Plant genetic resources education in Malaysia: Ways forward

Report from a one-day consultation

1 July, 2011

Serdang, Malaysia

Edited by Per Rudebjer
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Summary

National and regional collaboration and networking have proved useful for advancing higher education on plant genetic resources (PGR) in the Asia, Pacific and Oceania (APO) region. Supported by Bioversity International, universities in India, Malaysia, Nepal, Philippines and Sri Lanka have since the late 1990s collaborated on developing MSc programmes on PGR and enhancing their quality and relevance. Building on this dialogue, a regional workshop on PGR and agrobiodiversity education was held at University of Tsukuba, Japan in November 2009. Universities and research institutes from six countries in the region were represented: Fiji, Japan, the Republic of Korea, Malaysia, Philippines and Thailand.

The resulting **Tsukuba Action Plan** covered five areas: course enhancement, degree enhancement, short courses, networking, and awareness. The Action Plan identified issues and concerns, suggested actions and priorities, and indicated responsibilities for implementation.

Eighteen months on, Bioversity International and Malaysian universities organized a one-day workshop on 1 July 2011 in Serdang, Malaysia to review Malaysia’s progress in implementing the Tsukuba Action Plan. The meeting, entitled ‘**Plant genetic resources education in Malaysia: Ways forward**’, brought together representatives of five universities from Peninsular Malaysia, including MSc students. Staff from Bioversity International’s Headquarters and APO Regional Office also attended, as did Crops For the Future (CFF), and the Platform for Agrobiodiversity Research (PAR). The specific objectives were to:

- Review PGR and agrobiodiversity education activities in Malaysia since the regional workshop in Tsukuba in 2009.
- Develop action plan and recommendations for the further integration of PGR and agrobiodiversity in higher education in Malaysia
- Foster national and regional networking in support of PGR and agrobiodiversity education.

The participants noted that enhancing agrobiodiversity education is well aligned with **recent regional initiatives**:

- The Suwon Agrobiodiversity Framework was adopted during the International Symposium on ‘Sustainable Agricultural Development and Use of Agrobiodiversity in the Asia-Pacific Region’ in the Republic of Korea on 13-15 October, 2010. The framework observes that ‘Capacity development is needed at individual, systemic and institutional levels’, and that ‘Continuing education in the national systems is important, due to promotion or transfer of well-trained staff’.

- The Crops For the Future (CFF) is an international organization responsible for the promotion of neglected and underutilized plant species (NUS), hosted by Bioversity International, Malaysia. CFF is committed to enhancing public awareness and facilitate access to information, policy advocacy and capacity
building on NUS. It collaborates with the Crops for the Future Research Centre (CFFRC), a new venture between the Government of Malaysia and the University of Nottingham Malaysia Campus.

Bioversity International reported that several new learning materials of relevance to PGR and agrobiodiversity education in the APO region have recently been published, all available online, including:

- Crop genebank knowledge base
- E-learning course on pre-breeding for effective use of plant genetic resource
- Forest genetic resources training guide
- Learning module on the International Treaty on Plant Genetic Resources for Food and Agriculture
- Training manual on spatial analysis of plant diversity and distribution.

Each participating university then gave an update on their recent activities in PGR and agrobiodiversity education. The Tsukuba Action Plan has certainly had an impact in Malaysia. Universities have revised many courses, and introduced some new ones guided by the Action Plan. While this positive trend was duly noted, issues regarding both content and delivery continue to demand attention to ensure quality and relevance of education. During the plenary discussion a number of observations, suggestions and recommendations were made:

- Competencies and relevance: Programmes need to better respond to needs in the job market, including in the private sector. Hands-on experiences need to be strengthened in many programmes and more innovative learning methods are called for. Feedback from students and alumni is important for enhancing quality of education.
- Curriculum development: Although PGR and agrobiodiversity elements are incorporated in many programmes, there are gaps. A suggestion was made to introduce courses on neglected and underutilized species (NUS) at all universities. Bioversity was requested to bring all national stakeholders together in a forum to enhance networking and discuss content and delivery.
- Institutional aspects: There is a proliferation of faculties and programmes related to agriculture at various universities in Malaysia, which presents both opportunities and challenges. Coordination and synergies among universities can be enhanced and information sharing improved. Scholarships need to be made available.

Southeast Asia has several regional networks or relevance to PGR and agrobiodiversity education. Malaysian universities are encouraged to seize opportunities provided by e.g. the Southeast Asian Regional Centre for Graduate Study and Research in Agriculture (SEARCA). At the national level, universities could benefit from participation in the National Information Sharing Mechanism (NISM) of the Global Plan of Action on PGR, coordinated by the Malaysian Agricultural Research and Development Institute (MARDI).

The Platform for Agrobiodiversity Research (PAR) is a useful resource for Malaysian universities. Among its activities, PAR supports the development of a global
agrobiodiversity knowledge base, and identifies and facilitates relevant new and innovative research partnerships on agrobiodiversity.

Finally, the workshop participants reviewed Malaysia’s progress in implementing the Tsukuba Action plan since 2009. Good progress was noted regarding integrating PGR content into relevant courses. Some universities (UKM and IIUM) are in the process of broadening the scope of PGR programmes. Some programmes have introduced more flexibility that allows more time for research. Other needs remain: More Master’s scholarship opportunities should be created. Society’s needs for PGR expertise could be better understood. Short courses on PGR and agrobiodiversity for policy makers and young professionals need to be organized.

A number of further actions were recommended including (Table 2 - 6):

- Continue to integrate PGR content in relevant courses. Universities should identify priority topics. Training manuals should be developed to support the process.
- Setting up regional programmes that bring foreign students to Malaysia (i.e. from Myanmar and Laos)
- Determine the needs for PGR expertise through a survey in Malaysia. A small working group lead by UKM and Bioversity was requested to develop a questionnaire
- Each university to organize a short course during 2011-2012.
- MARDI’s seminar series could be an avenue for awareness-raising
- Continue to take advantage of opportunities for networking. The mailing list should be expanded to more universities, and should also include students
- A network website should be created, preferably linked to an existing website such as Regional Co-operation in Southeast Asia for Plant Genetic Resources (RECSEA-PGR).
Introduction

The plant genetic resources (PGR) upon which humankind depends for its agriculture and food systems are shared across countries and regions. Seeds and germplasm have travelled far and wide, creating a rich diversity in domesticated plants that is the backbone for agriculture today and in the future. It is therefore appropriate that higher education on PGR and, more broadly, agrobiodiversity takes a regional view. Universities in the Asia-Pacific region are doing exactly that. Agricultural universities in Malaysia, Philippines and India, among others, have collaborated since the late 1990s on developing and improving Master’s programmes on PGR. The effort is supported by Bioversity International’s Asia-Pacific and Oceania (APO) regional office. These programmes are developing critical human capacity in plant breeding and genebank management and, more broadly, conservation and use of agrobiodiversity.

A meeting of university representatives was held at University of Tsukuba, Japan in November 2009 to review the current status of PGR and agrobiodiversity education in the APO region and suggest actions that would strengthen such education. The resulting Tsukuba Action Plan covered five areas: course enhancement, degree enhancement, short courses, networking, and awareness. The Action Plan identified issues and concerns, suggested actions and priorities, and indicated responsibilities for implementation.

Eighteen months on, Bioversity International and Malaysian universities organized a one-day workshop on the same topic, on 1 July 2011 in Serdang, Malaysia. The aim was to review Malaysia’s progress in implementing the Tsukuba Action Plan. The meeting, entitled ‘Plant genetic resources education in Malaysia: Ways forward’, brought together representatives from five universities from Peninsular Malaysia. Participants also included three MSc students, staff from Bioversity International Headquarters and APO Regional Office and from the Platform for Agrobiodiversity Research (PAR).

This brief report summarizes the proceedings of the workshop, presents Malaysia’s progress in implementing the Tsukuba Action Plan and informs on further needs for strengthening PGR and agrobiodiversity education in the country.
Objectives and workshop programme

The general objective of the 1-day workshop, ‘Plant genetic resources education in Malaysia: Ways forward’, was to contribute to enhancing the quality and relevance of plant genetic resources and agrobiodiversity education in Malaysia. The specific objectives were to:

- Review PGR and agrobiodiversity education activities in Malaysia since the regional workshop in Tsukuba in 2009.
- Develop action plan and recommendations for the further integration of PGR and agrobiodiversity in higher education in Malaysia.
- Foster national and regional networking in support of PGR and agrobiodiversity education.

Table 1. Programme of the one-day workshop on 1 July 2011

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Resource person/Moderator</th>
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<tbody>
<tr>
<td>8.30-8.40</td>
<td>Opening Speech</td>
<td>Dr. Leocadio Sebastian Bioversity International</td>
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<tr>
<td>8.40-9.00</td>
<td>Introduction of participants and review of expectations</td>
<td>Mr. Per Rudebjer Bioversity International</td>
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<tr>
<td>9.00-9.30</td>
<td>Overview and agreement on the objective and programme</td>
<td>Mr. Per Rudebjer</td>
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<tr>
<td>9.30-10.00</td>
<td>Tea Break</td>
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<tr>
<td>10.00-12.00</td>
<td>Update on agrobiodiversity education activities in Malaysia since the Tsukuba meeting</td>
<td>Round Table Discussion</td>
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<tr>
<td>12.00-14.30</td>
<td>Lunch/Friday prayers</td>
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<tr>
<td>14.30-15.00</td>
<td>The role of national and regional networking in strengthening PGR and agrobiodiversity education</td>
<td>Dr. Paul Quek Bioversity International</td>
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<td>15.00-15.30</td>
<td>Platform for Agrobiodiversity Research</td>
<td>Mr. Paul Bordoni Platform for Agrobiodiversity Research</td>
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<tr>
<td>15.30-15.45</td>
<td>Tea Break</td>
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<tr>
<td>15.45-16.45</td>
<td>Review progress in Malaysia regarding action plan to integrate PGR and agrobiodiversity into higher education</td>
<td>Mr. Per Rudebjer</td>
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<td>16.45-16.15</td>
<td>Recommendations</td>
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<td>17.15-17.30</td>
<td>Closing</td>
<td>Dr. Leocadio Sebastian</td>
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Background and update on recent agrobiodiversity initiatives

Regional workshop on reviewing PGR education in East and Southeast Asia, Tsukuba 2009

Plant genetic resources (PGR) education is crucial for the conservation of agricultural biodiversity and for breeding improved varieties that increase agricultural production and improve the quality of our food basket. By equipping graduates with adequate theoretical knowledge and practical skills, PGR education help countries respond to challenges such as food and nutritional security for growing populations, threats of climate change, and sustainability of agroecosystems.

Bioversity International and University of Tsukuba, Japan invited scientists, PGR experts, and university professors in East and Southeast Asia and Oceania to a regional workshop on 17 -19 November 2009 at the University of Tsukuba. A key question was how to revitalize PGR education in the region, and make it relevant to society’s needs. The workshop observed, among others, that PGR programmes and courses in the Asia, Pacific and Oceania (APO) region attract only a limited and declining numbers of graduate students. Two factors behind this trend stand out: a perception among students of limited career opportunities for PGR graduates, and a reduction in scholarships available for such studies. The resulting paucity of capacity may potentially constrain the region’s plant breeding programmes. There is a need to make undergraduate students better aware of the MSc PGR programmes and informing potential employers of the benefits of hiring graduates of such programmes.

Universities also reported other constraints, including high costs of maintaining laboratories, lack of continuity of programmes due to low enrolment, an orientation of the PGR programmes towards the public sector, and a failure to capture opportunities in the private sector. The latter is linked to the PGR programmes’ current focus on conservation and diversity assessment, which may not be priorities of the private sector.

To keep the programmes and courses running in spite of a low demand, universities find it crucial to collaborate and share resources. One successful strategy is teaching PGR courses within other existing programmes. For example, Universiti Kebangsaan Malaysia has attracted students from other graduate programmes, who elect PGR courses as part of their degrees. More such innovative approaches to PGR education are called for.

The Tsukuba workshop developed an Action Plan on enhancing PGR education in East and Southeast Asia and Oceania, which covered five areas of intervention: Course enhancement, Degree enhancement, Short courses, Networking, and Awareness. Implementing these recommendations is largely a matter for concerned universities, with support from Bioversity International (Rudebjer et al 2010).

The Suwon Agrobiodiversity Framework

The raising profile of agrobiodiversity in the Asia-Pacific region was clearly demonstrated at an international meeting in the Republic of Korea on 13-15 October, 2010, on
‘Sustainable agricultural development and use of agrobiodiversity in the Asia-Pacific Region’. The meeting was organized by the Asia-Pacific Association of Agricultural Research Institutions (APAARI), in partnership with the Rural Development Administration (RDA), Suwon, Republic of Korea, Bioversity International, the Global Forum for Agricultural Research (GFAR) and a range of international centers. This broad institutional platform provided guidance on how to address the region’s challenges – alleviating poverty, assuring food and nutrition security, environmental sustainability as well as the emerging challenges of climate change – through the conservation and use of genetic resources for food and agriculture.

The resulting Suwon Agrobiodiversity Framework (APAARI 2010) proposes an integrated approach to ensure the continued availability of critical genetic resources. It emphasizes the need to build on current partnerships and eco-regional experiences. It recommends bringing together the different elements of genetic resources: microbes, crops, trees, livestock and microbes. It also points at the need to combine research disciplines including genetics, agronomy, socio-cultural and economic aspects.

Seven focus areas for research and development were identified:
1. Studies to enhance use of genetic resources through ‘subset approaches’ (manageable subsets of germplasm collections), and enhancing research on certain underutilized crops and their wild relatives
2. Pre-breeding and participatory plant breeding to enhance utilization of genetic resources in crop improvement programmes
3. Strategies and technologies to enhance in situ and ex situ conservation through use
4. Assessment of agrobiodiversity richness and status relative to economic, social and cultural (traditional knowledge) factors
5. Inter-disciplinary studies on ecosystems services for agriculture that agricultural landscapes, forests and wild ecosystems provide
6. Information systems and tools for data exchange
7. Supportive policies, laws and strategies to enable enhanced PGR exchange and use.

To facilitate implementation of the Suwon Agrobiodiversity Framework, the conference also identified a set of Areas of Regional Collaboration, one of which is ‘Strengthening agrobiodiversity capacity, education and public awareness’. Essentially, this recommendation was an outcome of the above-cited Tsukuba workshop. Among others, the Suwon meeting pointed out that:

- Capacity development is needed at individual, systemic and institutional levels
- Continuing education in the national systems is important, due to promotion or transfer of well-trained staff
- Capacity of local communities is important
- At institutional level, there is need for administrative frameworks, funding and monitoring and evaluation, etc.
- Public awareness and education on agrobiodiversity is recommended to start at early age.
The Framework highlights the need for making MSc PGR curricula more innovative and interesting to attract more students. There is also need to develop scholarship programmes. Short courses on PGR and Animal Genetic Resources offered by advance institutions in the region should be expanded to cover new tools, e.g. fingerprinting and information technology, as well as integrated approaches.

Crops For the Future

Crops for the Future (CFF), a new international organization based in Malaysia, emerged in 2009. Building on the achievements of its predecessor organizations, the Global Facilitation Unit for Underutilized Species (GFU), previously based in Rome, and the International Centre for Underutilized crops (ICUC) in Sri Lanka, CFF aspires to provide a platform for concerted action by stakeholders in neglected and underutilized species (NUS). With its goals of enhancing public awareness, facilitated access to NUS information, policy advocacy and capacity building, CFF strives to be a service provider for the global NUS community. Rather than ‘running its own show’ CFF invites the NUS community to take ownership in its strategy setting and action. In addition to its global function, the new CFF’s secretariat at Bioversity International’s APO office provides a platform for knowledge sharing and capacity building on agricultural biodiversity in the APO region.

On occasion of the recent 2nd International Symposium on Underutilized Plant Species, in Kuala Lumpur, the Crops for the Future Research Centre (CFFRC) was officially launched by the Prime Minister of Malaysia on 27 July 2011. CFFRC, a venture between the Government of Malaysia and the University of Nottingham will be located in Semenyih, adjacent to the University of Nottingham Malaysia Campus. The new centre, which is exclusively dedicated to research and development of NUS, is the largest of its kind. It represents an investment by the Government of Malaysia to the tune of some US$ 40 million covering the construction of the centre and its operation for the first 7 years, after which the centre should become self-sustaining.

CFFRC and CFF will closely coordinate their work. CFF will continue to focus on its role as an information platform and international facilitator. It will be locally strengthened through the brain power and opportunities of the research centre, whose principal mission is to remove the constraints along the value chain from genetic characterization to markets that limit the role of so many underutilized crops. The emergence of CFFRC provides bright perspectives for regional capacity building in terms of degree and group training.
Session 1. Opening session

Opening remarks

Dr Leocadio Sebastian, Bioversity International’s Regional Director, welcomed the participants and thanked them for accepting Bioversity’s invitation to the workshop. He indicated that the workshop was a follow-up to the regional workshop that was held at the University of Tsukuba, Japan in 2009. He enumerated the five priority areas identified during the regional workshop and urged participants to consider possible actions that can be implemented in Malaysia. Dr Sebastian also updated the participants on the recently concluded 2nd International Symposium on Underutilized Plant Species held in Kuala Lumpur, Malaysia on 27 June – 1 July 2011. He reported that the conference recognized the importance of integrating knowledge and information about underutilized crops in PGR courses and programmes.

Introduction of participants

Mr Per Rudebjer, Bioversity International, welcomed the participants and appreciated their willingness attend at a busy time of the year. He noted that this opportunity to meet with Malaysian universities came very timely, one and a half year after the regional workshop at in Japan. He especially welcomed the students to this meeting, point out the importance of their feedback for enhancing the quality and delivery of educational programmes. The participants then introduced themselves, giving a quick overview of their job position and institutional affiliation.

Setting the scene

In his overview, Mr Rudebjer pointed out the importance of PGR education for the ex situ and in situ conservation of agrobiodiversity, for pre-breeding and breeding, and for mobilization genetic resources in production systems. Such education needs to cover both commodity crops and NUS. It should consider formal and informal seed systems. It is important to the implementation of policies such as the Convention on Biological Diversity (CBD) and the International Treaty on Genetic Resources for Food and Agriculture. More often than not, curricula need to be reviewed to develop relevant PGR and agrobiodiversity competence in students.

Mr Rudebjer then summarized the results of the 2009 Tsukuba Workshop. This regional meeting reviewed universities’ experiences from teaching PGR courses and programmes. It reported on views and feedback from PGR stakeholders, including employers and students. The participants from nine universities and three research institutes provided a regional and international outlook on the conservation and use of PGR. Current issues confronting the teaching of PGR and agrobiodiversity were analysed. Finally, the workshop participants developed a shared understanding of the way forward, captured in the Tsukuba Action Plan.

The Tsukuba meeting pointed out a number of constraints in the delivery of PGR and agrobiodiversity education in the APO region:
• Few graduate students enroll in PGR Master’s programmes. This was linked to a perception of limited career opportunities for PGR graduates and a reduced availability of scholarships.

• Education programmes tend to focus more on conservation than on use of genetic resources.

• There are issues of research quality due to insufficient time allocated to research in some MSc programmes.

• High costs of maintaining laboratories.

• Lack of continuity of programmes due to low enrolment.

• Needs and opportunities in the private sector are not sufficiently captured in higher education on PGR.

Participants in the Tsukuba meeting then outlined strategies for curriculum change:

• Integrating PGR and agrobiodiversity in general agriculture programmes.

• Using a range of possible ‘entry points’ to start teaching agrobiodiversity topics in relevant courses and programmes.

• Enhancing and broadening MSc PGR programmes.

• Marketing PGR courses in other programmes to increase the number of students taking those courses (successfully applied at Universiti Kebangsaan Malaysia).

• Collaboration and sharing of resources.

The key output of the conference was an Action Plan for advancing PGR and agrobiodiversity education in SEAsia. The Tsukuba Action Plan identified and prioritized actions in the following five areas: course enhancement, degree enhancement, short courses, networking, and awareness. Eighteen months on, this one-day meeting was convened to review Malaysia’s progress in implementing the plan.

Finally, Mr Rudebjor introduced a number of learning resources that recently have become available including:

• The Crop Genebank Knowledge Base, provides easy access to knowledge and best practices for genebank management of selected crops, and to many aspects of general genebank management. It accessible online at http://cropgenebank.sgrp.cgiar.org/.

• An e-learning course on Pre-breeding for effective use of plant genetic resource, was released by the Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) in 2011. The course aims at strengthening capacities at the interface between germplasm conservation and its use in plant breeding. The self-learning course is available on CD and on-line at http://km.fao.org/gipb/index.php.

Bioversity International has published several training materials in 2010 and 2011, (available on http://www.bioversityinternational.org/training/training_materials.html) including:

• Forest genetic resources training guide containing an expanding portfolio of case studies to make FGR training relevant, attractive and accessible to non-specialists. The first three of case studies on species conservation strategies were published.
on-line in 2011. The Guide will continue to grow, as new case studies becomes available.

- **Learning module on the International Treaty on Plant Genetic Resources for Food and Agriculture** and the use of The Treaty’s standard material transfer agreement (SMTA).

- **Training manual on spatial analysis of plant diversity and distribution**, intended for scientists and students who work with biodiversity data and are interested in developing skills to carry out spatial analysis. The tool uses geographical information system (GIS) applications with a focus on diversity and ecological analyses.
Session 2. Update on agrobiodiversity education activities in Malaysia since 2009

Reports from universities in Malaysia

In Session 2, each participant gave an update on the respective university’s recent activities in PGR and agrobiodiversity education.

Universiti Kebangsaan Malaysia (UKM)  
Prof. Dr. Wickneswari Ratnam

The MSc PGR programme at UKM has a yearly enrolment of 20 students, with an intake of 10 students per semester. Recommendations from the Tsukuba meeting have been duly noted and follow-up actions have been taken to enhance the content. The scope of the programme has been broadened by introducing new courses on biotechnology and genetic enhancement. Renaming of courses was also done in conjunction with a revision of some courses’ content. Students have now been given an option to extend the programme by one to two semesters to allow more flexibility and time for research.

Universiti Putra Malaysia (UPM)  
Prof. Dr. Ghizan Salleh

UPM teaches a wide range of PGR-related courses, as reported in the Tsukuba proceedings. One addition to the list is the course on Seed Science and Technology (AGR 4102) which covers various aspects of seed storage and seed testing. A new postgraduate course on Seed Storage Science (AGR 5102) has also been introduced.

Universiti Malaya (UM)  
Prof. Dr. Halijah Ibrahim

The current PGR courses at UM are at the undergraduate level (biogeography and IPM). PGR elements are also incorporated into the postgraduate level programmes. The university is oriented towards ‘High Impact Research’ (HRI) that puts emphasis on biotechnology. Master’s programmes at UM are generally by research, including two agrobiodiversity-related MSc programmes on environment, and biotechnology, respectively.

International Islamic University Malaysia (IIUM)  
Prof Dr. Mohd. Osman

The IIUM is establishing an Institute of Plant Sciences, under which two courses (plant sciences, and applied plant sciences) will be introduced at the first-degree level. The institute is expected to accept new enrolments in 2012.

Developments in other Malaysian universities

Participants also informed about developments of relevance to PGR and agrobiodiversity education in other Malaysian universities, not present in this one-day meeting:
• The Faculty of Sustainable Agriculture at Universiti Malaysia Sabah covers forest biodiversity
• Universiti Sultan Zainal Abidin (UniSZA) deals with utilization of genetic resources
• Universiti Malaysia Terengganu has a Faculty of Agriculture
• Universiti Utara Malaysia teaches a course on agriculture entrepreneurship
• Universiti Teknologi Mara (UiTM) offers a plantation crop management course
• Universiti Malaysia Sarawak has a Forestry Faculty
• Malaysian private universities with interest in PGR include: Universiti Tunku Abdul Rahman, Monash University, and Nottingham University.
• Seed associations and other private interest groups are present in Malaysia.

Synthesis of recent developments
The Tsukuba Action Plan has certainly had an impact in Malaysia. Universities have revised many courses, and introduced some new ones guided by the Action Plan. While this positive trend was duly noted, course enhancement regarding both content and delivery continues to be important. During the plenary discussion a number of observations, suggestions and recommendations were made:

Competencies and relevance:
• Relevant education requires focus on developing skills that the job market needs
• Hands-on experiences need to be strengthened in many programmes. Innovative case studies, problem-based learning (i.e. classroom discussions) and other experiential learning methods could get more space
• Quality of education needs attention. Several approaches to receive feedback on educational quality were discussed including feedback from students and their associations, and from alumni via tracer studies and alumni networks
• Plant breeders and taxonomists (including forest taxonomists) are ‘endangered species’, indicating the need for developing capacity in these areas.

Curriculum development:
• A general observation was that PGR and agrobiodiversity elements are incorporated in many programmes. Still, the knowledge of PGR fundamentals can be weak.
• Course enhancement will require attention to both content and delivery methods. The meeting proposed that Bioversity should bring all national stakeholders together in a forum to enhance networking and discuss content and delivery.
• The visibility of PGR courses at postgraduate level is still weak. Students have the freedom to select courses and need to be aware of PGR opportunities.
• The pros and cons of research-based, respectively course-based MSc programmes were discussed at length. Some MSc programmes by course work have recently become more flexible to allow some research as well.
• A suggestion was made to introduce NUS courses at all universities
• Feedback is important for improving education programmes. Several mechanisms were mentioned: Tracking students after graduation; Autonomous student groups; Voices of alumni and the general public.
Institutional aspects:

- There is a proliferation of faculties and programmes related to agriculture at various universities in Malaysia, which presents both opportunities and challenges. For example, the new curriculum being developed at the International Islamic University Malaysia provides an excellent opportunity for integrating agrobiodiversity content. Creating specific niches can help profile universities.

- Coordination and synergies among universities on course content and delivery methods need to be enhanced.

- Information sharing on PGR education at the national level could be improved. Opportunities for national dialogue and influence should be seized, for example via professional societies or the National Professors’ Council. Private universities should be invited to national meetings.

- The Crops For the Future (CFF) hosted by Bioversity, and the newly established Crops For the Future Research Centre (CFFRC) at Nottingham University Malaysia Campus present new partnership opportunities for Malaysian universities.

- An EU-Malaysia university project is currently being implemented. Could PGR and agrobiodiversity aspects be included?

- Reduced funding (financial support for education and research) has been noted in Malaysian universities. Programmes need to be well funded and scholarships need to be made available.
Session 3: Networking and platforms

The role of national and regional networking

Paul Quek briefed the meeting on Southeast Asia’s education networks and their role in strengthening PGR and agrobiodiversity education in the region. These include the Southeast Asian Regional Centre for Graduate Study and Research in Agriculture (SEARCA), established under the Southeast Asia Ministers of Education Organization (SEAMEO), the Southeast Asian Network for Agroforestry Education (SEANAFE), and the ASEAN University Network.

SEARCA is a pioneer in training, research and knowledge exchange in agricultural development in the region. The organization seeks to enhance and strengthen agricultural curricula of universities, to establish common curricula and accreditation standards, for Southeast Asia to produce globally competitive graduates.

The Southeast Asian Network for Agroforestry Education (SEANAFE) is a network of 90 member institutions in six countries: Indonesia, Laos, Malaysia, Philippines, Thailand and Vietnam. SEANAFE is working towards improving agroforestry education, training, research and extension. The network aims to contribute to socioeconomic development, empowerment of farming communities and sustainable natural resource and environmental management in the Southeast Asian region.

The ASEAN University Network (AUN), was established in 1995 to facilitate regional collaboration on higher education among ASEAN member states. Its objectives are:

- to strengthen existing network of cooperation among universities in ASEAN
- to promote collaborative study, research and educational programmes on the priority areas identified by ASEAN
- to promote cooperation and solidarity among scholars, academicians and researchers in the ASEAN Member States
- to serve as the policy-oriented body in higher education in the ASEAN region.

Mr Quek stressed the importance of participating as stakeholders in the National Information Sharing Mechanism (NISM) of the Global Plan of Action on PGR. (The report on the State of the Worlds PGR is generated from such information). The Malaysian Agricultural Research and Development Institute (MARDI) coordinates the updating of NISM. Participation is a way to network with other stakeholders and access information on the status of PGR in the country, including education and on-going projects. Such information is also useful for graduates’ internship placements. The next NISM update is in progress and it was agreed that information on Malaysian universities as stakeholders will be forwarded to MARDI.

Finally, Internet sites, social media and wikis can support collaboration among universities, such as the Facebook page of the Malaysia Education Network, or the Southeast Asia Education Network, an Internet portal that primarily serves the region’s Bahasa Indonesia audience http://seaedu.net/.
The participants in the meeting suggested that there is need to increase awareness and publicity of the various PGR courses in the country. The website of the Regional Co-operation in Southeast Asia for Plant Genetic Resources (RECSEA-PGR) (http://www.recsea-pgr.net/) was suggested to host such publicity.

The Platform for Agrobiodiversity Research

Paul Bordoni

The Objectives of the Platform for Agrobiodiversity Research (PAR) are:

- **To support the development of an adequate agrobiodiversity knowledge base** through collating, synthesizing and disseminating agrobiodiversity knowledge, making available the relevant tools and practices that support improved use of agrobiodiversity, and identifying areas where information is lacking and new knowledge is needed.

- **To identify ways in which agrobiodiversity can contribute to addressing some of the major global challenges faced today** (e.g. environmental degradation, poverty alleviation, climate change, water quality and scarcity, and new global disease threats) by making available the information and options that ensure the contribution of agrobiodiversity in these areas.

- **To identify and facilitate relevant new and innovative research partnerships**, that strengthen multidisciplinary and participatory agrobiodiversity research, and involve work on different agro-ecosystem components (such as livestock, crops, soils, pollinators, etc.) and contribute to building agrobiodiversity research capacity, particularly in the developing regions.

PAR is actively building up a community of practice also by offering Web 2.0 services that enhance communication and foster networking (http://agrobiodiversityplatform.org). One of the instruments that could prove useful to this group of Malaysian universities is a Web-based tool for collective document writing. In order to use this tool one will need to become a member, by registering at the ‘Community Area’ of the PAR website.

The Platform, which has its Secretariat hosted by Bioversity International, is eager to raise awareness about agrobiodiversity and invites contributions to the newsletter and blog posts. We encourage universities to use PAR as an opportunity to connect to other groups of stakeholders.

As part of Bioversity’s Global Partnership Program (GPP), PAR participates in the shaping of policies developed by international bodies such as the Convention on Biological Diversity (CBD), the Intergovernmental Platform on Biodiversity and Ecosystem Service (IPBES) and others. It provides an avenue and opportunity for contributing to and influencing the formulation of policies developed in these forums.
Session 4. Action Plan for strengthening PGR and agrobiodiversity education in Malaysia

As reported above, the 2009 regional workshop in Tsukuba, Japan developed an Action Plan for strengthening PGR and agrobiodiversity education in the region (Rudebjer et al 2010). This one-day meeting provided an opportunity to review the progress in implementing the ‘Tsukuba Action Plan’ in Malaysian universities. Due to time constraints, only the highest priority items under each of the five themes were reviewed. The progress in the past 18 months was reported by each university, and the needs for ‘next actions’ were agreed upon.

Good progress was noted regarding integrating PGR content into relevant courses. Some universities (UKM and IIUM) are in the process of broadening the scope of PGR programmes. Some programmes have introduced more flexibility that allows more time for research.

Other needs remain: More scholarship opportunities should be created. The needs for PGR expertise need to be better understood. Short courses on PGR and agrobiodiversity for policy makers and young professionals need to be organized (Tables 2-6).

Table 2. Implementation of the Tsukuba Action Plan: Course enhancement

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress</th>
<th>Next Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporate PGR content in relevant courses</td>
<td>Good progress</td>
<td>• Development of customized training manuals (Bioversity to facilitate)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Universities to identify priority topics</td>
</tr>
<tr>
<td>Include PGR in 1st year undergraduate courses</td>
<td>(not reviewed)</td>
<td></td>
</tr>
<tr>
<td>Change names of courses to make them more attractive</td>
<td>(not reviewed)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Implementation of the Tsukuba Action Plan: Degree enhancement

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress</th>
<th>Next Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Broaden the scope of PGR programmes</strong></td>
<td>UKM (in progress) IIUM introduces 2 new study programmes</td>
<td>Individual universities’ continued attention</td>
</tr>
<tr>
<td><strong>Improve quality of research</strong></td>
<td>Flexibility introduced, allowing more time for research (max 4 semesters)</td>
<td>Individual universities’ continued attention</td>
</tr>
<tr>
<td><strong>Create scholarships</strong></td>
<td>No progress</td>
<td>Develop regional programmes that bring students to Malaysia, e.g. from Myanmar and Lao PDR. (Bioversity to facilitate)</td>
</tr>
</tbody>
</table>
| **Determine needs for PGR expertise**      | No progress                                   | • Survey to be done for Malaysia (who, how, when?)  
                                 |                                                | • A small working group consisting of experts created to develop the questionnaire (Bioversity + UKM)  
                                 |                                                | • Opportunities for using PAR, Young Professionals Platform for Agricultural Research for Development (YPARD) and Youth and United Nations Global Alliance (YUNGA). |
| **Change names to make programmes more attractive** | (not reviewed)                               |                                                  |
| **Develop industry-related research**       | (not reviewed)                                |                                                  |
| **Introduce courses on entrepreneurship**   | (not reviewed)                                |                                                  |
| **eLearning**                               | (not reviewed)                                |                                                  |

Table 4. Implementation of the Tsukuba Action Plan: Short courses

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress</th>
<th>Next Action</th>
</tr>
</thead>
</table>
| **Short courses/ workshop for policy makers, young professionals** | No progress | • Each university to organize a short course (between 2011-2012)  
                                 |                                                | • MARDI seminar series |
Table 5. Implementation of the Tsukuba Action Plan: Networking

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress</th>
<th>Next Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue networking on PGR education in APO</td>
<td>Ongoing</td>
<td>• Continue to take opportunities for networking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expand the mailing list, including students</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create a network website</td>
<td>-</td>
<td>Link to existing websites (RECSEA-PGR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop and support eLearning</td>
<td>(not reviewed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaboration to facilitate curriculum review</td>
<td>(not reviewed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Link educational &amp; PGR networks</td>
<td>(not reviewed)</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Implementation of the Tsukuba Action Plan: Awareness

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress</th>
<th>Next Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote relevant courses to attract prospective students</td>
<td>(not reviewed)</td>
<td></td>
</tr>
</tbody>
</table>

References


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