

**International Workshop on:  
Fast Growing Economies' Role in Global Agricultural  
Research for Development  
Beijing, China,  
February 8-10, 2010**

**The Regional Forum Brief:  
The Association of Agricultural Research Institutions  
in the Near East & North Africa (AARINENA)**

*<http://www.aarinena.org>*

**AARINENA Representative:**

**Ahmad Shukri Al-Rimawi**

**University of Jordan, Jordan**

*[ashrim@ju.edu.jo](mailto:ashrim@ju.edu.jo)*

## Introduction

AARINENA was established in 1985 as an autonomous body and a platform for agricultural research and innovation in the West Asia and North Africa (WANA) region in accordance with the recommendations of the 14th and the 16th FAO Regional Ministerial Conferences. Its mission is to contribute to the enhancement of agricultural and rural development in member countries through assisting member countries in creating effective national agricultural research systems, and fostering regional and international cooperation that serve the goals of sustainable agricultural development.

The WANA region is divided into 5 sub-regions:

- The Maghreb which includes Algeria, Libya, Malta, Morocco, Mauritania and Tunisia.
- The Nile Valley and Red Sea which includes Djibouti, Egypt, Sudan, Somalia and Yemen.
- The Mashreq which includes Cyprus, Jordan, Iraq, Lebanon, Palestine and Syria.
- The Arabian Peninsula which includes Bahrain, Kuwait, Oman; Qatar; Saudi Arabia and the United Arab Emirates (UAE).
- West and Central Asia which includes Iran , Pakistan and Turkey.

The WANA region is characterized by an arid and semi arid environment. This is manifested in low and erratic rainfall, limited arable land, and severely limited water resources. This situation is worsened by frequent drought events. The UN's climate-change conference in Copenhagen last December declared that 2009 "must be the year of climate change", and Prince Hassan of Jordan has noted that no one from the region of WANA- an enormous area facing huge environmental, social, and human-security problems - could disagree (Prince Hassan, 2009). Climate change is already a reality that we are facing. Developing countries have contributed the least to climate change, but they will be hit the hardest, particularly in WANA. It will put additional constraints for the already fragile ecosystems of dry areas and limited natural resources in WANA. There is an urgency to strengthen further research and technology transfer on adaptation, mitigation and production system resilience, and to rally the forces of the public and private sectors in developing strategies for sustainable development and food security under climate change. Agriculture in its widest sense will be affected by a changing climate, but is also part of the solution.

The prevailing scarcity of water in the WANA region makes it one of the poorest regions in the world in terms of water resources, both globally and per inhabitant, particularly in the Near East. The total population of the region makes up 10 per cent of the world population, of which 50 per cent is rural. Population is increasing by 2.7 per cent per year and this will only exacerbate the situation in a region that receives only 3.5 per cent of the world's precipitation and has only 2.2 per cent of its renewable water resources (Marchand, 2007). Arable land represents only 7.5% of the total land resources (ranging from 2% to 35%). Arable land is very limited compared with the population; in 1999, the region had an average of 0.25 ha of arable land per capita (Casas, Solh & Hafez, 1999), and probably about 0.15 ha at present. Irrigated agricultural lands accounts for 50-88% in some countries in the region, such as Egypt, Iraq, Oman, and Iran. The other countries in the region have a considerable area that depends on rain fed agriculture. Such countries suffer from the lack of water and stress conditions frequently prevailed, resulting in yield reduction, lower quality and seasonality of production (Abou-Hadid, 2006). Hence, with the added pressures of a globalizing world, managing natural resources in an

efficient and sustainable manner is the most critical issue for food production in the region.

Decreasing agricultural production has a negative impact on food security, as well as on efforts toward poverty alleviation. Food production is very low, and varies widely across countries. Yet, post-harvest food losses in the region are very high, and estimated to exceed 30 %. The region is a “food deficit” region, and is the largest “net food importer” among developing countries. Table 1 in the Annex show that the percentage of self sufficiency in the Arab World is decreasing for all food commodities, especially for cereals, and the food gap is increasing throughout the period 1972 – 2006. Food consumption in general, including the consumption of fruits and vegetables, is increasing due to increased population growth and urbanization, but it is still generally low compared to that in other regions. There is excellent potential for export, especially to the European and Gulf markets. However, improvement of the export sector will require major improvements in the production systems and in the post-harvest sector. There is a strong need for the enhancement of agricultural and rural development in the region through fostering agricultural research and technology development, and by strengthening intra- and inter-regional cooperation (Yahia, 2002).

Heterogeneity defines the WANA region as it exhibits many forms of diversity. These include socio-economic diversity (richer and poorer countries and regions depending on the location of natural resources, differences in the local food economy, public and private extension and technology transfer, large commercial farmers coexist with smallholders. ...); cultural diversity and geographical diversity (agro-ecological and climatic zones, arable land, population growth and rural vs. urban populations ...). The variation in ecosystems across the region is reflected by high biological diversity in flora and fauna. The region is rich in indigenous plant genetic resources, but most of its diversity is threatened by erosion, and many other environmental problems.

Diversity can lead to differences in the nature and extent of development problems, and efforts of agricultural development and technology transfer must recognize and accommodate for local diversity and varying levels of development, and to take into account of biodiversity conservation and a more proper management of natural and environment resources for sustainable agricultural development. To achieve this, a program must firstly establish the nature of diversity in the area, and then develop conceptual frameworks and activities accordingly.

Note: The above Introduction could be briefed and reduced since there is some redundancy!

### **Contribution of agricultural research to the Region’s development**

In a study of 18 National Agricultural Research Systems (NARSs) of the WANA region, Casas (1999) found that most of the NARSs were lacking financial resources and effective linkages between the NARS institutions. Linkages were often rather weak, both among the ARIs and between the ARIs and the faculties of agriculture. Linkages with public and private development organizations were also of concerns to the main ARIs, which set up diversified channels for intensifying them.

Formulation of national strategic AR plans or AR institutes (ARIs) master plans; and dynamic relations with regional and international AR centers and organizations, contributed to strengthening agricultural research and capacity

building in the WANA countries, in addition to enhancing coordination at the national and regional levels. These efforts paved the road for more active and balanced relations within the region. Further improvement of these linkages may rely on further changes within these organizations and in the national agricultural policies.

Technology development reported by the NARSs that are successfully adopted by the end users include improved cultivars of cereals, legumes, vegetables, and fruit trees; biological and chemical control of plant diseases; better utilization of annual feed resources; and improved local animal breeds. Large increases in the yields of major crops are observed during the last decade and the reduction of food gap for grain is observed in Egypt and Syria for example. Turkey has a core group of qualified research staff and a growing research capacity in plant genetic resources conservation. Self-sufficiency in vegetables and fruits has been achieved in Yemen and Jordan (Casas, 1999). Habbab (2009) reported that modern irrigation methods such as sprinkler and drip irrigations have been introduced in the WANA Region, but they still account for limited areas of agricultural production with the exception of Cyprus and Jordan where the total irrigated areas are small. The Gulf countries, particularly Saudi Arabia also have more than 2/3 of their irrigated areas equipped with modern systems, particularly central pivots. However, even where these systems have been introduced, their efficiency is generally low in comparison with the potential because of bad on-farm management. The overall irrigation efficiency in the region is estimated at 45-50%.

Casas (1999) concluded that scientific results and impact on agricultural production were modest when the large amounts of resources allocated to the NARSs are taken into account. Apart from some verbal statements made by NARS leaders which suggested that AR has had a rather significant positive impact on agricultural development, formal studies of research output related to the impact of NARS on agricultural production are absent or rare. Although, there was definite improvement in self sufficiency in some individual countries, Table 1 shows that the food gap in the Arab World is increasing throughout the last four decades.

Poor linkages between research, extension, the farming community, especially women, and policy makers are the norm in the WANA region. This lack of interaction has significantly affected the effectiveness of technology transfer activities. In general, extension programs remain dominated by classical top-down approaches that consider farmers as passive recipients. Farmers' input in setting research agendas remains the exception rather than the rule. In the very rare instances where participatory mechanisms are in place, they tend, by and large, to benefit high-resource farmers (Belaid, Solh, & Mazid, 2003).

Improvements in the agricultural sector and production cannot be merely attributed to NARSs. One cannot exhaust in any one analysis the many variables that might account for performance of the agricultural sector. These variables include private and public extension; education and general training; improved infrastructure, such as dams or new or improved roads, etc. Besides, technologies generated appear to be more readily adopted by large-scale farmers, agricultural development agencies, rural development societies, rather than by the majority of medium- and small-scale farmers. Thus, scientific inventory or evaluations of the impact of research of the NARS on agricultural production at the national level are imminent.

The NARSs are not to be blamed alone for such a situation; the deficiencies in agricultural policies and the socioeconomic underdevelopment in most countries do

not generally provide favorable circumstances for agricultural research and development and dissemination of innovations (Casas, 1999).

Note : Since this is part of the introduction AGAIN it should be summarized to the main out put of Casas study.

### **✂ The experience of collaborations and partnerships within the Region and also those that are of bilateral and multilateral nature with individual countries**

AARINENA acted as a facilitator in bringing the views, aspirations and research priorities of the WANA region to the attention of relevant international organizations with the aim of promoting a sustainable agricultural development through attraction of global agricultural and developmental communities, as well as donors to support the regional and sub-regional research projects and related activities.

The association has acted as a collaborator and partner with other relevant regional and international institutions and recognized by the GFAR and the CGIAR as an association representing the WANA region in global research community.

The association has supported National Agricultural Research Systems (NARS) in the region in capacity building through training programs, technical and scientific workshops and conferences, and establishing regional agricultural information and communication system (RAIS) through active support and active participation of GFAR, ICARDA and FAO.

### **AARINENA Regional Networks**

AARINENA has contributed to agricultural production through establishing four networks for commodity crops of particular importance to this region: date palm, cotton, olive and medicinal & aromatic, and aromatic plants, and supported their activities. It has also contributed to agricultural development through establishing Water Use Efficiency Network, Agricultural Biotechnology Network and the Regional Plant Genetic Resources Network (PGRN).

Representatives from the NGOs, Private Sector, Public and Private Research Institutions and universities are actively involved in the networks. Table 2 in the Annex summarizes the information related to these networks such as the date of establishment, members, partners and collaborators.

The highlights of the progress on these Networks are as follows:

#### **■ Date Palm Global Network (DPGN) (<http://dpgn.uaeu.ac.ae/>)**

The regional Date Palm Global Network (DPGN) was established by AARINENA in April 2002. To unify efforts and facilitates action, the network merged to the Date Palm Global network that was established under the auspices of the FAO. Member countries are Egypt, Sudan, Libya, Morocco, Tunisia, U.A.E., Qatar, Oman, Saudi Arabia, Iran, Iraq, and Pakistan. Besides AARINENA, the coordinating board includes representatives of the technical groups, regional coordinators and representatives of the different regional and inter-regional date palm networks.

The network secretariat is hosted at the United Arab Emirates University at Al-Ain and assisted by technical secretariat from FAO. The objectives of the network are to identify the problems facing propagation (including use of tissue culture),

production and processing of dates; to identify the top and rare date varieties; to apply the latest techniques in the production and processing of dates; to strengthen collaboration between commercial laboratories and research units and to ensure a continuous exchange of information through training programs, technical and scientific workshops and conferences.

■ **Inter-Regional Cotton Network in Asia and North Africa (INCANA)**  
(<http://www.cottonnetwork.org/>)

The Cotton Network in Asia and North Africa was established in October, 2002 as an inter-regional network in cooperation between AARINENA, APAARI and CACAARI and with the support of GFAR and ICARDA. This reflects the importance of cotton production in a number of developing countries in Asia and North Africa, who produce more than half of the world's cotton production, and considering the prime role and importance of cotton in their agricultural economies. The leading producers in WANA region are members in the network, namely: Egypt, Iran, Pakistan, Syria, India, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

The network secretariat is hosted at the Agricultural Research and Education Organization (AREO) in Iran. The objectives of the network are; to strengthen cooperation among regional and international cotton research institutes (such as Mediterranean Cotton Research Network); to support cotton research; to organize training workshops to exchange information on research results, experiences and success stories of locally proved new technologies; to establish a data base on cotton research production; and thus to promote productivity and increase cotton yield in member countries. Successful transfer of biological control technology among members is to be acknowledged for the network.

■ **Olive Oil Network**

(<http://www.aarinena.org/rais/documents/OliveNet/index.htm>)

The Olive Oil Network was established by AARINENA in December, 2004 with the support of GFAR, FAO and ICARDA. Members are AARINENA olive producing countries; Tunisia, Morocco, Libya, Egypt, Syria, Lebanon, Jordan, Turkey and Cyprus. Research institutes, universities, NGOs, and private sector in member countries are involved in the network.

The network secretariat is hosted by the Olive Tree Institute at Sfax, in Tunisia. Three olive technical working groups are formed: olive production and protection group to be hosted by Egypt; post-harvest processing technologies to be hosted by Jordan; and socio-economic and commercialization group to be hosted by Syria.

To strengthen the inter-regional collaboration between Southern and Northern Mediterranean olive producing countries, and to disseminate R&D results to Mediterranean olive producing countries, the network established linkages to the European System of Cooperative Research Networks in Agriculture (ESCORENA) to establish national, regional and global collection of germplasm in cooperation with FAO, IPGRI, and CIHEAM. There is some cooperation with European olive producing countries Spain, Italy, Portugal, and France.

The activities of the network are to raise funding, and exchange experiences and knowledge through publishing a newsletter and organizing common activities such

as seminars, workshops, exchange experts and training courses with emphases on farmers' capacity building.

The objectives of the network were to expand and develop olive cultivation, to study the genetic variation of olive trees and assess their water use efficiency particularly in rain fed areas and to assess their resistance to pests and diseases, drought and salinity conditions and to assess the oil quality; to promote olive productivity, products quality and the development of innovative marketing; to develop guidelines for good agriculture practices (GAP and organic olive growing, biological control of pests and post harvest technologies); and to improve the quality of table olives and olive oil and reinforcing labeling requirements.

**■ Medicinal and Aromatic Plants Network (MAP)**  
**(<http://www.aarinena.org/MHPWeb/>)**

The Medicinal and Aromatic Plants Network (MAP) was established by AARINENA in September, 2004, with the support of GFAR, ESMAP, ICARDA, IPGRI. Member countries are Egypt, Sudan, Morocco, Jordan, Syria, Kuwait, Oman, Yemen, Iran and Malta. The network has been established as a partnership among all the different bodies and stakeholders in each of the participating member countries that are involved in any manner through out the overall medicinal plant chain, starting from cultivation and production to processing, marketing, and research and funding support and include: NGOs, Private Sector, public and private research institutions and universities as well as other national and international supporting organizations (GFAR, IPGRI...).

The network secretariat is hosted by the National Center for Agricultural Research and Extension (NCARE) in Jordan. Four technical working groups were formed: conversation and sustainable use; agricultural practices; post harvest technology group; and commercialization and socio-economic group.

The objectives of the network are; to build the capacity of NARS in the region through provision of technical advice and training on MAP operations; to increase support to conservation, use of MAPs through public awareness strategy; to have a Website for MAP; to stablish a link to the industry with the aim of familiarizing participants with the European Union rules and conditions of agricultural practices, manufacturing and marketing leading to better quality assurance to the European consumer.

**■ Water Use Efficiency Network**

The Water Use Efficiency Network was established by AARINENA in November, 2007, with the support of GFAR, FAO and ICARDA. Member countries are Morocco, Tunisia, Libya, Egypt, Sudan, Oman, Yemen, Syria, Jordan, Turkey and Iran.

The network secretariat is hosted by the National Institute for Agricultural Research (INRA) in Morocco. Four technical working groups were formed. The objectives of establishing the network were; to contribute to water saving, improvement and sustained productivity and quality through mobilization of existing knowledge and production of adapted technology packages, and to facilitate the exchange of experiences on the management of water under scarcity conditions through the use of "less-thirsty" genotypes.

### ■ **Agricultural Biotechnology Network**

The Agricultural Biotechnology Network was established by AARINENA in December, 2007 to serve as a cooperating body among members. Member countries are Egypt, Sudan, Morocco, Tunisia, Libya, Saudi Arabia, Kuwait, Oman, Yemen, Syria, Lebanon, Jordan, Iran and Cyprus.

The network secretariat is hosted by the Agricultural Genetic Engineering Research Institute (AGER) in Giza, Egypt. Four technical working groups were formed: omics and molecular markers technology, (Iran), gene transfer, expression and regulation, (Tunis), bio-safety, intellectual property rights (Syria), bioinformatics and knowledge management, (Egypt).

The objective of the network is to promote cooperation among the regional institutions on agricultural biotechnology.

### ■ **The Regional Plant Genetic Resources Network (PGRN)**

WANA region is rich in plant diversity. It is area of origin of more than 150 cultivated plant species (wheat, barley, lentil, many fruit trees ...) that still support today's agriculture and feed large percentage of the world's population.

Plant genetic resources provide the basis for the genetic improvement of food commodities and other crops essential for food security and people's livelihoods world wide. The objective is a sustainable conservation and use of plant genetic resources for food and agriculture (PGRFA) in line with the FAO International Treaty. The AARINENA regional conservation strategy included a recommendation to establish a PGR network. The network will play an instrumental role in promoting inter-regional cooperative research and training programs on PGRFA, and to strengthen the region's contribution to global PGRFA.

The proposal to establish the Regional Plant Genetic Resources Network (PGRN) was adopted at the 11<sup>th</sup> conference of AARINENA at Damascus in October, 2008, with the support of GFAR, FAO and ICARDA. The PGRN network secretariat is hosted by the Agricultural Research Corporation in Sudan. Core member countries are Egypt, Iran, Morocco, Pakistan and Turkey, but all member countries in the WANA region are eligible for membership.

### **Regional Agricultural Information System (RAIS)**

In co-operation with the GFAR, AARINENA established and developed a Regional Agricultural Information System (RAIS). The objectives were to increase the effectiveness of the agricultural research in the region, and to increase their abilities to reach the end-user. The RAIS Secretariat has been hosted by the Agricultural Research and Education Organization (AREO) - Iran.

RAIS enhances information and knowledge access and exchange within the region for ARD, and at the global level. The network would provide mechanisms to strengthen, coordinate, and add value to national (NAIS), regional (RAIS) and international initiatives in order to increase agricultural production and improve food security in the region, and for the benefit of improving performance of farmers and agrarian businesses.

The system (RAIS) enhances AARINENA Website ([www.aarinena.org](http://www.aarinena.org)) to disseminate information to member countries. The website began operating July 2002.

RAIS covers publications, such as the bi-annual Newsletter, OLEA Information Bulletin of the ESCORENA, and Proceedings of Meetings for conferences, the executive Committee, regional networks meetings, workshops and training courses organised in cooperation with GFAR, FAO and ICARDA. A number of success stories have been published. These include producing seed of indigenous pasture species in hot humid gulf climate to re-vegetate degraded lands in Oman (publication 2005/10); micro propagation and DNA fingerprinting of date palm trees in Saudi Arabia (publication 2006/1); an outreach seed program to revitalize community-based traditional seed systems in Yemen (publication 2007/1); and linking farmers to markets in the WANA Region from Egypt, Jordan and Yemen.

The RAIS also include the implementation of RAIS priority projects. AARINENA played the major role in the implementation of many other activities. These include formulation of the “Strategic Framework for Global Post-harvest Initiative-Linking Farmers to Markets” on marketing and trade of horticultural crops, packing and packaging, quality management, modified and controlled atmospheres, post harvest handling of cut flowers and apples; and organizing a workshop on “Global Partnership Program on Linking Smallholder Farmers to Growth Market” in Cairo, sponsored by GFAR, and attended by representatives of the regional ARD Forums of AARINENA, APAARI, FARA FORAGRO.

Note : Again you should write a brief summary about the above networks with their impact on agricultural reasech for development

### **Collaboration with Regional and International Organizations**

AARINENA acted as a facilitator in bringing the views, aspirations and research priorities of the WANA region to the attention of relevant international organizations with the aim of promoting a sustainable agricultural development through attraction of global agricultural and developmental communities, as well as donors to support the regional and sub-regional research projects and related activities. Collaboration with the Regional ARD Forums include participation in the ERA-ARD Conference on ‘Agricultural Research for Development (ARD) in Europe’ Held in Brussels, June 2007; establishment of North African Sub-Regional Organization (NASRO) with FARA; collaboration with APAARI and CACARI in the General Assembly and Expert Consultation on Agricultural Innovations in India (2006); cosponsoring the INCANA General Assembly Meeting in Syria 2007; and participation in CACARI Expert Consultation on Regional Research Need Assessment meeting in Tashkent , 2007.

### **Agricultural Research and Extension Linkages in the WANA Region**

The world witnessed a global food and economic crises in the last few years. Its effects spanning all countries, North and South, rich and poor. In agriculture, increases in world food prices, use of bio-fuels in developed countries, fuel crisis and water crises due to climate change etc., have all contributed to a renewed interest in agriculture and of the importance and prominence of its role in development. Agriculture can be the main source of growth for the agriculture-

based countries and can reduce poverty and improve the environment in all countries.

Technologies and knowledge management are essential elements towards sustainable natural resources use for food production, food safety and better local and global market access and agro-industrial development. Access to technology is a basic element of any strategy to promote food security and eradicate poverty (IFAD, 1995). Thus, transformation of knowledge into action is badly needed, and to this end, the linkages between research and various technology transfer agencies in an agricultural research and extension system (ARES) are crucial to enhance the impact of new technologies on farmers. The ARES include all those generating, transmitting or using knowledge: researchers, policy-makers, extensionists, farmers and other stakeholders. Interdependence and linkages between major institutional actors in an ARES are widely recognized as essential for an effective flow of technology and information between research, extension, and farmers (Peterson et. al., 2002). Yet, lack of institutional coordination and cooperation has long been noted, particularly in developing countries (Swanson, 1997; Marsh & Pannell, 2000).

Poor linkages between research, extension, the farming community, especially women, and policy makers are the norm in the WANA region. The increasing scarcity of resources at the regional level has been exacerbated by a high degree of research duplication leading to an extreme dilution of resources. Seeking regional approach to agricultural research, based on NARSs' comparative advantage; would enable the development of a critical mass of research that could lead to substantial economies of scale; would significantly reduce research duplication and would enhance the efficient use of scarce regional resources by enhancing complementarities and synergies; would promote the exchange flow among scientists and institutions; would enhance the sharing of information, methodologies, and experiences; and would be more attractive to donor agencies (Belaid, Solh, & Mazid, 2003).

### **Key Challenges to Relevant and Effective Agricultural Research for Development**

In search of greater understanding and more operational solutions, and relevant and effective agricultural research for development, some of the key challenges that will need to be addressed are the following:

■ What to research or what areas require new knowledge? Can we identify the agricultural research issues or researchable issues? Should we acknowledge the diversity of development and agricultural issues facing rural farmers in the WANA region, thus, allowing for more local participation by the farmers and local research authorities to identify needs and priorities?. Should we decentralize governance and implementation of research and extension institutions and increase participation of stakeholders?. Research programs, to be relevant, have to focus on agricultural production challenges specific to the region, that is, location-specific research. The best extension cannot compensate for irrelevant or ineffective research.

■ How research areas are prioritized, programmed and implemented on those areas or groups with highest potential to production (for economic efficiency) or to equity (for social considerations)? How to ensure that research addresses well-defined audience groups such small and poor farmers?. The challenge is how to promote

development that balances economic growth with those of equity and environmental interests, while limiting the negative external effects of agriculture.

■ How research output has to be disseminated and taken up by users more effectively? Are the researchers expected to disseminate their findings to users, or should it be through extension specialists? Should we rely on public and private extension? Why the research output does not get into use? Why resources allocated by the public sector for market research and research output promotion/dissemination are minimal?

■ How to develop an institutional system for linking research with farmers and to extension activities? What are the types of linkage mechanisms between research and extension institutions? How to incorporate mechanisms for stakeholder participation to improve efficiency (results: inputs) and the relevance of ARD? How to join forces of the public and private sectors to promote relevance and efficiency of research? Should the public agricultural research and extension focus on resource-poor farmers and public goods such as environmental conservation e.g. integrated pest management, which are of little or no interest to commercial sector? Research and extension institutions need to incorporate mechanisms for participation. Swanson (1997) cited two basic types of linkage mechanisms: organizational and managerial. Organizational mechanisms involve the structural modification of the research and/or extension organizations that are involved in an AR4D, and the managerial mechanisms involve managerial interventions. Table 3 presents a range of organizational mechanisms and managerial interventions. Stronger collaboration and complementarities need to be sought between research institutions and the private sector and with NGOs, and the importance of regional and international partnerships has to be recognized. This also helps to diversify funding sources; to utilize local knowledge and farmers' capacity to experiment and innovate, farmer-to-farmer-diffusion of technology (FAO, 2004).

The mechanisms for research-extension linkages that are receiving the least attention may turn out to have the greatest impact. Poor linkages between research, extension, the farming community, and policy makers are the norm in the WANA region (Belaid, Solh, & Mazid, 2003), and this is an area where the Fast Growing Economies and GFAR can make the greatest contribution in the search for a Global Agricultural Research for Development.

### **Research and Extension Recipients' Segmentation**

The issue of the contribution of agriculture to growth and poverty reduction can be seen and better understood by categorizing countries according to the share of agriculture in aggregate growth over the past 15 years, and the current share of total poverty in rural areas, using the \$2-a-day poverty line. Table 4 shows the GDP, AGDP, and the contribution of agriculture to the GDP for the Arab countries and Turkey, Pakistan and Iran. This perspective presented in the World Bank Report (2008), produces three types of countries:

- Agriculture-based countries, where agriculture accounts for a large share of GDP, and thus is a major source of growth, and most of the poor are in rural areas. This group includes Sudan in the WANA Region. Agricultural development will have to focus more on increasing productivity of the predominately small farmers. Food security and self-sufficiency will be improved as growth is addressed.
- Transforming countries—agriculture is no longer a major source of economic growth, but poverty remains overwhelmingly rural. This group includes Morocco in

the WANA Region, and 92 percent in the Middle East and North Africa are in transforming countries. Balancing attention to equity as well as national economic growth is needed to address and resolve the twin problems of poverty and regional socio-economic imbalances.

- Urbanized countries—Agriculture contributes directly even less to economic growth, and poverty is mostly urban. This group includes the countries in the Arabian Peninsula in the WANA Region. The emphasis of research is shifting away from the development of productivity increasing technologies towards that of new approaches to social and environmental issues, such as the protection of natural resources and food safety.

This classification has implications for public policy in using agriculture for development. Market segmentation within countries has been identified by a number of researchers as having application to agricultural technologies (Brown & Bewsell, 2007 ; Kaine, Bewsell, Boland, & Linehan, 2005). Market segmentation is a method for dividing a heterogeneous population into groups or segments that are homogenous. Different characteristics, such as socio-economic, ecological or demographic information, can be used to segment a population. Understanding what is of benefit to farmers means understanding the context or environment in which they farm and helps us determine what influences decision making and behaviour, either to encourage change or discourage change. Reviews of the policy environment are required to see how this has contributed to the reorganization of research. This will require the political will to move forward with reforms that improve the governance of agriculture. Ultimately, success will also depend on concerted action by the international development community to confront the challenges ahead.

Is the above sections refelect what the terms of reference sent you by the organizer? Where is the section on the role of growing economies in agricultural research for Development????

Suggestions for consideration at the workshop on how the fast growing economies and economically developing countries (the South) can build further collective leadership?

## References

- Abou-Hadid, A. (2006). *High Value Products for Smallholder Markets in West Asia and North Africa – Trends, Opportunities and Research Priorities*. High Value Agricultural Products Workshop, Faculty of Agriculture, Ain- Shams University, Cairo, Egypt.
- Al-Hassan Bin Talal (2009). *The WANA Vision: Regional Model for Global Survival*, Prince Hassan of Jordan, 29 July 2009, Open Democracy.net
- Asopa, V.N, and Beye, G. (1997). *Management of agricultural research: A training manual*. Module 8: Research-extension linkage, FAO, Rome.
- Belaid, A, Solh, M & Mazid, A. (2003). *Setting Agricultural Research Priorities for the Central and West Asia And North Africa Region*, ICARDA, Aleppo, Syria. [http://www.icarda.cgiar.org/ARP\\_CWANA/ARPS\\_FINAL\\_REPORT1.htm](http://www.icarda.cgiar.org/ARP_CWANA/ARPS_FINAL_REPORT1.htm)
- Brown, M. and Bewsell, D. (2007). *Using a Market Segmentation Approach to Better Target Extension Programs – Aligning Learner Needs with Learning Programs*. AIAEE Proceedings of the 23rd Annual Meeting Polson, Montana, USA.

- Casas, J. (1999). *Economy and Agriculture of the WANA Region: Some Basic Data*, WANA NARS Study (1999).
- Casas, J. Solh, M. and Hafez, H. (1999) *NARS in the WANA Region: An Overview and A Cross-Country Analysis*, WANA NARS Study (1999).
- Kaine, G., Bewsell, D., Boland, A.-M., & Linehan, C. (2005). *Using market research to understand the adoption of irrigation management strategies in the stone and pome fruit industry*. Australian Journal of Experimental Agriculture, 45(9), 1181-1187.
- FAO (2004). *Agricultural Research: Its Role and Contribution to Sustainable Rural Development*. 24th FAO Regional Conference for Europe, Montpellier, May 2004. [http://www.fao.org/Unfao/Bodies/RegConferences/erc24/erc24\\_en.htm](http://www.fao.org/Unfao/Bodies/RegConferences/erc24/erc24_en.htm)
- Habbab, S (2009). *Regional Reviews, towards the Global Conference on Agricultural Research for Development in WANA Region*, AARINENA.
- IFAD (1995) *Technology Generation and Diffusion, Conference on Hunger and Poverty*, September 1995, Discussion Paper 2, The International Fund for Agricultural Development (IFAD).
- Marchand, M. (2007). *Potassium Fertilization and Water Use Efficiency Under Saline Conditions*, IPI Coordinator WANA. e-ipc No. 13, September 2007.
- Marsh, S.P. and Pannell, D.J. (2000). *Agricultural Extension Policy in Australia: The Good, the Bad and the Misguided*. Australian Journal of Agricultural and Resource Economics, 4 (44), <http://crcnet.vivid.global.net.au/newsletter/SeaNews/dpap982f.htm>
- Nichterlein, K. (No date). *Agricultural Research for Sustainable Development (ARD): Challenges and Trends*. Research and Technology Officer, FAO Regional Office for Europe.
- Peterson, W. , Galleno, V., Eponou, T., Wuyts-Fivawo, A Wilks, W. (2002) *Methods for Planning Effective Linkages. International Service for National Agricultural Research (ISNAR)*, The Netherlands. <http://www.isnar.cgiar.org/publications/briefing/Bp45.htm>.
- Swanson , B. (1997). *Strengthening research-extension-farmer linkages*, in Swanson, B., Bentz, R. & Sofranko, A. (eds), *Improving Agricultural Extension: A Reference Manual*, FAO, Rome.
- World Bank (2009). *World Development Report 2008: Agriculture for Development* [http://siteresources.worldbank.org/INTWDR2008/Resources/WDR\\_00\\_book.pdf](http://siteresources.worldbank.org/INTWDR2008/Resources/WDR_00_book.pdf)
- Yahia, Elhadi. (2002). *Summary Report of the Regional Workshop for the West Asia North Africa (WANA) Region*, AARINENA, FAO/GFAR Global Initiative on Post-harvest Phase 1 , Cairo, Egypt , February 2002.