Technical Conference on Agricultural Biotechnologies in Developing Countries: Options and opportunities in crops, forestry, livestock, fisheries and agro-industry to face the challenges of food insecurity and climate change
- ABDC-10

Asia Pacific Parallel Session

Harnessing Biotechnology for Food Security in the Asia-Pacific Region

3 March 2010, 14:00-15:45

Facilitator: Sudhir K. Sopory, ICGEB
Panelist: Jawahir L. Karihaloo, APAARI
Panelist: Chanda Nimbkar, India (on behalf of Oswin Perera, Sri Lanka and Chanda Nimbkar)
All others: Participants
Rapporteur: Tashi Samdup, Bhutan

Asia-Pacific Region Specific Session

AGENDA

14.30 Welcome & introduction

14.40 Panel talk show

15.20 Discussion with audience

16.10 Closing

16.15 Coffee

ROLES

Sudhir Sopory, ICGEB: Facilitator
APAARI: Host
Jawahir Karihaloo, APAARI: Panelist 1
Chanda Nimbkar, India (on behalf of Oswin Perera, Sri Lanka and Chanda Nimbkar) : Panelist 2
Tashi Samdup, Bhutan: Rapporteur
All others: Participants

EXPECTED OUTCOMES

- To better understand the issue, identify gaps and needs...
- To identify options for the future...
- To have content for summary for next days plenary

RULES

- Participate and share experiences
- Keep focus on key issues
- No one dominates
- Respect the time

Crop Biotechnology

Jawahir L. Karihaloo

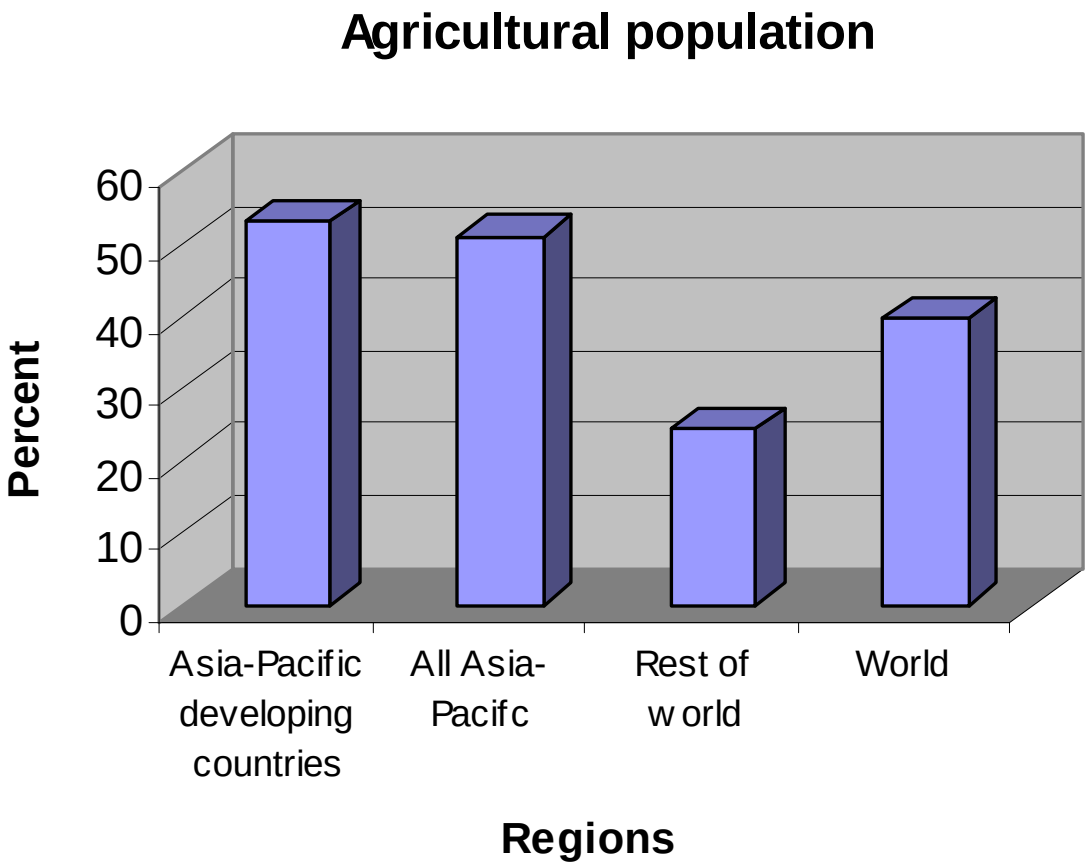
Asia-Pacific Association of Agricultural Institutions (APAARI)

Diversity of Asia-Pacific region

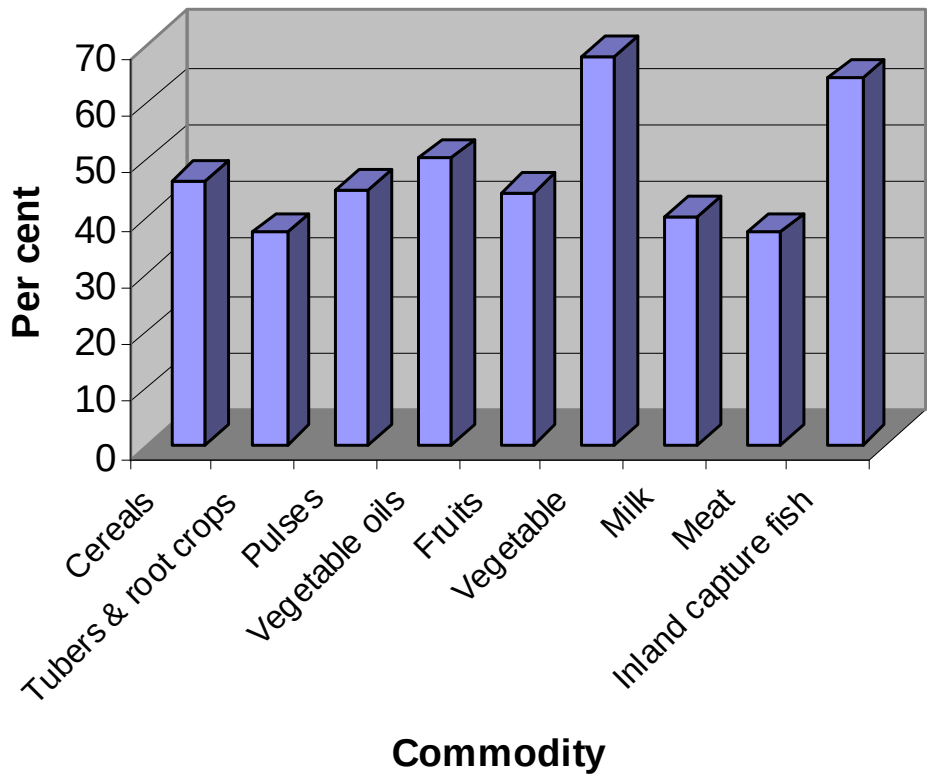
- 38 developing countries
  - Southeast Asia
  - South and Southwest Asia
  - Central Asia
  - East Asia
  - Pacific Islands

Diverse economies and experiences in adoption of biotechnology in agriculture

Agriculture is important to A-P region



AP region contributes substantially to world agricultural production



Adoption of biotechnology: Status

- 17 countries have one or more ministries responsible for biotechnology research in agriculture
- 11 have ongoing programs on application of biotechnology in agriculture.
- Twenty-one countries are party to or have ratified the Cartagena Protocol on Biosafety of the CBD.
- More than 50 crops and forestry trees are being targeted for genetic modification for diverse traits, most prominent among which are resistance to diseases and pests, and abiotic stress tolerance

Some successes - Micropropagation

- Farmers in Vietnam have been growing potato from tissue culture plantlets due to which potato yields are estimated to have doubled from 10 to 20 tonnes per hectare.
- In China, development of disease-free mother plants of sweet potato led to at least 30 percent yield increase.
- In India, integration of micropropagation, disease detection and elimination, and conventional propagation in potato and sugarcane has led to substantial improvements in seedling quality and health and economic returns

Some successes - GM

- GM crops are under commercial cultivation in China, India and the Philippines.
- In addition, China, Korea, the Philippines and Thailand have approved some GM crops for food and livestock feed.
- In India the area under Bt cotton reached 7.6 million hectares in 2008-09, which constitutes nearly 81% of the total cotton area of the country.
- The Indian cotton production reached 4.9 million tonnes in 2008-09, from 2.3 million tonnes in 2002-03 when the first Bt hybrids were introduced.

Some successes - MAS

- Marker aided selection has been used to develop a downy mildew resistant pearl millet hybrid ‘HHB 67-Improved’.
- Bacterial blight resistant varieties of rice have been developed in China and India.
- In the Philippines, rice variety IR64-Sub1 developed through marker aided selection from the popular IR64 has tolerance to submergence.

Some successes – Other crop improvement technologies

- 1,336 food crop varieties having been developed through mutation in Asia.
- In Vietnam, three new mutant rice varieties having tolerance to salinity and good food quality have been released to farmers due to which farmers' incomes have increased by US $350 million per year.
- Doubled haploid and interspecific hybrid rice varieties are being grown in China and Vietnam

Some successes – Genetic resources conservation

- Biotechnological tools are being used for conservation, characterization, evaluation and enhancement of crop and forestry genetic resources.
- Genebanks and other institutions in China, India, Indonesia, Malaysia, Pakistan and the Philippines apply *in vitro* and cryopreservation techniques for *ex situ* conservation of vegetatively propagated and recalcitrant species.
- In China, *two in vitro* banks have 1,787 collections while in India, seven *in vitro* and cryopreservation facilities hold 7,922 and 1,904 accessions, respectively.

Despite past successes challenges remain

- Two-thirds of the world's undernourished live in Asia-Pacific region
- A number of countries at "serious" or "alarming" severity levels on 2009 Global Hunger Index
- Likely loss in agricultural productivity due to climate change 15 to 50% by 2080

Harnessing biotechnology for food security

- Identify issues
- SWOT analysis
- Identify and prioritize options

Issues

- Policy support
- Investments
- Capacity – technology, technology adaptation and adoption, regulatory & IP issues, communication
- Public awareness and participation in decision making
- Regulatory management

Strengths

- Policy commitment in several countries to application of biotechnology for agricultural development
- Large national agricultural research systems in a number of countries with proven impacts
- Good funding support to agriculture R&D in a few countries
- Good local capacities in some countries
- Commitment to CBD and CPB of most countries indicating harmony in the region to biosafety regulatory approaches
- Biosafety regulatory systems established and functional in a number of countries
- Active participation of international research centres in addressing local R&D issues
- Existence and participation of regional fora and networks in building partnerships, capacities and policy advocacy
- Vibrant CSO and farmer organization communities in some countries
- Emerging public-private partnerships

Weakness

- No specific policy on biotechnology for agriculture in several countries
- Declining per captia investment in agricultural R&D in several countries
- Limited local capacity in R&D, technology transfer, IP and regulatory issues
- Biosafety regulatory systems still to be established and become functional
- Inconsistency in regulatory decision making
- Weak linkages between technology developers and adopters
- Limited local private sector participation in basic technology development
- Limited public private participation
- Lack of public awareness and communication efforts to enable informed public participation in decision making

Opportunities

- Existing biotechnology tools provide vast opportunities to address food security issues. Several of these are simple, cost effective and easily adaptable by farmers
- The skills of already existing large scientific and technical human-power base can be enhanced in a relatively short time
- Asia-Pacific region is a vast reservoir of genetic resources which can be efficiently conserved, managed and utilized to address food security issues.
- International and regional opportunities exist to build capacities, seek policy guidance and collaborate

Threats

- Non adoption of biotechnology may:
  - aggravate short and long term food security problems
  - Delay adaptation to climate change
  - Increase dependence on imports for meeting food needs
  - Restrict conservation and utilization of genetic resources

Strengthening biotechnology for food security - Options

- Extend policy support by recognizing biotechnology as an integral component of strategy to meet the challenges of food insecurity and climate change
- Increase funding support to R&D in biotechnology commensurate with the needs to establish required institutions and build diverse range of capacities. Besides national governments, international agencies that are involved in agricultural development and poverty alleviation should extend need-based funding support.
- Adopt need-based biotechnology tools and techniques as components of integrated strategies and package of practices to develop improved crop and animal strains and providing benefit to resource poor farmers
- Develop IP and benefit sharing policies that balance the needs to facilitate transfer of technologies to users while providing fair share of benefit to technology developers

Regulatory management

- Adopt biosafety regulatory systems with robust, science based and transparent approval processes
- Build confidence in GM technology which will facilitate a transparent and acceptable regulatory system
- Facilitate transboundary movement of biotechnology products through bilateral and regional arrangements including agreed biosafety information requirements and data acceptance
- Simplify regulatory norms for GM crops and traits of known environment and human safety

Creating awareness by improving communication

- Train young scientists as communicators, not just in the field of biotechnology but also on issues of agriculture, food security and environment safety.
- Arrange discussions between scientist, CSOs, farmer organizations and consumer groups to foster understanding and cooperation between all stakeholders.
- Develop farmer-scientist linkages and cooperation through conducting field visits, seminars etc.
- Set up scientific academia and communication units at the national level to assist in awareness creation.

Creating awareness through education

- Include biotechnology in school syllabi providing factual information about its usefulness and safety aspects.
- Develop educational tools including websites on GM technology, safety of GM crops, IP and regulatory systems.

Strengthen linkages

- ***Regional linkages***

  In view of the proven strengths in some NARS of the region, there is a need to create strong regional linkages to benefit from their expertise and experiences. International centre located in the region have a similar role in facilitating adoption biotechnology in the region.

- ***Interregional and South-South linkages***

  The existing fora such as APAARI, FARA, AARINENA and other networks already functional within these platforms can play a major role in facilitating South-South interaction.

Strengthening linkages

North-South linkages

Countries of the South have abundant genetic resources while the tools and technologies are available in North. North-South linkages for germplasm, technology, products and information exchange will be of mutual benefit and help the developing countries to accelerate the pace of biotechnology adoption.

Public-Private linkages

The strengths of public and private sectors are mutually complementary. There is a need for the two to work together with mutual trust and commitment to create a dynamic and result oriented working environment.

Capacity building

- Need to strengthen capacity in developing countries especially in the area of advanced biotechnology tools, technology transfer, scientific risk assessment and management, ownership and intellectual property issues, public communication.
- Collaborate in regional and interregional capacity building through support of NARS, CG centres, other international institutions and regional fora like APAARI, FARA and AARINENA.