Overview of Biotechnology and Biosafety in the Asia-Pacific and the Facilitation Role of APAARI

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Diversity of Asia-Pacific region

- 38 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

Agricultural population

- Percent
- Asia-Pacific developing countries
- All Asia-Pacific
- Rest of world
- World

AP region contributes substantially to world agricultural production

Commodity

Undernourished people

Challenges

- Productivity deficit
- Farmer Income
- Resilience, Sustainability
Biosafety: Status

- Twenty-one countries are party of or have ratified the Cartagena Protocol on Biosafety of the CBD.
- Biosafety Regulatory Systems in place: Australia, China, Indonesia, India, Japan, Korea, New Zealand, Iran, India, Malaysia, Myanmar, Philippines, Vietnam.

GM crops - some successes

- GM crops are under commercial cultivation in China, India, Pakistan, Philippines and Myanmar.
- China, Japan, Korea, the Philippines and Thailand and Chinese Taipei have approved GM crops for food and livestock feed.
- In India the area under Bt cotton reached 10.8 million hectares in 2012, which constitutes nearly 90% of the total cotton area of the country.
- In Pakistan, Bt cotton covers 2.8 million ha.
- In Philippines, GM corn covers 49% of 1.2 million ha potential yellow corn area.

Top world cotton producers

### GM crops approved and under cultivation (2012)

<table>
<thead>
<tr>
<th>Country</th>
<th>for food</th>
<th>for cultivation</th>
<th>Under cultivation</th>
<th>Area (Mha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>6</td>
<td>4</td>
<td>cotton, canola</td>
<td>0.7</td>
</tr>
<tr>
<td>China</td>
<td>7</td>
<td>8</td>
<td>cotton, papaya, tomato, sweet pepper</td>
<td>4.0</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>1</td>
<td>cotton, maize</td>
<td>10.8</td>
</tr>
<tr>
<td>Japan</td>
<td>9</td>
<td>8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Korea</td>
<td>6</td>
<td>3</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1</td>
<td>1</td>
<td>cotton</td>
<td>0.3</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1</td>
<td>1</td>
<td>cotton</td>
<td>2.6</td>
</tr>
<tr>
<td>Philippines</td>
<td>7</td>
<td>2</td>
<td>maize, cotton</td>
<td>0.8</td>
</tr>
<tr>
<td>Chinese Taipei</td>
<td>2</td>
<td>0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Thailand</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Soybean and corn sources in Japan

<table>
<thead>
<tr>
<th>Crop</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>0%</td>
</tr>
<tr>
<td>Corn</td>
<td>100%</td>
</tr>
<tr>
<td>Domestic</td>
<td>0%</td>
</tr>
</tbody>
</table>

Protests against GM crops

Constraints to adoption of GM technologies

- Policy environment not very conducive in many countries
- Limited capacity (technology, technology adaptation and adoption, regulatory & IP issues, communication) especially in small Island nations
- Limited and unsustained funding for biotechnology R&D
- Public awareness and IP issues
- Regulatory approval delays and costs

Biotechnology policy initiatives

High Level Policy Dialogue on Biotechnology for Food Security and Poverty Alleviation, Nov. 2005

Recommendations

Considering the important role of biotechnology in meeting the Millennium Development Goals, both conventional and GM biotechnological approaches need to be promoted in the developing countries of Asia-Pacific region....

Eleven recommendations on 3 expected outcomes:
1. Identification of major priorities in biotechnology
2. Recommended role of different stakeholders
3. Mechanisms of enhanced stakeholder cooperation

Expert Consultation on Agricultural Biotechnology for Promoting Food Security in Developing Countries Malaysia, 20-22 August 2008
Recommendations

**Enabling policy environment:**
- Extend and enhance policy and funding support to biotechnology R&D
- Adopt need-based biotechnology tools and techniques, and integrated strategies and package of practices to improve small farm-level productivity and profitability
- Adopt IP and benefit sharing policies appropriate to the need to protect farmers’ and consumers’ interests

**Human Resources Development:**
- Strengthen, with support from FAO and other donor agencies, some existing national institutions to serve as Regional Hubs for sustained capacity building
- Collaborate in regional and interregional capacity building through support of NARS, CG centres, other international institutions and regional fora
Recommendations

**Improve Regulatory Management:**
- Adopt biosafety regulatory systems based on robust science and transparent approval processes
- Facilitate transboundary movement of biotechnology products through bilateral and regional arrangements including agreed biosafety information requirements and data acceptance

**Enhance awareness through education and communication:**
- Develop educational tools, status reports and web-based information systems
- Include biotechnology and agriculture oriented courses in school syllabi
- Train scientists not just in the field of biotechnology but also on issues of agriculture and food security, environment safety and in communication skills
- Organize dialogues between scientists, CSOs, farmers organisations and consumer groups

**Strengthening linkages:**
- Regional linkages within the Asia-Pacific region; south – south linkages; north – south linkages; public – private linkages; public – public linkages
- Draw on existing regional fora like APAARI, AARINENA, FARA and networks to develop linkages
- Conduct workshops to define available resources and needs, followed by mutually agreed work-plans

**Compilation on Biosafety Regulations of Asia-Pacific Countries**
- Biosafety and related acts, rules, regulations and guidelines of 39 countries.
- Key features of the regulations.
- Status of national legislative preparedness with respect to Cartagena Protocol on Biosafety.
- Additional chapters on status of biotechnology, biosafety issues and international instruments on biosafety.

**Workshop on Biosafety Regulations in the Asia-Pacific Region**
- Workshop on Biosafety Regulations for Transgenic Crops and the need for harmonising them in the Asia-Pacific Region,
- Date and Venue
- Highlights and Recommendations
- Workshop
- Compilation of Biosafety Regulations of Asia-Pacific countries
  - Biosafety Regulations of Asia-Pacific countries
  - Thailand Biosafety Guidelines (1992)
- The Guidelines encompass all work related to gene manipulation employing DNA-negative for purposes including the development of transgenic plants, animals and microorganisms, production of vaccines, commercial and industrial manufacturing of eDNA derived products, and release of transgenic materials and products into the environment.
  - The Guidelines consist of two parts: the first one concerns transgenic work in laboratories and the second on field testing. Both parts have common Guidelines as follows:
  - The classification of work relating to GMOs according to level of risk and safety.
  - There are three categories: work having no risk, work having low risk, and work with high risk.
  - The basis of the risk, risk management and controls are made in these levels.
  - Three groups of personnel and organizations have been identified for institutional arrangement in monitoring and control of risk. The Guidelines also give details on roles and responsibilities of these persons and committees.
Biosafety Regulations of Asia-Pacific countries

Source:

Performance and Economic Impact of GM Crops in the AP

ASIA-PACIFIC CONSORTIUM ON AGRICULTURAL BIOTECHNOLOGY (APCoAB)

COMMERCIALIZATION OF Bt CORN IN THE PHILIPPINES

A STATUS REPORT

Bt Cotton in India (2009) 2nd edition

I. Introduction

II. Biosafety Regulatory System

Biosafety of Bt cotton National regulatory system National Biotechnology Regulatory Authority (NBRA)

III. Development and Commercialization of Bt Cotton

IV. Performance and Impact of Bt Cotton

V. Concerns and the Way Ahead

Genetic background
Genetic diversity
True breeding varieties
Resistance development
Secondary pests and diseases
Illegal Bt cotton
Seed marketing
Other issues

VI. Epilogue

VII. Bibliography

Appendix I

Appendix II

Bt corn in the Philippines

News and Events Mailer

Asia-Pacific Consortium on Agricultural Biotechnology

Publications on APCoAB website

Expert Consultation on Agricultural Biotechnology, Bioware and Biosecurity - Abstracts

The publication provides a forum for consultation meetings held at APCoAB in collaboration with the Asia-Pacific Commission on Agricultural Biotechnology (APCoAB) in Manila, Philippines. It includes reports of the consultation meeting held in 2005-2006. The topics covered in the consultation meetings include biotechnology for food and nutrition security, biotechnology for environmental sustainability, and biotechnology for disease control.

Expert Consultation Meeting on Postharvest and Value Addition of Horticultural Produce

The consultation meeting focuses on the postharvest and value addition of horticultural produce. It includes discussions on the challenges and opportunities of postharvest and value addition, the role of science and technology in improving postharvest and value addition, and the impact of postharvest and value addition on the horticultural sector.

Makerspace Interface for GMO Food Crops

The consultation meeting focuses on the development of makerspace interfaces for genetically modified food crops. It includes discussions on the design and development of makerspace interfaces for GMO food crops, the role of makerspaces in promoting the adoption and use of GMO food crops, and the impact of makerspace interfaces on the horticultural sector.
In conclusion – Objectives of the meeting

- Sharing of recent knowledge on scientific advances in biotechnology, biosafety and related information management
- Status of biotechnology and biosafety adoption at national level
- Identify biotechnology priorities especially aimed at small farmers
- Enhancing communication for public awareness
- Regional cooperation for biosafety management

Thank you for your attention