



**Report**  
**on the Proceedings of the**  
**International Workshop On Fast**  
**Growing Economies' Role in**  
**Global Agricultural Research**  
**for Development**

8-10 February 2010  
Beijing, China



# **Report on the Proceedings of the International Workshop On Fast Growing Economies' Role in Global Agricultural Research for Development**

## **Summary**

The sharp rise in global food and fuel prices in 2007–08, the financial crises of 2009, and the consequent global recession compounded by the continuing high prices of food staples globally have highlighted the fact that there is an urgent need to reemphasize and reorient agricultural development in economically-developing countries. These changes in agricultural development are critical in order to ensure the sustainable production of food as well as vulnerable populations' access to food in these countries.

In the face of ever increasing demand for food, the world now also faces new challenges that will affect food production in the foreseeable future: a looming crisis in the availability and use of water for agriculture; the decreasing availability and high cost of fertilizers, especially phosphates; climate change that will bring about not only a rise in temperature, but also a shift in rainfall patterns and a rise of sea levels in fertile deltas across the world; increased degradation, erosion and loss of agricultural lands; rapid spread of diseases and pests and loss of biodiversity among several others.

Spectacular growth in agriculture and the consequent ability to feed the world in the 20<sup>th</sup> century was attained through concerted application of science and technology to agricultural development. Agriculture in a globalized, interconnected and interdependent world is now more complex and becoming more knowledge intensive. The new drivers for change in agricultural development now increasingly require new knowledge from the outside, beyond that available locally in the communities that practice agriculture or in the institutions that guide it. The new necessity for knowledge and for the application of science and technology to meet global needs in agricultural development in the 21<sup>st</sup> Century now requires fresh efforts and rethinking, especially around collaboration and partnerships that contribute to global agricultural development and progress.

Fast growing economies are increasingly emerging also as dominant forces in global economic, social and environmental affairs. These economies represent the world's largest potential markets and trading partners, the source of much of both the world's natural and human resources and of major sustainability challenges and innovation. Some of the dramatic successes in rapid development are illustrated in the examples from Brazil, Russia, India, China and South Africa (BRICS), all fast growing economies where agricultural policies coupled with more intensive Agricultural Research for Development (ARD) have led to dramatic growth in the sector and support to their overall economies.

With their economic development and scientific advances, these fast growing economies have a lot of information and experience regarding AR4D, to share with other economically developing countries. These countries with fast growing

economies have been making efforts to contribute to agricultural development in other developing countries, particularly those in Africa and Asia, through economic and technical assistance, as well as capacity building initiatives. However, the potential of their contributions in ARD has not been fully realized due to a lack of a cohesive and coherent effort through collaboration and partnership.

The International Workshop on Fast Growing Economies' Role in Global Agricultural Research for Development was held from 8 to 10 February 2010 in Beijing by the Chinese Academy of Agricultural Science (CAAS). This Workshop was supported by the Global Forum on Agricultural Research (GFAR). More than 34 participants, most of them senior representatives of national research systems, from 15 countries, 6 Regional Forums on Agricultural Development and 4 International organizations deliberated and contributed actively to the Workshop.

The International Workshop was conducted over a period of two and a half days. It discussed the status of ARD in fast growing economies, their current and potential contributions to ARD for development impact globally as well as their needs for collaboration and partnerships. This was followed by expression of regional needs by representatives from Africa, West Asia, Central Asia, Asia-Pacific, Europe and Latin America. Major International and Regional Institutions which are stakeholders in agricultural development also indicated their perspectives on the subject. A discussion on specific issues such as ARD Investment, Institutional Change, Capacity Development, Sharing of Information, Knowledge, Skills and Technology and Research to Enable Market Participation were also discussed. Almost one full day was spent on deliberating the way forward in further enabling the fast growing economies with large agricultural research capabilities to play a larger role in agricultural development globally.

The contributions and capacities of the agricultural research systems of the fast growing economies were presented in some detail. The experience of these countries revealed the important role agriculture played in their evolving economies and how emphasis on agricultural development and support from research systems contributed to their overall economic development. The key factor was that their agricultural development and sovereignty in issues related to food helped their economies to develop by reducing food imports and inflation from food prices. This in turn helped them better support their development industries, services and now knowledge based industries and services. They had also developed substantive indigenous research capacities in agriculture, as well as strong education and extension systems. There was also the political will to invest in agricultural development and agricultural research. These countries benefited from collaboration and partnerships in building their agricultural research, education and extension systems. Many of these countries are also now major exporters of agricultural commodities including food. They have vast stores of information and experiences that could contribute substantially to development globally if harnessed effectively.

One major common challenge for all countries is to apply science and technology to develop the agriculture of the resource poor, small holder farmer and producer and enable him/her to participate equitably in markets. In many of the fast growing economies countries, the agriculture for the resource rich is very much similar to that in economically developed countries. There is a dichotomy of agriculture in these

countries and, parallel to it, in agricultural research as well. For many, this issue is not in the application of science and technology to agricultural development per se but in it contributing to agricultural development of the resource poor.

All countries indicated that they had bilateral, multi-lateral and global collaboration and partnerships of various types, around several themes and commodities and with differing intensities in engagement. Several new and innovative models and approaches in collaboration and partnerships are being developed and implemented. All countries stressed the need for increased collaboration and partnerships in ARD to meet their own national needs and emerging challenges and also contribute together to regional and global challenges.

The contribution and needs expressed by the fast growing economies countries were for collaboration, partnerships and learning together from experiences not only in research around commodities and problems but also in:

- Advocacy for agricultural development and application of science and technology;
- Reform and restructuring of research and innovation systems, education and extension systems and their management;
- Agricultural and ARD related information and knowledge management;
- Supporting market participation through research and innovation.

Representatives from Africa, West Asia, Central Asia, Asia and Pacific, Europe and Latin America, after detailed presentation on the state of ARD in their respective regions, expressed that:

- Complexity and asymmetries in all regions and between regions are key common themes and they are a cause of perplexity and limiting collaborative action in ARD in all regions. However there are commonalities among the needs such as in institutional issues related to agricultural development and application of science and technology, managing research and innovation systems, capacity development and access to new information at various levels;
- Despite all limitations and difficulties, networks have contributed significantly to mobilize capacities, to harmonize activities and to map limitations, risks and opportunities and also share information within the regions;
- The challenge is how to take advantage of asymmetries to amplify access to capacities from countries and organizations that are better positioned within each region;
- There are many cases of success, productive interactions and cooperation within and between regions, but these are not well known, well mapped, documented and disseminated;
- To access, describe and use success cases as references and examples of what can be done would be a very productive way to disseminate and to promote best practices and successful strategies leading to better and more effective collaborations within and between regions.

The major International and Regional Institutions indicated their contributions and felt that there is a need for enabling greater collaboration and partnerships among the

fast growing economies and also with economically developing countries for development impact globally. They could play an effective role in supporting ARD globally, regionally and at country level, removing asymmetries, building capacities enabling sharing of information, knowledge, skills and technology and enabling partnerships and collaboration.

The specific issues discussed by the participants included:

- Investment from Fast Growing Economies;
- Policy Needs at International, Regional and National levels for participation and investing;
- Capacity Development;
- Institutional Reform;
- Improving Sharing of Information, Knowledge, Skills and Technology;
- Market participation;
- Common research Goals and Interventions.

Specific recommendations for each of the issues were made that would contribute to the fast growing economies countries effective role in contributing to development globally. These are available in the detailed report of the International Workshop.

In the way forward, it was agreed that there was a need for an initiative to create a group of countries that have fast growing economies and substantial investment, human capital and experiences in agricultural research such as Brazil, China and India so that they can participate together and jointly in global dialogues and decision making related to agricultural research for development. They felt that the first step should be taken by GFAR to invite this group of countries to be a direct member of the forum in addition to participating through regional fora. The Fast Growing Economies National Agricultural Research Systems (NARS) have an important role also in strengthening regional forums. This should be followed by advocacy, awareness and sensitization of the important role that fast growing economies with large NARS have in global ARD and for the need for harnessing their contribution to development globally.

The participants from the fast growing economies with large NARS also felt that the focus of their collaboration and partnerships in agricultural research should not be only their financial or funding contributions to agricultural research especially to international research organizations. The main focus should be on sharing and exchanging information, experiences, knowledge, skills and technology globally.

The main areas where such partnerships and collaboration could substantially contribute are in:

- Advocacy, sensitization and awareness building on the contribution agricultural research has for agricultural development and overall economic, social, environmental and technological development in developing countries;
- Institutions and Systems development for agricultural research and innovation, education and extension;

- Sharing and exchange of information on agricultural research and innovation processes including those of policy making, strategizing, infrastructure and capacity development and research management *per se*;
- Sharing data, information, knowledge, skills and technology related to agricultural development, research and innovation;
- Improving the architecture and governance of global agricultural research for development systems and the flow of information and technology globally;
- Contribute to the development of global programs of collaboration and partnerships such as the new Mega-programs of the reformed CGIAR.

A key message from the Workshop was that for a rapidly emerging, more knowledge intensive agriculture, a new knowledge revolution in agriculture and its development is needed. This translates into change / reform / restructuring / reengineering agricultural research and innovation systems for development. In an ever increasing inter-connected world, no one can meet their agricultural challenges alone and in isolation. Cooperation, collaboration and partnership among all are a must. The fast growing economies want to play a more active role in ARD globally. They want their contributions driven by shared interests and needs and not rhetoric. They want their contributions judged not by their funding of international research organizations but the value they generate in sharing experiences, information, knowledge, skills and technology. They want change in systems, institutions, structures and processes of collaboration and partnerships so that their efforts have development impact.

Some of the suggestions for action from the participants were:

1. To make full use of global platforms such as of GFAR to enable Fast Growing Economies to play a greater role in global ARD. GFAR may invite the large NARS of fast growing economies to participate directly in its governance and activities;
2. The fast growing economies should be actively engaged in the development of databases, information systems and platforms initiated and/or organized by GFAR to improve information-sharing for global and common good of ARD stakeholders and partners;
3. GFAR should support and provide avenues for the fast growing economies to enhance their role in regional ARD networks and cooperation;
4. Strengthen cooperation in areas of global common concerns, such as climate change, food safety, water resources utilization, trans-boundary disease, managing biodiversity, control of invasive species, agricultural products trade etc.;
5. Reinforce coordination, through appropriate programs such as on genomic studies, among the fast growing economies, especially in the field of agriculture research as well as in policy-making of agricultural science and technology;
6. GFAR should set up a Task Force for providing information, including historical, on the evolution and development of agricultural research, education and extension systems so that the information, experience, knowledge and skills acquired in fast growing economies in restructuring of ARD systems can be available to other NARS.

# **Report on the Proceedings of the International Workshop On Fast Growing Economies' Role in Global Agricultural Research for Development**

## **INTRODUCTION**

The sharp rise in global food and fuel prices in 2007–08, the financial crises of 2009, and the consequent global recession compounded by the continuing high prices of food staples globally have highlighted the fact that there is an urgent need to reemphasize and reorient agricultural development in economically-developing countries. These changes in agricultural development are critical in order to ensure the sustainable production of food as well as vulnerable populations' access to food in these countries.

In the face of ever increasing demand for food, the world now also faces new challenges that will affect food production in the foreseeable future: a looming crisis in the availability and use of water for agriculture; the decreasing availability and high cost of fertilizers, especially phosphates; climate change that will bring about not only a rise in temperature, but also a shift in rainfall patterns and a rise of sea levels in fertile deltas across the world; increased degradation, erosion and loss of agricultural lands; rapid spread of diseases and pests and loss of biodiversity among several others.

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Fast growing economies are increasingly emerging also as dominant forces in global economic, social and environmental affairs. These economies represent the world's largest potential markets and trading partners, the source of much of both the world's natural and human resources and of major sustainability challenges and innovation. Some of the dramatic successes in rapid development are illustrated in the examples from Brazil, Russia, India, China and South Africa (BRICS), all fast growing economies where agricultural policies coupled with more intensive Agricultural Research for Development (ARD) have led to dramatic growth in the sector and support to their overall economies.

With their economic development and scientific advances, these fast growing economies have a lot of information and experience regarding AR4D, to share with other economically developing countries. These countries with fast growing economies have been making efforts to contribute to agricultural development in

other developing countries, particularly those in Africa and Asia, through economic and technical assistance, as well as capacity building initiatives. However, the potential of their contributions in ARD has not been fully realized due to a lack of a cohesive and coherent effort through collaboration and partnership.

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The Workshop, after a short formal inauguration by Dr. Tang Huajun, Vice President of CAAS and acting for the President of CAAS, and Dr. Adel El-Beltagy, Chair of GFAR, took stock of the achievements, capacities, challenges, current and potential roles of the national research systems of China, Brazil, Egypt, India, South Africa, Vietnam and France in global ARD.

### **Fast Growing Economies**

The contributions and capacities of the agricultural research systems of the fast growing economies were presented in some detail. All fast growing economies countries clearly indicated increased food production and productivity and the importance of agricultural development in their economies. The experience of these countries revealed the important role agriculture played in their evolving economies. They also indicated how agricultural development contributed to their overall economic development. Agricultural development also cushioned their economy through availability of food, export and reduced inflation from high food prices over years and especially in recent food price and financial crises. All countries showed remarkable progress in increasing agricultural production and productivity that was, in varying proportions, attributed to agricultural research and the application of science and technology.

The key factor was that their agricultural development and sovereignty in issues related to food helped their economies to develop by reducing import and inflation from food prices. This in turn helped them better support their development industries, services and now knowledge based industries and services. They had also developed substantive indigenous research capacities in agriculture, and strong education and extension systems. There was also the political will to invest in agricultural development and agricultural research. These countries benefited from collaboration and partnerships in building their agricultural research, education and extension systems. Many of these countries are also now major exporters of agricultural commodities including food. They have vast stores of information and experiences that could contribute substantially to development globally if harnessed effectively.

Various models and approaches in agricultural research and extension systems, institutions and their structures, policy support and strategies, ARD investment and its modalities (from public, private and public-private), as well as challenges, old,

unsolved and new, were presented. These included the need to increase productivity, to enable research for effective market participation, to renew and build new capacities, to reform research, education and extension systems, climate change, water management, salinity, desertification, managing diseases and pests, biological diversity etc. All countries also expressed the opinion that not enough has been done to address these issues and even greater challenges remain.

One major common challenge for all countries is to apply science and technology to develop the agriculture of the resource poor, small holder farmer and producer and enable him/her to participate equitably in markets. In many of the fast growing economies countries, the agriculture for the resource rich is very much similar to that in economically developed countries. There is a dichotomy of agriculture in these countries and, parallel to it, in agricultural research as well. For many, this issue is not in the application of science and technology to agricultural development per se but in it contributing to agricultural development of the resource poor.

All countries indicated that they had bilateral, multi-lateral and global collaboration and partnerships of various types, around several themes and commodities and with differing intensities in engagement. Several new and innovative models and approaches in collaboration and partnerships are being developed and implemented. All countries stressed the need for increased collaboration and partnerships in ARD to meet their own national needs and emerging challenges and also contribute together to regional and global challenges.

### **Conclusions from the Session on Fast Growing Economies Countries**

A key message from this session was that for a rapidly emerging, more knowledge intensive agriculture, a new knowledge revolution in agriculture and its development is needed. This translates into change / reform / restructuring / reengineering agricultural research and innovation systems for development in an ever increasing inter-connected world. No one can meet their agricultural challenges alone and in isolation. Cooperation, collaboration and partnership among all are a must. The contribution and needs expressed by these countries were for collaboration, partnerships and learning together from experiences not only in research around commodities and problems but also in:

- Advocacy for agricultural development and application of science and technology;
- Reform and restructuring of research and innovation systems, education and extension systems and their management;
- Agricultural and ARD related information and knowledge management;
- Supporting market participation through research and innovation.

Some of the suggested ways forward were;

- Greater and direct role of the large NARS of fast growing economies in Regional and Global ARD Organizations;
- Evolving new mechanisms similar to CGIAR Challenge Programs for fast growing economies collaboration and partnerships in ARD;
- New and improved information and knowledge sharing mechanisms.

## **REGIONS**

### **Africa**

In Africa, there has been high variability in growth rates for the 15 sub-regions over time. However, growth has not had significant poverty reducing impact. There is need to better spread benefits of future growth to the poor. The target is to attain and then sustain an overall growth of 6%.

Agriculture is a priority area for the New Partnership for Africa's Development (NEPAD). Four recent African Union Summits have focused on aspects of agricultural development and food security in Africa. The Comprehensive African Agricultural Development Programme (CAADP) established at Maputo is the overall framework for revitalizing African agriculture.

The four pillars of CAADP for agricultural development are:

- Pillar I - Land and water management
- Pillar II - Rural infrastructure and trade-related capacities
- Pillar III - Increasing food supply reducing hunger
- Pillar IV – Agricultural Research, technology dissemination and adoption; supports the other three pillars

FARA is the lead institution for CAADP Pillar IV and has developed the Framework for African Agricultural Productivity (FAAP). FAAP acts on:

1. Evolution and reform of agricultural institutions and services;
2. An increase in the scale of investments towards Africa's agricultural productivity to increase annual aggregate spending in agriculture;
3. Aligned and coordinated financial support moving from 'project' to 'programme' mode;
4. Adoption of common processes for strategic dialogue;
5. Establishment of multi-donor trust funds or pooling of funds.

The national, regional and continental agricultural research institutions in Africa have made significant contributions to agricultural development on the continent. New agricultural technologies developed by these institutions have enhanced the productivity and profitability of the agricultural sector and therefore contributed to food and nutrition security

In Africa, action must be far-reaching with significant impact in the short time—a revolution. This requires a continent-wide framework owned by Africans. This requires sufficient and sustained investment (internally generated and externally supported). Science and innovation capacity are crucial elements in Africa's development. This now requires support to advocacy, especially for ARD investment, policy and institutional reform and the creation of new essential institutions, developing and validating best practices, facilitating exchange of information, and building connections among the various actors in the agricultural system.

## **West Asia and North Africa**

The West Asia and North Africa (WANA) region is a large net importer of food and very vulnerable to climate change, desertification and water shortages.

With frequent droughts and heat waves, climate change is already a reality in the WANA region. Several of its most fertile areas, including the Nile Delta, are seriously threatened by an increase in sea level and saline ingression.

The area has significant biodiversity that can contribute to overcoming the challenge of desertification, water shortage and climate change.

Most of the NARS lack financial resources and effective linkages. Improvements in agricultural technology are limited. Percentage of investment in scientific research is 0.2 percent of GDP, in comparison to 2.8 percent in the developed countries. Large increases in the yields of major crops were observed during the last decade (1990-2004) in Algeria, Egypt, Sudan, Morocco and Syria. But overall, increases are not enough to balance supply and demand.

All the NARS in the region need institutional reform and new capacities in research and extension in addition to investment in agricultural research and development. There is significant scope for collaboration and partnership with the region, inter-regionally and internationally.

## **Asia-Pacific**

The region houses almost 60% of the worlds' population, 75% of the agricultural population, about 63% (640 million) of the hungry and malnourished, and 50% (over 660 million) of the extreme poor; and these numbers are growing. Agriculture remains the main rural livelihood and includes; small farm holders, pastoralists, tribal, fishermen and agricultural laborers. The Asia-Pacific region faces major challenges including: population pressure and growth; stagnation or slow productivity growth; high food and energy costs; climate change and economic shocks. The region has remarkable research achievements and high rates of return both in terms of growth and poverty reduction.

The region has well established National Agricultural Research Systems in many countries. There are several International and Regional Agricultural Research and Development organizations. These include those of the CGIAR, and the World Vegetable Centre. The Regional Associations include APAARI, APSA, APAFRI, ICIMOD, NAARAP etc. More than 30 networks on various subjects and commodities work within the region. The subject matter of these networks includes crops, genetic resources, fish, fruits, biotechnology, information/communication, and systems.

The region has vast heterogeneity in economic status and ARD investments. China and India are large economies, with huge populations and large GDPs of more than 8542 billion dollars with high GDP growth rates of 6 to 9 %, and relatively modest share of agricultural contribution in total GDP (agGDP) between 11 to 15%. The rest

of the South Asia and South-east Asia have modest populations, medium growth rates (around 4%) and marginally higher proportionate shares of agGDP. The Pacific region has much smaller population, GDP, and agGDP, with growth rate of only 2.3% and is heavily dependent on agGDP (35%).

In 2002, ARD Investment in the region totaled \$9.6 billion. China, Japan and India together accounted for about 70% of the total ARD investment with China and India accounting for 40%, South-east Asia for 14%, and the Pacific for less than 0.5%. India and China had high growth in their ARD investment; Malaysia and Vietnam showed impressive growth; however Pakistan, Indonesia and Laos were more sluggish. The bulk of the Investment was by national governments. There was some contribution but not significant dependency on aid. The private sector has recently gotten involved in agricultural research. Only Indonesia and the Philippines have some share from the private sector. Overall, some of the NARS are well managed and well-funded systems producing world-class research, while others have experienced significant declines in their R&D spending. Malaysia and Vietnam realized impressive growth in agricultural R&D spending, whereas growth in other countries has remained sluggish (and in some cases negative). Also there is a high degree of variance in political and policy support to agricultural R&D. All countries in the region invested less than 0.5% of agGDP in agricultural R&D, with the only exception being Malaysia with 1.92%. China, Papua New Guinea, Sri Lanka, India and the Philippines invested more than 0.4% (but less than 0.5%), while all other countries have been investing only at a small level.

China had more than 50 thousand researchers, while Nepal, Sri Lanka, and Laos have less than 500, and Papua New Guinea has only about 100.

The needs of the region from collaboration and partnerships are heterogeneous but collectively include;

- Capacity Building in ARD;
- Effectiveness of ARD;
- Investment in Agriculture and ARD;
- Global and Regional Issues;
- Research and Development Projects;
- Genetic Resources and Advanced Biotechnology;
- Regional Networking for Institutional Development; and
- Information and Communication Technology and Management.

### **South America and Caribbean**

The region includes 33 countries in South America and the Caribbean, has a population of 578 million, and represents around 8.5% of the world population. It has 23% of the world's arable lands, 31% of its water resources, and 46% of its tropical forests. This region is very heterogeneous in many aspects: natural resources, social, and economic. More than 44% of the region's population lives under the poverty line, with a high proportion, 64%, located in rural areas.

The region has several well established NARS. These include Brazil, Argentina, Chile, Uruguay, and CARDI in the Caribbean.

The Priority Areas for ARD in South America and Caribbean include:

- Increasing production and productivity of agriculture;
- Addressing the challenges of climate change;
- Diversification and differentiation of agricultural products and services;
- Access to quality and safe food;
- Development of agro-energy;
- Conservation and sustainable management of natural resources;
- Promotion of institutional innovations.

The constraints and challenges to ARD in the region are:

- Filling the gap between current and potential yields;
- Little use of available technologies;
- Lack of an integrated approach to value chain;
- Outdated regulatory framework;
- Structural or political factors preventing innovation;
- Human resources without appropriate training;
- Poor availability of information (information asymmetry);
- Weakness in application of advanced biotechnology;
- The focus on agribusiness as opposed to family farming;
- The view that small-scale agriculture is part of the problem, not solution;
- No coordination among different institutions;
- Lack of recognition of multi-disciplinarity of agriculture.

**The needs of the region are:**

- Building on the successful experiences of cooperation in the LAC Region – PROCl, networks;
- Better integration between public and private sector;
- Promote mechanisms for development of shared and common vision among stakeholders, in innovation systems;
- Improving interaction between communities and NARIs;
- Partnership for exchanging information and experiences;
- Incorporation of the experiences of indigenous communities;
- Facilitate access to new markets, and lower risk for farmers;
- Incorporation of family agriculture to food strategies;
- Training of all actors in the chain;
- Strengthening of consumer organizations and participation;
- Promoting regional networks for collaboration.

The Potential contribution from Fast Growing Economies to ARD in the LAC region can be:

- To facilitate the interchange of successful experiences;
- To support small farmer's integration into agribusiness;
- To promote research and training on the application of modern management, technology and global experience for cooperative development;

- To support the induction of new machinery and techniques applied for small scale farmers;
- To improve interaction between communities and agricultural research related to climate change;
- To formalize partnerships and mechanisms between the LAC countries and the Fast Growing Economies for exchanging information;
- To increase the interaction between agricultural research institutes and agencies regulating markets and exports between LAC countries and of Fast Growing Economies; and
- To engage the direct linkage of business actors of LAC and Fast Growing Economies with producers.

### **The Central Asia and South Caucasus (CAC) Region**

This region is formed by the former Soviet Union countries in Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) and the South Caucasus (Armenia, Azerbaijan, and Georgia). The eight countries of the region attained independence after the breakdown of the former Soviet Union in 1991.

The region is endowed with a large geographical area of 419 million ha (mha) consisting of irrigated land, rangelands, mountains and deserts with a wide biodiversity.

The recent review process in CAC region has helped in identifying the priority needs for ARD in the region which can be grouped into five categories:

1. Institutional issues,
2. Research issues,
3. Policy issues,
4. Environment protection issues, and
5. Socioeconomic issues.

The most important messages that have come from the review process are as follows:

- Ensure greater investments in and support to agricultural research, education and extension;
- Restructure and strengthen agricultural research, education and extension systems (NARES) creating suitable structure and capacity building;
- Ensure the required collaboration, partnerships and linkages among different stakeholders of the AR4D at the national, regional and global levels, which are vital for the region;
- Ensure that the prioritized researchable issues are addressed by the NARS of the CAC countries; and
- Address socioeconomic issues especially gender/women-related issues considering their significant contribution to agriculture in all the countries of the region.

The CAC region is going through an economic transition. It has significant potential to contribute to global food production and ARD, however it remains geographically

isolated. It has significant barriers in integrating into global ARD which arise from several factors including language and the current geopolitics. The region needs a lot of assistance in strengthening agricultural research, education and extension for agricultural development from the international community including the CGIAR and GFAR.

## **Europe**

Europe as a geographical region is comprised of 42 countries presenting tremendous differences in all aspects: socio-political systems, agricultural policy, agricultural performance, research systems, levels of poverty etc. The region now made up of the developed West and the economically transiting East, is the major donor of development aid, including ARD, and has significant capacities, at individual country level, in agricultural research. It also has significant pockets of rural poverty especially in the East in which small holder farmers and producers can benefit from the application of new technologies in agriculture.

The perceived challenges in ARD by Europe are:

- Climate change – forecasting, alleviating, coping, mitigating;
- Growing pressure on environment - growing population;
- Energy security – food or energy dilemma;
- Increasing demand for food change in consumption and dietary patterns;
- Plant & animal diseases – pandemics;
- Globalisation – ensuring the poor are not disadvantaged.

Arguably, the most important outcome of the European consultations was agreement on the need to radically strengthen the processes which influence the way research is conducted – the so-called 'how' issues. These range from the need for far greater donor collaboration to the need to introduce new incentives to encourage researchers to generate products that are more readily accessible to users. Consistent key priorities emerging from the Europe Review, the e-consultation and the face-to-face meeting can be captured in six "keywords": Prioritization, Coordination, Continuity, Partnerships, Incentives, and Communication.

The European Union is striving for a Europe wide collaborative environment in agricultural research. It is also seeking combined, multilateral collaborative linkages with other regions and countries.

In Europe there are four major networks and coordination mechanisms for international agricultural research: SCAR, EIARD (donors), ERA-ARD (national programs), and AGRINATURA (research and education). The last three deal with developing and emerging countries, under the umbrella of the European Forum (EFARD), while SCAR (the Standing Committee on Agricultural Research) furthers the attainment of the EU Common Agricultural Policy.

There are several instruments around food security and environment for collaboration and funding in ARD globally, both at the level of the European Union (e.g. Food Security Thematic Programme, VIIth Framework Program), and at the level of individual countries (e.g. North-South-South programs, joint campuses, etc.).

## **Conclusions from the Session on Regional Needs and Contributions**

- Complexity and asymmetries in all regions and between regions are key common themes and they are a cause of perplexity and limiting collaborative action in ARD in all regions. However there are commonalities among the needs such as in institutional issues related to agricultural development and application of science and technology, managing research and innovation systems, capacity development and access to new information at various levels;
- Despite all limitations and difficulties, networks have contributed significantly to mobilize capacities, to harmonize activities and to map limitations, risks and opportunities and also share information within the regions;
- The challenge is how to take advantage of asymmetries to amplify access to capacities from countries and organizations that are better positioned within each region;
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- To access, describe and use success cases as references and examples of what can be done would be a very productive way to disseminate and to promote best practices and successful strategies leading to better and more effective collaborations within and between regions.

## **Regional and Global Institutions**

### **Food and Agricultural Organization (FAO)**

For the Food and Agricultural Organization (FAO) the role of agriculture is for reducing:

- Poverty,
- Hunger,
- Food insecurity, and
- Environmental degradation.

FAO is now focussed on targeting smallholders for development.

The FAO carries out:

- Impact studies (socio-economic),
- Multi-stakeholder intervention,
- Leveraging existing capacities in NARS, together with CGIAR and other providers, and
- Promotes South-South collaborations.

The FAO considers knowledge generation and dissemination as well as the need to increase investments important for global ARD. It believes that fast growing economies have a significant role to play in global ARD.

## **FAO/International Atomic Energy Agency (IAEA)**

The FAO/IAEA program (separate from FAO) assists member states through coordinated research projects, technical cooperation programs and laboratory support and training. Nearly 500 Institutions in member states around the world are involved and 500 individuals are trained every year. The organization has 50 projects for concrete impacts around productivity, incomes, and sustainable use of natural resources among others.

## **The Consultative Group on International Agricultural Research (CGIAR)**

The CGIAR accounts for about 5 per cent of the global investment in ARD. However it is an important major global agricultural research system with a focus on developing countries.

Its core activities are in:

- Germplasm,
- Catalyst,
- Policy support,
- Capacity development,
- Awareness and advocacy, and
- Research.

There is an ongoing change in the CGIAR with a renewed vision, mission and goals as well as a new structure.

## **Asian Development Bank**

The Asian Development Bank (ADB) supports agriculture and rural development largely through financing infrastructure, roads, irrigation, microfinance, and trade development activities.

The ADB now has both short and medium to long term food security plan. Agricultural research, science and technology are considered as part of the medium to long term plan. Activities in this plan for ARD would be to enhance for agriculture:

- Productivity,
- Connectivity, and
- Resilience.

## **Conclusions from the Session on Institutions Perspective**

The major International and Regional Institutions indicated their contributions and felt that there is a need for enabling greater collaboration and partnerships among the fast growing economies and also with economically developing countries for development impact globally. They could play an effective role in supporting ARD globally, regionally and at the country level, removing asymmetries, building capacities enabling sharing of information, knowledge, skills and technology and enabling partnerships and collaboration.

## **SPECIFIC ISSUES**

The Workshop discussed several issues related to participation of the fast growing economies in global ARD.

These included:

- Investment from Fast Growing Economies;
- Policy Needs at International, Regional and National levels for participation and investing;
- Capacity Development;
- Institutional Reform;
- Improving Sharing of Information, Knowledge, Skills and Technology;
- Market participation; and
- Common research Goals and Interventions.

### **Investment from Emerging Economies in ARD**

All the fast growing economies countries have different strategies for investment in ARD. They invest primarily in their own ARD systems but there are many spill offs that other countries have the potential to benefit from. However, this does not happen as there are very few structures that enable effective, efficient and rapid dissemination of these spill offs.

All fast growing economies have programs of collaboration and partnerships. They vary in intensity (one time or short (1-3 years), medium(3-5 years), long (more than 5 years), spread (in one or more than one area), size of investment (funds) and type of support (infrastructure and human capacity, joint programs etc.). Brazil, China and India each have several programs and have supported ARD in Africa and Asia. India largely supports its South Asian neighbours though has initiated an Africa wide program through NEPAD/African Union. China has several ARD related support and collaborative projects in Asia and Africa. Brazil has the Labex approach in Africa and Asia in addition to Europe.

There is yet no coordinated approach among the fast growing economies or the South to collaborate together in ARD other than through what is attempted through the regional forums and GFAR and through the CGIAR which is primarily a “hub and spoke” arrangement for international collaboration. Most collaboration is bilateral or in very few cases, multilateral such as in Asia through the Rice-Wheat Consortium or PAEPARD in Africa. Many regional organizations such as ASEAN, SAARC and the African Union have avenues and budgets for this collaboration.

Certain new groupings such as India-Brazil and South Africa trilateral initiative (<http://www.ibsa-trilateral.org/>) have emerged. This initiative has collaboration in agriculture but very little information in collaboration in ARD through IBSA was available.

Many of the fast growing countries NARS and Academies pursue similar agendas in agricultural research and innovations and tackle problems that are often common in development. There was a strong opinion that international organizations such as

GFAR, FAO and CGIAR have a role to play in promoting inter-NARS, inter-governmental and inter-scientific community interactions and collaborations.

Direct investment in international ARD such as the CGIAR has in recent years shown an upward trend. India now supports the CGIAR with USD 6 million. There is a potential for growth of investment in ARD by these countries if suitable institutions and structures emerge.

The regional forums and organizations, global and international organizations, scientific bodies and the diasporas such as of the Chinese, Indian, Korean and West African also play a significant role in collaboration between countries, especially developed and their own home countries in scientific community level collaboration and partnerships. However these collaborations and partnerships are ad-hoc in terms of formalization and structure. Hence learning on an institutional level is thwarted and usually not sustained from these collaborations.

There are several bottlenecks to increasing these investments and collaborations. First of all, most inter-governmental collaborations are initiated through the Foreign Ministries of respective governments. There is a strong geo-political and technical bias in initiating and supporting these initiatives. Second there are very few opportunities or initiatives by the NARS of the fast growing economies themselves. Most of their funds are focused and budgeted on national needs and need special consideration to initiate support to foreign NARS directly. While there are International Cooperation Departments in these NARS these usually follow up on inter-governmental collaboration. They also monitor and support these collaborations. The third is the lack of awareness and advocacy on the role international collaboration in ARD and the benefits that countries can have from such collaboration.

Advocacy for increased investment (financial and human) in collaboration and partnerships by the fast growing economies emerged as an important issue. There are many common issues where such collaboration would be beneficial not only between the fast growing economies and the South, but also between the fast growing economies and the developed countries, as well as collaborations jointly by the fast growing economies and developed countries for the South and for global development. This advocacy is limited by the lack of available data, information and contacts as well as success stories and case studies on these collaborations. Other countries and international organizations could learn about advocacy related to agriculture from some of these countries that have made agriculture a key area for economic development and have made agricultural research central to this development.

One suggestion that was made was that a levy on trade or agricultural commodities trade from developing countries and importing developed countries could be initiated in order to fund global ARD effort.

The role of international organizations such as GFAR and FAO in investing in collaboration partnerships between developing countries was discussed and considered an important area for these organizations to work upon.

## Capacity Development

Capacity Building is both a key area and pillar for effective ARD investments. Without indigenous capacities, collaboration and partnerships between governments and NARS are not generated. Collaboration and partnerships with foreign countries have contributed significantly to development of agricultural research and innovation in many countries including the fast growing economies. A good example is India where collaboration with the United States and the development of State Agricultural Universities using the Land Grant Model of State Universities did pave a way for the country's now strong agricultural research, education and extension base. India therefore provides, from its support to other countries, the most support (60-70 % of total investment) in capacity development especially in education and training.

There is a need for institutional (policies, strategies, structures, management processes etc) building along with capacity development. The experiences gained by the fast growing economies in developing human skills and infrastructure for ARD as well as in institution building in ARD needs to be shared through collaboration and partnerships.

The suggestions in collaboration in capacity development include:

- *Developing and building educational institutions such as agricultural universities and colleges;*
- *Enabling and supporting foreign students to study in the fast growing economies whose technologies and technology generating processes are more fitting to the needs of economically developing countries;*
- *Supporting training and providing training in economically developing countries;*
- *Joint and collaborative research, education and extension development programs;*
- *Grants of scholarships and fellowships;*
- *Promoting training and awareness building visits of scientists and science managers as well as farmers and the civil society.*

## Policy

An important point made by both China and India was that agricultural development occurred not only from increased investment in agricultural research but also and more importantly, because of investments in infrastructure, markets, agricultural support systems etc. These investments made the investment in agricultural research more worthwhile. A political will for improving agricultural development is also important. The fast growing economies were not in favour of supporting those countries where there was no overt interest in agricultural development.

The overall issue of the priority agricultural development holds for developing countries other than the fast developing economies was also raised. Apparently there was a perception that agriculture was not an economic or development priority for several countries and they had no agricultural development policies. It could also be that agriculture is a very sensitive political issue in many countries and therefore no publicly available policy was presented. The need for various policies in addition to

that on agriculture and agricultural development such as on trade, intellectual property rights for not only technologies but also data and information, telecommunications, education, public-private partnerships etc were also brought up. The need for internal national leadership for agriculture and its development and the application of science and technology was also discussed.

There were also discussion on how current Intellectual Property Rights regimes limit freer sharing and exchange of agricultural information, knowledge, skills and technology. An interesting point made was that new blocs of countries that view IPR regimes differently, such as of the BRICS countries, may be formed to manage IPR issues at the international level in a better way.

There is a deeply felt need for fast growing economies countries to share their policy and policy making processes experiences in ARD with other economically growing countries.

### **Improving Sharing and Exchange of Information Knowledge, Skills & Technology for Agricultural Development and Research**

Agriculture globally is increasingly becoming more knowledge intensive. The new reality is that, because of complex agribusiness chains, there are many more new actors and stakeholders to ARD than ever before. Today there are pluralistic sources of agriculture related information and pluralistic users of this information. Access to new information, knowledge, skills and technology in a rapidly globalizing world decides which agricultural system will remain competitive and with it which agricultural innovation will have impact on agriculture and its development.

The participants of the Workshop discussed several issues such as:

- What kind of processes, strategies, channels and flows must be in place to enable availability and access to applicable, affordable, useful and relevant agriculture related information, knowledge and skills especially through use of ICTs?
- How to enable effective and efficient use of new information and knowledge?
- What new tools and channels in addition to the existing ones are needed, especially for development impact?
- How to enable access and use of information in a world of complex institutional arrangements, such as of Intellectual Property Rights related to information sharing in ARD?
- How to move institutions out of the conventional practices or outdated strategies and adjust institutional practices to the new needs and strategies?
- Do we need new institutions to improve and govern information flows related to ARD?
- How to face new agricultural challenges such as climate change?

The discussions were initiated around who is the main target of ARD information. Is he/she the farmer? There was an opinion that the consumer today is an important coordinator of the agri-food and agro-industry and that the farmer should not be considered as the only or most important target for new agriculture related information. Further there is a huge diversity of sources of agriculture related

information: consumers, farmers, researchers, private sector, government and similarly users. It was also an opinion that different countries, stakeholders and users have different needs of information according to their realities and that there cannot be a simple or generic approach or solution to providing information. It is important to think of information needs in the context of specific countries, users and specific realities. For example for Vietnam increasing the knowledge of the farmers towards globally competitive agriculture was very important while this was not the case in Europe where farmers were more aware. It was also pointed out that users across the world may have similar information needs. For example coffee growers in Brazil may have the same needs related to innovation in coffee production. There was also a felt need that there must be now the ability to include groups that have a voice in the decision process such as the environmentalist civil society activists or “green” groups as in Europe. The current complexity indicated that there was a need for a new typology for agriculture related information. However, common in every complex situation was centrality of the decision making process and the need for information to make decisions more accurate and precise for each user.

The most important issue for governments, NARS and the scientific community was to consider the system that makes the decisions related to ARD. The need for multiple platforms to provide the needed information even at country and organization level was therefore recognized. The solution was to offer access universally to data and information objects as a global public good that could be processed and customized for individual users and made into a private good.

It was recognized that deep institutional changes at global, international, regional, national and community levels are needed to make relevant and useful data and information objects more freely available and accessible as globally available public goods. There was also a need for global collaboration and partnerships, beyond that in making data and information available, to enable effective use of publicly available data and information objects such as through public good applications and tools and investment in enabling learning. In a world that is rapidly moving into what is called “cloud computing” and the “semantic web” there is a huge potential to reduce the information divide that today divides countries, societies and communities through unequal access and capacity to effectively use information.

The fast growing economies also now have huge capacities in information management and experience in making effective use of information for ARD. These capacities and experience now need to be shared globally and more specifically with other developing countries as these experiences are more akin to their own situations and realities.

For the resource poor farmer the issue of affordability of information is also a key issue. There is an urgent need for extension systems reform. Documentation through case studies and success stories is very important way to learn about experiences in information sharing and exchange for the multiple stakeholders to ARD.

A suggestion was made to develop a core center for meta-analysis of world farming practices, institutional reform and sharing of experiences in information sharing and exchange. It was further suggested that GFAR may be an appropriate knowledge organization for such sharing of information.

The participants also considered the need for sharing and exchanging information such as for climate change and its impact on agriculture. It is an issue that is new and needs to be further looked into by the global community.

The issue of new capacities now needed for effective sharing, exchange and use of information was also discussed. It was concluded that developing this capacity could be a global collaborative activity with the fast growing economies playing a more central role in this global activity.

It was concluded that there is an emerging and urgent need for sharing of data, information, knowledge, skills and technology to meet emerging challenges to global agriculture. A focused approach, for example, around genomics, climate change or managing epidemics, where the developed countries have the analytical technologies and capacities and the economically developing countries have the data and information or the critical cohorts for these studies, can form the basis for new collaborations and partnerships. However, this would need deep changes in current institutional frameworks or even new institutions for sharing and exchanging information.

The role of GFAR, FAO/United Nations and CGIAR based on the discussions can be defined in this area as:

1. *Advocacy for collaborations* and partnerships in sharing data and information objects as a global public good, increasing investments in enabling data and information to be shared and exchanged and for institutional reform and new institutions that enable more equitable available, access and applicability of data and information;
2. *Providing Institutional frameworks*, including standards, rules and regulation for data and information objects available as a global public good;
3. Enabling the support needed for the capacity development needed to manage and use public good data and information for agricultural development and ARD globally;
4. *To advocate, promote and foster the fast growing economies central role in bridging the information divide* between economically developed and developing countries in improving the management of ARD related information.

### **Enabling Market Participation by Developing Countries: Common Research Goals and Intervention**

The issue of lack of or reduced investment in agricultural research as a “market failure” especially in some economically developing countries was mentioned and discussed. Public sector investment in agricultural research competes with other development investments such as in infrastructure, health and education. Thus lack of investment in agricultural research by governments can also be considered a “market failure” in the public sector development investment market. The ways to improve investment in agricultural research would be to create awareness and sensitization of the role investing in agricultural research for development has in agricultural development and overall economic development. The successes of the

fast growing economies, such as in China, India and Brazil, can also be in part attributed to the application of science and technology in agriculture and in investment and political support to research and development.

The following issues were also considered at the Workshop;

- Importance of marketing agricultural commodities in a globalized world;
- Level and types of markets;
- Constraints and Problems : Issues;
- Opportunities and potentials : Issues; and
- Common Research Goals and Interventions in enabling participation in markets.

The importance of marketing agricultural commodities in a globalized world needed no reiteration. The issues for consideration were more towards greater equity in market participation by economically developing countries with their trading partners including the economically developed world and the fast growing economies. Agricultural research and innovation are key contributors towards greater equity and effectiveness in market participation that can benefit millions of farmers and small producers the world over.

The following core issues related to equitable participation in markets where collaboration and partnerships between the fast growing economies and the economically developing countries to strengthen the sharing of information and knowledge can contribute significantly to trade and market participation in global trade by all countries were discussed:

- *Quality, Quantity, Access and Timeliness of Input supply.* Appropriate input forms the basis for efficient throughput and quality output in farming. Some of the key inputs in farming are seed and breeding material and there is a vast potential for sharing this bilaterally, multilaterally and globally. There was a felt need to share experiences in reducing input costs, credit and subsidies management and also in increasing efficiency of input use;
- *Reducing Harvest and post harvest losses, post harvest processing and eco-friendly and economically efficient marketing;*
- *Marketing infrastructure* This formed another area where information, knowledge, skills and technology as well as experience sharing and support from fast growing economies could contribute to economically developing countries. The experiences in developing infrastructure in rural areas and for marketing such as roads, communications, market information systems, market intelligence and market friendly policies for agricultural commodities are vital for development and need to be shared;
- *Government policies* for market support and intervention as well as micro and macro assessment of WTO arrangements, Trade Restrictions, Preferential and Quota Market Imperfections Market margins and market efficiency Information and regulations, assessment of the pros and cons of Free markets and competition on national agriculture and rural development;

- *Non-Tariff barriers, Quarantine Restrictions, Objective Pest Risk assessment and information.* It was felt that research and development in this area through collaboration and partnership would contribute significantly to reducing non-tariff trade barriers that restrict participation in global trade;
- *Niche Markets and certification, traceability and market segmentation; and*
- *Implications of Climate change and accounting for environmental cost of trade.*

## **THE WAY FORWARD**

The Workshop has revealed the vast potential of the role the fast growing economies have in contributing to development impact in economically developing countries and globally. It has also enumerated the needs of all actors in agricultural research for development and the areas where collaboration and partnerships can contribute to development in economically developing countries, regions and globally.

The essence of the discussions revealed that there is a lack of awareness and sensitization on the role of the fast growing economies and their ability to contribute to global development through collaboration and partnerships. The lack of awareness is at various levels, at the global and regional level among international organizations and bodies, at the national level among governments and NARS leaders, managers and policy makers and at the community level where new information and knowledge to participate in globally competitive markets and meet emerging challenges to agriculture is urgently needed.

There have been many initiatives at the global, international, regional, multilateral groupings and between countries for collaboration in science and technology among and with those countries that have large NARS and have fast growing economies which include agricultural research. However most have failed through recent efforts to demonstrate visibly development impact through these collaborations. It is important to know the reasons why.

The Workshop participants felt that this was primarily because collaboration and partnerships in agricultural research are driven largely by the rhetoric of development aid and not by shared interests and needs. The Earth as a planet viewed from space has no boundaries and no one can distinguish in day time which areas are developed and those that are not. Today crises such as of climate change and global epidemics bring to the fore that the world is ultimately one and so far lonely. All the solutions to its problems have to come from within. Inequity and unequal development threatens the world's peace and prosperity. Hunger and extreme poverty are a blot on the entire mankind. Global geo-political interests and needs such as of peace, prosperity, eradication of hunger and poverty should drive collaboration and partnerships among all countries, developed, fast growing as also economically undeveloped.

There are very few structures at the global, regional and multilateral level to promote and support the role fast growing economies can play in agricultural development through agricultural research and innovation. There is an urgent need to create these structures where fast growing economies can group themselves together and

develop appropriate policies and strategies to contribute through agricultural research for development globally. This is a global developmental necessity. .

The participants also pointed out that at the national level, decisions in collaboration and partnerships are made at the Foreign Ministry level with participation sometimes a shared interest of the Commerce Ministry and it is for the Agricultural Ministry or the NARS and the scientific establishments to follow up. It is very rare that the NARS have the freedom or the liberty to initiate partnerships and collaborations with foreign countries. Most collaborations initiated by the NARS are at the individual scientist or institute level and usually lack collective impact at the national level.

However, participants also felt that developing structures without the due processes for collaboration and partnerships for development impact will not be enough and goes back to the primary cause of development aid being driven largely by rhetoric and not needs. Participants wanted equal attention to processes in addition to the strengthening of existing and new structures.

It was agreed that there was a need for an initiative to create a group of countries that have fast growing economies and substantial investment, human capital and experiences in agricultural research such as Brazil, China and India so that they can participate together and jointly in global dialogues and decision making related to agricultural research for development. They felt that the first step should be taken by GFAR to invite this group of countries to be direct members of the forum in addition to participating through regional forums. where their roles They also have a role in strengthening the regional forums.. This should be followed by advocacy, awareness and sensitization of the important role that fast growing economies with large NARS have in global ARD and for the need to harness their contribution to development globally.

The participants from the fast growing economies with large NARS also felt that the focus of their collaboration and partnerships in agricultural research should not only be their financial or funding contributions to agricultural research especially to international research organizations. The focus should be primarily on sharing and exchanging information, experiences, knowledge, skills and technology globally.

The main areas where such partnerships and collaboration could substantially contribute were in:

- Advocacy, sensitization and awareness building on the contribution agricultural research has for agricultural development and overall economic, social, environmental and technological development in developing countries;
- Institutions and systems development for agricultural research and innovation, education and extension;
- Sharing and exchange of information on agricultural research and innovation processes including those of policy making, strategizing, infrastructure and capacity development and research management *per se*;
- Sharing data, information, knowledge, skills and technology related to agricultural development, research and innovation;

- Improving the architecture and governance of global agricultural research for development systems and the flow of information and technology globally; and
- Contribute to the development of global programs of collaboration and partnerships such as the new Mega-programs of the reformed CGIAR.

## **CONCLUSIONS**

Partnerships and collaboration in agricultural research for development are through various types of collaboration. These include through global approaches and systems to produce global public goods such as of the CGIAR. The Global Forum on Agricultural Research's (GFAR) Global Partnership Programs are also examples of international collaboration. There are also examples of regional organizations producing public goods useful at the global level such as the Rice Wheat Consortium for Indo-Gangetic Plains (RWC), the International Centre for Integrated Mountain Development (ICIMOD), the PROCISURs in South America and the Caribbean, etc. The various Regional Fora for Agricultural Research (AARINENA, APAARI, CACAARI, FARA, FORAGRO, EFARD) are also platforms that advocate, promote and support regional partnerships and collaboration. There have been several multilateral country arrangements for cooperation and collaboration in ARD such as between European and African stakeholders, such as the Platform for African and European Partnership in Agricultural Research for Development (PAEPARD) funded by the European Commission, through FARA and EFARD. Bilateral arrangements for cooperation and support in agricultural research exist between many countries, such as among the technologically advanced with the economically developing and within the economically developing countries. The Workshop participants agreed that there is now a new need for a group of countries which have fast growing economies and also large NARS to contribute directly in improving ARD globally.

Collaboration and partnerships in development, especially around agriculture, can be for various purposes such as for strengthening friendly ties, improving trade, sharing information, knowledge, skills and technology and contributing to national, regional and global security, especially of food and nutrition. Emerging concepts in collaboration and partnerships as revealed at this Workshop include geo-political needs and considerations such as climate change, managing trans-boundary disease epidemics and eradicating hunger and extreme poverty that threaten world peace and prosperity.

There has been a wide array of areas for collaboration, sharing and exchange and acting in partnerships. These include conserving and managing genetic resources, developing new plant and animal varieties, natural resources management especially land and water, managing diseases and pests, agronomy, agricultural processing, etc. New areas of collaboration and partnerships are emerging. These include genomics, climate change, biodiversity management ICT and information management applications, material sciences and space technology applications etc.

Collaboration and partnerships between countries and regional organizations are through several means. These include funding support, in kind support through equipment and infrastructure development, human capacity development including training and visits, action research that leads to development etc. This support is

either fully funded by one or some partners or partially funded jointly by all the partners. However this should not be the only guide to successful partnerships and collaboration. In today's world, sharing of information and knowledge globally are also vital contributions.

There have been many success stories of such collaborations. The "Green Revolution" in Asia is one example of what cooperation and support can achieve in ARD and agricultural development and progress. The Rice and other Genome projects are also recent examples of global and multilateral cooperation. However, bilateral cooperation and partnerships, especially between developing countries and with the participation of the BRICS countries, has not been publicly well documented and its impact has not been properly assessed. There are currently very few such success stories effectively documented for the world to learn from. This does not mean that there are no success stories. It only means that not enough has been done to create awareness of the successes that have happened.

A key message from the Workshop was that for a rapidly emerging, more knowledge intensive agriculture, a new knowledge revolution in agriculture and its development is needed. This translates into change / reform / restructuring / reengineering agricultural research and innovation systems for development. In an ever increasing inter-connected world, no one can meet their agricultural challenges alone and in isolation. Cooperation, collaboration and partnership among all is a must. The fast growing economies want to play a more active role in ARD globally. They want their contributions driven by shared interests and needs and not rhetoric. They want their contributions judged by the value they generate in sharing experiences, information, knowledge, skills and technology. They want change in systems, institutions, structures and processes of collaboration and partnerships so that their efforts have development impact.

Some of the suggestions for action from the participants were:

1. To make full use of global platforms such as of GFAR, and to enable Fast Growing Economies to play a greater role in global ARD\_ GFAR may invite the large NARS of fast growing economies for direct participation in its governance and activities;
2. The fast growing economies should be actively engaged in the development of databases, information systems and platforms initiated and/or organized by GFAR to improve information-sharing for the global and common good of ARD stakeholders and partners;
3. GFAR should provide the support and avenues for fast growing economies to enhance their role in regional ARD networks and cooperation;
4. Strengthen cooperation in areas of global common concerns, such as climate change, food safety, water resources utilization, trans-boundary disease, managing biodiversity, control of invasive species, agricultural products trade etc.;
5. Reinforce coordination, through appropriate programs such as on genomic studies, among the fast growing economies, especially in the field of agriculture research as well as in policy-making of agricultural science and technology; and

6. GFAR should set up a Task Force for providing information, including historical information, on the evolution and development of agricultural research, education and extension systems so that the information, experience, knowledge and skills acquired in fast growing economies in restructuring of ARD systems can be available to other NARS.

Annexure I:

Program of the International Workshop on the Fast Growing Economies Role in Global Agricultural Research for Development

Annexure II

Background Note

Annexure III

Presentation by Dr. Adel El-Beltagy, Chair GFAR

Annexure IV:

Presentations made by Fast Growing Economies Countries

China  
Brazil  
Egypt  
India  
Vietnam  
France

Annexure V:

Presentations made by the Regions

Africa  
West Asia  
Central Asia and South Caucuses  
Asia-Pacific  
Europe  
South America and the Caribbean

Annexure VI:

Presentations made by Institutions

FAO  
IAEA  
CGIAR  
ADB

Annexure VII

Presentations made by Working Groups on Specific Issues

Annexure VIII:

Presentations made by Working Groups on the Way Forward

Annexure IX

List of Participants





