems:** presence of multiple extension service providers is widely recognized, with a growing and dynamic non-public sector, including NGOs, private firms, producer associations, and farmers’ organizations, gradually assuming more and more active role in providing extension services to farmers.

**New partnerships:** Increased and diversified farmer needs for information and services, as well as the presence of multiple information sources and service providers in the rural space, are calling upon extension institutions to open up to new partners. Besides the vital and ever so important partnership with research and education institutions, agricultural extension needs to establish linkages and build new partnerships with other actors in rural development, including private sector, NGOs, farmer organizations, marketing and credit facilities, input suppliers and other service providers. In addition, sub-regional, regional and international cooperation and partnerships are being emphasized for most effective utilization of available human, physical and natural resources.

**New roles for public extension institutions:** With increased decentralization, presence of multiple actors and service providers, new and diversified partnerships as well as the wider scope in extension coverage, the public extension institutions are called upon to assume new roles and responsibilities.

There is a marked need for coordination, participatory planning; networking; information/experience sharing; evaluation and dissemination of lessons learnt; monitoring; and of course, quality control. All are clearly public roles that should be assumed by a high-capacity public institution, evidently the extension institution, with reviewed mandate and well trained staff to undertake the new tasks. Failure to do this, results in lack of coordination, causing extensive overlap, sometimes contradiction and confusion to rural communities and always leaving technical, geographical and social gaps, with most probably the poor and illiterates left behind.

**Constraints Facing Agricultural Extension in North Africa:**

National extension institutions in North Africa, contributed greatly to agricultural and rural development in the Sub-region since their establishment during the second half of the twentieth century. Notwithstanding significant developments, contributions and achievements of these institutions, most systems are faced by a number of constraints that have considerable impact on their performance and effectiveness.

A recent study on agricultural extension systems in the Near East commissioned in 2003/2004 by FAO Regional Office for the Near East revealed a number of constraints having significant impact on public extension institutions in the Region. Despite the wide diversity in institutional, economic and agro-climatic aspects among countries in the Region, responses received from member countries showed considerable similarity in constraints faced by their extension institutions. However, some issues remain specific to some countries and not to others.

In North Africa, responses received from Algeria, Morocco and Tunisia identifier a number of constraints facing public extension institutions and affecting their functions to differing extents. These constraints can be grouped as follows:

**Resources:**
- Lack of adequate resources impedes planning, implementation, monitoring and evaluation of extension activities at field level;
- Aging of extension staff coupled with reduced new recruitments and low incentives;
- Reduction in extension staffing at field level;

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10 FAO/RNE, Survey on extension systems in the Near East (unpublished)
- Multiple tasks for extension staff, sometimes consuming up to 50% of staff time on non-extension work;

- Shortages in means of transportation especially at field level.

**Linkages:**
- Weak extension-research linkages and absence of effective mechanism for collection, assessment and packaging of research results;
- Absence of linkages between extension and faculties of agriculture active in the field of extension;
- Weak linkages between extension and other relevant service institutions and actors.

**Coordination:**
- Absence of a common integrated vision for research, extension and education within the rural development policy framework;
- Weak linkages between agricultural extension and research institutions resulting in lack of coordination and sometimes divergence of objectives;
- Weak coordination between and among different interventions leading to inefficient use of resources.

**Services:**
- Limited geographic coverage and low extension/farmer ratio especially for rural women;
- Focus on technical and production issues with no coverage of socio-economic and gender issues in extension messages;
- Scarcity in extension studies and low capacity in producing extension support materials;
- Inadequate content in extension messages resulting in weak response from farmers, exacerbated by limited access to information for field extension staff.

**Potential Role of Communication and ICTs:**

In the context of increased decentralization of government structures, emergence of pluralistic systems of extension service delivery and diversified knowledge and information needs and resources in the rural sector, communication for development, including new ICTs are recognized as a crucial tool for effective and efficient coordination at all levels.

Within a new extension paradigm, extension institutions would need to adopt effective communication tools and methods to overcome issues related to reduction in staff and resources, for optimum use of resources and wider coverage. The systematic use of communication can enhance linkages, strengthen coordination and support partnerships by giving a voice to all stakeholders, including farmers, field staff, local authorities and national decision makers; mobilizing people for participation and action; disseminating information for education and training; and sharing new ideas, practices and technologies. Communication methods and tools provide powerful means for fostering strong collaboration in agricultural research, training, extension and education interventions.

Agricultural extension is identified as an area where ICTs have a potential impact. When used appropriately, ICTs can overcome several constraints in institutional linkages and coordination as well as issues of physical isolation in rural areas. Several initiatives are implemented by countries and donors throughout the world to tap the potentials of ICTs in addressing the needs of farmers, rural development and food security. FAO promotes two internet-based communication initiatives:

- The Virtual Extension-Research Communication Network (VERCON), which links up research and extension institutions with a potential for opening up to other partners and institutions.
- FARMNET, which links up internet based networks with conventional communication channels in response to farmer information needs.

11 FAO, Communication: A Key to Sustainable Agricultural and Rural Development
Experiences gained through implementation of these initiatives will be covered in forthcoming presentations.

These and other ICT initiatives when integrated with communication for development methods and tools enable extension and research institutions to address farmer needs timely and effectively towards sustainable agricultural development and food security. In addition, well-planned communication networks provide viable tools for linking partners, enhancing coordination and facilitating documentation and sharing of experiences and lessons learnt among physically remote partners. It also provides feasible linkages that can support regional and international cooperation and partnerships, linking relevant institutions and organizations and facilitating information access and sharing.

III- AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEMS FOR RURAL DEVELOPMENT (AKIS/RD): The case of Morocco

Abdallah GAAYA

1- AKIS/RD CONCEPTIONAL FRAMEWORK:

A document was prepared by the staff of the Food and Agriculture Organization of the United Nations (FAO) and the World Bank concerned with agricultural education, research and extension – and their integration into Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) – where rural people, especially farmers, are partners, not simply recipients. It is intended as a vehicle for sharing ideas and principles with the various stakeholders addressing the causes, and seeking solutions, for rural poverty. It has four main purposes:

- To set forth a shared vision for an integrated approach to agricultural education, research and extension that would respond to the technology, knowledge and information needs of millions of rural people.
- To facilitate dialogue with decision-makers, both in governments and in development organizations, ensuring that proposals for investment in (AKIS/RD) are well founded and receive due consideration.
- To provide the staff of FAO and the World Bank, and their counterparts in client countries, with a common set of principles to guide their work in agricultural education, research and extension.
- To ensure synergies from complementary investments in education, research and extension, resulting in more effective and efficient systems.

2- DEFINITION OF AKIS/RD:

An Agricultural Knowledge and Information System for Rural Development links people and institutions to promote mutual learning and generate, share and utilize agriculture-related technology, knowledge and information.

The system integrates farmers, agricultural educators, researchers and extensionists to harness knowledge and information from various sources for better farming and improved livelihoods. This integration is suggested by the “knowledge triangle” displayed below (Fig.1). Rural people, especially farmers, are at the heart of the knowledge triangle. Education, research and extension are services - public or private - designed to respond to their needs for knowledge with which to improve their productivity, incomes and welfare and manage the natural resources on which they depend in a sustainable way. A shared responsiveness to rural people and an orientation towards their goals ensures synergies in the activities of agricultural educators, researchers and extensionists. Farmers and other rural people are partners within the knowledge system, not simply recipients.

12 Abdallah GAAYA, former SDRE Agricultural Training and Extension Officer - FAO
13 Most of the paragraphs in this section adapted from FAO/WB publication (2000).
Figure 1: The Knowledge Triangle

3- AKIS/RD: THE CASE OF MOROCCO

An AKIS/RD exists in some form in all areas, as rural people have traditional, as well as modern, sources of information relevant to their livelihood strategies. In practice, Government technical agencies play an important role in promoting innovation and modernization and providing services to rural producers. Agricultural production systems are important in most rural economies however the new vision of AKIS/RD focuses on farming communities and rural populations as full partners and not anymore as recipients or beneficiaries. Therefore, they are at the heart of rural livelihood systems where non-agricultural income and social services are also critically important in many cases.

During the biennium 2000-2001 four case studies were planned in the framework of SDRE Programme and Work Budget (PWB), in Cameroon, Malaysia, Morocco and Uganda. These countries were selected as samples to represent similar FAO-member countries in the various regions of the World. Morocco was identified as the representative of Middle East and North African countries

4- SUMMARY HIGHLIGHTS OF THE STUDY:

Objectives and Methodology of the Study:

Under the FAO Regular Programme, the present survey seeks to consider the following:

- Look into the status of the AKIS/RD system in Morocco, including its components, mechanisms, human, physical and financial resources.
- Clarify the position and interest of the government into the AKIS/RD system together with its constraints and future prospects.
- Assess the programmes and actions undertaken with a view to highlight their points of strengths and weaknesses.

The methodology which has been pursued in the completion of this study has mainly consisted of carrying out a documentary type of work on the relevant institutions. Investigation on this topic was completed by a series of interviews as well as through participation in discussions in several seminars and workshops. The various lessons learnt from previous experience will allow the responsible officials to make headway in a more efficient implementation of the AKIS/RD system in Morocco and in countries of the region with similar conditions.

The Main Operators of AKIS/RD:

The Farmers:
The general census of agriculture carried out in 1996 provided the distribution of farmers according to their education level as detailed in the following table:
Table 1: Distribution of farmers according to education level

<table>
<thead>
<tr>
<th>Instruction level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without any education (Illiterate)</td>
<td>1,206,635</td>
<td>81%</td>
</tr>
<tr>
<td>Quranic or basic education school</td>
<td>260,114</td>
<td>17%</td>
</tr>
<tr>
<td>High school or University</td>
<td>26,095</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,492,844</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The agricultural knowledge and information system for rural development (AKIS/RD) has to take into account that some 81% of farmers are illiterate. Consequently, resource allocation and programme development should be conceived with special consideration.

The agricultural cooperatives:
All types of Cooperatives have always been of particular interest in policies of agricultural development. The large dispersion of agricultural production and the insufficient development of competitive and well organized private sector either within or outside the agricultural sector play in favour of the development of the cooperation sector. According to the general census of agriculture conducted in 1994, the number of farmers operating on micro-farms represents 40.1% of total farmers covering only 6.3% of the total arable land.

The Professional Associations:
The Agricultural Professional Associations (APA) are few in comparison with cooperatives. They both act in the same sectors of activity. Contrary to cooperatives, their number increased especially in the beginning of the eighties. The first associations were created following some market liberalization in the sector of exports of citrus fruits and early maturing vegetables. The other associations were established after the first Government measures of disengagement in the sectors of sugar, cotton, dairy production and in the marketing of export crops as well as in the sectors of cereals and legumes.

There are about 180 associations of which 56 are national and 124 regional associations. They cover many and various sectors of activity articulated around specific products (fruits and vegetables, cereals and legumes, seeds, sheep and goat, sugar crops), or services (providing production inputs, export, etc), or actions of local agricultural development. The total number of members nationwide, by region, or by sector is unknown. We are consequently unaware of the numbers and membership distribution in these associations.

Higher Agricultural Education:
Government efforts, supported by foreign assistance, related to institutional development of higher agricultural education system, permitted to establish an important network centered on pedagogy, sciences and life skills. This network includes 3 main institutions:

- IAV Hassan II at Rabat and its Horticultural Complex at Agadir;
- ENAM (National Agricultural School) at Meknès; and
- ENFI (National School for Forest Engineers) at Salé.

These institutions have also the mandate of research and technology transfer, in addition to ensuring continuing education for technicians of both public and private sectors.

Agricultural Vocational Education and Technical Training:
The system of vocational education and technical training in agriculture is constituted of the following establishments:

- 15 Institutes of specialized technicians in agriculture which provide training for 2 years after Baccalaureate (High School Diploma);
- 20 Centres of Agricultural Qualification (CQA) of which 18 train qualified workers, whereas 2 provide only continuing education;
- 2 Agricultural High Schools that provide pre-service training for agricultural technicians;
- 6 Agricultural High schools preparing for the Baccalaureate exam in agricultural sciences. This section is also covered by 3 high schools affiliated to the Ministry of Education.

The National Agricultural Research System (NARS):
The present situation of agricultural research is characterized by the emergence of the National Agricultural Research System (NARS) that is composed of:

- The national institutions of agricultural research: the National Institute of Agricultural Research (INRA), the National Centre of Forestry Research (CNRF) and the Service of Experiments, Tests and Standardization (SEEN);
- The institutions of higher agricultural education: the Institute of Agronomy and Veterinary Science Hassan II (IAV-Hassan II), the National Agricultural School of Meknès (ENA) and the National School of Forestry Engineers (ENFI);
- The Department of Education, Research and Extension (DERD), in charge, iter alia, of orientation, coordination, monitoring and evaluation of research programmes in collaboration with relevant and concerned institutions;
- The universities of the Ministry of Education are also getting more and more involved in agricultural research;
- In the same way, some state owned companies (SODEA, SOGETA, etc.), professional associations and the private sector lead applied agricultural research in domains related to their specific activities.

The National System of Agricultural Extension:
The Ministry of agriculture has always granted a primordial role to the agricultural extension considering the importance of information and training of farmers on agricultural production and marketing, professional organization, and preservation of environment and natural resources.

Improvement of the standard of living and income of rural and farming populations depend on the improvement of their access to reliable and useful information at appropriate time to adopt suitable techniques and rationally use production factors in order to guarantee economic profitability of the agricultural activities.

This can only be achieved through a public service of efficient agricultural extension, capable of integrating national strategic priorities of agricultural and rural development, real needs of populations in different regions, results of agricultural research and efficient use of human and physical resources.

5- CONSTRAINTS OF THE AGRICULTURAL TECHNOLOGY SECTOR:
The technological sector is facing a number of constraints that hinders it from fully achieving its missions. These deficiencies are related to the absence of integration mechanisms of component activities, low valorization of human resources, insufficient physical and financial resources, inefficient management and a shy opening on the socio-professional sector.

Absence of coordination and linkage mechanisms between components of the technological sector: The performance of the sector is jeopardized to varying extent by the following factors:
- Absence of a global and concerted policy of research, education and extension. Such a policy should define orientations and priorities;
- Absence of a common method of planning research and extension activities, and adaptation of education curricula;
- Absence of a monitoring and evaluation system of activities and of the impact of technologies proposed to the farming communities;
- Lack of coordination between agricultural extension, research and education institutions: research results are not automatically made available to extension and in return the latter does not provide feedback on constraints of agricultural production;
- Weak links between the technological sector and the technical departments of the Ministry of agriculture, which does not encourage the needed interaction between development programmes on one hand and research, extension and education, on the other.
This issue is aggravated by the absence of a system of communication and information between components of the sector; a system that could avoid duplication and facilitate exchange and sharing of results and experiences.

**Insufficient, unequally distributed and under valorized human resources:** Staff working in the technological sector is facing several constraints that prevent them from reaching their full potential:

- **Incentive:** absence of a system of incentive and remuneration, lack of a common statute for researchers; absence of statute for extension staff;
- **Up-grading:** in spite of new progress recorded every day, in domains of sciences and technologies and the rapid change in the agricultural sector, managers and technical staff of the sector still work with classical methods. Up-grading programmes and level of competence through continuing education reveal to be necessary;
- **Numeric insufficiency doubled by regional disparities:** current technical and scientific resources are less (in quantitative terms) than what is required by an agricultural sector characterized by a wide range of diversity in the physical, biological and socio-economic context. On the other hand, agricultural extension is marked by strong regional disparity. This disparity is very pronounced in zones with fragile agro-ecological systems (mountains, range land and oasis).

**Financial resources well below norms and needs:** The financial resources allocated to the sector are characterized by their insufficiency and their irregularity:

- The budget allocated to research is insufficient and is well below international norms.
- Higher agricultural education institutions are confronted with financial difficulties due to budgetary restrictions experienced during recent years. Furthermore, these institutions do not benefit from budget allocated to agricultural research.
- The budget of institutions for technical training and vocational agricultural training is in constant reduction of 10% per year whereas the demand for training is increasing;
- The budget of the Extension Centres (CT) is mostly spent for payment of staff salaries (95%).

The low budgets cause an alarming deterioration of facilities and infrastructures. Furthermore, the reduced budgets allocated to the technological sector are seriously aggravated by their irregularity. This situation is damaging because the main activities of institutions of the sector include human resources development projects over several years. The financial resource irregularity is translated into either interruption of on-going projects or a decline of educational quality of training.

**An irrational management of resources and coercive procedures:**

- **Inadequacy of budgets and programmes:** The budgetary restrictions lead institutions to allocate the meagre financial resources to maintain only programmes that either the Ministry or themselves consider important;
- **Coercive financial and accounting procedures:** These procedures concern the whole accounting and financial process from the development of budgets until the payment of suppliers and beneficiaries. They are time consuming and lack efficiency;
- **Absence of statute for certain institutions** which limit their management autonomy;
- Establishment of certain structures, such as the observatory of employment, was not preceded by all the legislative measures necessary to carry out their missions;
- **The statute of CTs (Extension Centres)** has not been updated for required consistency and efficiency to meet needs and expectations of the farming communities.

**Low degree of inter-penetration of the sector components with their socio-professional counterparts:** In spite of some commendable efforts spent by institutions of the sector, in order to put in place and to promote methods of diagnosis, planning and assessment of activities of education, research and technology transfer, one can note the persistence of the weak implication of the profession in these activities.

The strong administrative sponsorship of Chambers of Agriculture, as a public establishment reduced their role to collaborators of the administration. Relationships between Chambers of Agriculture and the Ministry
are more of dependence nature than of partnership. All these weaknesses are coupled by the existence of highly diversified missions of these Chambers, lacking unity and consistency. Furthermore, their statute is very broad and inaccurate with regard to distribution of management responsibilities among the elected president and the appointed director.

Difficulties and problems of agricultural professional associations:

- **Inadequate legal texts governing associations**: The Moroccan legislation does not include institutional arrangements susceptible to serve needs of the professional organizations with specific statutes.

- **Financing of the agricultural professional associations**: With the exception of few associations serving productive sectors, most associations experience difficulties in making funds available for their activities.

- **Limited human and material resources**: The low human and material resources come from the weakness and difficulties of financing. The immediate consequences result in an apparent difficulty for these associations to achieve their missions. The Government assistance to certain associations remains weak.

- **Agricultural professional association representation**: In a certain number of cases of agricultural professional associations, the representation is honestly doubtful. Some associations maintain their leaders for decades and therefore marginalize all democratic rules and legal control of their activities.

6- CONCLUSIONS:

The AKIS/RD in Morocco needs a complete overhaul for more efficiency and a better adaptation to the real needs of the farming population. The process should be progressive and implemented through pilot and integrated projects in the CTs and CMVs.

The underlying principle of the strategy to be put forth should rely basically on appropriate methods allowing a top-down and a bottom-up communication between grassroots users organizations and decision-makers and calls therefore for developing programmes, which take into account the expressed needs and aspirations of farming communities.

Integrating programmes such as the PRV, PSDA or PMVB will lead to better economic efficiency by rationalizing the fair distribution of actions and budgetary allocations among the various stakeholders and encouraging them to work in closer collaboration.

In general, agriculture-based instruction, research and outreach programmes have been severely affected by budget cuts at a time when they are required for innovation and quality improvement of education, research and services.
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ACHRONYMS

AKIS/RD: Agricultural Knowledge and Information System for Rural Development
APA: Association Professionnelle Agricole
(Agriculture Professional Association)
CMV: Centre de Mise en Valeur Agricole
(Centre for Agricultural Development)
CNRF: Centre National de la Recherche Forestière
(National Centre for Forestry Research)
CQA: Centre of Qualification in Agriculture
(Centre for Pre-service Training in Agriculture)
CT: Centre de Travaux (Extension Centres)
DERD: Direction de l’Enseignement, de la Recherche et du Développement
(Education, Research & Extension Department)
ENA-M: Ecole Nationale d’Agriculture de Meknès
(National School of Agriculture of Meknès)
ENFI: Ecole Nationale Forestière d’Ingénieurs
(National School for Forestry Engineers)
FAO: Food and Agriculture Organization of the United Nations
FAO/SDR: Research, extension and Training Division, FAO-Rome
FAO/SDRE: Extension, Education and Communication Service, FAO-HQ
IAV: Institut Agronomique et Vétérinaire – Hassan II
(Institute for Agriculture and Veterinarian Sciences-Hassan II)
INRA: Institut National de la Recherche Agronomique
(National Institute for Agricultural Research)
ITA: Institut de Technologies Agricoles
(Institute of Agricultural Technology)
KAP: Knowledge, Attitudes and Practices
LA: Lycée Agricole (Agricultural High School)
PMVB: Projet de Mise en Valeur des zones Bour
(Dry Land Development Project)
PRV: Projet de Recherche-Vulgarisation
(Research-Extension Project)
PSDA: Projet de Soutien au Développement Agricole
(Agricultural Development Support Project)
SEC: Strategic Extension Campaign
SEEN: Service des Expérimentations, des Essais et de la Normalisation
(Experiments, Tests and Standardization Service)
SNRA: Système National de la Recherche Agricole
(National Agricultural Research System)
SODEA: Société de Développement Agricole
(Agricultural Development Society)
SOGETA: Société de Gestion des Terres Agricoles
(Agricultural Land Management Society)
WB: World Bank
Agricultural extension service is nowadays common practice in most countries and holds a pivotal position in programs and projects aiming to modernize the countryside. The concept of extension is however being over-used by any kind of institutions: political institutions, national and international organizations involved in rural development in general and agricultural production in particular.

As a matter of fact, the concept has gained much significance for countries where agriculture represents the key economic activity for the population. These countries often fail to produce the foodstuffs necessary to meet the needs of their population. Extension has engendered abundant literature and a considerable quantity of experiments and projects, often remembered for their failure. Several assumptions can be made to explain these failures, the most conspicuous residing in the vague definition of the term of extension, open to all kinds of interpretations.

Indeed, each agent or each institution has probably their own idea about extension, based more on their own experience than on the nature of the service they belong to. In other words, there is no single, universally accepted definition, applicable in all kinds of situation. One is actually dealing with a dynamic, ever-changing concept that cannot be rigorously pinned down. The term itself denotes a permanently moving phenomenon of the rural areas.

The necessity of extension in agricultural development need not be demonstrated. However, setting up an operational and effective extension system must meet the aspirations and concerns of the various economic actors, namely public authorities and the professional organizations. Their mission and roles must be defined in an accurate manner.

In Algeria, a Governmental agricultural extension system was adopted in 1985, along the lines of an interventionist approach meeting the requirements of a planned economy. This system has been revised in the few past years to fit in the new environment characterised by the recent reforms introduced in the agricultural field so as to promote participatory approaches in the implementation of any development program or project.

In this presentation, we will try and describe the Algerian experience in the field of extension during a phase informed by the new agricultural and rural development policy.

1- ALGERIA: HIGHLIGHTS AND OVERVIEW:

Situated in North Africa, at the heart of the Maghreb, an integral part of the Arab World, Algeria is a politically pluralistic republic. Algiers is the administrative and economic capital. Bordered in the North, over 1,200 km, by the Mediterranean, Algeria is the 2nd largest country in Africa (2.4 million km², 4/5ths of which covered by the Sahara).

Algeria includes 48 Wilayas (Governorates) and 1,541 municipalities or Communes. Algiers, the first seaport of the country, and Oran, the second biggest city of the country, located on the Western coastline, are significant commercial and harbour poles. To the East, Constantine is the capital of an agricultural, industrial and cultural area and Annaba an important economic and commercial centre.

Changes and Mutations:

As of 1988, Algeria has opted for the democratization of public life, on the political level, recognising multipartism and political pluralism, granting freedom of thought and expression: pluralistic electoral processes have since been regularly held. Pluralistic Trade-unions have also been authorized.

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15 Abdessalem LAKHDAR, Directeur technique en charge des études et des programmes de vulgarisation, INVA - ALGERIA
In the economic sphere, the passage from a planned economy to a market economy and its corollaries in terms of responsibility, liberalization, autonomy and effectiveness induced a major reorganization of the economic sectors mainly translated in a structural readjustment of companies and the redeployment of the national economic apparatus. On the instigation of the Breton Woods institutions, Algeria has launched structural adjustment programs and adopted economic reform programmes consisting mainly in correcting structural imbalances in order to optimize the use of available resources.

Population: The Algerian population continues to increase at more or less moderate pace (1.53% per annum), slower than in the 1980s (3.1 %). By January 1st, 2004, the population reached 32,080 Million. Today, 41% of the population (13 million) live in rural areas and above 2 Million people work in the primary sector, i.e. 24 % of the economically active population.

Macro-economic Data: In the early 1990s, Algerian economy stagnated mainly because of low investments over the decade 1980/90. In 1995, the tendency was reversed, with an annual real growth evaluated over the period 1995/2000 at 3.3%, thanks mainly to the resumption of the agricultural sector and services (the tendencies in 2000 - 2002 show that inflation rate varies between 0.3 and 1.4% with a peak of 4.2% in the year 2001). This rate reached 2.8% in 2003. Exchange reserves reached US $34 billion by mid 2004 and would reach the unequalled record level of US $ 40 billion by the end of 2004.

Geography and Relief:
On the map, Algeria occupies a considerable stretch (240 million ha), yet arable land is limited to 8.45 million ha of good agricultural land, that is 3.36% of the total surface. The relief layout shows unequal distribution of the productive natural resources and a clear division of the country into bioclimatic zones. There are two large definitely opposite sets: Northern Algeria and Southern Algeria. The Northern part, extending between the Mediterranean and the Sahara on a 350 km wide strip, is made of two compartmentalized areas:
- The Tell area, which borders the Mediterranean coastline over a 100 km wide area, is known for the practice of truck farming, arboriculture, vine growing, bovine breeding on the coast and cereals on the interior plains.
- The steppe area which extends from the south of the Tell to the Southern piedmonts of the Saharan Atlas over a 100 to 300 km wide zone is known for sheep, goat and equine breeding, as well as rustic arboriculture.

Southern Algeria is a desert entity of more than 2 million km² and occupies 4/5th of the country’s total surface. Agricultural activity in this vast desert is scattered over some valleys and oases with date palm tree plantations. This area is known for the practice of date palm growing and camel breeding.

On the climatic level, the climate in the North is Mediterranean; On the high plateaus and in the Saharan Atlas, it is of semi arid to arid continental type: rainfall (400 mm to 200 mm per annum); in the Sahara, it is less than 130 mm per annum. Climatic variations account for production fluctuations from one year to another.

2- PRESENTATION OF THE AGRICULTURAL SECTOR:
Algeria enjoys enormous natural potentials which enable it to promote and develop its agricultural and rural sector. In the past 15 years, agriculture contributed up to 11% of the GDP and it has been in constant growth since the 1970s. In the past three years, boosted up by the National Agricultural Development Plan, the agricultural sector has witnessed concrete gains in terms of created employment opportunities, income and wealth, due, in the last resort, to the impetus given to agricultural production since the Plan was launched in 2000.

Agricultural Potentials:
Effective agricultural area covers 8.45 Million hectares, that is 3.36 % of the country’s total surface (240 Million hectares). It is bound to increase thanks to the development actions (71.000 hectares were reclaimed since 2000). 194 Million hectares, that is to say 81.5 % of the total surface of the Algerian territory is desert. A modest part of the territory (32 million hectares, i.e. 13.44%) is used for permanent pastures in arid and
semi arid climate areas on the high plateaus. As for the forests, scrub forests and esparto grass cover, they represent 7 million hectares.

The farming population amounts to 6,907,585 people including 24.5% women. The agricultural active population amounts to 2,112,717 permanent labour force, including 358,151 women, distributed over 1,023,799 farms, 70% of which are small-scale farms (between 0.1 and less than 10 hectares).

**Utilization of Effective Agricultural Area:**

- Field crops cover 50.45% of effective agricultural area, including 48.2% of cereals in 481,370 farms;
- Arboriculture covers 6.39% of EAA in 199,578 farms, that is 20% of the total number of farms (1,023,799);
- Market and industrial crops cover 3.24% of the total EAA;
- Fallow covers 39.61% of the total EAA, while natural prairies cover 0.31% of EAA
- Irrigated lands cover 620,687 hectares, i.e. 7.34% of the EAA. Arboriculture covers 41.2% of the irrigated EAA, market and industrial crops 33% and field crops 25.8% of the irrigated surfaces.

**Breeding and livestock production:** As regards breeding, the national livestock is composed of 18,738,166 sheep, 1,464,663 bovines, 3,186,878 goats and 333,933 camels. For poultry production, there are over 23,000,000 units for egg production, over 39,000,000 units for chicken production and 866,000 turkeys.

**Farms:** At present, there are 1,022,799 farms, 39,646 of which are managed by women. Farm managers of less than 30 years of age represent 5.3% of the overall total while those of 60+ years of age represent 37%. The following table lists the educational level of farm managers.

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No education at all</td>
<td>662,192</td>
</tr>
<tr>
<td>- Can read and write</td>
<td>102,024</td>
</tr>
<tr>
<td>- Primary education</td>
<td>109,080</td>
</tr>
<tr>
<td>- Specialized training</td>
<td>41,995</td>
</tr>
<tr>
<td>(1st, 2nd, and 3rd degree)</td>
<td></td>
</tr>
<tr>
<td>- Intermediary level</td>
<td>59,377</td>
</tr>
<tr>
<td>- Secondary education</td>
<td>33,982</td>
</tr>
<tr>
<td>- Higher education</td>
<td>15,145</td>
</tr>
<tr>
<td>- Agricultural training</td>
<td>27,158</td>
</tr>
</tbody>
</table>

**Agricultural reforms and policies:**

Marked by mitigated results, successive reforms were undertaken in the agricultural sector with a priority view to achieving food security, provided the tools and mechanisms for their implementation were made available. But the fact is that none of the reforms launched since Independence has succeeded: Self-management in 1963, the Agrarian Revolution in 1972 and the Reorganization of the Socialist Fields in 1987. Though partners in the reform, farmers were only requested to act as mere executors.

Drawing the lesson of past experiences, new orientations and strategic choices were adopted, translated into a solidarity-based agriculture founded on complementarities and the modernization of methods and means, a rehabilitated agriculture integrated within the national economy, based on sustainable development and an agriculture enhancing natural riches, production, the know-how of the various regions and the specificity of each soil.

*Since the year 2000, the new orientations and strategic choices have been translated into concrete facts, thanks to the adoption and implementation of the National Agricultural Development Plan (PNDA) to which was added the rural dimension in mid 2002.*
The rationale behind this step is to allow the agricultural sector to consolidate its place in national economy, contribute in a more significant way to the improvement of supply in agricultural products, play its role in adjusting and safeguarding the agricultural and rural space and finally succeed in integrating international economy and improve its competitiveness.

**Extension in the Context of Land Reforms:**

The passage from a planned economy to a market economy and its corollaries in terms of responsibility, liberalization, autonomy, effectiveness was to induce a reorganization of the agricultural public sector. This reorganization of the agricultural sector should entail a rupture between the public authorities and the producers in terms of the orientation of the production, injunctions, financial and tariff support to the price of agricultural inputs.

One key element emerges from these reforms is the emergence of the agricultural profession now free to organize itself and produce within a market economy context. Emancipated from administrative supervision, it now holds its fate in its own hands.

**Thus,** the land reforms led to a deep transformation of the agricultural landscape in such a way that the main elements impacting extension are:

- The emergence of autonomous farms free of any interference, managed by farmers responsible for their own development
- Fast multiplication of the associative and co-operative movements, the new partners of the extension network
- Newly created Chambers of Agriculture offer a new space for dialogue.
- The new economic rules which require new financing and management mechanisms for extension activities.
- Redeployment of the research apparatus to create a network of close connections.
- The liberation of the information and communication sector constitutes yet another vector for the transmission and dissemination of progress.
- The emergence of new economic partners.

**Need for extension:** The necessity of extension in agricultural development need not be demonstrated. However, setting up an operational and effective extension system must meet the aspirations and concerns of the various economic actors, namely public authorities and the professional organisations. Their mission and roles must be defined in an accurate manner.

**3- THE GOVERNMENTAL EXTENSION SYSTEM:**

In Algeria, in the mid 1980s, much thought was given to the relevance of extension in agricultural development. In 1985 the first results were reached, translated into the Ministerial Circular 1055 organizing the national agricultural extension services, defining the missions and roles of the various structures involved in agricultural extension. The following structures are mentioned in the Circular:

- Administrative structure;
- Technical - scientific structure;
- Technical - logistic structure;
- Methodological support structure;
- Structures outside the Ministry of Agriculture.

The extension system is still governed by a bureaucratic conception since it integrates all administrative structures as well as the technical-economic structures, operating upstream and downstream the production line without succeeding however in crystallizing the whole of fieldwork potentials. In this context, it is worth noting that the main links with the farmers (the extensionists) remain naturally and officially most underprivileged.

The consequence is that the system organization set in 1985 remained in total inadequacy with the engaged changes and reforms, both on the political and economic levels especially with the emergence of the
agricultural profession as a key partner. Hence, the necessity to reshuffle the extension system to make it one of the main actors in the profession.

The system which regarded farmers as mere executors of a policy decided elsewhere in administrative offices could not possibly accommodate itself with a situation where producers made their own decisions.

**Restructuring of the extension system:**

On the basis of the current trends of agricultural development requiring, on the one hand, State intervention in the field of orientation, coordination, regulation and evaluation and, on the other hand, the facilitation and achievements of activities by the profession.

- Extension activity is being integrated into the profession and its various organizations. The authorities may direct and support this activity by setting up certain mechanisms and incentive measures.

- The current extension system reflects congestion at all levels: the definition of objectives, the determination of the strategy, the development, implementation and evaluation of the extension programs.

The new extension system rests on light structures, with special emphasis on the local level, involving the agricultural extensionists, research cadres and the leaders of the profession.

**Extensionists:**

Regardless of their titles, body or ranks, extensionists are communication people. Their main qualities thus pertain to the “capacity to speak” and, by way of consequence, the “capacity to listen.”

At present, they are mainly based in the technical and administrative structures and in the cooperative associative network. There are 1,600 extensionists, 1,400 of whom were trained in extension methodology, within the framework of a permanent course conducted in 1989 in three training institutions, with the assistance of FAO (Algeria Project/FAO 87.004).

Within the framework of the new approach to agricultural and rural development, extensionists are in charge of the implementation of proximity programmes for the farmers.

**Subject Matter Specialists (SMS):**

They operate within the structures of agricultural production, where extension is a secondary function. They intervene by conducting test sites and demonstration for the farmers. They are called on by extensionists or professional associations to provide advice according to their field of competence. SMS operate in the following structures:

- Technical Institutes and Stations as well as Research centres;
- Structures in charge of the supply, transformation and marketing of agricultural production;
- Agronomic and vocational training institutions;
- Cooperatives and State offices Networks.

**Progressive farmers:**

In the areas deprived of structures in charge of the production of technical reference frames, therefore of specialists, the only existing source of technology lays in the hands of progressive farmers in the area concerned, who serve as a relay in the training of the neighbouring farmers.

Professional associations as well as agricultural services call upon these farmers in order to encourage them to help improve the technical level of the other farmers and play a major role in the production of references and models for the development of farms.
Professional Organizations:
In 1992, the “agriculture forum” stressed the need to further involve the profession in taking their responsibility in the field of extension. In 1994, an agreement was reached between the Ministry of Agriculture with the Chambers of Agriculture for the progressive transfer of extension activities to the profession and to mobilize all human, material and financial resources. Today, almost 50% of extensionists were transferred to the profession.

4- THE CURRENT ORGANIZATION OF EXTENSION:

The current organization of extension rests on the following structured device:

Administrative structure:
- The National Extension Council (CNVA)
- The Extension Sub-division attached to the Training, Research and Extension Division
- Central Technical Divisions at the Ministry for Agriculture
- The Wilaya Extension Committee
- Training and Extension bureaus attached to the Divisions of Agricultural Services
- Daïra Agricultural Subdivisions
- Communal Agricultural Delegations

Technical-scientific structure:
- Two National Institutes of Agronomic Research and Forestry Research with their entities distributed over the national territory (INRA-INRF)
- Specialised Technical Institutes by track of production (07) and Institutes for Phyto-sanitary Protection (01) and Veterinary medicine (01)
- The Higher Commission for the Development of Steppes (01) and the Commission for the Development of the Saharan Zones (01)

Technical-logistics structure:
- National and Regional offices
- Service Cooperatives
- Cooperatives Unions
- The National Fund for Agricultural Mutual Help and its regional funds (4)
- Rural Development Banks

Methodological support structure:
- The National Institute for Agricultural Extension (INVA) which constitutes the Ministry’s focal point for the implementation of its program through the development of communication and extension strategies.
- Agricultural Training Establishments (ITMAS-10 and CFVA-02)

The agricultural profession:
- The National Chamber of Agriculture and the wilayas Chambers (47)
- The Inter-professional Councils
- Professional Associations and Non-Governmental Organizations.

Structures outside the sector:
- National Union of Algerian Farmers
- Mass Media Information Means
- Higher Education and Training Institutions Network

Young investors:
Engineering Consultancy Bureaus set up by young people holding diplomas in agronomic or veterinary sciences
5- PROGRAMMING EXTENSION ACTIONS:

The programmes for proximity extension such as carried out today are defined by:

- The nature of the message, topic or action
- Objectives to be reached through the dissemination of messages
- Recipients of the extension services
- Extension Methods to be used
- Time and venue of the course of action
- Programme Follow-up and Assessment instruments

The approach stems, on the one hand, from the priorities set by the Ministry of Agriculture in terms of development, and, on the other hand, from the farmers’ expectations and concerns. Roughly speaking, this measure should be deeply rooted at community level (i.e. farmers). To carry out the extension programme, three levels are involved:

Community Level:
At this level, extensionists collect all information necessary to identify the target group. The information is collected from:

- Study of the milieu (monograph)
- Inventory of the farmers’ needs
- Extension programmes and assessment of the previous years
- Community project development
- Priority development programmes

Daira Level:
The Head of the Sub-division examines and determines with the Daira extensionists the topics specific to each community by justifying the objective(s) to be reached, the implementation details, the expected results and the follow-up/evaluation methods. The synthesis of the programme integrates the extension topics beyond the communal framework.

Wilaya Level:
As the final stage of the synthesis of the extension programme at the level of the wilaya, extension is worked out by the wilaya coordination unit, in collaboration with the Heads of Subdivisions. It includes the extension topics which exceed the Daïra framework, such as: fairs and exhibitions, shows, extension campaigns, scientific and technical demonstrations, etc.

For its adoption, this program is submitted to the wilaya technical committee composed of the representatives of the technical and administrative structures, the profession, State offices, specialized associations and trade-union organizations (UNPA).

The extension program is supplemented by a training programme for extensionists and farmers. The scheduled field actions are carried out and managed on the basis of a series of management tools made available to the extensionists. They consist of:

- demonstration plots guide
- contact-farmer guide
- extension methodological guide
- follow-up and evaluation guide

Central Level:
At the national level, the programme is the overall synthesis of the various wilaya programmes carried out by the Training, Research and Extension Division in charge of the orientation and follow-up/evaluation of the implementation of the extension programmes.
Mass Extension Programme: At the central level, MADR Extension Subdivision and the Annual Mass Extension Programme run parallel to those carried out locally, at the level of farms. The technical topics translated into extension messages are set by the technical institutes. This programme is articulated around the following media aspects:

Television activities: they include three forms of production:
- Commercial short daily spots (30 to 60 minutes)
- Short programmes, 5’ to 6’ minutes broadcasted twice a week (Monday and Friday).
- NVA produces and is in charge of programming with ENTV.

Radio activities: Three national channels and 24 local radio stations produce and broadcast, in collaboration with the extensionists in charge of radio activities at the level of the DSA concerned:
- Monthly programmes dealing with an important issue related to development.
- Short spots (4 to 5 minutes) dealing with technical advice to inform producers about incentive measures, epizootics, etc.

Production and distribution of information materials:
- Production and distribution of posters, booklets, technical guides, etc., in the benefit of various populations (farmers, extensionists, technical experts, schools in rural areas).
- Distribution is carried out by INVA, DSA and the various Technical Institutes concerned with the topic. These materials assist the extensionists and farmers.

Campaigns and scientific demonstrations:
Conferences, seminars, open days, show rooms, fairs and exhibitions with a national, regional or local character, are scheduled at the beginning of each crop year and widely disseminated over the different structures.

6- CAPACITY BUILDING PROGRAMMES:

Methodological training for extensionists: The permanent course in extension methodology caters for the training of extensionists, coming in their majority from the DAs. The training is supplemented by short sessions organized to meet the needs of the extensionists.

Technical enhancement for extensionists and development agents from the institutes concerned and all farmers: The objective is to provide technical support along the lines of the recommendations related to the production systems in the areas concerned and to farm management.

7- LINKAGES:

Linkages between research and extension:

In order for extension to transmit to the farmers production recommendations, it resorts to research outputs for the solution of technical problems. In its turn, extension represents a major source of information needed by research, to gain information about concrete agricultural problems.

Among these established mechanisms, the most organized one lays in the joint Research-Extension-Profession committees. Indeed, the formulation of production recommendations and research proposals is “a two-way process” The recommendations are based on research outputs, on the actual field conditions and the production situation as they are conveyed by the agricultural extensionists and the farmers.

Furthermore, there exist many other linkage opportunities between extension and research: fieldwork visits and frequent meetings are also a significant means to link extension and research.
Linkages between training and extension:

As an agricultural development activity, extension requires continuous enhancement of the performance of extensionists. It is necessary to distinguish between two types of training: Methodological training and technical training.

**Methodological training:** Extensionists need technical references but also methodological tools to better communicate with the farmers. These tools must go through research, experimentation and adaptation before their application.

The Agricultural Extension National Institute (INVA), an administrative public establishment and the focal point for the Ministry of Agriculture and Rural Development, is currently experimenting extension approaches and methods to support the current agricultural and rural development policy, in collaboration with the main beneficiaries, i.e. the agricultural profession.

**Technical training:** Technical upgrading courses are given by subject specialists so as to promote professional contacts between extension, research and the profession. The training covers many aspects:

- Short training sessions conducted in CFVA and fieldwork contacts for the establishment and joint control of demonstrations plots;
- Visits by extensionists to the research centres and stations and joint participation in extension activity evaluation periodic meetings.

8- COOPERATION PROJECTS IN AGRICULTURAL EXTENSION SERVICE:

**FAO Projects:** Two projects were carried out in collaboration with FAO regarding agricultural extension services: the first (83.002) called: “communication - extension”; the second, (87.004, considered as a continuation of the first project) is called: “Enhancement of the National Pedagogical Agricultural Centre, as an implementation agency of the project.” The first project was devoted to the training of extension trainers, the introduction of the permanent extension course and the adoption of extension tools.

Apart from its training component, the second project was devoted to the equipment of the CNPA and the supply of extension material means. In addition, two quite recent projects were launched in two pilot Wilayas: Tizi-Ouzou and Jijel so as to define an intervention strategy in favour of rural women.

**World Bank Projects:** Project 1: “BIRD Pilot Extension Project”. It aims to set up follow-up/evaluation mechanisms of extension activities and adopt coordination mechanisms between Research centres - Training - Extension. It spanned over 5 years (1993-1997). Six pilot Wilayas were involved, i.e. approximately 600,000 farmers and five training Centres. The project aims to introduce extension organization and methods, train and enhance extension staff and farmers, reinforce training and extension centres and enhance INVA for the production of written and audio-visual teaching material.

Project 2: “job creation in rural areas”, financed by the World Bank, is devoted to the creation of income-generating activities for rural women, along with an extension component.

**FNUAP Project:** “Integration of the concepts of reproductive health and family planning in the programs of rural development”. It aims to implement, within the framework of an integrated and participatory approach, a multi-sector intervention for sustainable development. Within this framework, the 17 poorest Wilayas were identified and a subsequent training scheme for extensionists and health agents was launched.

**IFAD Projects:** Project 1: “Development of cereal cultivation and breeding in small- and medium-size farms”, along with its extension component.
Project 2: “Development of Oued Melleg in the Tebessa Wilaya.”. The project aims to promote activities intended for rural women, along with a training and extension component.

**German-Algerian cooperation Project:** “Implementation of a programme for the eradication of illiteracy among rural girls between 8 and 18 of age”, along with a training and extension component.

**9- IMMEDIATE MEASURES TO PROMOTE AND GIVE NEW IMPETUS TO EXTENSION:**

In the past ten years, extension has tried to tune in with the new agricultural and rural institutional landscape. Today, re-energising extension will have to go through:

- Readjustment of the current national extension apparatus compared to the new PNDAR requirements and the adoption of an extension strategy so as to define both the specific and general objectives to reach;
- The vital necessity to develop linkages between research and extension by the installation of an Intranet network between research institutions (INRAA, INRF, Technical Institutes) and development institutions (DSA and CAW, INVA, training institutions);
- Financing of proximity and mass extension programs: up to now, extension activities have always been funded either within the framework of projects, or indirectly within the framework of the operational budgets of the structures concerned. Never has a specific financing plan or a special extension budget been drawn up;
- Enhancement of extension activities through management, follow-up and evaluation at the various levels of intervention (CAW, DSA, Subdivisions and communities), in particular with regard to the harmonisation of extension tools;
- Enhancement of the partnership with the national media (radio and television) by means of conventions and agreements to consolidate the current organization (implemented since 1995 with ENRS and ENTV) and to reinforce communication in the field of agricultural and rural development;
- Upgrading the level of extension staffing both at the national and local levels, in order to improve their intervention through the creation of a graduate or post graduate higher education structure specialized in extension/development within the structures of Higher education (INA, INES, etc);
- Re-energising partnership with specialized international institutions and organizations: FAO, IFAD, FNUAP, GTZ, OADA…, to allow extension staff to keep abreast with the latest innovations in the field of extension/development.

**ii- AN OVERVIEW OF THE AGRICULTURAL EXTENSION IN THE JAMAHIRYA**

Amr Gumaa SHIRIEHA

The total surface of Libya amounts to 1.8 Million km\(^2\). It is a hot, arid area characterised by high temperatures and low rainfall, with the exception of the coastline which has a Mediterranean climate. Agricultural lands represent 2% of the overall surface; the total arable lands amount to 3.6 million hectares. The lands with a productive potential with a rainfall above 200 millimetres a year are estimated to 1.3 million hectares. Lands with permanent irrigation represent 14%, rangelands 8% and forests 0.34% of the Libyan total area. The agricultural sector contributes up to 7% of the GDP and offers employment opportunities to 18% of the total active population. Agricultural imports represent 18% of the total imports.

In the past three decades, the Great September 1st Revolution devoted huge financial means to agriculture and to animal and marine wealth, thus largely impacting the farmers’ living standards. Many agricultural, production and settlement projects were carried out, the most prominent among them being the Great Artificial River meant to carry millions of cubic meters of fresh water from the Sahara to the coastline areas.

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16 Amr Gumaa SHIRIEHA, Director of the Sustainable Agriculture Project, Centre for Agricultural Research – LIBYA
1- STRATEGIES FOR THE AGRICULTURAL SECTOR:

- Achievement of self-sufficiency in the field of cereals, meat and vegetables.
- Protection of the environment and natural resources through optimal utilisation.
- Contribution to the enhancement of farmers’ income.
- Promotion of settlement of communities in the agricultural areas.
- Enhancement of agricultural research and establishing linkages with agricultural extension and agricultural training institutions.

2- ADMINISTRATIVE ORGANISATION OF THE SECTOR:

The Department of Agricultural and Rangeland Development supervises all agricultural and production projects, agricultural training institutions and specialised agricultural companies. At the level of each “administrative division” is a Popular Committee in charge of supervising and implementing agriculture and animal and marine wealth policies.

Agricultural Extension:
Agricultural extension is used as a means to link with the farmers, in so far as it is considered as an informal, unofficial educational process, based on persuasion and conviction, aiming to promote changes in the farmers’ attitudes for the management of their land.

The Tasks of Agricultural Extension could be summed up as follows:

- Drawing the general policy of the agricultural extension programme in collaboration with the agricultural research centres and other popular mechanisms.
- Planning and follow up of extension programmes at the local level;
- Establishing linkages and coordination with the agricultural research centres, agricultural higher institutes and specialised agricultural institutions in order to convey and extend research outputs through various extension methods;
- Devising training activities for agricultural extensionists and supervising their implementation;
- Carrying out information and extension programmes (publication of magazines, extension bulletins, extension posters, agricultural fairs and exhibitions, radio and television programmes);
- Assessing extension programmes and methods and conveying the outputs to the research centre and the various technical bodies.

Agricultural Research:
The Agricultural Research Centre as a reference educational institution was founded by virtue of the 1971 Law No. 109. It is considered as the reference mechanism to: 1) define the policies of the agricultural sector in the Jamahiriya; and 2) set up and implement strategies and programmes. It is the oldest scientific research institution in the country. The Centre is in charge of scientific research in the field of agriculture, reinforcing its structures and training the necessary technical staff. The mission of the Centre could be summed up as follows:

- Drawing the general strategy for scientific research aimed at the promotion of agricultural development
- Collecting, classifying and assessing technical, economic and social studies pertaining to the agricultural sector.
- Carrying out researches and studies for the development and protection of natural resources.

3- AGRICULTURAL RESEARCH AND EXTENSION RELATED POLICIES:

- Administrative and organisational stability of agricultural extension bodies;
- Providing the necessary financial and management means for agricultural extension to play its role;
- Reinforcing linkages between agricultural extension organs and universities and specialised agricultural institutes;
- Adopting priorities for agricultural researches within the framework of the development goals and
programmes, while putting special emphasis on the importance of transferring international knowledge and its adaptation to local conditions;
- Support of agricultural scientific research institutions, at the financial and staffing levels, including setting the priorities for national and international training.

Ways and Means to Convey Extension Information:

It goes without saying that agricultural extension aims to convey knowledge, the outputs of research and techniques to the various categories of farmers, regardless of their age, level of training, economic and social status, through different effective ways and means, with a view to bringing about changes in the farmers’ attitudes, ranging from awareness building and exposition to adoption and field implementation. In the Jamahiriya most techniques are used to convey information, according to a set of priorities, taking into account the financial means and human resources available for the agricultural extension organs, including:

- Extension farms and pilot farms
- Field visits
- Extension meetings
- Training workshops
- Radio and television programmes
- Agricultural bulletins
- Agricultural exhibitions and contests
- Rural Development centre.

4- CONCLUSIONS:

By way of conclusion, it is necessary to spell out the hindrances standing in the way of extension activities:

- Inexistence or instability of the administrative structure of the agricultural extension services;
- Weakness of the communication channels between the agricultural extension services and scientific research institutions, leading on the one hand to the inability to convey the research outputs to the farmers and, on the other hand, to the impossibility for research institutions to know the implementation results and the point of view of farmers. They can thus have no feedback to orient or enrich their studies;
- The impossibility for agricultural extensionists to fully devote themselves to extension work;
- Inexistence of full-time farmers and illiteracy among some of them constitute social obstacles for extensionists and prevent farmers from comprehending the importance of agricultural extension and getting familiar with innovative technologies;
- The absence of a regulatory framework governing the relationships between agricultural extension organs, research centres and the parties funding agricultural extension programmes leading to the weakness of the tripartite communication channels between research, agricultural extension organs and the agriculturalists;
- The absence of international and regional efforts in the fields of consultancy and of transfer of technology projects related to agricultural extension has had a negative impact on the promotion of agricultural extension, in comparison with other agricultural activities;
- Need for enhancement and support of rural development by competent agriculture staff in the field of agricultural extension in order to train the farmers’ wives and daughters in the agricultural and economic sectors;

The outstanding advances in the sector of agriculture owe much to the effective role of agricultural extension. We are therefore called upon to spare no effort in the enhancement of agricultural extension services for the benefit of farmers in developing countries, whether it be at the local, regional or international level, thus bridging the gap in the field of food security and raising the farmers’ standards of living.
Introduction:

The Islamic Republic of Mauritania covers 1,030,700 km² with more than 80% of desert territory. The national population census carried out in 2000 by the National Statistics Office (ONS) estimates the population of Mauritania at 2,548,157 inhabitants with a growth rate of 2.63% per annum. Since the great droughts at the end of the 1960s, the country has undergone major changes. The nomads, who constituted 65% of the population in 1965, now represent only 10%.

Contributing about 20-30% to GDP, the rural sector constitutes one of the three pillars of national economy. In spite of their vulnerability in the face of climatic variations, livestock and agriculture still ensure food security for about half the population and employs around 65% of the active population.

The potentials of arable land are estimated at 502,000 hectares, including 137,400 hectares irrigated, 220,000 hectares rain-fed, and 139,100 ha watershed, and 5,500 ha in the oases. The use of this potential is completely dependent on the availability of water (rainfall). In the forest - rangeland sector, estimated area is 102,500 hectares, including 48,000 hectares of classified forests. Livestock are estimated today at 1,692,000 cattle, 1,397,000 camels, 13,759,000 small ruminants and 3,500,000 poultries.

The needs in cereals supplied by the national production have undergone a very irregular evolution, with an average rate of coverage ranging from 29% to approximately 41%. In addition, following the improvement of animal health, the ration of livestock is 1.4 UBT/inhabitant, one of highest in the sub-region. Dairy production is estimated at an average of 400,000 T, which is the equivalent of 150 l/inhabitant/year, much below the national needs.

In 2003 and 2004, the country was invaded with desert locusts at an unprecedented scale. The damages are estimated at 50% and reaching 100% in certain areas.

1- STRATEGY FOR THE RURAL SECTOR:

The strategy for rural development by 2015 evolves around four main axes:

- to support growth of the sector so as to ensure the country’s food security;
- to ensure equitable access to the resources of the sector;
- to increase the offer and availability of public goods and services necessary to the sector’s sustainable development;
- to develop the management capacities of integrated and participative rural development.

The implementation of these orientations goes through three main categories: (1) development of tracks supported by Research - Training and effective Extension, (2) development of economic and social infrastructures and (3) enhancement of the sector’s institutional and organisational framework.

2- SITUATION OF RESEARCH - TRAINING - EXTENSION

History:
From 1955 to 1972, agricultural research projects were entrusted with foreign institutions (IFAC, IRAT) or carried out within the sub-regional framework on the basis of agreements or agreement projects.

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18 Dah OULD ZERROUGH, Chef de service de la recherché a la Direction de recherché, formation et vulgarisation - MAURITANIA
One had to wait until 1973 to see the creation of the first national institution for agricultural research: the Agronomic research Division at the Ministry of Rural Development. The National Centre for Breeding and Veterinary research was created at the end of the same year. At the end of 1974, the National Centre for Agronomic Research and Agricultural Development (CNRADA) replaced IFAC and IRAT branches.

Enriched with two new structures, Agronomy research had to consolidate its achievements and promote new activities in order to overcome the constraints of development in the rural sector.

The absence of a central structure to coordinate the activities among various operators involved in research had in the past constituted a real constraint for the development of the sub-sector. The Research, Training and Extension Department (DRFV) was thus created in 1993.

3- ACTORS IN THE SUB-SECTOR:

3.1 The Research, Training and Extension Department (DRFV):

DRFV is in charge of matters pertaining to agronomic and veterinary research as well as the formulation and extension of production techniques, in particular:

- development and follow-up of the sectoral policies in these fields;
- development and follow-up of agronomic and veterinary research national policies;
- definition of teaching and vocational training policies, programmes and methods in the field of rural development;
- definition of policies, programmes and methods in the field of agricultural and pastoral extension techniques;
- contribution to the necessary coordination of activities among the various actors of the National Agricultural Research System (SNRA);
- promotion of agricultural research activities carried out by institutions and structures external to the Ministry of Rural Development and Environment.
- facilitation and incentive of the coordination and dialogue cadres within the agricultural research national system (CA, CST, CNRA);
- mobilization of the resources necessary to finance and manage the “joint research funds”.

3.2 The National Breeding and Veterinary Research Centre (CNERV):

The centre was created on April 5, 1973. It is a public administrative establishment with civil status and financial autonomy. It has a Board of Directors and an executive Board of Managers. Its mandate is: “to allow and support any medical, veterinary and zoological research useful to the development of Breeding in Mauritania”. It is mainly in charge of:

- Diagnosis of epidemic diseases legally acknowledged as contagious and of parasitic and infectious diseases;
- Tracking and epidemic survey of the main diseases for medical, sanitary or economic purposes;
- Study of the diseases hampering the development of breeding, in terms of their extent, distribution and actual incidence and of necessary research in order to control these diseases;
- Search and experimentation of all methods likely to contribute to the zoological improvement of national livestock;
- Ensuring health control of foodstuffs of animal origin, canned food and drink and contributing to public health.

CNERV is divided into five services: serology, bacteriology, parasitology, virology and animal husbandry. Its headquarters are in Nouakchott. CNERV faces many constraints, mainly (i) unchanged budget for several years, (ii) lack of high level researchers.

NB: The CNERV laboratories are well equipped and are up to the required standards.
3.3 National Centre for Agronomic Research and Agricultural Development (CNRADA):

CNRADA was created in 1974, as a civil entity with financial autonomy. It has a Board of directors which validates the programmes of research institutions on the recommendation of the scientific council. CNRADA’s headquarters are in Kaédi and has 3 main stations (Rindiao, Belinabé and Sylla), 4 secondary stations (Rosso, Kiffa, Kouroudjel and Nouakchott) and several support points scattered all over the country.

Among the constraints, mention should be made of the lack of high level researchers able to cover the whole array of research topics in the agro-ecological zones of the country.

3.4 The National Training and Extension School (ENFVA):

The school was created in 1962 under the name of Training and Extension Centre (CFVA) with considerable support from FAO; it was renamed in 1972 to become the National Training and Extension School. It already trained several agents in the fields of agriculture, livestock and forestry. In addition, the school contributes to the continuous training of the department’s agents as well as to the development of modules, according to the needs of the rural sector.

4- GENERAL FRAMEWORK OF RESEARCH - TRAINING - EXTENSION:

4.1 Research:

The agricultural research policy is defined in the National Agricultural Research Plan. This National Agricultural Research Plan (PNRA), conceived over the period 1995-2004, aimed to find solutions to a certain number of difficulties met by the National Agronomic Research System (SNRA) in Mauritania. It submitted a state of the arts of agronomic and veterinary research in Mauritania.

The PNRA came out with concrete measures to improve performances in the various research fields, through validated research programmes, operation resource allocation for the different structures, the status of researchers, etc. Based on a systemic approach, the PNRA included 5 programmes reflecting the country’s 5 ecological agro areas:

- Silvicultural-rangeland programme with 3 sub-programmes;
- Irrigated programme with 3 sub-programmes;
- Rain-fed level programme with 4 sub-programmes;
- Oasis programme with 3 sub-programmes;
- Peri-urban programme with 2 sub-programmes.

Thus, in order to ensure better coordination of agricultural research activities, the Ministry of Rural Development and the Environment set up frameworks for dialogue likely to give new impetus to, and re-energise, the rural sector, namely:

- The National Council for Agricultural Research (CNRA)
- The Scientific and Technical Committee (CST)
- The Research & Development Regional Committees (CR-RD).

These organs did not, however, operate on a regular basis. Linkages between the various components of the Research - Training - Extension triptych did not work.

Output Dissemination:

By means of partnership agreements concluded within the framework of the projects, the centres have a real opportunity to disseminate research outputs. These centres can also carry out their task through the distribution of technical files, scientific articles, reports, the media (rural radio, TV, newspapers), fairs and exhibitions. The distribution remains however very limited and very few research outputs were adopted.
4.2 Extension:

The national extension policy was carried out by the Department of Agriculture which used to have 28 extensionists spread over seven agricultural wilayas in the country. Their job consisted in giving agricultural advice to a restricted group of producers scattered all over the national territory, via the Agricultural Extension Project (PVA) designed and implemented by UNDP and FAO. This project paved the way for the creation of an Extension Service within the Department of Agriculture.

The very limited number of extensionists did not make it possible to reach satisfactory rates of performance, given the vastness of the territory and the diversity of production systems. However, this project helped set up an extension system and certain actions were carried out by the Department of Agriculture:

- Constitution of a core of extension specialists at different levels
- Development of technical files on the various farming systems in Mauritania
- Dissemination of a limited number of technical topics.
- Creation of seeds production companies within Mauritania, i.e. Inter-professional Seeds and Seedlings Producers Association.

Along with the Department of Agriculture, certain projects, such as the Oases Development Project (funded by INSIPID), Breeding II (ADB), PLEMVASP (FAO/UNDP), FLM, OXFAM and other international NGOs had undertaken, each in its sector and geographical area, extension work.

In spite of this diversity, which is in many ways very enriching, a few discrepancies remained, mainly in terms of the space covered and the production systems. In the last analysis, the multiplicity of programmes ended up in a dispersal of efforts, redundant overlapping action, the absence of coverage of certain zones. Moreover, little account was taken of the environmental dimension in the extension activities carried out.

Starting from the mid-1990s, a large Seeds Development Programme (PDS), backed by FAO, including an ambitious extension component, substituted the Agricultural Extension Project (PVA) and the Department of Agriculture launched a “think tank” for the implementation of a national system of harmonious extension. The test phase saw the introduction of the “Train & Visit” method at the level of the National Rural Development Company (SONADER), ending up with the implementation of the Agricultural Services Project (PSA), financed by the World Bank in 1993, meant to constitute the federating structure for all extension activities. In the same year, the Research, Training and Extension Department was set up for the development and implementation of extension, research and training policies.

The Department spared no effort to extend the maximum of technical advice to the producers, with a view to improving the productivity of the existing operating systems. This was done through the enhancement of techniques via the extension of priority topics set along the participative diagnoses identified with the help of the farmers. An extension apparatus made up of 149 agents was set up, along with an adequate training support to warrant suitable technical advice.

Significant efforts in the field were no doubt made in the past few years, in particular a better awareness on the part of the extensionists. Training supplied to the structure made it possible to have operative extensionists. In the first three years, the project adopted an extension approach by means of training and visits encouraged by the World Bank. Since 1998, however, the project has taken steps that focus on the local socio-economic specificities of the milieu. This new, un-constraining step unleashed the extensionists’ initiatives and allowed better dialogue with the other actors at the level of the villages for more effective harmonization of the activities.

Enriched by the new extension experiences, extensionists were able to develop a harmonious approach combining several methods. One of the outcomes was to bring together researchers, extensionists from the various structures and trainers to discuss development issues.
Extension, a pivotal element for effective change in the rural world, was discussed and analysed in order to improve and multiply actions necessary for the improvement of production and productivity to raise the income of the producers and their professional organization.

The objectives of Research - Training - Extension such as they emerge from the sectoral development policy letter are as follows:

- Development, extension and dissemination of adapted agro-forestry and rangeland techniques;
- Capacity building of the production professional organizations in their economic function through a wide-scale approach of the largest number of farmers;
- Contribution to the improvement of productivity, income and production of these groups;
- Reinforcement of the producers and their agricultural advisers.

For the achievement of these objectives, the Government has taken all the necessary steps for implementation of the following measures:

- Performing technical advice made more available to rural producers;
- Deployment of extensionists all over the production areas;
- Optimal use of the available training potential for the benefit of the rural sector by allocating the necessary resources for training;
- Adaptation of training contents to the needs of agricultural professionals;
- Retraining of extensionists to allow them to better respond to issues raised by farmers;
- Enhancement of adaptive research consisting in borrowing technologies developed elsewhere, testing and adapting them to the country;
- Introduction of research in oasis as well as rainfed croplands;
- Development of applied research in order to improve livestock production.

The results reached are still insufficient both for the improvement and dissemination of technical training and for the management of farms and associative structures. To alleviate these weaknesses, the Government worked out a sectoral development policy relating to Research - Training - Extension. The policy is drawn out in the 2015 strategy document by the Ministry of Rural Development and Environment.

Main Communication Channels:

The main linkage channels between research - training and extension actors are still radio transmitting-receiving sets. The telephone and the Internet are steadily gaining ground as the majority of the urban centres are connected to the telephone and the Internet networks. Within the framework of modernization of the administration, the Government will, in 2006, complete the connection of all public administrations to the Internet.

5- PROSPECTS:

5.1 In the field of Research:

- Development and adoption of an incentive status for agricultural researchers, such as stipulated in the provisions of the law on the general statute for civil servants and contracted State employees (Subparagraph 2 of Article 31) and launching of a continuous training scheme leading to a diploma for researchers;
- Updating the National Agricultural Research Plan (PNRA);
- Recruitment of doctorate level researchers to replace researchers close to retirement;
- Enhance research means;
- Apply the principle of exclusiveness of research in the hands of agricultural research centres, such as stipulated in the decrees governing their inception and create a national Consultative Committee for Agricultural Research and Development (CRDA);
- Enhance its coordination mechanisms, in order for DRFV to fulfil its coordination mission between research, training and development;
- Continuation and reinforcement of the co-operation programme initiated in 1998 with ICARDA.
5.2 In the field of Training and Extension:

- Provide technical support and advice to producers and foster the creation of socio-professional organizations, so as to improve their production techniques and their productivity, to have easier access to the goods and services necessary to achieve and optimise their production targets;
- Draw a national training plan for the Ministry for Rural Development and Environment;
- ENFVA plans to take up the training in 2006 of junior staff to remedy for the lack of staff in the fields of supervision and follow-up of development programmes, caused by the structural adjustment;
- Enhancement of linkages between Research - Training - Extension through periodic training sessions of grassroots extensionists (AVB), AMRT, EMP followed by AVB, re-energising the regional development committees.

iv- MOROCCO-COUNTRY REPORT

Akka OULAHBOUB\textsuperscript{19} and Chafik KRADI\textsuperscript{20}

Introduction:

Located between two seas and a desert, the Kingdom of Morocco covers 710,850 km\textsuperscript{2}. It is bordered to the South by Mauritania, to the North by the Mediterranean Sea, to the East by Algeria and to the West by the Atlantic Ocean. The country is subdivided into 16 economic areas, 42 provinces and 26 prefectures. The total population amounts to about 30 million inhabitants with 53% in an urban environment. Agriculture holds an outstanding place in the economy of the country. It contributes up to 15-20 % of GDP and contributes up to 40 % of job opportunities.

In a rural environment, economic activity and employment are still mainly agricultural: about 80% of rural households are agricultural households. However, 71% of the farms are of less than 5 hectares and occupy only 24% of the useful agricultural surface.

Moroccan agriculture needs to be upgraded because of its weight on the economy. The fluctuations of agricultural production due to climatic hazards negatively affect the whole of the economy.

Trade globalisation weighs upon Moroccan agricultural policy. The conventions with the United States, Turkey, Egypt and Tunisia, as well as the association convention with the EU on agricultural trade, urge Morocco to engage in deep reforms for a better optimisation of its production, its agricultural potentials and commercial opportunities, thus allowing it to meet the requirements of competitiveness.

As a matter of fact, the latest developments at the economic and scientific level, the social demand for technologies and the sustainable management of natural resources constitute key elements in the agricultural and rural development policy, such as defined, for its orientations, in the 2020 rural development strategy document and in the long-term agricultural development strategy. The main objectives of the strategy are:

- Increasing agricultural production to meet the local needs in food and the demands of external markets;
- Increasing employment and income in the agricultural sector;
- Preservation of natural resources and the optimisation of irrigation water;
- Enhancement of vocational training for rural men and women;
- Improvement of services related to the quality of life: health, drinking water, electricity and transport;
- Correction of regional disparities in terms of infrastructures, land planning and development projects.

With the support of the World Bank, MADRPM began the implementation of this strategy through the implementation of the Integrated Rural Development Programmes centred on Small and Average-size

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Hydraulics (DRI-PMH), the Integrated Rural Development Programmes centred on Optimisation of Bour (rainfed) cultures (DRI-PMVB) and the Rural Development Programmes centred on Natural Resources Management (DRI-GNR). These programmes constitute a model and a driving force for interdisciplinary and inter-institutional work within an organisational framework (programme-contracts).

The extension approach adopted within the framework of these three programmes is an ascending approach, based on the analysis of the populations’ needs and their translation into action plans. One thus speaks of the Douar (village) Development Plan (PDD) at the local level, the Communal Investment Programme (PIC) and the Communal Development Programme (PDC).

1- ORGANISATIONAL AND INSTITUTIONAL MEASURES FOR AGRICULTURAL EXTENSION AND RESEARCH:

1.1 Administrative structures:

Agricultural Extension System:
Agricultural extension has always been one of the main components of development agricultural policy. Since independence, agricultural extension has been given a determinant role for increasing production, diversification of activities and improvement of farmers’ income. These tasks can be carried out only through effective agricultural extension services, likely to integrate at once the national strategic priorities for agricultural and rural development, the actual needs of the populations, the achievements of agricultural research and the effective use of human and material resources.

Planning extension activities is governed by a process based on an ascending approach. Extension programmes are more and more diversified, integrating the various components of rural development. They are managed, coordinated and supervised by the Agricultural Extension Services Division (DVA)/DERD, which is in charge, *inter alia*, of supporting the devolved services for technical conception and the identification of extension means and methods.

The implementation of these programmes is entrusted to the Provincial Directorates for Agriculture (DPA) through Work Centres (CT), and to the Regional Offices for Agricultural Optimisation (ORMVA) through the Agricultural Development Centres (CDA) or the Centre for Agricultural Optimisation (MVC), and to the agricultural professional organizations and their local organizations.

The personnel mobilized for the implementation of extension programmes consists of 4,000 agents (engineers and technicians).

Agricultural Research System:
National Agricultural Research (RNA) has witnessed the progressive emergence of several institutions involved in the agricultural sector. This evolution of research imperatively imposes new integration and participation concepts evolving around three principles:

- Research regionalization;
- Research devolution;
- Reinforcement of proximity research.

It is within this framework that INRA, which plays a major role in the production of knowledge and technologies, has recently introduced new reforms which also involved:

Structures and intervention capacities:
- Launching of a Scientific Directorate in charge of orientation, coordination and follow-up, assessment of research activities and research development;
- Launching of a Research and Development Directorate (DRD) in charge of coordination, management and follow up of Research-development activities (R/D);
- Launching of new Regional Centres for Agronomic research (CRRA) at Rabat and Errachidia to cover the whole of the country’s agro-ecological diversity;
- Launching of Research Units (UR);
- Launching of the regional committees for research orientation and management.

**Methods and tools:**

Programming medium-term Research and Research and Development 2005-2008 (PRMT) taking into account CRRA orientations and operational objectives. It is a participative and iterative approach which led to the identification of the multidisciplinary Research projects, budgeted with precise activities, results and bill books. R/D actions and the transfer of technology are an integral part of PRMT projects. They are carried out by the Development and Research Services (SRD) which are interface structures.

### 2- OTHER OPERATORS AND LINKAGES BETWEEN AGRICULTURAL EXTENSION AND RESEARCH:

#### 2.1 Operators in Agricultural Extension and Research:

Professional agricultural organizations: ANOC, ANEP, ANPVR, SONACOS COMAPRA, ASPOT, FERTIMA contribute to extension actions in their respective fields. However, these operators intervene in favourable areas, whereas enclosed difficult areas are left with the State structures.

Agricultural extension actions are also programmed and followed up by several structures: MADRPM (Central Directorates, State Companies). This multitude of operators requires deliberation on the objectives, methods and means for the implementation of extension programmes. NGOs, input sale companies also take information or promotion actions for their products.

In addition to the universities, several establishments under the supervision of MADRPM operate in the field of agricultural technology-generating research (INRA, IAV, ENA, ENFI, CNRF, LARV, SEEN and LOARC) and contribute to its dissemination. However, the multiplicity of by-laws and statutes, along with the absence of “gateways” between these establishments does not favour an exchange of experience and human resources nor a smooth information flow and communication.

This situation sometimes leads to discrepancies at the level of the messages received by the farmers. Besides, there is a general consciousness about the lack of synergy between these operators. It is in this way that DERD has, for the past two years, conceived and implemented a federating project (PROFED) aiming at creating synergy between these institutions.

#### 2.2 Current Linkages With Associations, NGOs, Research, Training, The Private Sector And Coordination And Communication Mechanisms:

Extension linkages with research have lately been reinforced through legal provisions defined within the framework of conventions for the transfer of research outputs and the facilitation of technology transfer days for the benefit of the farmers. On the whole, 13 conventions have been signed between DERD and INRA, relating to 9 CRRAs. The programmes covered by these conventions are:

- Food security Programme for the production of cereals and rehabilitation of food legumes, for which three conventions were signed with INRA;
- Pilot programme for the promotion and dissemination of new technologies in arid cultures (2002-03, 2003-04 & 2004-05);
- Planning “facilitation days” for the transfer of technology, for which 9 conventions were signed with CRRA.

DERD coordinates the steering committee comprising of INRA representatives and the provincial DPV and DPA coordinators. This committee supervises the implementation of the programmes and evaluates its activities. DERD will soon carry out the evaluation of these experiences.
Annual meetings for presentation of research results, as well as “open door days” for experimental domains organized by CRRA, constitute a forum for contact and exchange of information between researchers - extensionists - farmers and professionals.

Actually, with the emergence of rural organizations (NGOs, associations…) with growing impact on the development of rural areas at the regional level, and in light of field reports, the current linkages between research and NGOs prove to be very limited.

For instance, with the support of IPGRI, INRA succeeded in mobilizing international funds to finance local NGO projects to safeguard in situ biodiversity in the southern oases of Morocco. It is also helping an NGO at Ait Ba Amrane, in the province of Tiznit, with the installation of a unit for cactus processing.

In the same context, in collaboration with NGOs, DERD is undertaking a whole socio-economic promotion programme for rural woman. This programme aims at integrating rural women within the development process through the promotion of women’s activities, alleviation of illiteracy and launching of income-generating small projects (truck farming, valuation of agricultural products, rabbit breeding, caprine breeding, bee-keeping, poultry farming).

In addition, a workshop on civil society and sustainable development is planned to be held at Erfoud, on 7-11 March, 2005 on the occasion of the international symposium on oasis systems, to be convened jointly by INRA and Tafilalt ORMVA to discuss linkages of research and development with associations.

2.3 Extensionists’ Involvement in Planning and Launching of Extension and Research Programmes:

The traditional methods of the transfer of technology, characterised by their linear approaches and evolving around specific tracks, are yielding to new methods, based on the principle of: farmers’ participation, proximity and the involvement of local associations and professional organizations in the planning, implementation and follow up-assessment process.

Although notable progress was accomplished in the practical application of these new concepts of Transfer of Technology and Research and Development, the reactions of Research and Development Institutions to the deep changes in the rural world (degradation of the natural resources, lower income of farmers, emigration…) are still below the expectations and aspirations of the population. Moreover, the exchange of information and experiences between the various institutions involved in the transfer of technology is still low.

Medium-term research planning and research-development 2005-2008 set up by INRA was but a first experience which allowed all partners in research (extensionists, developers, professionals and farmers), on the occasion of the regional workshops convened for this purpose in 2003-04, to decide on the relevance and feasibility of research topics on the basis of the constraints and potentials then identified.

2.4 Type And Level Of Technical Support To Field Extensionists:

Though the past five years' budgetary restrictions have seriously affected the evolution of extension structures at the local level, significant efforts are being exerted for the benefit of extension staff:

- Organization of training sessions: 10,000 training days /year;
- Distribution of documentation, bulletins and brochures;
- Organization of training sessions in Morocco and abroad to upgrade extensionists’ knowledge;
- Attendance of seminars and workshops
- Upgrading the structures of proximity: installation of the buildings, scientific and technical equipment
- Purchase of vehicles and the motor cycles;
- Assignment of available lodgings;
- Incentives through travel expenses and end–of-year bonuses to the extensionists;
- Professional promotion.
3- MAIN CONSTRAINTS AND CHALLENGES FOR AGRICULTURAL EXTENSION AND RESEARCH:

There are two types of constraints and deficiencies relating to agricultural extension and research, one is environmental, the other systemic. The constraints related to the environment are: climatic hazards weighing heavily on investments in agriculture, uncontrolled distribution chains, the inadequacies of socio-economic infrastructures, the agrarian structures (71% of farms < 5 hectares, parcelled out: 7 plots / farm), illiteracy affecting 76% of farmers.

The systemic constraints are of a different kind: existence of several operators with little synergy and deliberation; insufficient human resources and allocated means below the required needs.

Extension and research challenges are huge so as to face a new economic environment which gives precedence to quality, largely requiring technologies, knowledge and supervision. This of course calls on significant decisions in terms of approach, methodology, restructuring extension and research directorates, targeting research and research and development activities, staff redeployment and the revision of budgetary programmes.

The need of good coordination between the development and research institutions is more and more urgent. At this level, Information and Communication Technologies can be an asset to be envisaged in order to facilitate the flow of information between these institutions.

4- ASSISTANCE BY FAO, OTHER DEVELOPMENT ORGANIZATIONS AND DONORS:

4.1 Extension:

Co-operation with FAO is not recent. This momentous institution accompanied Morocco since independence. At present, there are five projects in progress, focused on:

- Small and average-size farms (in progress),
- Gender approach in development (in progress),
- Support of the programme for agricultural development support in ORMVAs,
- Reorganization of the CT and
- Use of ICT (proposal).

In the same way, bilateral co-operation programmes with France, Spain, Holland, as well as multilateral co-operation with JICA, GTZ, OADA, OADR, CIHAM are being developed in other parts of the country…

4.2 Research:

INRA has recently joined CGIAR group as full member. Agreements were concluded with the institutions belonging to this group. In addition to co-operation with FAO (project: the Roles of Agriculture; project in preparation on plant genetic resources; project on training in management of broomrape in food legumes cultures ), INRA launched collaboration projects with ICARDA (biotechnology, improvement of plants…), IPGRI (conservation of plant genetic resources), IFPRI (food policies), CYMMYT (improvement of plants), IWMI (irrigation), ICRA (production system), the European Union, as well as bilateral co-operation protocols with friendly countries.

5- INFORMATION AND COMMUNICATION SYSTEM:

5.1 Main Communication Channels between Extensionists and Farmers:

The main communication channels between extensionists and farmers are characterised by direct contact at the time of field visits, “facilitation days”, demonstration land plots, trips by farmers and farming contests. Radio “Midi 1” with the programme “the farmer’s calendar” broadcast twice a day in the morning has been
very successful. Television is used to broadcast advertisement spots, Al Fellah (farmer) documentary dealing with the topics accompanying the crop season (ploughing, seed, harvest…). It should be noted that access to the media is costly; it is therefore conditioned by budgetary availabilities.

Sources of Technical Information:

It should be recalled here that the step taken by INRA and DERD and their intervention structures is systemic and iterative, including four phases: diagnosing the needs, checking research outputs with the farmers, large scale dissemination and follow-up / evaluation.

The sources of technical information derive primarily from agronomic research and higher education and training establishments (IAV Hassan II and ENA Méknès).

5.2 Main ICT Practices in Research and Extension Institutions:

In addition to the traditional methods of information “technical information bulletins, scientific reviews, activity reports, technical files, etc.), ICT practices are now holding an increasingly important place in the national systems of agricultural research and extension.

For INRA, information and communication hold an outstanding position in its new organization. As a matter of fact, INRA reinforced in 2003 the Intranet and the Internet infrastructure through the coverage of ten sites (7 at the regional level and 3 at the central level) equipped with small and medium size networks enabling them to communicate between themselves and to connect with the Website through dial-up connection. For the reinforcement of the management of communication actions, INRA has also launched a network of communication attachés with SRD/CRRA, who are offered continuous training in the field.

At the same time, INRA is undertaking research for the adaptation of the Geographical Information Systems (SIG) in the management of agriculture, environment and resource management (the projects for the development of rangelands /CRRA at Oujda).

For extension, considerable efforts have been made in the field of communication. Thus, the publication of two periodic reports per year of follow-up-evaluation of agricultural activities is a great achievement. By the same token, the bulletin on the transfer of technology (which reached its 120th issue), published in thousands of copies and distributed nation-wide, comes to enrich the information system based on research outputs.

Moreover, DERD is in the process of developing a Geographical Information System. The proposed plan consists of the installation of a dashboard allowing the supervision (monitoring) of DERD main activities, in particular those related to the management and follow-up of regional structures, production and dissemination of information, coordination of research activities, training and transfer of technology, and support of development projects.

5.3 Information on the Telephone, the Internet and Access to Radio in Urban and Rural Environments:

After its liberalization, the telecommunications sector in Morocco has gone through real evolution. Indeed, the introduction of mobile telephones (about 6 million subscribers in 2004 for Itisalat Almaghreb only) has considerably improved communication in urban and rural environments and fostered a certain organization in the profession. The national and regional radio stations (accessible in all areas) and television (accessible in un-enclosed and electrified areas) are being used to support certain field extension activities.

The use of the Internet is growing in urban and semi-urban environment, especially for communication within NARS, Development and professional institutions. However, much remains to be done in this field.
6- FUTURE PROSPECTS FOR RESEARCH AND EXTENSION SYSTEMS:

6.1 Future Prospects for the Extension System:

The objectives and orientations for future strategy in agricultural extension can be summed up as follows:

- Reinforcement of the extension decentralized and ascending approach, taking into account farmers’ demands;
- Reinforcement of proximity extension by the involvement of the civil society and subcontracting of extension activities to "consulting engineers";
- Targeting extension actions in relation to tracks and ecosystem;
- Reinforcement of linkages with research and training;
- Training of staff in coordination with the higher education and research institutions;
- Enhancement of linkages with Agricultural NGOs and professional Organizations;
- Subcontracting extension activities to "consulting engineers";
- Development of communication;
- Upgrading the structures of proximity.

6.2 Future Prospects for Research System:

For an agricultural research system to be successful it needs perfect coordination between its various components, good relations with development partners, available resources and adequate statutes and management procedures. The strategic axes for a future research system are:

- Improvement of relationships with one’s immediate environment while alleviating the inadequacies noted in terms of the mode of governance in the concerned establishments and linkages with the national and international partners;
- Introduction of a new type of management implying a federated national agricultural research system to accompany the changes witnessed in the national and international environment;
- Development of human resources by the enhancement of internal potentials within the system;
- Development of the financial resources within the framework of contract programmes;
- Enhancement of Research & Development by the creation of inter-professional centres: olive-growing agro-pole (CRRA at Marrakech), Citrus Fruit Centre (CRRA at Kénitra), Date Palm Culture Centre (CRRA at Errachidia), Irrigation Centre of Excellence (CRRA at Tadla);
- Enhancement of communication techniques.

In light of these new prospects, INRA was restructured in 2003 to remedy the weaknesses diagnosed, with a view to promoting proximity research for development, creating a synergy between researchers, adopting a rational use of human and financial resources, finding targeted high-quality and cost-effective technologies. The guiding principles underlying this reorganization are:

- A new organization to consolidate regionalization and devolution through:
  CRRAs, which have now gone up from 8 to 10, thus covering the whole of the agro-ecological diversities in the Kingdom;
  30 Research Units (UR) operating in research projects and multidisciplinary Research & Development;
  SRDs which are interface structures, whose activities are integrated in these UR projects.

- A participative planning through a medium-term research and Research & Development programme based on project-integrating demands;
- Subcontracting research to make up for the inadequacies of human resources;
- A system likely to diversify its financing sources;
- A performance rating system throughout the implementation of research programmes (PRMT 2005-2008);
- A strong and effective communication and information system.
### ACHRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANOC</td>
<td>Ovine and Caprine National Association</td>
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<tr>
<td>ANEB</td>
<td>National Association of Bovine Stockbreeders</td>
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<td>ANPVR</td>
<td>Red Meat Producers National Association</td>
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<td>ASPOT</td>
<td>Oilseed Producers Association</td>
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<td>AUEA</td>
<td>Agricultural Water Users Association</td>
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<td>BM</td>
<td>The World Bank</td>
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<td>CT</td>
<td>Work Centre</td>
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<td>CDA</td>
<td>Agricultural Development Centre</td>
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<td>CNRF</td>
<td>Forest Research National Centre</td>
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<td>CRRRA</td>
<td>Regional Centre for Agronomic research</td>
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<td>CGIAR</td>
<td>Advisory Group for International Agricultural Research</td>
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<td>COMAPRA</td>
<td>Moroccan company for the Marketing of Agricultural products</td>
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<td>DRI-PMH</td>
<td>Integrated Rural Development centred on the Small and Medium size Hydraulics</td>
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<td>DRD-MVB</td>
<td>Integrated Rural Development centred on Bour Optimisation</td>
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<td>DRI-GNR</td>
<td>Integrated Rural Development centred on the Management of Natural Resources</td>
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<td>DVA</td>
<td>Division of Agricultural Extension</td>
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<td>DERD</td>
<td>Teaching, Research and Development Directorate</td>
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<td>DPA</td>
<td>Provincial Agricultural Directorate</td>
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<td>DS</td>
<td>Scientific Division</td>
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<td>DRD</td>
<td>Directorate of Research and Development</td>
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<td>ENAM</td>
<td>National School of Agriculture at Meknès</td>
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<td>ENFI</td>
<td>Forest Engineers National School</td>
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<td>FERTIMA</td>
<td>Morocco Fertilization</td>
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<td>INRA</td>
<td>National Institute for Agronomic Research</td>
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<td>IAV Hassan II</td>
<td>Hassan II Agronomic and Veterinary Institute</td>
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<td>LARV</td>
<td>Veterinary Research and Analysis Laboratories</td>
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<td>LOARC</td>
<td>Official Analysis and Research Laboratory at Casablanca</td>
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<td>MADRPM</td>
<td>Ministry of Agriculture, Rural Development and Fishing</td>
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<td>ONG</td>
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<td>OAP</td>
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<td>Medium term Research Programmeming</td>
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<td>Douar Development Programme</td>
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<td>RNA</td>
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<td>R/D</td>
<td>Research &amp; Development</td>
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<td>SRD</td>
<td>Research and Development Service</td>
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<td>SEEN</td>
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<td>Seeds Marketing National Company</td>
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<td>Geographical Information System</td>
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<td>Information and Communication technologies</td>
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<td>UR</td>
<td>Research Unit</td>
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v- AGRICULTURAL EXTENSION IN TUNISIA: Development Perspectives

Moufida TOUAYI

Introduction:

There is no doubt that agriculture is a vital sector in the economy of Tunisia. Generating resources and employment, it is at present mutating, yielding to, and assimilating, the changes imposed by the global economic environment marked by competition and the free exchange of products.

In the past three decades, significant investments were made in the benefit of the agricultural sector, in terms of both infrastructure and production. In this context, the sector is called upon to mobilise and optimise the resources that are still available and to enhance its performances for a better productivity, a wider achievement of quality and competitiveness that will ensure a comfortable position in the aforementioned environment. Despite achievements in the agricultural sector, all recent analyses point to important potentials that remain un-valorised. Better use of irrigation water, enhancement of production techniques, and a more rational management of farms will indeed make it possible to achieve gains in productivity and reach better results, both qualitatively and quantitatively, for many products, such as wheat, potatoes, milk, meat, etc. Better results will enable the sector to meet the challenges imposed by the recent measures taken by the Tunisian Government to liberalise the internal market and open onto foreign markets.

In order to achieve these results, the regional institutions, the Ministry of Agriculture and Water Resources supervision services, as well as the profession need to exert significant efforts in the coming years in the field of information and training so as to enhance the knowledge and know-how of the majority of producers in the agricultural sector. This is why agricultural extension comes on top of the priorities in the new development strategy set by the Ministry of Agriculture and Water Resources.

Agricultural extension is indeed considered as one of the tools contributing in the evolution of the agricultural sector and in the mobilisation of all its potentials so as to stimulate production and cover the trade balance deficit in food products.

The analyses made at the level of agricultural extension have shown that the structures, programmes, organisation of activities and the human and material resources allocated to it are no more adapted to the requirements of agricultural development and that it is necessary to introduce certain reforms.

In the last years of the 7th Plan, special emphasis was put on agricultural extension, mainly in its institutional aspect: in 1989, extension territorial cells (CTV) were set up at the regional level (CRDA); in 1990, the Agricultural Extension and Training Agency was set up at the central level.

A five-year national agricultural extension development project started in June 1991 and was carried out within the framework of the 8th Plan. The project succeeded in overcoming a few constraints met by the agricultural extension system, through the introduction of certain reforms that launched an agricultural extension system with a proximity agricultural extension network, made up of CTV and CRA, allowing it to cover all the regions in the country and gain experience after many years of technical cooperation for the implementation of a field and mass agricultural extension programme which contributed to a large extent in the significant progress made by the sector.

1- THE PRESENT SITUATION OF AGRICULTURAL EXTENSION IN TUNISIA:

Following the guidelines of the agricultural extension master plan, the present system is based on a single three-level system (central, regional and local):

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21 Moufida TOUAYI, Deputy Director of Agricultural Extension, Follow-up and Coordination Programming, Agricultural Extension and Training Agency - TUNISIA
- At the central level: the Agricultural Extension and Training Agency (AVFA) is in charge of mass agricultural extension, support, follow-up and coordination of field extension
- At the regional level: the Agricultural Development Regional Commissions (CRDA) is in charge of field agricultural extension through Extension Territorial Cells (CTV) and the Agricultural Radiance Centres (CRA)

At the central level:

Within AVFA, five Technical Directorates are in charge of training and agricultural extension:

- Agricultural Operation Directorate.
- Professional and Private Agricultural Extension Supervision Directorate.
- Training and Agricultural Extension Support Directorate.
- Training and Fishing Extension Directorate.
- Pedagogical-Technical Directorate.

The central team is composed of 54 cadres and agents (33 cadres and 21 agents) in charge of:

- Conception and implementation of agricultural extension policy, in conformity to the development plans guidelines;
- Elaboration, follow-up and evaluation of agricultural extension programmes;
- Coordination of the field agricultural extension system through pedagogical and logistic support;
- Production and dissemination of written technical documents and audiovisual supports;
- Training and re-training of the extensionists and the staff in charge of their supervision;
- Awareness-raising of the farmers and their organisations in order to undertake agricultural extension actions and promote professional structures.

At the regional level:

The Regional Agricultural Development Commissions (CRDA) are in charge of field agricultural extension by means of a network made of:

- 24 Coordination Units (UC)
- 183 Territorial Extension Cells (CTV)
- 844 Agricultural radiance Centres (CRA)

The field agricultural extension network operates with 841 cadres and agents distributed as follows:

<table>
<thead>
<tr>
<th>Regional Structures</th>
<th>Cadres and Agents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>DVPPA</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>UC</td>
<td>47</td>
<td>30</td>
</tr>
<tr>
<td>CTV</td>
<td>166</td>
<td>5</td>
</tr>
<tr>
<td>CRA</td>
<td>580</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>806</td>
<td>48</td>
</tr>
<tr>
<td>Percentage</td>
<td>94%</td>
<td>6%</td>
</tr>
</tbody>
</table>

- The Division for Extension and the Promotion of Agricultural Production (DVPPA), mainly in charge of: planning, organisation and follow-up of agricultural extension actions and training; coordination with the different CRDA districts, technical services, and regional subject matter specialists who ensure support to agricultural extension activities;
- CTVs are in charge of helping extensionists (at CRDA level) organise their programmed work (allocation
of means of transport and common equipment, follow-up and provision of technical support); - CRAs are in charge of: make new technology-related information and options available to farmers; participate in the selection of research topics related to the field problems met by farmers; awareness-raising and training of farmers to form groups (cooperative society, association); help farmers groups in a rational way.

**Training of Extensionists:**

The upgrading of extensionists is undertaken through continuous technical and pedagogical training, so as to keep abreast of new technologies. For instance, 1,909 extensionists of both sexes were trained during the 2003/2004 campaign.

**Supervision Rate:**

Supervision rate in Tunisia remains very heterogeneous and differs from one area to another, according to the surface index (irrigated or rainfed) and the index of farmers supervised by extensionists:

<table>
<thead>
<tr>
<th>Supervision rate</th>
<th>Specificities</th>
<th>National Average</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. according to the area (area per extensionist)</td>
<td>Rainfed areas</td>
<td>11,452 ha</td>
<td>2,774 ha Zaghouan 18,620 ha Kairouan</td>
</tr>
<tr>
<td></td>
<td>Any mode of culture (irrigated or rainfed)</td>
<td>8,390 ha</td>
<td>764 ha Tozeur 28,556 ha Medine</td>
</tr>
<tr>
<td></td>
<td>Public and private irrigated areas</td>
<td>747 ha</td>
<td>75 ha Mahdia 1,642 ha Bizerte</td>
</tr>
<tr>
<td>2. according to the number of farmers (number of farmers per extensionist)</td>
<td>Number of basic extensionists only</td>
<td>746 farmers</td>
<td>242 farmers Ariana 1,154 farmers Medine</td>
</tr>
<tr>
<td></td>
<td>Besides CTV heads</td>
<td>595 farmers</td>
<td>248 farmers Ariana 2,822 farmers Medine</td>
</tr>
<tr>
<td></td>
<td>In public irrigated areas</td>
<td>285 farmers</td>
<td>156 farmers Ariana 32 farmers Medine</td>
</tr>
</tbody>
</table>

2- MODES AND STRATEGIES OF INTERVENTION:

2.1 Agricultural Extension Strategies:

Field agricultural extension strategies are based on the participatory approach in programming extension activities and agricultural training, as well as intensive extension campaigns.

The participatory approach in programming extension activities and agricultural training is based mainly on:

- Participation of all parties concerned in the programming of activities;
- taking into account development priority axes as laid out in the national Plans;
- taking into account the “extendable” achievements of research;
- getting present production situation as close as possible to development projections (such as suggested in Plans and by producers).

**Intensive extension campaigns:** are based on dissemination by mass media (radio and TV), targeted groups method, written supports, etc.

### 2.2 Intervention Modes:

The main extension modes may be summed up as follows:

- Information days
- Demonstration plots
- Intervention on farm
- Organised visits
- TV spots
- Radio releases
- Radio programmes
- Technical documents.

### 2.3 The Role of Extensionists:

At present, the main tasks undertaken by extensionists may be summed up as follows:

- Preparation of extension programmes (annual and monthly), after deliberation with the producers;
- Implementation of extension programmes according to the different extension modes;
- Follow-up and impact assessment of the extension programmes;
- Follow-up of agricultural campaigns, assessment of yields.

### 2.4 Participation of the professional structures in agricultural extension activities:

Among the professional structures participating in agricultural extension activities, mention must be made of:

- National Agriculture and Fishing Union (UTAP)
- Inter-professional groupings
- Service cooperatives
- Technical centres
- Agricultural extensionists.

### 3- AGRICULTURAL EXTENSION ANNUAL ACHIEVEMENTS:

The annual achievements in terms of field and mass extension may be summed up as follows:

#### 3.1 Field Extension:

On the basis of the system laid out by the Agricultural Extension and Training Agency relating to the programming and follow-up of extension actions, extensionists carry out a field extension programme, which includes annually:

- 3,500 information days in the benefit of 43,000 farmers
- 2,300 practical sessions in the benefit of 19,300 farmers
- 500 demonstration plots in the benefit of 3,100 farmers
- 60 visits organised in the benefit of 700 farmers
- 186,000 individual field interventions
3.2 Mass Extension:

The Agricultural Extension and Training Agency carries out, annually:

- 180 TV spots
- 365 radio programmes
- 144 radio releases
- 48 radio files
- 5 technical fiches

4- AGRICULTURAL EXTENSION ENHANCEMENT PROJECT:

Owing to the special attention given by the Government to extension since the 7th Plan and the implementation in 1991 of an extension development plan, co-funded by the World Bank, many improvements have been introduced at the level of the State extension system. Following the experience accumulated over many years of technical cooperation, the project enabled the implementation of an agricultural extension methodology:

- Conception and implementation of a programming, follow-up and assessment approach;
- Launching of computerisation in the extension system at the central and regional levels;
- Updating and enhancement of the programming approach by including the qualitative aspect (programming by objective) particularly at the level of components of the intensive extension campaigns.

5- CONSTRAINTS:

In spite of the significant evolution in the agricultural extension sector in the past few years, agricultural extension faces many constraints, mainly:

- The multiplicity of decision-making levels;
- The number of topics to be extended is not proportional to the means made available to extensionists;
- Lack of material and human resources at the central and regional levels
- At the regional level, extensionists are called on to undertake many tasks beside agricultural extension activities;
- Links between research and extension are still weak;
- Weak participation of the profession to agricultural activities.

6- DEVELOPMENT PROSPECTS:

In order to ensure the development of agricultural extension in Tunisia, it is recommended to:

- Ensure the re-training and continuous training of extensionists in terms of communication and organizational aspects;
- Reinforce CRDAs (CTV, CRA) with human and material resources;
- Ensure that extension themes are proportional to available resources and orientate extension programmes along the regional priorities;
- Further develop professional and private agricultural extension through the supervision of agricultural extensionists via the Agricultural Extension and Training Agency and the research institution;
- Carry on the awareness-raising of producers so that they get together into operative groups with a view to facilitate agricultural extension activities;
- Associate the private sector to the production of written and audiovisual supports;
- Enhance the research-extension links.
THE NATIONAL AGRICULTURAL RESEARCH SYSTEM IN TUNISIA

Dalel AZZOUZ

Introduction:

As of the mid-eighties, the agricultural sector has gained new momentum with subsequent positive results in the fields of food security, self-sufficiency and the promotion of production, in such a significant and continuous way that resulted in production surpluses for several products. On the other hand, investments in the sector were consolidated and the situation of food trade balance clearly improved with the generation of positive surpluses. Thus, the contribution of the sector in the achievement of national development objectives has made a qualitative stride forward.

These results need to be consolidated in the future, all the more so as the sector has to face major challenges, in particular:

- A larger opening onto the external markets and the need to adapt to the requirements of the international environment in terms of the quality standards of products;
- The necessity to take into account the climatic conditions, with a view to attenuating the variability of agricultural production;
- The management of production surpluses;
- The rational management of natural resources: preserving ecological balance and warranting the sustainability of the use of these resources.

Thus, one of the axes around which agricultural policy evolves is: the enhancement of the sector, through the promotion of agricultural research and higher education, as well as extension and training.

1- THE NATIONAL AGRICULTURAL RESEARCH SYSTEM:

The policy adopted in terms of agricultural research made it possible to found a national research system with complementary components that take into account development objectives, in particular self-sufficiency, improvement of quality and control of production costs, management of production surpluses, preservation of natural resources and biodiversity.

The current structure of the agricultural research system in Tunisia is actually the outcome of a reorganization process still to be completed. Following a study carried out in 1987 and complimented by other successive studies, the Education, Research and Extension Directorate (DERV) in the Ministry of Agriculture, was replaced in 1990 by two public administrative establishments (civil entities with financial autonomy) the Institution of Agricultural Research and Higher Education (IRESA) and the Agency for Agricultural Extension and Training (AVFA). IRESA is in charge of coordinating the various institutions. It is also entrusted with:

- Promoting agricultural research through the establishment of linkages between agricultural research and higher education institutions on the one hand, and, on the other hand, agricultural extension and the producers;
- Setting up agricultural research programs and allocating the necessary budgets for their implementation;
- Follow up, coordination and evaluation of program implementation;
- Ensuring that agricultural research and higher education institutions serve agricultural production.

IRESA includes central Directorates composed of a general secretariat, four Directorates (including one in charge of the dissemination of innovations and of linkages between research and extension) and regional Directorates also called regional poles of agricultural research and development (PRRD). The agricultural research and higher education institutions are under the authority of IRESA.

22 Dalel AZZOUZ, The Agricultural Research and Higher Education Institution - TUNISIA
The studies carried out within the framework of restructuring agricultural research in Tunisia showed that regionalization is necessary to bring research closer to the local communities, further involving these local communities within research programming and management, thus taking into account the specificity of agricultural conditions in the various areas.

Created in 1995, PRRDs are the first stage towards decentralization. There are seven PRRDs, distributed according to homogeneous agro-climatic areas: the first in Mornag for the North-East; the second in Béja for the sub-humid North-West; the third in Le Kef for the semi-arid North-West; the fourth in Chott-Mariem, Sousse, for the Mid-East; the fifth in Sidi Bouzid for the Mid-west; the sixth in Médenine for the South-east; and the seventh in Tozeur for the South-West.

The poles are run by an on-site coordinator, representing IRESA and appointed by a presidential decree. The coordinator is assisted by the regional council for agricultural research and development (composed, inter alia, of the governors concerned, representatives of scientific institutions, development organizations and the professionals) and by a scientific and technical committee (composed of researchers and technicians involved in research programs). PRRD tasks cover mainly:

- Jointly with CRDA, identification of the regional research needs so as to transmit them to the Central Programming Directorate;
- Coordination and orientation of research activities at the level of the local experimental stations attached to the various research institutes;
- Liaison with the extension structures in the area;
- Upgrading of research and dissemination of information.

At the regional level, PRRD coordinators thus ensure interaction between researchers, extensionists, professional organizations and the farmers, via the regional Councils of Agricultural Development Research and the Scientific and Technical Committees. The coordinators thus facilitate direct contact and ensure two-way linkages: research outputs and the needs of the socio-professional actors.

2- RESEARCH INSTITUTES: MEANS AND FINANCING:

There are four research institutes (with Administrative Public Establishments by-laws, EPAs) under IRESA supervision:

The National Institute for Agronomic Research (INRAT)

The National Institute for Agricultural Engineering, and the National Forestry Committee (INRGREF), resulting from the merger in 1995 of the former Research Centre of Agricultural Engineering (CRGR) and the National Institute of Forest Research (INRF)

The Olive Tree Institute (IO), also in charge, since 1996, of rainfed arboriculture

The Tunisian Veterinary Research Institute (IRVT).

These research institutes are organised into a network of research stations (in the process of reorganization) and are funded with up to 0.7% of the agricultural GDP (about 22 million Dinars/year). Some 200 researchers work under their authority. 10 agricultural higher education institutions carry out research in the field of agriculture and veterinary medicine: More than 300 teachers-researchers undertake part-time research (about 25% of their workload) and approximately 500 postgraduate students (master and doctorate) are part of the research programmes.

Other research institutions, outside IRESA authority, carry out research in the sector of agriculture. Among these institutions, mention should be made of INSTM (National Higher Institute for Marine Sciences and Technologies), INRST (National Higher Institute for Scientific and Technical Research) and IRA (Higher Institute for Arid Areas), all operating under the authority of the Ministry of Scientific Research, Technology and
Capacity Development. Other institutions, attached to the Universities, carry out basic research in biology and environment and thus take part in certain research projects that bring added value in terms of research for the agricultural sector.

At this level, it is worth noting that each IRESA researcher and teacher-researcher is connected to the Internet and has an e-mail address. Each establishment (related to IRESA) takes advantage, within the framework of a national program, of subscriptions for 360 international magazines on the network.

In order to facilitate communication, resource sharing, dissemination and upgrading of research tasks, IRESA set up a National Network of Agronomic Education and Research: AGRINET (Agricultural Network). This network groups research institutions and agronomic higher education institutions. It is physically conceived around the Agriculture Internet service provider, located at the Institution of Agricultural Research and Higher Education. This network provides internet-related services relating, an Intranet, electronic mail (in Internet and Intranet). Moreover, it allows information communication on Intranet and a wider access to bibliographical data bases. The technical Directorates as well as (regional) agricultural development committees are connected to AGRINET network through the Intranet.

The funding of research is carried out according to the following criteria:

- Management of operation credits (Rubric I);
- Management of Rubric II special credits (Participation funds, federating projects (PF) and funds from international co-operation);
- Credits from the former Secretariat of State for Scientific and Technological Research (SERST) allocated to the laboratories;
- Management of equipment credits (Rubric II): credits allocated directly to the institutions or credits intended for the institutions and allocated to IRESA within the framework of financing on foreign loan.

Certain development organizations also contribute to the funding of research. A few Research Activities (AR) are planned to meet the profession's requirements.

Within the framework of the Orientation Law on Scientific Research, 17 laboratories and 16 research units were set up within the agronomic research and higher education institutions. Thus, since 1997, the SERST stopped financing PNM and supported the financing of research laboratories and units.

IRESA continues to finance research activities (AR), the funds received from former SERST by the laboratories are then distributed to the selected AR.

3- RESEARCH PROGRAMMING:

The programming strategy of agricultural research is currently based on:

- Determination of the priority fields (DP) according to the national needs;
- Setting up programming committees;
- Development of federating projects;
- Preparation of multi-annual budgeting;
- Human resource development.

The sectors identified as priority areas are: field crops, breeding, arboriculture, cash crops, water, natural resources, agricultural mechanization, animal health, fishing and aquaculture.

In each DP, 2 to 5 Federating Projects (PF) are defined and represent generally the different tracks (example: in the field crops DP, there are PF for corn, barley, fodder crops, legumes with seeds and production system). There are at present 36 PFs.
The concept of “federating projects” was introduced to limit the number of projects to be managed and aims at developing interdisciplinary research activities with the participation in the same project of scientific staff from several institutions.

Since 1997, these PFs have replaced the mobilizing national programs (PNM) set up by the former Secretariat of State for Scientific and Technological Research (SERST). Research Projects are formulated at the level of each PF and represent generally a carefully selected set of topics or issues, meeting a definite need (programming by objectives).

An AR proposal is actually left to the initiative of the researchers (or group of researchers). The topics are defined to: 1) ensure continuity within the set of previous topics or topics in progress; 2) meet the needs of a given professional or development organization; 3) meet the request of the political decision makers.

The selection of priority or relevant ARs is entrusted with the Programming and Assessment Committees for agricultural research: CPERA. In 1998 10 Programming and Assessment Committees for Agricultural Research (CPERA //DP) were created. These CPERAs are composed of representatives of the administration, teachers, researchers and representatives of the profession. The role of CPERA covers:

- Setting the priority criteria for the assessment of research actions and projects;
- Evaluation of research projects and actions submitted to IRESA in terms of content and order of priority;
- Evaluation of coherence between projects within each field (to avoid overlapping, be up to the importance of the tracks); and
- Evaluation of the results achieved and possible decision to go on with the research.

IRESA has defined the same operational methodology for all the Committees so that a proposal submission file for research projects must contain basic information for selection and evaluation.

CPERAs and their operational mechanisms brought about definite improvement in programming. The obligation to fully justify a project, including the potential input of the innovation, entails the required rigour and the identification of elements allowing follow-up and evaluation. The participation of farmers and other professionals in the work of the committees is also a favourable factor for the harmonisation of research and needs.

Dissemination of Outputs and Linkage between Research and Extension:

Each IRESA and AVFA sets up a special Directorate to facilitate the linkages between research and extension and produce documents readily available to the extensionists. For the dissemination of scientific information, IRESA made considerable efforts which resulted in:

- Preparation of a number of technical files highlighting the research outputs for each DP. These documents are periodically updated;
- Annual elaboration of documents synthesizing abstracts of dissertations and memoirs defended at the higher agricultural education institutions;
- Annual organization of a seminar to submit and discuss the latest research outputs;
- The regular organization of workshops to discuss the research outputs of completed research projects.

With the completion of each AR, researchers are requested to prepare a summary of the results obtained. This synthesis is given the name of “technical file” (FT). In fact, it is the tool which translates into simple terms the outputs or achievements of a given item of research for the users. These FTs are discussed when workshops are convened then transmitted to AVFA and to the various development administrative and professional organizations.

One of the advantages of these presentation-workshops is that they involve, in the discussion of research outputs, not only field specialists but also the representatives of the prime users (farmers, AVFA, administration)
and of the CPERA concerned. They represent a significant breakthrough since they offer a preliminary
assessment and give information on the outputs of each new research project.

During these workshops, research prospects are also discussed. The items raised, as well as the recommendations
are then recorded in a report dispatched to all the stakeholders, namely AVFA, CPERA, and the development
administrative and professional organizations (technical Directorates, inter professional groupings, offices,
UTAP…). All the documents thus drafted, as well as the seminars proceedings and the workshop reports,
are then reproduced and largely disseminated (by mail) to AVFA, Technical Directorates, Offices, inter-
professional groupings, Profession…).

It is also to be noted that, thanks to the new reproduction and dissemination tools, in order to ensure easier
use and a broader dissemination of information, IRESA has, in the past three years, substituted electronic
documents for hard copies. All the documents are then reproduced on CD-Roms. The contents of these CD-
Roms can be consulted on IRESA Web site.

Within the framework of the project for the enhancement of support services to agriculture (research
component) co-financed by the World Bank, so as to achieve a better dissemination and upgrading of
scientific information and research outputs through the new communication and information technologies,
IRESA has planned to set up two databases which will be operational via AGRINET network.

4- THE RESEARCH OUTPUTS REPOSITORY:

The Agronomic Scientific Research Information Database in Tunisia (BISRAT):

The idea is to make the repository of agricultural research outputs available in a computerized base. This
base will make it possible to meet the user's needs, via AGRINET network, regardless of the users' place of
residence or work, whenever the information is needed. It will foster a faster, broader and more effective
access to the new results and the techniques thus achieved. This database will group the final reports/output
files relating to the completed research projects as well as the workshops reports and all information
pertaining to the results obtained.

In this context, to ensure that the outputs are presented in a user-friendly form, IRESA launched a study
entitled “Translation of research outputs”. This study includes 3 phases. The first phase examined the
possibility for their recipients to use these FTs and led to the revision of the terms of reference relating to
the development of these files (called research output files --FRR). The two remaining phases will enable the
drafting of existing FTs (approximately 80) according to the new format (FRR).

We are here concerned with computerized networking of the references of documents available in the
documentation units of the various IRESA-related institutions. This base will constitute the collective catalogue
of agronomic documentation and will also include all national scientific production.

BISRAT Network will enable:

- The preservation and broader capitalisation of agricultural scientific research memory in Tunisia, opening
  up online consultation of the documentary files;
- The computerization of library management (loan, acquisition);
- The management of international subscription: possibility of access to international online libraries;
- The scientific and technical exchange of information with universities, through the synchronization of
  BISRAT network with the collective catalogue of the Tunisian University.
ANNEX I

SUB-REGIONAL WORKSHOP ON APPLICATION OF ICTs FOR ENHANCEMENT OF EXTENSION LINKAGES, COORDINATION AND SERVICES
Hammamet 22 - 24 November 2004

AGENDA

Sunday 21 November

Arrival of participants and accommodation in Hotel Diah Ledina, 8050 Yasmine Hammamet, Tel: 27.241.000, e-mail: info@medina.com.tn

Monday, 22 November

09:00 - 09:30 - Registration
09:30 - 10:00 - Opening Session
  - FAO Statement
  - Minister of Agriculture Statement
10:00 - 10:30 - Coffee Break

SESSION I: Chairperson - M.M. SINACEUR, FAO
10:30 – 13:00 - Introduction of participants
  - Presentation of workshop objectives and programme (C. OFARRELL, FAO)
  - Agricultural extension: expanded scope, changing structures and emerging partnerships (M. HANI, FAO)
  - Overview of agricultural research for development in the Region – (M. EL MOURID, ICARDA)
  - Discussion
13:00 - 14:00 - Lunch Break

SESSION II: Chairperson - M. EL MOURID, ICARDA
14:00 - 17:00 - Agricultural Knowledge and Information Systems (AKIS/RD): Case study from Morocco (A. GAAYA, FAO)
  - Communication for Development and ICT applications in extension: successful initiatives (C. OFARRELL, FAO)
  - Virtual Extension-Research Communication Network (VERCON): case study from Egypt (Mr M. SHAKER, AERDRI)

Tuesday, 23 November

SESSION III: Chairperson - A. GAAYA
9:00 - 11:00 - Country briefs (Country Representatives)
  - Algeria
- Libya  
- Mauritania  
- Morocco  
- Tunisia

11:00 - 11:30 - Coffee Break

11:30 - 13:00 - Working Groups Session I - Situation, needs and potentials

13:00 - 14:30 - Lunch Break

14:00 - 16:00 - Working Groups Session II - Partnerships, resources and methods

**PLENARY SESSION: Chairperson - A. OULAHBOUB**

16:00 - 17:00 - Working Groups Presentation in Plenary and discussion

20:00 - Diner offered by FAO

**Wednesday, 24 November**

09:00 - 11:00 - Working Groups Session III – Discussion of project profile

11:00 - 11:30 - Coffee Break

**SESSION IV: Chairperson FAO**

11:30 - 13:30 - The way forward - recommendations and discussion  
- Wrapping up
SUB-REGIONAL WORKSHOP ON APPLICATION OF ICTs FOR ENHANCEMENT OF EXTENSION LINKAGES, COORDINATION AND SERVICES
Hammamet 22 - 24 November 2004

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Annex III

PROJECT IDEAS

TITLE OF THE PROJECT:
Building and development of extension services intervention capacities with regard to small farmers

CONCEPT:
Strengthening of farmers extension research linkages through ICTs (Information and Communication Technologies).

OBJECTIVES:
- Re-orienting research activities to correspond to socio-economic conditions of small farmers.
- Improvement of extension services provided to small farmers.
- Development of participatory approaches at planning, monitoring and evaluation levels.
- Improvement of small farmers’ productivity levels and incomes.

ACTIVITIES:
- Feasibility study (diagnosis) to identify constraints and needs.
- Set up of budgeted participatory extension programmes.
- Participatory monitoring.
- Reinforcement and equipment supply of extension structures in terms of ICT.
- Capacity building for Extensionists at all levels.
- Periodic evaluation to determine strengths and weaknesses of the programme.

EXPECTED RESULTS:
- Research /extension relations are strengthened.
- Implementation of production techniques improved.
- Communication and information techniques are applied to support extension activities.
- Incomes and livelihood conditions of small farmers are enhanced.

PROJECT 2

TITLE OF THE PROJECT:
Networking of regional research and extension Organisations

CONCEPT:
Strengthening of research/extension linkages to enhance extension services to farmers.

OBJECTIVES:
- Research/extension/farmers information exchange.
- Strengthening of linkages between research, training, extension and funding institutions.
- Capacity building of researchers and extension agents.
- Improvement of production techniques implemented by farmers.
- Coordination of Research and Extension efforts in Maghreb countries.

ACTIVITIES:
- Carry out studies in every country in order to identify their respective needs.
- Supply research and extension structures with necessary material and software (data processing).
- Adjust the network operation according to national needs.
- Create a regional centre concerned with the storage, analysis, treatment, and dissemination of technical scientific information (agricultural).
- Assure Human resources training and development.
- Follow up and evaluate the network activities.

EXPECTED RESULTS:
- Linkages between research and extension organisations in Maghreb countries are strengthened.
- Successful experiences in different countries are registered.
- Extension and research services are improved
- The regional centre for network management is operational.