

# Synthesis report of the GCARD Process and Conference: Towards Transforming Agricultural Research for Development

## **Context**

Agriculture drives economic growth and has been most effective in alleviating hunger, malnutrition and poverty in poorer nations. As noted in the *2008 World Development Report*<sup>1</sup>, agricultural growth is critical for the socio-economic development of rural populations. About 70% of the hungry, poor and other marginalized people live in rural areas and agriculture is the major source of their livelihoods.

Science-led agriculture has been instrumental in reducing hunger, poverty and malnutrition. During the past 50 years, agricultural research and technology development, coupled with appropriate policies and investments, have fed three billion additional people. As a result, the proportion of those who are hungry worldwide has fallen. However, over 1 billion people, one-sixth of the world's population, are hungry and malnourished and almost 1.5 billion people live below the poverty line. A quarter of all children in developing countries are malnourished and one billion people lack clean drinking water<sup>2</sup>. Low human development in food-deficit countries undermines their potential for socio-economic development. The shining lights from the Green Revolution have dimmed and growth in agricultural productivity has significantly declined. The rural-urban divide has widened, often threatening peace. And the risks and vulnerability associated with climate change, market volatility, energy crisis, environmental degradation, water scarcity, biodiversity loss, pandemic diseases and increasing population pressure exacerbate the situation.

Yet, the global community has failed to prioritize agricultural research for development over the past three decades; this has left many countries ill-equipped to meet the development needs of the rural poor and national food and nutritional security. Despite high rates of return, investment in agricultural research in developing countries is dismal, hardly amounting to 0.5 percent of agricultural GDP against the desired level of 1.5 percent<sup>3</sup>.

By 2050, the world population will grow to over 9 billion. The projections are that the world will need a 70 percent increase in global food production - and **a doubling in food production in developing countries**<sup>2</sup>. Almost all of the increased production must come from increases in yields and cropping intensity as land, water and other production resources are shrinking, but also from reducing post harvest losses and waste. These enormous challenges facing the agricultural research community can only be achieved through adopting a new paradigm. Reformed and vibrant agricultural research, technology, innovation, extension and knowledge systems will be required to

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<sup>1</sup> World Bank, 2008. *World Development Report*. Washington DC: World; Available at [www.worldbank.org](http://www.worldbank.org)

<sup>2</sup> FAO, 2009. *World Summit on Food Security: feeding the world, eradicating hunger*. FAO, Rome. Available at [www.fao.org](http://www.fao.org)

<sup>3</sup> Pardey, P. G., J. M. Alston, and R. R. Piggott, eds., 2006. *Agricultural R&D in the developing world: Too little, too late?* Washington, DC: International Food Policy Research Institute. Available at [www.ifpri.org](http://www.ifpri.org)

bridge the huge yield gaps and to break the poverty-hunger-malnutrition-ecological degradation conundrum and steer and accelerate the desired development.

### **GCARD 2010: A Conference with a Difference**

With the above backdrop, and triggered by the 2008 global food crisis, the Global Forum on Agricultural Research (GFAR), a multi stakeholder-led initiative that serves as a neutral forum for dialogue and action on strategic issues in agricultural research for development, in partnership with the change process in the Consultative Group on International Agricultural Research (CGIAR, itself a stakeholder in GFAR), and France as host country, organized the first Global Conference on Agricultural Research for Development (GCARD) from March 28 to 31, 2010, at Montpellier.

The conference was built on foundations laid by reviews on the drivers and research challenges identified in six regions - Asia-Pacific, Central Asia and the Caucasus, West Asia and North Africa, Sub-Saharan Africa, Europe and Latin America and the Caribbean. The review process, comprising extensive reviews of the literature and electronic and face-to-face consultations with a wide stakeholder community (involving ca.2000 people) prioritized Agricultural Research for Development (AR4D). The Conference itself (GCARD2010) attracted huge interest, was attended by 800 invited stakeholders, including policy makers, scientists, academics, extension agents, non-governmental organizations (NGOs), private sector and representatives of philanthropic foundations, farmers and development agencies, and provided an opportunity for dialogue and to share knowledge on ways to reshape the AR4D landscape to enable it to better achieve the goals of further reducing hunger and poverty and contribute to the wider targets set by the Millennium Development Goals(MDGs). GCARD follows a six-year cycle, starting in 2010, and with an outlook, through a continuing process, towards significantly reformed AR4D systems by 2016.

The Conference delegates were charged with responding to the following four questions:

- What are the development needs where agricultural research can play its best role?
- How best can AR4D stakeholders turn research into development impact at scale?
- How can more effective pathways be developed to create impact for the poor?
- What investments, institutions, policies and capacities are necessary?

By answering these four questions GCARD aimed to lay out and initiate a pathway to transform the global AR4D system to achieve greater impact for poverty reduction, food and nutrition security and environmental sustainability, with special reference to smallholder farmers.

### **Development Needs where agricultural research can play its best role**

Agricultural research in the past has helped increase agricultural production and productivity of farming. It has improved food security at the national level in several

countries which in effect has contributed to more rapid economic growth and social development, reduced hunger and extreme poverty, especially in rural areas. Agricultural research now and in the future will need to contribute further to reaching and surpassing the Millennium Development Goals, especially those related to hunger, poverty and environment, globally.

The GCARD also identified the need to better understand, prioritize and meet the pressing global challenges facing resource-poor farming communities. These include:

- Climate change
- Energy crisis
- Water crisis
- Pandemic pests and diseases, and biosecurity
- Desertification
- Biodiversity conservation and use
- Market access and returns, risks, volatility and unfair trade
- Urbanization and the poverty-linked decline of small farmer livelihoods

To meet these challenges, agricultural research needs to transform. The GCARD process identified a number of current practices and processes which need to be changed/improved in order to transform AR4D to make it more effective for the poor. These include:

- Refocusing agricultural research on the livelihoods needs of smallholder farmers using an integrated systems approach
- Mobilizing political will and adequate investment in agriculture and especially in AR4D
- Harmonizing international research priorities, donor interests and regional and national strategies and needs
- Connecting research, extension, farmer, policy and markets and strengthening value chain approach
- Paying due attention to the increasing feminization of agriculture and the mainstreaming of gender in AR4D
- Scaling-up and -out proven and new technologies
- Developing and adopting supportive policies, institutions, governance structures and rules and procedures for greater impact of AR4D
- Building partnerships for working collaboratively among all AR4D stakeholders
- Strengthening the capacity of human resources for AR4D at all levels
- Designing and providing incentives to ensure that research outputs are transformed into development outcomes
- Promoting the involvement of youth and young farmers in rural and agricultural activities
- Better knowledge of how poor farmers can access inputs and markets and manage risks

These challenges have been analyzed in detail in the report of the GCARD Global Author Team<sup>4</sup> and for each region in the GCARD Consultation process:

### **Turning Research into Greater Development Impact**

The message of GCARD2010 is that the global community needs to create a new **transformed global architecture for agricultural research** more attuned to today's realities, ready to meet the development needs of resource-poor smallholders and prepared to address future challenges. This will require changes both in **what** research is conducted and **how** it is done.

The GCARD consultation process, led by the Regional Fora (RF<sup>5</sup>), also provided the opportunity to review how national, regional and global priorities could be taken into account in designing future AR4D programs. This resulted in a specific overview of needs and priorities for each region.

Box 1 summarizes the global research challenges, shared by all regions; these constitute a research focus of a transformed AR4D system.

#### ***Box 1. Shared thematic research challenges for a transformed AR4D***

- Sustainable agricultural intensification through increased productivity and production of major food crops
- Effective natural resources management (land, water, biodiversity)
- Diversification of agricultural products and systems: crop, livestock, fisheries, agro-forestry
- Developing a systems approach to address livelihoods of resource-poor smallholder farmers, especially women farmers
- Developing resilient agriculture in resource poor or marginal areas through harnessing new areas of science (e.g. biotechnology, communication and information technology)
- Pursuing a comprehensive value chain approach, including the development of markets, with emphasis on quality and safety for agriculture
- Research on non-agricultural food security, income enhancement and poverty reduction
- Research on vulnerability to climate change and resilience building by developing adaptation and mitigation measures
- Policy research on impact of trade liberalization, market volatility, decentralization of markets and intellectual property rights
- Research on nutritional, and environmental health considerations
- Research on the impact of changing economies, urbanization, energy security and population demographics on changing food diets and urban agriculture
- Research on trans-boundary pandemic and zoonotic diseases

The GCARD has also identified several challenges in the AR4D process, which were found to be common for all regions, as summarized in Box 2.

#### ***Box 2. Shared process challenges for a transformed AR4D***

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<sup>4</sup> U Lele, J Pretty, E Terry and E Trigo, Transforming Agricultural Research for Development, Report of the GCARD Global Author Team., GCARD 2010 [www.egfar.org](http://www.egfar.org)

<sup>5</sup> The Regional agricultural research Fora: AARINENA, APAARI, CACAARI, EFARD, FARA & FORAGRO

- Advocacy for increased and sustained investments in AR4D
- Implementing participatory, demand-driven and people-centered research approaches
- Integrating agricultural, ecological, socio-economic sciences into an interdisciplinary research paradigm
- Integrating gender, age, ethnicity, poverty and other dimensions of exclusion
- Strengthening national research and innovation systems, re-vitalising extension services and enhancing linkages and partnerships between researchers, educators, policy-makers, extensionists, private sector and NGOs
- Strengthening enabling mechanisms and policies to foster public private partnerships
- Building human, institutional and research management and communication capacity for more effective AR4D
- Integrating local indigenous knowledge into the AR4D cycle
- Using AR4D outputs to inform policy and national development planning
- Institutional rebuilding post-conflict and post-disaster

Despite the general agreement on issues facing global agriculture, not surprisingly, the consultations in regions also revealed different region-specific priorities and challenges and these are summarized below:

## **Africa**

Africa noted that 70% of its one billion inhabitants live in rural areas and depend on agriculture for employment and sustenance. Women farmers produce 80% of household food. However, Africa's agriculture has under-performed as attested to by the continent's overwhelming dependence on food imports (USD16.5 billion in 2007 alone) and the fact that sub-Saharan Africa remains the only region in the developing world where the number of hungry, poor and malnourished people is increasing. These facts underpin the development of the Comprehensive African Agricultural Development Program (CAADP) which has been adopted by all African governments as the framework for Africa's agricultural development. Africa is hopeful that the GCARD process will facilitate the stronger implementation of CAADP. For this to happen, Africa:

- Emphasized the need to involve relevant stakeholders, especially farmers, in priority setting, implementation and evaluation
- Stressed the need for strengthened institutional and human capacity in:
  - Management of risk and vulnerability
  - Policy analysis and evidence-based advocacy
  - Land and water management
  - Generation, management, dissemination and utilization of knowledge
  - Development and upscaling of technologies to increase food security
  - Integrated crop-tree-livestock systems
  - Linking farmers to markets for increased incomes

## **Asia-Pacific**

The Asia-Pacific highlighted that it comprises over 70% of world agricultural population, its per caput land availability is one-fifth of that in the rest of the world, and despite the unprecedented success of the Green Revolution, the Region, especially South Asia, is home to majority of the world poor and hungry. While highlighting research on systems based on the three major cereals (rice, wheat and maize), the Asia-Pacific Region also emphasized research on livestock (milk, meat, eggs), millets and other coarse grains, oilseeds, pulses, fruits, vegetables, agro-forestry and fisheries. Diversification of agriculture using both systems and value chain approaches to sustainably enhance productivity, rural employment and income of smallholder farmers is now a priority – all leading to food and nutrition security and poverty alleviation. In addition to a focus on women and youth, it was felt that progressive farmers, NGOs and private entrepreneurs, particularly small and medium entrepreneurs should become more involved in the planning, technology generation and transfer, monitoring and evaluation processes for AR4D. Among other research priorities identified were post harvest management, value addition (agricultural processing), quality improvement and assuring food safety. A stronger capacity to manage risk, biosecurity, energy security, soil, water and biodiversity by farmers and other stakeholders is needed. Efforts are needed also to improve policy dialogue and communication, so that research can be better linked to rural development and farmers, especially the majority smallholder farmers, can be effectively linked to science and markets. In the Pacific islands indigenous crops and farming systems and the atolls require special attention due to their high vulnerability to the impacts of climate change and natural disasters.

### **Central Asia and the Caucasus**

The Central Asia and the Caucasus (CAC) region is characterized by a large geographic area consisting of both irrigated and rain-fed areas with vast rangelands. The priority needs for AR4D in the CAC region were grouped into five categories: (i) institutional issues, (ii) research issues, (iii) policy issues, (iv) environmental issues and (v) socioeconomic issues. Among the institutional issues, agricultural extension is of the highest priority followed by restructuring agricultural research and education, capacity building, partnerships and collaboration. The priority research issues include generation of improved technology for diversified sustainable crop production in both irrigated and rain-fed areas; water and irrigation management; livestock research including rangelands; horticulture; seed systems; forestry; and mountain agriculture. Among the policy issues, the need for greater investments in agriculture as well as agricultural research, education and extension at national and jointly at regional level is considered the most important, followed by marketing, processing and value addition of agricultural commodities and developing suitable agricultural development policies related to rural employment, land tenure and property rights. Conservation of biodiversity, climate change and desertification are considered the most important issues under the environment grouping. Among the socioeconomic issues, gender mainstreaming was considered the most important in view of the important role that women play in agriculture. Strengthening AR4D with support of the international community is crucial for the CAC region, which is still a transition economy.

### **West Asia and North Africa**

The region is characterized by its fragile ecosystems, water scarcity, progressive desertification and land degradation, a heavy reliance on food imports, and by being a “hot-spot” for climate change impact. Hence, the region prioritized food security and productivity issues such as improving varieties to cope with environmental stressors (salt, heat, drought), and increasing productivity of mixed systems, generation of alternative income for smallholders and risk and vulnerability mapping for climate change impacts. Natural resources management is equally important, specifically the conservation and utilization of the region’s unique biodiversity, integrated water management and optimization of water productivity. Livestock and fisheries are also priorities for the region, as well as the management of rangeland and property rights for common resources. Under markets and value chain development, the comparative advantages of specific regional products would be a key-focus of research, as well as post-harvest systems, food safety, market access and policies and the role of agro-enterprises and cooperatives. Solving issues related to the region’s gender imbalance in decision making related to agriculture and its development, weak human and institutional capacities, inadequate policies and investments in AR4D and rebuilding AR4D systems post-conflict are also important priorities for the region.

## **Europe**

Based on its experience as the principal global donor region, provider of academic, research and support services and direct in-country involvement in AR4D, the consultation in Europe identified several main drivers and associated research issues. First and foremost, there was agreement that AR4D needs to focus more on poverty reduction, hunger and associated issues confronting the poor in the region, especially East Europe, and globally. Six researchable themes were prioritized: forecasting, alleviating and mitigating climate change; addressing the growing pressure on the environment due to population growth; energy security – the food or energy dilemma; satisfying the demand for food and changing nutritional demands; forecasting and coping with pandemics; and ensuring the poor are not disadvantaged by globalization and that returns to farming enable viable livelihoods. One of the most important outcomes of the European consultation was agreement on the need to radically strengthen the processes which influence the way research is conducted: greater donor collaboration and harmonization; smarter approaches to prioritizing pro-poor AR4D; greater continuity of research support; greater, more diverse partnerships – cross-discipline and cross-sector; new incentives for researchers and partners to ‘translate’ research products to user benefits; more funding for and better ‘marketing’ of research products through communication. In Eastern Europe, a diversity of development and agricultural issues face rural farmers and AR4D professionals – income poverty in a number of countries; significant levels of relative poverty; low productivity on smallholder farms; isolation of researchers; rural unemployment; social exclusion.

## **Latin America and the Caribbean**

Family farms represent 80% of total agriculture in the Latin America and the Caribbean (LAC) region highlighting the importance of agricultural research for development to the economy and welfare of rural populations. There is considerable heterogeneity of the farming systems due to geopolitical, eco-regional and climatic variability etc. Abject poverty, malnutrition and degradation of resources, among other severe limitations are seen in some countries. The LAC Region defined seven priority subjects and action areas: Food and nutritional security; Increased production and productivity;

Diversification and differentiation of agricultural products and services; Challenges of Climate Change; Preservation and Sustainable management of natural resources; Development of bio-energy; and Promotion of institutional innovations. It also defined several strategic elements to facilitate implementation of the research priorities and for strengthening regional mechanisms: Build on existing successful experiences and institutions in the region; Promote major integration of public / private sectors, and stimulate greater participation of the private sector in R & D; Incorporate indigenous and small scale farmers experiences; Improve the interaction of AR4D organizations with communities and other sectors; Formalize partnerships and mechanisms for exchange of information and experiences; Build capacities of all the actors involved in R & D processes; and Institutionalize FORAGRO as the forum for discussion and promotion of institutional change.

### **GCARD and the MDGs**

The successful implementation of necessary policy actions will transform the global AR4D system and contribute to the alleviation of poverty and hunger through its direct and indirect influence on **all** the MDGs-the promises made a decade ago.

#### ***Eradicate extreme poverty and hunger (MDG1)***

The outcomes of AR4D, such as higher productivity and profitability, increased employment, reduced post harvest losses, and increased competitiveness will lead to the enhanced availability and access to food at community, household and individual levels. This is essential for achieving comprehensive food and nutritional security and poverty reduction.

#### ***Achieve universal primary education (MDG2)***

AR4D leading to higher rural incomes will help families with critical cash needs to access education services. AR4D will support a more knowledge-intensive and labor-saving agriculture, demanding higher skilled hands and encouraging higher school attendance

#### ***Promote gender equality and empower women (MDG3)***

The transformed AR4D, as set out in the GCARD process, will accelerate the mainstreaming of gender issues thereby improving income of women farmers and improving the education of girls (MDG2). AR4D focused on the empowerment of women in developing countries will lead to increased inheritance transfers to women and entitlement to land and other natural resources.

#### ***Reduce child mortality (MDG4), improve maternal health (MDG5), combat HIV/AIDS, malaria and other diseases (MDG6)***

Improved food and nutritional security, the overarching goal of AR4D, will contribute to the above MDGs. Furthermore, the outcomes of AR4D could lead to higher nutritional content of food products, e.g. essential vitamins and mineral sources to complement basic diets. AR4D leading to higher rural incomes will help families with critical cash needs to access health services.

### ***Ensure environmental sustainability (MDG7)***

A reshaped AR4D system will:

- Promote conservation agriculture and other sustainable agricultural practices
- Reduce pressure on land, water, biodiversity, energy, and forests
- Improve the global carbon economy by reduction of GHG-emissions and increased carbon sequestration
- Revitalize the rural agro-based economy, thus minimizing migration from villages to cities and slowing down the growth of slums

### ***Develop a global partnership for development (MDG8)***

Improved global partnerships in AR4D are at the core of the GCARD agenda. The GCARD process is geared towards collective action on a number of strategic issues, such as equitable market rules and access for smallholder producers, fair trade, the elimination of zoonotic and pandemic diseases and opportunities to manage risks from climate change.

### **Research themes and change process of the CGIAR**

GCARD2010 enabled public discussion of the ongoing CGIAR change management process aimed at revitalizing and strengthening the international agricultural research system towards greater impact in development. This has led to a new vision and strategic direction for the CGIAR, aiming to create increased openness, dynamic partnerships, a results-based culture, and clarified accountabilities. Reached through a global analysis in 2009, the CGIAR put forward a draft Strategic Results Framework (SRF) for discussion in GCARD2010. The SRF when finalized will guide and shape the reform process of the CGIAR and is expected to deliver greater efficiency and development impact for the poor through concerted actions between the CGIAR Centers and embed these into the demands, associated actions and commitments of national AR4D systems. The impact of this focused approach will require wide ownership of these agendas, incorporating other advanced research institutions as required, AR4D actions at the national level, with governments and other stakeholders determining its fit with their needs and whether they are themselves willing to take on ownership and responsibility for addressing these agendas and making the national-level investments required if the research proposed is to achieve its desired development impacts. For success, such research must therefore be in line with national objectives and be recognized to add value to national capabilities through international public good products.

The draft SRF included the following eight overall thematic areas<sup>6</sup> for research:

*Theme 1: agricultural systems for the poor and vulnerable:* foresees integration for the CGIAR centers' work on specific areas of poverty hotspots, resilience, sustainable agriculture, integrating promising crop livestock production systems, improving food security in sustainable manner and with the goal to improve the livelihoods of 250

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<sup>6</sup> CGIAR, 2010. *Strategic Results Framework*. CGIAR Alliance Available at [www.cgiar.org](http://www.cgiar.org)

million poor people through broad based productivity growth, while conserving natural resources;

*Theme 2: enabling agricultural incomes for the poor:* aims to strengthen policy, institution, investments and markets required to achieve income growth for the poor, contribute to enhanced and secured livelihood opportunities for farmers, innovations along the value chains etc, and to reduce marketing costs by 20%;

*Theme 3: sustainable crop productivity increase for global food security:* focuses on the three main cereals (rice, wheat and maize); looks at research options for increasing productivity and sustainability, exploring genes for important traits, improving crop management, and increasing water and fertilizer use efficiencies – all leading to food security;

*Theme 4: agriculture, nutrition and health:* promotes coordinated research at the interface of agriculture, nutrition and health; looks at issues of gender and access, reduction in maternal and child malnutrition, micronutrient deficiencies and diseases related to unsafe food supply;

*Theme 5: water, soils and ecosystems:* aims to increase productivity of water, land, crops, livestock, fish and agroforestry for the benefit of the poor, improving access to water, reversing degradation and improving resilience of ecosystems;

*Theme 6: forests and trees:* promotes technical and policy changes to enhance productivity, conserve and develop agroforestry, strengthen policies and implementation, reduce deforestation, increase income through increased planting of appropriate tree genetic resources and elevate carbon stocks and income;

*Theme 7: climate change and agriculture:* prescribes coordinated action to diagnose the directions and potential impacts of climate change; develop adaptation and mitigation options, assess vulnerability with science-based diagnosis, and improve national and global policies;

*Theme 8: mobilizing agricultural biodiversity for food security:* targets the conservation of agricultural biodiversity and genetic resources, creating global gateway to information, promoting wider use of genetic diversity and policy research, impacting productivity, trait identification, and biodiversity conservation.(this important theme has subsequently been considered to be a cross cutting area within the programmes of the CGIAR).

In addition to these themes, three cross-cutting platforms were proposed: *capacity building, gender and strategic planning and intelligence.*

At GCARD2010 the CGIAR reached out to stakeholders to receive feedback on the draft SRF and the eight thematic areas and three platforms proposed. Key observations from GCARD included:

- There was broad congruence between the eight thematic areas and the priorities and needs identified through the regional consultations

- For Theme 3, on sustainable crop productivity increases for global food security, GCARD recommended that the basket for food security composed of three major cereals (rice, wheat, maize) be enlarged to include other pro-poor crops. Examples of these pro-poor crops are sorghum, pearl millet, cowpea and groundnut.
- Intensive broad-based consultations and partnerships are needed between the CGIAR and the national systems, facilitated by the Regional Fora, to develop and implement the mega-programs and appropriate management structures and to align these with national and regional research priorities and development policies.
- Lessons learned from previous CGIAR partnerships should be taken on board in the design of new partnerships that are transparent and have a clear framework for monitoring and evaluation
- The SRF would benefit from an institutional analysis of evolving roles and comparative advantages of major actors such as OECD countries, fast growing economies, and the private sector.
- A people-centered approach as described in the SRF needs to be adhered to in the development and implementation of the mega-programs with focus on socio-economic and ecological dimensions as well as the value of the proposed research itself

Since the GCARD2010 Conference, the CGIAR has embarked on a major programme development process, involving discussions around each of 15 collective themes, subdivided from the above concepts into more tangible pieces of work. They have sought input from a significant number of stakeholders to aid the design of their more focused programmes, but many may not yet feel an ownership of these programmes. The next step required is to consider a) who else needs to be involved and supported in the innovation chains involved between farmer and researcher and whether there is buy-in from these partners to the ideas involved and b) how these international investments match with country's development and investment frameworks as to whether there is a basis of national commitment and investment to achieving the impacts identified from international research. This requires wide consideration and dialogue, recognizing the need and responsibility for international research to link to the much wider issue of integrating its actions with national innovation systems and help to support the strengthening of national systems where required to achieve impact at the scale desired.

### **Transforming AR4D to Better Support Smallholder Farmers**

Smallholder farming offers a real opportunity to significantly improve food and nutritional security and increase income and social capital at community, household and individual levels in poor countries. By giving particular focus to the needs of smallholder farmers, agricultural research systems can be transformed to make a more tangible difference to the lives of the poor and can create a virtuous cycle that contributes to more rapid global economic growth and development.

Most governments have identified health and education as key features of their poverty reduction strategies (PRSPs), yet agriculture and rural development and the crucial role of knowledge and science in these have been ignored despite their documented impacts.

Sustainable intensification of production is required to bring the large increases required in food supply at prices affordable by the poor of both rural and urban areas. Moreover, the poor and hungry, lacking both resources and enabling inputs, have often been last to benefit from technologies produced by reductionist approaches to AR4D and so can become further disadvantaged. A more holistic and integrated approach, that takes account of rural realities and is pro-poor, pro-smallholder, pro-women and pro-environment, with more effective and equitable market participation for small producers, is required if agricultural knowledge and technologies are to have large-scale societal and developmental impact.

### **Actions for a Transformed AR4D**

Analyses and regional and thematic consultations prior to and during the GCARD2010 reviewed key areas in which change was required to transform AR4D:

#### ***Restructuring agricultural research systems***

Dynamic new market opportunities, far-reaching technological and institutional innovations, and new roles for the state, the private sector, and civil society have emerged which characterize the new context in which AR4D needs to operate in order to address the myriad challenges identified by GCARD. To address the new reality, the national systems of agricultural research and development need to restructure and reorient themselves to specifically consider technologies that directly target and are accessible to resource-poor farmers and/or food insecure groups, while protecting the environment and natural resources that support their livelihoods. Further, effective national demand setting, recognizing the roles required of national research and innovation systems must form the cornerstone for strategizing, planning, implementing, problem-solving and leveraging on multiple fronts, including partnership with the CGIAR and other advanced international research systems. The new structure should encourage the application of participatory methodologies and the direct involvement of men, women and youth as producers and consumers in the design, implementation, monitoring, and evaluation of experiments and adaptation of new technologies. Greater accountability is required to the intended beneficiaries of research (alongside that to investor governments and donors) to engender more trust and value in public sector research institutions by society and also in science itself. The whole process has to be problem-solving, consultative, bottom-up and transparent. It is also important that attention is paid to upstream science to provide solutions for the medium- and long-term.

#### ***Technology/innovation for sustainable intensification***

Technology and innovations are central to accelerated growth and inclusive development. They need to include a diversity of approaches and practices, integrate traditional knowledge, customs, traditions and innovative local agro-ecological methods, remain relevant for the long term, be forward-looking, able to capture new opportunities and minimize risks which may cause hunger and poverty.

In particular, they need to address constraints identified through the GCARD regional consultations as crucial issues, which included: human resource development; new incentives for stakeholders to become more committed to AR4D; greater accountability

and effectiveness in new partnerships; and the challenges of climate change and other volatilities. New technologies and innovations need to go well beyond just raising yields and be dynamically geared to meet the challenges of increasing resource scarcity and the structural transformation of the economic and social role of agriculture for development, with impact along the value chain, greater returns to farmers and more sustainable livelihoods. To effectively achieve this, it will be necessary to build on past science and knowledge and ensure the new approach is more inclusive, cross-linkage of biological and social sciences being of particular importance.

### ***Enhanced and sustained investment***

Investment in agriculture and AR4D, critical as it is, has dramatically declined over the last two decades, seriously hampering agriculture-led growth, and remains low. The Official Development Assistance (ODA) to agriculture dropped significantly, falling from a peak of 17 percent in 1979 during the height of the Green Revolution, to a low of 3.5 percent in 2004. It also declined in absolute terms: from US\$ 8 billion in 1984 to US\$ 3.5 billion in 2005. The World Bank lending to agriculture dropped from 30% to less than 10%; and private sector investment in agriculture in developing countries is hardly 2 percent of the total investment in the sector, against about 50 percent globally.

To achieve desired large-scale development impacts and meet the need to double food production over the coming 40 years, CGIAR estimates that it will require at least US\$1.5 billion p.a. for its activities; concomitantly, the national systems of developing countries will thus also need to *pro rata* triple their investments. **Funding for AR4D should be sustained and cannot turn on and off like a tap as has been the case over the past few decades.**

National systems account for about 96 percent of total public expenditure on AR4D in developing countries. However, this averages only 0.4% of Agricultural GDP (AgGDP) while a norm of 1 to 1.5% of AgGDP has been cited to optimize development impact. Whereas global investment in the CGIAR is only 4% of the total, when this is blended appropriately with wider national and regional investments, it can serve as a significant catalyst providing significant leverage for a much larger development impact such as in building national agricultural research and innovation capacities. Therefore, in the reform process, the Mega Programs of CGIAR must excite the funding community for AR4D and their AR4D partners by putting forward a concrete, credible, granular plan of result-oriented impact, which include strong and equitable linkages with the national systems of agricultural research and innovation. While the GCARD was very supportive of the new funding afforded to the CGIAR's Mega Programs, the continued lack of investment in the national systems puts into question the ability of AR4D to adapt the foreseen research outputs for local use and for wide-scale uptake.

The private sector is a key player in the new paradigm, particularly as drivers within the value chains. However, whilst in developed countries the private sector accounts for 40% of AR4D funding, in developing countries this is less than 2%. Thus, huge opportunities exist for many private sector institutions, particularly in the longer-term, as providers of goods and services, in added-value industries and in commodity markets. Clearly, in addition to market issues, national policy, stability and other issues influence the preparedness of the international private sector to invest in developing country agriculture.

The 'balance and quality' of new resources must also be considered to increase their effectiveness in AR4D. Thus, they need to: (i) cater to the needs of small producers and their communities; (ii) bring more focus to eco-regional agricultural systems that are largely ignored by global AR4D such as dry land, hill and mountain systems, coastal eco-regions and small island countries; (iii) attain higher net incomes, purchasing power and economic gains; iv) pursue environmentally-friendly and sustainable farming systems and entail broader consideration of NRM, socio-economic research and human development; v) balance maintenance research, basic, applied and strategic research as well as futuristic research; and vi) be sustained over the longer-term – not just 1-3 years. Considering the under investment in agricultural extension of all forms in recent decades, greater emphasis needs to be placed on agricultural education and the scale-out and adaptation of relevant and profitable existing research products. To make national AR4D programmes more attractive and boost investment, it will be necessary to involve farmers and value chain partners more directly, ensure clear accountability lines, and have good research strategies backed up by concrete milestones and public awareness.

Likewise, international development agencies and governments need to increasingly consider how financing mechanisms might be developed that place more funds and decision making in its utilization at the disposal of the clients of agricultural research, such as farming groups, rural organizations, professional associations of small and medium enterprises etc. Foreign donors, international development agencies and especially governments of developing countries may have to explore and advocate for new modalities for joint funding of agricultural research. The re-emergence of philanthropic organizations as supporters of AR4D needs to be aggressively explored. Private foundation funding (e.g. the Gates Foundation and the Rockefeller Foundation) could play a crucial role in taking on long-term high-risk strategies and these should be included in strategizing AR4D globally. Emerging and Fast Growing Economies, such as Brazil, Russia, India and China (BRIC countries) also have large national capacities and long experience in AR4D and these need to be suitably harnessed for agricultural development globally and regionally.

A major challenge and collective failure that needs to be addressed is the poor linkage between investments in agricultural research, particularly multilaterally, and those made in wider processes of rural development, whether directly by governments or via bilateral supporting investments. Unless these systems are better aligned, we will not see the development returns so crucially required from agricultural research.

### ***Strategic partnerships and collaboration***

No one can overcome the huge global agricultural challenges alone. Therefore, active and equitable multi-partnerships (in innovation and research, different disciplines, institutions and geographical regions, public-private etc) are a key to knowledge-based agriculture. Such an approach should result in building the capacity of partners and lead to increased accountability in poverty reduction, productivity growth, environmental sustainability and resource utilization. However, the difficulties associated with establishing and implementing viable partnerships were highlighted in GCARD2010; it was concluded that appropriate incentives will need to be in place for rewarding

successful partnerships and benefits need to be accrued by all involved. The strengthening of inter-country national systems of agricultural research and innovation could be networked to benefit from spill-over effects and the opportunity of involving the BRIC countries and others as “providers” of technologies, with expertise and innovations captured. The regional fora should be better networked with each other and add their collective voices to gain confidence and support of investors in AR4D.

It is necessary that all the AR4D actors, through collaboration and partnership, support the change process and bring in the social skills and knowledge required. Greater involvement of the private sector would promote business possibilities for all stakeholders involved. The private sector drives the organization of value chains that bring the market to smallholders and commercial farms. However, the state – through enhanced capacity and new forms of governance – is needed to correct market failures, regulate competition, engage strategically in public-private partnerships and promote competitiveness in the agribusiness sector.

‘New agriculture’ is led by entrepreneurs in extensive value chains linking producers to consumers; many more entrepreneurial smallholders could be added to these value chains if duly supported by appropriate policies, institutions, knowledge and investments. For those who are not able to capture economies of scale in production and marketing, labor-intensive commercial farming can be a better source of income in which case efficient and fair labor markets are the key instrument for reducing rural poverty. There is a need to develop methods to transfer knowledge and technology and all actors of the value chain to think, plan and work in cycles much longer in scope and scale than they are used to, and the risks and benefits of all partners should be identified and agreed upon right from the beginning of the partnership. The participation of farmers, NGOs, CBOs, CSOs as partners has contributed critical know-how to AR4D programmes, they need to be included more and more in all the stages of AR4D cycle.

The international actions and capability brought in support of national systems by CGIAR partnership remains critical for AR4D in many countries with limited resources. Embracing the principles of subsidiarity, competitiveness and complementarity, the CGIAR’s role brings best value where focused on the development of international public goods and addressing complex goals at the intersection of poverty, food security and environmental issues/risks. True and equitable partnership between CGIAR, national systems and regional fora is required going forwards. It is also necessary that future CGIAR focus should be on areas where greatest value is added through international actions at the interface of advanced research and its field application, and by producing more demand driven, product-oriented research outputs with greater co-ordination and the development of partnerships. The Centers need to include more farmers and end-users in the design, implementation and governance of programmes.

### ***Effective institutions***

It is necessary to build human, institutional and financial resources for AR4D, and promote effective use of these collective capacities, particularly networks, by strengthening key relationships among research, development (extension, seed and other input suppliers, markets, infrastructure such as roads, storage and transport and financial services sector) and farmer actors. Institutional development of sub-regional and regional fora and those related to agriculture in many of the national systems of the

developing countries is critical in bringing greater regional efficiencies, cross-learning and alignment with regional policies and actions. Land reform, insurance and access to affordable finance through loans etc. are also key institutional supports for adoption of new agricultural technologies and innovation. New institutional structures are needed to attract private sector participation in AR4D directly and through public-private-community partnerships. AR4D systems in many developing countries need strengthening and change in their systems of accountability and reward to better reflect the development value of their research. Research and innovation management leadership and guidance need to become more effective through institutional support both in national systems and along agricultural value chains, organizing farmers into producer companies, Self Help Groups, etc. to enable them to access information, technology, markets, credit, insurance to mitigate risks and other services has to be facilitated.

### ***Enabling policies, strategies and advocacy***

Science and technologies are key parts of the solution to hunger and poverty, but are not sufficient for impact in themselves and need to be complemented with enabling policies and mechanisms. Greater focus is needed on the agricultural sector and on AR4D in Poverty Reduction Strategy Plans (PRSPs), emphasizing the value of income and productivity growth and alleviation of vulnerability through ensuring inclusiveness of the rural poor and their opportunity through new knowledge and technologies to make efficient use of land, water, biodiversity, socio-economic safety nets and markets to escape from poverty and food insecurity. GCARD2010 highlighted that: sustained investment support and political will are required to build-up national scientific infrastructure and institutions. Policies need to enable transformed AR4D architecture to foster greater cross-sectoral approaches, diversity of approaches to innovation and effective partnerships and links among researchers, programs and institutions along innovation pathways and at all stages of value chains. Commensurately, infrastructure, ICT, knowledge pool, human resource, fair trade, pro-poor market management and rural employment capacities would need to be strengthened. It is also important that policies on incentives, subsidies and regulatory barriers do not become obstacles for science and technologies reaching the poor.

### ***Strengthening stakeholder capacity***

Agriculture is knowledge intensive and becoming increasingly so, therefore, integrated strengthening of national capacities in agricultural research, education and rural development is key to address the emerging challenges in AR4D cycle. Internal quality assurance and reward mechanisms need to be embedded into learning systems at all levels of the chain and go beyond measures of formal publication alone. Capacity for research planning, monitoring, impact assessment and research governance in project and financial management and administration is weak and needs strengthening. The need for capacity building is increasing both for higher education as well as for less conventional capacity strengthening through continuous education, lifelong learning and community learning through multi-stakeholder innovation platforms. A major challenge to all AR4D actors is improving skills of poor farmers, women, and youth in modern agriculture and in income-generating rural non-farm activities, thus leveraging

the commitment of all concerned national and international institutions for both upstream and downstream development needs.

### ***Bridging knowledge, information and communication gaps***

Public research systems should be based on the open and free exchange of information and ideas; enabling public access to information provides great returns to small-holder farmers with low levels of literacy and in remote locations. Creating knowledge systems and strengthening communication with smallholder farmers, women, youth and other along the production-consumption chain for participating effectively and equitably in markets is important. Current and emerging challenges for AR4D such as climate change and making effective use of new sciences and technologies require even more sharing and exchange of data and information globally. Thus, more resources need to be allocated to information and communication technologies and to making messages accessible via different media, in order to inform governments, donors, extensionists, farmers, markets and the wider public on new research products and their potential benefits. At the same time clearer public accountability will be fostered, making programs more attractive to their national governments and funding agencies.

### ***Empowering women***

Women make up the majority of small farmers in Africa and in many other parts of the world. And, feminization of agriculture continues to rise. However, the particular needs, constraints and opportunities for women farmers have not been adequately recognized and single technology-focused research has not sufficiently addressed either opportunity for value addition, market access, household food security and nutrition, or constraints such as access to land, water and credit or ergonomically-appropriate technologies. This lack also extends to public extension systems, which have often not enabled women to share their knowledge directly. In view of their critical role in agriculture in economically developing countries, women need to be given a central role as strategic partners in AR4D and equal opportunities in the sharing of new knowledge, skills and technology. Affirmative action training, income for their labours, investment opportunities and education for women are important to engender equality and increase their contribution to development and attainment of the MDGs, especially reduced inter-generational transmission of poverty. Women are also under-represented in research and innovation systems. Participatory research with women, particularly to develop and adopt gender-responsive technologies, strengthening and innovating processes that bring women into AR4D, and enable them to stay in the field are crucial to addressing this imbalance. These actions would lead to greater gender awareness in society and contribute to gender transformative empowerment. Gender is a non-negotiable and central issue in AR4D.

### ***Improved governance and accountability***

Agricultural research-for-development systems, national and international, need to become more accountable to their intended beneficiaries. Outside the cash crops, where research is often directly funded by and accountable to farmers, there is a misfit between research accountability to those served by AR4D and to those funding it. To attain the desired outcomes, to focus on solving problems, and to relate AR4D to the needs of stakeholders, it is important to ensure direct participation of farmers and other

beneficiaries in the planning implementing and monitoring of research and to build in regular monitoring, evaluation and impact assessment. The SRF approach of collective actions and collective responsibilities, yet specific accountabilities, builds the potential for large-scale concerted impacts and performance-based allocation of resources and for ensuring accountability. Quantifiable collective targets and indicators (e.g. as defined for the MDGs), and time-bound feedback systems should be put in place for this purpose. Development is a sovereign issue and national systems should lead research priority setting with a focus on poverty reduction, capacity development and gender equality and should be strengthened to up-scale research and procure technology if needed, for development impact based on a decision-making framework. Regional Fora should enable these priorities to be linked coherently with regional policies, investments, political frameworks and regional use of resources.

### **The Way Forward:**

To address the limitations of the current approach to AR4D, GCARD2010 concluded that agricultural research must become more small farmer-centred, gender-balanced and development-driven, embrace new strategic partnerships with all stakeholders, develop new capacities, devise more effective incentives, and become more accountable to society. In order to create a transformed global AR4D architecture, participants in the GCARD2010 expressed strongly that changes were required at all levels to transform and strengthen agricultural research and innovation systems, with individual responsibilities and collective actions among all involved in the AR4D systems of developing countries, emerging economies, industrialized countries and global/regional organizations.

### **The new global AR4D architecture required**

The new architecture for AR4D builds on two key binding principles *viz.* i. satisfying the development needs of poor farmers and consumers who must be at the centre of the research agenda; and ii. that desired development objectives should drive innovation processes, policies, partnerships and increased investments. It also brings together two cross-linked approaches: a) collective research and knowledge sharing actions globally to address key development themes; and b) transformation and strengthening of agricultural research and innovation systems, so that the products of research can be effectively and quickly delivered to meet key development objectives.

The principles and approaches for this transformed AR4D were collated and presented in the **Montpellier Road Map for Change (described in the Report “Transforming Agricultural Research for Development” upon which this Synthesis is based)**. These included more strategic partnerships and collaboration; increased capacity strengthening, greater, wide-scale and sustained investments; enabling policies and strategies; greater advocacy and more effective communication to bridge knowledge gaps; greater accountability to the poor and funding institutions; improved governance; and mainstreaming gender issues into development. These were identified as the main pillars for reshaping AR4D to reach the hitherto unreached and each will require institutional responses and actions to be elaborated and delivered at national, regional and global levels.

The following list of cross-linked approaches provides **guidance** for a transformed AR4D:

**Priority setting.** The process of arriving at objective and transparent **regional and national priorities** needs to be strengthened; GFAR has a role to play in providing common generic guidance on SMART priority setting strategies

**Human, financial and institutional strengthening** to meet the under-investment gap; need to take advantage of new opportunities provided by the emergence of the BRIC countries

**A transformed CGIAR system** working via inclusive large scale Programs to deliver international actions towards large scale development impacts desired by partner countries; need to ensure these have wide stakeholder support and NARS capacity to implement outputs.

Changes in **policies, incentives and institutions** to meet the challenge; and greater attention paid to the voices of the poor, the farmers, the private sector, NGOs and civil society.

**Need for mapping** ; Nationally and regionally driven programs should be based on an analysis of: incidence and location of poverty; the changing situation in food security, agricultural productivity and production; the performance of the green (land) and blue (water) environment sectors; agricultural research architecture; strengths, comparative advantages, weaknesses of actors; growing differentiation among the national research and innovation capacities. National and local institutions should be strengthened to support such country-led AR4D programs. In most vulnerable countries and areas acceleration frameworks should be created to identify bottlenecks, constraints and solutions and successful experiences brought to scale.

**Sustainable productivity improvements** will need to be secured under increasingly different and difficult challenges. More adaptive agricultural research is required, particularly at the local/national level to enable it to play a more significant role in addressing food security and poverty reduction. The parlous state of the extension services in most developing countries will need immediate attention as will promotion of greater North-South-South knowledge transfer and increased partnerships with the private sector and CSOs.

**Profitability and Livelihoods.** Whereas financial gain from farming practice is an important criterion, AR4D should also give consideration to the acquisition of other capital assets including social, physical, natural, cultural and human capital to enable the poor to achieve meaningful and sustainable lifestyles.

**Sustainability.** Agricultural research has high returns compared with investments in other sectors - but it often takes a long time and sustained support for the pay-offs to be realized. Unfortunately research funding is normally only provided in tranches of 1-5 years (median of 3 years) which usually mirrors the duration of a political administration. Changing these short time-lines and associated mind-set will require advocacy at the highest level. The proposed Mega Programs of the CGIAR designed to address priority national development needs provide an opportunity for supporters of AR4D to provide much-needed long-term support. The more recent funding of longer-term AR4D programmes by the emerging Foundations such as Bill Gates-style

philanthropy is an encouraging step in this direction. World Bank and USAID have recently revived their longer-term funding support to agriculture, including agricultural research.

**Resilience.** The new architecture will require resilience which will be achieved through complementing the present concentration of AR4D effort on commodities with more farmer-centric research which will ensure that complementary social issues and day to day difficulties faced by smallholder farmers are also addressed e.g. the development of entrepreneurial skills and access to vibrant markets, better communication, the empowerment of rural women, new appropriate incentives for researchers, extensionists, providers of goods and services, more subsidies, credit and insurance to enable science and technology to reach small farmers and associated value chain partners.

**Inclusiveness.** Emphasis on farmer-centred research primarily means that farmers are involved in all aspects of the research to development continuum. Inclusiveness will automatically lead to more holistic approaches and closer linkages with other sectors of the economy particularly health, education, infrastructure and finance.

### **Reshaping institutions for the future**

Based on the foregoing guidance, the following institutions are urged to **undertake immediate action to implement the new paradigm**. Designing this architecture will not be easy even under the best of circumstances. It will take time to establish, even if ALL stakeholders take responsibility and do their fair share. But, if all stakeholders do not play their roles, a major opportunity will be lost.

### **The National Systems of Agricultural Research and Innovation:**

GCARD2010 noted the term National Agricultural Research Systems (NARS) seems to be largely synonymous with the National Public Sector/Funded Agricultural Research Institutes (NARIs). By this, other important stakeholders such as the agriculture faculties of universities, the extension services, the private sector, farmers' organizations and policy makers are normally excluded from the deliberations and activities of the NARS. Conducting AR4D along commodity or social value chains will be impossible without the active participation of all relevant stakeholders.

It should also be recognized that the National systems range of activities is clearly much broader than that of the CGIAR—including in-depth work on post-harvest, mechanical technologies, fruits and vegetables, value chains, mountain agriculture, urban agriculture, rangelands, brackish water systems etc.

Therefore,

-the National systems must learn to be accountable for the resources invested in them and scientists and extension staff rewarded for collaboration with the private sector in achieving developmental benefits.

-advocating and sharing knowledge on researchable issues faced by smallholder farmers with policy makers, the private sector and civil society organizations will eliminate some of the under- and mis-investment in agricultural research.

-greater accountability will promote the involvement of the members of the AR4D community in policy making.

-African NARS need to explore every avenue to ensure that need for strengthened human and institutional capacity is addressed. The small NARS in particular would need to be encouraged to strengthen collaboration with the bigger and better endowed NARS and become more partnership-oriented.

-the 'enlarged' national systems of agricultural research and innovation should collaborate with national authorities and the regional fora in mapping exercises (who does what, strengths and weaknesses, value chains etc) and in developing research strategies and programmes which address national pro-poor priorities and gaps in regional challenges and which embrace the new AR4D paradigm.

## **GFAR**

As the executive body charged with facilitating the transformation process of AR4D by the global community (the 2009 L'Aquila Joint Statement of G8 on Global Food Security) **GFAR will now work to advocate, facilitate, monitor and share initiatives for collective action** to enable cross-cutting reform and strengthening of research and extension systems at national, regional and international levels and increase their development impact. It will do this by re-committing its efforts at addressing the four GFAR pillars through:

-Supporting (eg. with guidance and seed funding) and orchestrating (eg. with time guidelines) the roll out of the Road Map's implementation and implications in each region, with collective progress reported at GCARD 2012. This will include encouraging the regional fora to urgently reconvene to consider the foregoing implications and to develop regional AR4D strategies and programmes with budgetary requirements in readiness for GCARD 2012.

-Strengthening agricultural research for development systems, which will require an evidence based advocacy to facilitate increased investment in research, training and delivery systems and GFAR needs to be at the helm of this exercise.

-Working through expert groups to help strengthen the involvement of development actors and farmers in the research processes and in regional and national research fora.

-GFAR will also need to work through each regional body to facilitate participation of national and regional partners in the design and implementation of the large scale programs that are in process of being initiated by the CGIAR; and to develop mechanisms for increasing the accountability of research to its clients and their development aims.

-Sharing best practices between regions while developing the capacity to report on changes in donor and country actions in support of achieving shared development goals.

- Developing the capacity and overseeing the mapping processes on which regional institutions do what (best); catalyse methodology and data collection processes for monitoring changes in human capacity; resource additional finances; and foster new institutions and partnerships as a consequence of adopting the new paradigm.

Whereas the outcomes of the **GCARD** consultation process 2009/10 facilitated by GFAR and the Regional Fora were considered to be a good start, these should be seen as first steps towards stronger more effective priority setting processes globally and among various groups of actors and agencies. The consultation process needs proven systematic methodology to enable users to come up with priorities which address the needs of smallholders.

**In the final analysis**, the lessons learned from GCARD2010 for adoption by GFAR when planning the next GCARD include: need for uniform interpretation of the framework/methodology to increase the value of the process; better sequencing and phasing of priority setting processes to capture real needs of the smallholder farmers and the poor; greater commonality of participants at each stage of consultation to increase coherence and equality; far greater participation of the farmers and the poor, the private sector and civil society; need to manage high expectations created among regions through the consultation process; provision of guidance on common smart priority setting approaches; and judicious implementation and monitoring.

### **The Regional Fora**

While acknowledging the important role the Regional Fora are playing in AR4D, it was felt that they can become even more effective and proactive if the following actions are taken or intensified.

They need to consider to:

- be more active advocates of the new AR4D paradigm and improved knowledge sharing, especially with policy makers and the private sector;
- increase efforts to ensure that national research and innovation systems are inclusive with representation in them by all stakeholders;
- increase assistance to sub-regional and national systems in SMART priority setting processes;
- recognise that any new architecture for research and development must be on the basis of regional and national priorities.
- through mapping the current institutions and their expertise involved in AR4D within a region, the RFs could help to determine their strengths and weaknesses as also needs and potential to contribute to regional and global AR4D, facilitate capacity strengthening where required, and encourage greater collaboration with appropriate new actors in addressing priorities. Recognizing the different capacities of in-region institutions to undertake applied /adaptive research and to transfer the knowledge generated to poor farmers and value-chain institutions is an important step in initiating meaningful collaboration.

### **National Governments**

Increased funding is desperately required to support small-holder farmers in developing countries to address food insecurity concerns. However, agriculture is often not identified by government as part of their official Poverty Reduction Strategies. This needs to be corrected.

-the African Union has agreed that its component Governments will devote 10% of their GDP to agricultural development in support of NEPAD-CAADP principles. Although the number of countries who have met this agreement is steadily increasing, there is an urgent need for all food-deficit countries to make the necessary investments to promote agriculture.

-policy makers in the agriculture sector of the developing countries need to promote sector-wide approaches that have succeeded in meeting the needs of the poor in the health and education sectors. Transforming the existing approaches and architecture will require strong leadership, time and resources - and sustained effort.

-agricultural research and extension services in particular need to be strengthened

**Developing countries** including **emerging economies** should commit to:

- Taking leadership positions at their respective levels
- Enhancing their own policies, institutions and investments in support of achieving better impacts on the poor
- Enabling private sector involvement in agricultural development
- Fostering institutional innovations to transform their national and regional AR4D systems
- Incorporating their strategic needs to support such transformation in strategies
- Adopting an inclusive process involving all relevant stakeholders to develop strategies on what technologies and knowledge need to be generated or mobilized nationally and how to access new technologies and knowledge from external sources;
- Strengthening their sub-regional and regional organizations as instruments to foster regional cooperation, better use of available resources, and improved scientific infrastructures

**Industrialized countries, emerging economies and global and regional organizations** should:

- Adopt explicit commitments to increase well co-ordinated investment and human resource development to (i) meet the needs and MDGs or nationally-established goals for poverty reduction, food security and environmental sustainability, and ii) ensure that national and international efforts attain the required levels of investment
- Support national efforts to build sub-regional and regional organizations to complement national efforts, particularly to support smaller countries, so as to achieve the necessary scale to effectively meet research needs and promote international standards and accountability in research management;
- Ensure effective inclusion of research, extension and capacity development in rural development programs in response to needs.

**Civil society, NGO and farmer's organizations** should:

- **be an effective and equal member of decision making and priority setting system**
- **undertake advocacy for research and innovation**
- **be involved in program implementation**

### **International development agencies**

- GCARD highlighted the need for greater internal alignment within the aid and donor community and international development agencies to improve coordination and collaboration and foster a sense of common purpose and “trust” across all agencies. Individual bilateral donors tend to develop and implement ARD programmes in isolation from other donors and agencies; support is often targeted at countries based on historical ties, trade interests or political allegiances;
- Support for AR4D is normally limited to 3-5 year tranches, a period usually incompatible with the generation and adoption of innovation and sustainable development. This approach needs to be reconsidered and the horizon for funding be suitably extended.
  - there is significant concern in the development community about food security issues and the likely failure of achieving the MDGs by 2015 and some significant new pledges of increased support have been made. However, failure to fulfill these pledges on time has raised mistrust in the donor community’s commitment.
- The GCARD process was successful in harnessing new resources for the CGIAR mega-programmes although core funding required to enhance the capacity of partner NARS to adapt new findings from the MPs at the farmer level is still awaited.

### **The CGIAR**

The CGIAR’s portfolio of 8 thematic research areas (Mega programs) was endorsed by GCARD; these will be developed into major programmatic areas which could strengthen the flow of international public goods throughout the global AR4D system. The following complementary actions were recommended during the Conference:

- Devolve research activities appropriately to national systems and move CGIAR research emphasis upstream towards applied research rather than adaptive research;
  - engage in more effective partnerships between Centers and the private and other sectors;
  - promote the CGIARs comparative advantages;
  - help mobilize and leverage investments for national systems to carry out AR4D;
  - build National systems capacity to be more effective partners;
- Facilitate capacity building for gender participation and diversity research at the National systems level;
- Clearly identify responsibilities and accountabilities for outcomes.

- Create strong congruence between the CGIAR's revised agenda and the priorities and needs identified through the regional activities supported under the GCARD process
- Greater and effective partnership of CGIAR with NARS and regional research fora are needed in implementation of AR4D programs

## **The Global AR4D Community**

### **Finally,**

Regional and international organizations will need to play proactive roles in technological and intellectual support, capacity building and creation of effective regulatory frameworks with the end objective of addressing the MDGs. As the challenges transcend the usual boundaries of agricultural research, effective collaboration and partnership among several disciplines and stakeholders must be forged to provide technological, socio-economic and policy solutions

The entire global AR4D community has a responsibility to advocate for the critical role played by agricultural research in promoting development. The widespread food riots in many parts of the world 2 years ago clearly showed that food security is essential for the maintenance of peace, prosperity and stable governments. Adoption of the new holistic approach to AR4D will also make significant contributions to the attainment of all 8 Millennium Development Goals. These concepts must constantly be made known to developing country governments, policy makers, the media and the farming community. It is only through such concerted efforts that changes in the current jaundiced mind-set of many governments and the media will take place; and it is not someone else's job to advocate for the crucial contribution that agriculture makes to development - it is all our jobs!

### **Conclusion**

Agricultural research, technology development and innovation, rooted in the principles of social justice, economic returns, and environmental sustainability to increase productivity, income and livelihoods in perpetuity can help abolish chronic hunger and extreme poverty. But this research alone will not deliver the desired development at scale. Sustained political will, responsive policies, increased quality investment, effective partnership with differentiated responsibility and accountability are critical for turning commitments into action. We must act now as the hungry child cannot wait. His/her name is Today and not Tomorrow.