

BIO SAFETY



Newsletter



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From Desk of Editor



As we are heading towards the final stages of implementation of the Phase II Capacity Building Project on Biosafety, I am pleased to be associated with the project as the National Project Director and my colleague Shri Gyanesh Bharti, Joint Secretary, MoEF&CC is the National Project Coordinator.

There has been considerable progress in project activities in last six months. This newsletter provides a glimpse of workshops and trainings conducted under the project from January - June 2016 and showcases various project outputs. The project outcomes have also been shared with the representatives of 10 countries from Asian region in the "Regional Conference on Biosafety for Sharing of Experiences" held on April 7-8, 2016 at Hyderabad.

The contributions by Shri Hem Pande, Former National Project Director and Dr. Ranjini Warriar, Former National Project Coordinator (who has now superannuated) towards successful implementation of project are highly appreciated.

The preparation for forthcoming Eighth Meeting of Conference of Parties serving as Meeting of Parties (COP-MOP-8) to the Cartagena Protocol on Biosafety to be held from December 4-17, 2016 at Cancun, Mexico have been initiated. The relevant documents are being made available at <https://www.cbd.int/doc/?meeting=MOP-08>.

I invite all readers to provide their feedback, as we prepare our country position for participation in COP-MOP-8

Dr Amita Prasad
Additional Secretary

Ministry of Environment, Forest and Climate Change

Preparatory Processes and Milestones towards COP-MOP 8



The Secretariat of Convention on Biological Diversity (SCBD) has initiated the preparatory processes and milestones towards the eight meeting of conference of the Parties serving as the meeting of the Parties (COP-MOP 8) of the Cartagena Protocol on Biosafety (CPB). The COP-MOP

8 is scheduled to be held from December 4-17, 2016 at Cancun, Mexico. The preparatory process and milestones can be accessed at <https://bch.cbd.int/preparatory-processes.shtml>.

The COP-MOP 8 will be held in conjunction with the second meeting of the COP MOP to the Nagoya Protocol on Access and Benefit Sharing and the thirteenth meeting of the COP to the CBD. The SCBD has now notified the provisional agenda for all the three meetings at <http://www.cbd.int>

Regional Conference on Biosafety for Sharing of Experience

A "Regional Conference on Biosafety for Sharing of Experience", was organized as part of the Regional Networking and Cooperation component of the Phase II Capacity Building Project on Biosafety at Pragati Resorts, Hyderabad on April 7-8, 2016. The two day conference was organised by MoEF&CC in association with Biotech Consortium India Limited (BCIL).

The "Regional Conference was intended for sharing of experiences by the participating Asian countries for harmonization of biosafety frameworks at regional level. It was attended by 115 participants including the officials from the concerned Ministries/ Departments of 10 countries viz Bhutan, Cambodia, India, Lao PDR, Malaysia, Mongolia, Philippines, Republic of Korea, Sri Lanka & Vietnam. A cross section of stakeholders from India including members of regulatory committees, senior officers from various Ministries /Departments and scientists from partnering institutions associated with the Phase II Capacity Building Project on Biosafety were also present.

The Regional Conference was divided in six sessions i.e., the inaugural session and five technical sessions. These technical sessions were structured to cover the four thrust areas of the Phase II Capacity Building Project on Biosafety including a session on regional harmonization.



- Biology Documents as tools for ERA of GE Crops
- Initiatives taken for strengthening enforcement capacities including plant quarantine, custom officials etc
- Implementing identity preservation systems for LMOs in India
- Identity preservation in Basmati Rice done as a case study
- Establishing a network of referral laboratories for LMO detection
- Methodologies for Socio economic assessment of LMOs
- Approaches to risk communication strategies in biosafety
- Role of media in communicating science
- Publication of outreach material for public awareness

Technical Session I	Risk Assessment and Risk Management
Technical Session II	Handling, Transport, Packaging and Identification
Technical Session-III	Socio-Economic Considerations
Technical Session-IV	Public Awareness
Technical Session V	Capacity Building Needs and Initiatives Underway for Implementation of Biosafety Regulatory Framework in the Asian Region

Presentations by the representatives of participating Asian countries provided an overview of the existing status of biosafety framework of their respective countries particularly with regard to national policies on biosafety, biosafety laws and regulations, biosafety administration systems, procedures for granting approval to GMO applications, current status on research, development and use of GMOs with a focus on challenges and key areas for capacity building in biosafety. Presentations were followed by interactive discussions among participants.

Presentations were given by project partners, focusing on the outputs achieved. These included:

- Approaches to strengthening Environmental Risk Assessment (ERA) of Genetically Engineered (GE) crops in India

Message from Dr Alex Owusu-Biney, Portfolio Manager (Biosafety), GEF Coordination, Division of Environmental Policy Implementation, UNEP shared with the participants.





Regional Workshop on Risk Communication

As part of the Phase-II Capacity Building Project on Biosafety, a two day "Regional Workshop on Risk Communication" was organized from April 4-5, 2016 at Hyderabad with an objective to provide training in communication skills for addressing queries related to LMOs/GMOs at various stages of regulatory process specific to different stakeholders. The faculty included Prof. Paul Teng, Nanyang Technological University, Singapore; Dr. Andrew Powell, Chief Executive Officer (CEO) from Asia Bio Business (ABB) Pte. Ltd, Singapore and Dr. Andrew Roberts, Communication Specialist.

The program of the regional workshop consisted of an inaugural session wherein Dr. Gita Bamezai from the Indian Institute of Mass Communication (IIMC) talked about "Communication as a Tool for Addressing Public Concerns in Science" and Dr. Andrew



Powell talked about the proposed "Risk Communication Strategy for India" that is being prepared under the Phase II Capacity Building Project on Biosafety. The inaugural session was followed by four technical sessions. At the Technical Session-I, Prof. Paul Teng briefed about the course objectives, evolution of risk communication, practitioner foundation theories, trust determination and risk perception. The Technical Session-II covered topics related to evolution of risk communication, practitioner foundation theories, practical steps in building a risk communication strategy, message map development etc. The Technical Session-III and IV covered topics related to Message Map development, higher levels of risk debate, deficit model failings, mental process that hinder communication of risk and how to fine tune the message maps, use risk communication principles in oral communications and using message maps as a basis to respond in an interview.

The regional workshop was attended by 52 participants representing Bhutan, Cambodia, India, Lao PDR, Malaysia, Mongolia, Philippines, Republic of Korea, Sri Lanka & Vietnam from Asian Region. The participants also comprised of members from various regulatory and compliance committees from India.

Visit to DuPont Knowledge Centre



A visit to Research and Development facility at DuPont Knowledge Centre (DKC), Hyderabad was organized for international delegates from the participating 11 countries i.e., Bhutan, Cambodia, India, Lao PDR, Malaysia, Mongolia, Philippines, Republic of Korea, Sri Lanka & Vietnam. Participants also visited to its Green House Facilities where research on transgenic crops is underway.

State-of-the art research facilities at Dupont/ Pioneer were appreciated by the participants.

Workshops for Strengthening of Environmental Risk Assessment of Genetically Engineered Plants

Three workshops were organized for strengthening Environmental Risk Assessment (ERA) of Genetically Engineered (GE) plants under the risk assessment and risk management component of the Phase II Capacity Building Project on Biosafety at New Delhi from February 22-25, 2016. The workshops were conducted by Centre for Environmental Risk Assessment (CERA)-ILSI Research Foundation, Washington, USA and coordinated by Biotech Consortium India Limited (BCIL), New Delhi.

S. N.	Workshop Topic	Date
1	Training workshop for ERA of GE plants	February 22-23, 2016
2	Workshop on Non Target Organisms (NTOs) in the Context of ERA of GE plants	February 24, 2016
3.	Workshop on Dossier Preparation for GE Plants	February 25, 2016



The objective of the three workshops was to create a pool of trained resource persons for ERA of GE plants. The main target group of stakeholders included members from regulatory committees viz., Review Committee on Genetic Manipulation (RCGM) & Genetic Engineering Appraisal Committee (GEAC), research scientists State Agriculture Universities (SAUs) and the public sector research institutions.

Dr Monica Garcia-Alonso, Director, Estel Consult Ltd, London, UK and Dr Michael Wach, Senior Scientific Program Manager, CERA-ILSI Research Foundation, Washington, USA were the faculty for the training programs. The format of the workshops

included presentations followed by exercises conducted in groups consisting of 5-6 participants, to enable in depth understanding of the concepts presented by the faculty.

Post workshops the participants of the three workshops were surveyed to evaluate the impact and also to assess the knowledge gained through an online quiz.

1. TRAINING WORKSHOP FOR ERA OF GE PLANTS

Dr. Ranjini Warriar, Advisor, MoEF&CC and National Project Coordinator (NPC), Phase II Capacity Building Project on Biosafety welcomed the faculty and participants. She mentioned that the workshop is aimed to introduce the



concepts for ERA of GE plants, the use of problem formulation approach, data transportability etc. She also made presentation on the draft "Guidelines for ERA of GE plants".

Presentations on the following topics were made.

- Agriculture Biotechnology: The context and the science
- Introductions to ERA: Key Concepts and Methods
- Guidelines for Planning and Preparing ERAs: An International Perspective
- Applying Problem formulation to Risk Assessment of GE Crops
- Useful Resources for ERA
- ERA of GM Crops: Weediness and Invasiveness
- ERA for GM crops: Non Target Organisms (NTOs)
- Confined Field Trials
- Data Transportability

The two day training workshop was attended by 57 participants.



2. WORKSHOP ON NTOs IN THE CONTEXT OF ERA OF GE PLANTS

The workshop on Non Target Organisms (NTOs) in the context of ERA of GE plants was attended by 16 participants with expertise in the field of entomology. It was aimed at describing the methodology used for evaluating the impacts of NTOs in the context of ERA of GE plants including crop inhabiting arthropods such as pollinators, herbivores etc.



The faculty presented the following topics related to NTO Assessment:

- Problem Formulation and Protection Goals
- The Tiered Approach and Laboratory Studies
- Risk Characterization
- Semi-field and Field Studies

The presentations were followed by an exercise on "Bt Rice: Case Study", conducted in groups of 2-3 participants to enable practical understanding of the methodology discussed by the faculty.

3. WORKSHOP ON DOSSIER PREPARATION FOR GE PLANTS

Recognizing the importance of data quality in facilitating faster review and approval process of GE plants by the regulatory authorities, a 'Workshop on Dossier Preparation for GE plants', was organized on February 25, 2016.

The workshop was aimed towards familiarizing participants

with the relevant data which is important for preparing a meaningful dossier. Knowing in advance the data requirements as needed by regulatory authorities for evaluating safety assessment of GE plants, would help developers/researchers to plan their experiments in a systematic manner. This would also help regulators in finding the appropriate information easily and therefore speed up the review/approval process.



Participants were informed that dossiers should include only the relevant information and be supplemented with study reports as annexures. The individual study reports as annexures can then be appropriately used with the dossiers for different purposes such as commercial cultivation, import, export etc to the regulatory authorities since the information requirements vary for each purpose.

It was attended by 35 participants mainly comprising of members from regulatory committees viz., RCGM & GEAC, scientists from SAUs and research institutions. The following topics were presented by the faculty:

- Applying Problem Formulation to Risk Assessment for GM Crops
- Regulatory Submission: Objectives and Key Considerations
- Data Needs for Environmental Risk Assessment
- Preparing a Meaningful Dossier

Impressions from Participants

- For first time participants, gradual transition from basic knowledge was very well planned and the learning was boosted from practical exercises
- The exercise work with respect to problem formulation and working out the ERA across various case study was excellent
- The aspect of environmental risk assessment was dealt at a greater depth. Lot of misconceptions prior to the workshop were clarified
- The knowledge gained can be put to use in planning and conduct of GE experiments in the future
- Ensured understanding of the issues which are required to be taken into consideration before any scientific intervention is to be done
- Mostly post open field trial is the important one and especially weediness and invasiveness of other species are to be look. This will help me make a better ERA document for the organizers/ implementing agencies
- The event is quite informative covering all the related aspects of ERA right from the beginning to final contents
- Workshop manual is extremely useful, especially steps to be followed for effective ERA.
- Website resources were also useful
- I learnt the skill for preparing Dossier which is very different than writing scientific work.

Consultative Meeting on Proposed Guidance for Environmental Risk Assessment of GE Plants

A Consultative meeting on the proposed guidance for ERA of GE plants was organized by MoEF&CC on February 26, 2016 at New Delhi under the Chairmanship of Shri Hem Pande, Secretary, Department of Official Languages (Former Special Secretary, MoEF&CC and NPD, Phase II Capacity Building Project).

It was aimed to deliberate on the three proposed guidance documents being prepared by an Expert Committee under the Chairmanship of Prof. C.R. Babu, Professor Emeritus, University of Delhi and Co-chair Dr. K. Veluthambi, Professor (Retired), School of Biotechnology, Madurai Kamaraj University, Madurai (also Co-chair, GEAC). These three documents are Guidelines for the ERA of GE plants, ERA of GE plants: A Guide for Stakeholders and Risk Analysis Framework that about have been prepared through extensive deliberations/ discussions during a series of seven meetings.

Shri Hem Pande, apprised participants of India's commitment towards strengthening the risk assessment and risk management of LMOs under the Cartagena Protocol on Biosafety. He informed that the three proposed guidance documents have been prepared to provide a

systematic and structured approach to be adopted for carrying out risk assessment of GE plants. These documents are based on internationally accepted principles by agencies such as Secretariat to Convention on Biological Diversity, OECD, Office of the Gene Technology Regulator (OGTR), European Food Safety Authority (EFSA) etc. to convention on Biological Diversity, OECD, Office of the Gene Technology Regulator (OGTR), European Food Safety Authority (EFSA) etc.

Prof. C.R. Babu in his remarks indicated that these three documents are now ready for finalization. It was indicated that adoption of these guidance documents would strengthen the environmental risk assessment process and help in clarifying apprehensions in the minds of stakeholders about GE crops. Dr Ranjini Warriar, Adviser, MoEF&CC presented the key elements of the ERA guidance documents.

The meeting was attended by 48 participants comprising of members of regulatory committees and scientists from public and private sector engaged in research and development of GE plants.

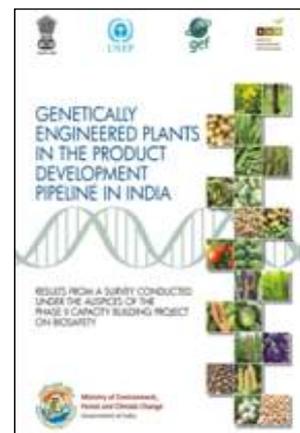
Genetically Engineered Plants in the Product Development Pipeline in India

A questionnaire based survey was conducted by MoEF&CC under the Phase II Capacity Building Project on Biosafety. The survey was aimed to identify which all GE crops and traits are currently under development or anticipated to be developed within the next 10 years in India with an objective to structure regulatory preparedness. The report of the survey has been produced as a booklet titled "Genetically Engineered Plants in the Product Development Pipeline in India". Over 85 different plant species have been reported to be currently being used in experimental work ranging from plants used for food, livestock feed, fiber fuel and dietary or medicinal purposes.

The survey indicates that the ten most prevalent crops under research and development are Rice, Cotton, Tomato, Brinjal, Maize, Tobacco, Banana, Chickpea,

Pigeon pea and Wheat. The results also indicate that 80 % of the on-going projects are limited to basic research, transformation, regeneration or early stages of event selection in contained conditions and only 20 % of the research has progressed to event selection in confined field trials.

Copies of documents can be obtained by writing to Project Coordinator Unit (PCU) at biosafety_mef@nic.in



Crop Specific Biology Documents

Crop specific biology documents include information of a particular plant species such as nomenclature of the crop, geographical origin, reproductive biology, its related species including wild relatives, potential for gene introgression, important insect-pest & diseases etc. Such species specific information provides baseline information to serve as a guiding tool for use in risk assessment of GE plants via comparisons with their non GE comparator. These biology documents provide information in a readily accessible format.

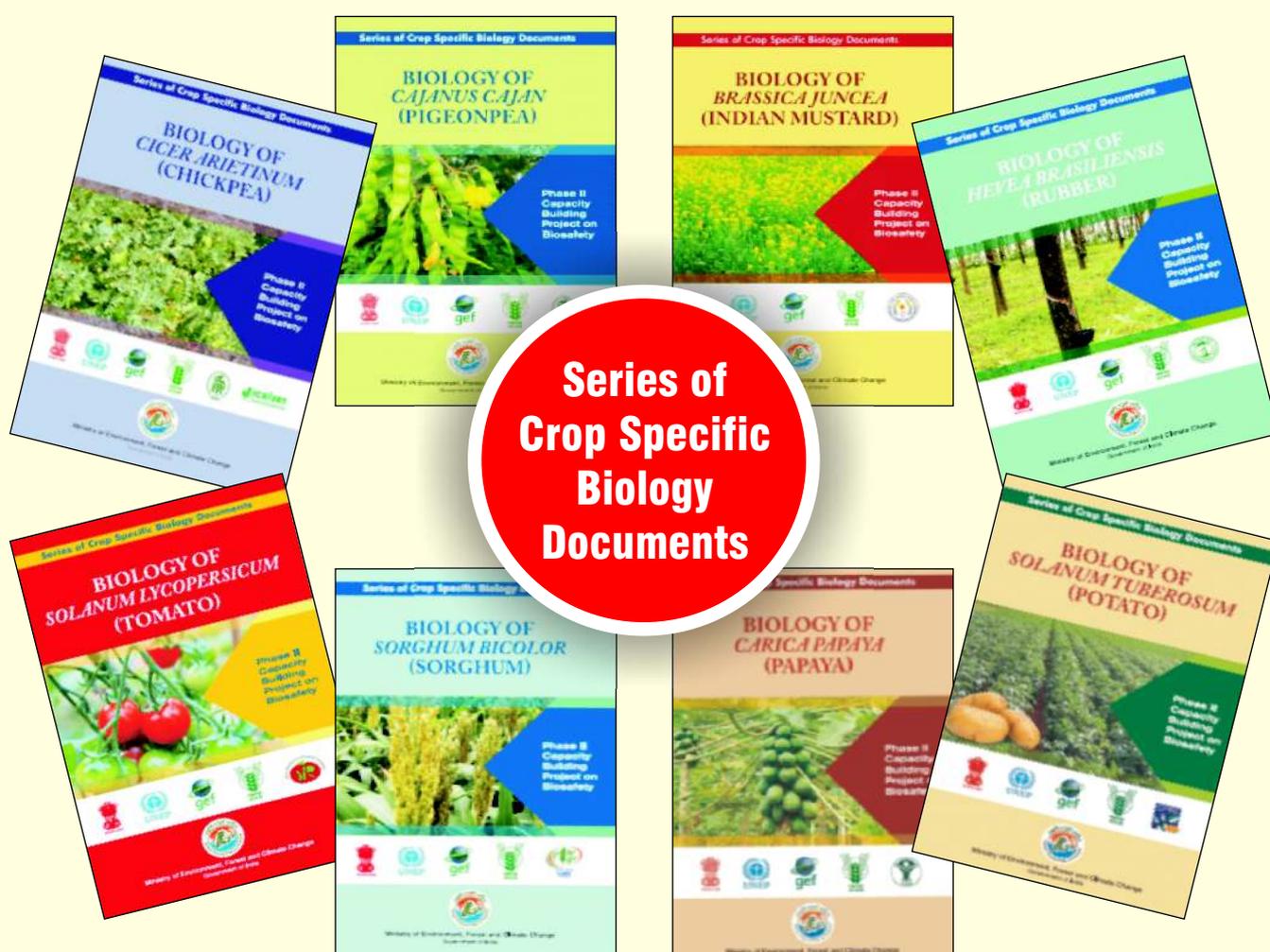
As part of the Phase II Capacity Building Project on Biosafety, MoEF&CC has now prepared additional eight crop specific biology documents for the crops that are in the product development pipeline. These eight crop specific biology documents viz., Tomato, Sorghum, Papaya, Potato, Mustard, Rubber, Chickpea and Pigeon pea have been prepared in association with crop specific Indian Council of Agriculture Research (ICAR) institutions and Rubber Research Institute of India.

The information contained in the biology documents can be

S.N.	Crop	Name Research Institution
1	Chickpea	Indian Institute of Pulses Research (IIPR)
2	Mustard	Directorate of Rapeseed and Mustard Research (DRMR)
3	Papaya	Indian Institute of Horticultural Research (IIHR)
4	Pigeon Pea	Indian Institute of Pulses Research (IIPR)
5	Potato	Central Potato Research Institute (CPRI)
6	Rubber	Rubber Research Institute (RRI)
7	Sorghum	Indian Institute of Millets Research (IIMR)
8	Tomato	Indian Institute of Vegetable Research (IIVR)

used by applicants as information in application forms submitted to regulatory authorities; by regulators as a guide and reference source for their regulatory reviews and as information sharing, research reference and public information.

Copies of documents can be obtained by writing to PCU at biosafety_mef@nic.in



Resource Catalogue

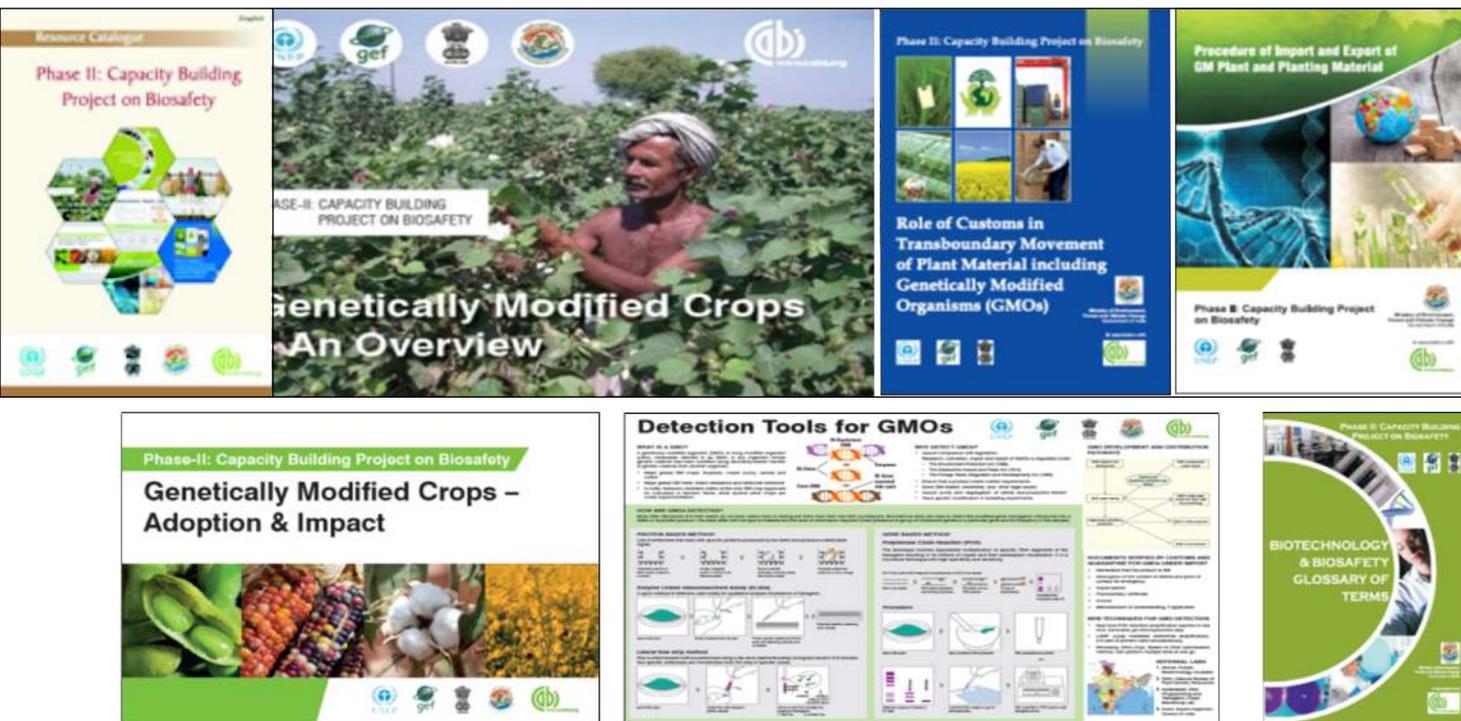
A Resource Catalogue has been prepared collectively by MoEF&CC and CABI South Asia comprising of six publications in different formats such as information sheet, poster, glossary of terms, booklets etc.

These publications are aimed to deliver scientific information in a simplified form in order to promote awareness about GM crops. Role of customs in transboundary movement of plant material and the procedures for import and export of GM plants in India have been included.

The Resource Catalogue has been translated into

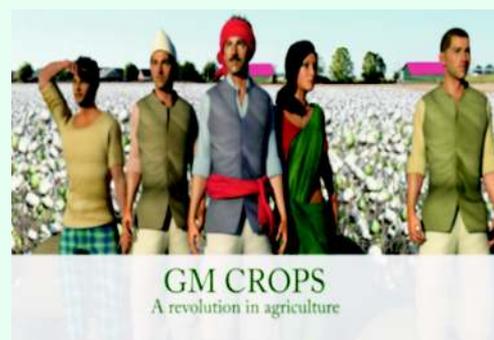
S.N.	Publications
1	Biosafety Glossary of Terms
2	Genetically Modified Crops: An Overview
3	Genetically Modified Crops: Adoption and Impact
4	Detection Tools for GMOs
5	Role of Customs in Transboundary Movement of Plant Material including GMOs
6	Procedure of Import and Export of GM Plant

eight regional languages of the key agricultural states where GM crops are cultivated i.e., Hindi, Marathi, Gujarati, Bengali, Tamil, Telugu, Kannada and Punjabi.



GM Crops: A Revolution in Agriculture

An animated movie "GM Crops; A Revolution in Agriculture", has been prepared as a tool towards innovative information dissemination to bypass the hurdles of literacy and language by CABI South Asia as part of the Phase II Capacity Building Project on Biosafety. The movie portrays an example of the village Amravati, showcasing the agony of poor farmers facing consistent loss in their cotton yield due to bollworm infection. As a solution to the huge losses in crop productivity the farmers are advised to make use of new technologies for farming such as GM technology. It explains scientific aspects of GM crops and attempts to simplify the scientific terms and facts as can be understood by a common man.



Training Workshops on Strengthening Enforcement Capacities for Transboundary Movement of LMOs



Training of officials from National Biodiversity Authority and State Biodiversity Boards



Training of officials from State Seed Testing Laboratories



Training of officials from State Food Testing Laboratories

The enforcement officials play an important role in implementation of national rules and regulations related to transboundary movement of agricultural commodities/ material including plants, seeds and other biological materials. Realizing the importance of strengthening of enforcement officials for transboundary movement of GMOs/LMOs and updating them about the latest regulations as well as technological developments, the MoEF&CC organized three training workshops for:

1. State Biodiversity Boards at Chennai on May 9, 2016
2. Food Safety Officials at Mohali on May 20-21, 2016
3. Seed Inspectors at Hyderabad on May 27-28, 2016.

More than 100 participants attended the three workshops, including officials from the National Biodiversity Authority, State Biodiversity Boards, Food Safety and Standard Authority, State Food Testing

laboratories, Seed Inspectors from State Agriculture Departments and Seed Testing officials from State Department Laboratories. The trainings informed participants about biosafety regulations at national level as well as India's commitments under the Cartagena Protocol on Biosafety (CPB).

The faculty of the training workshops included regulators and eminent scientists i.e., Dr. Ranjini Warriar, Adviser, MoEF&CC; Dr. B. Sesikeran, Chairman, RCGM; Dr K. Veluthambi, Co-Chair, GEAC; Dr K.C. Bansal, Officer on Special Duty, Division of Education, Indian Council of Agriculture Research; Dr P. Ananda Kumar, Principal Scientist, Indian Institute of Rice Research; Dr B. Dinesh Kumar, Deputy Director, National Institute of Nutrition; Dr Ajit Dua, Senior Scientist, PBTI and Dr. Vibha Ahuja, Chief, General Manager, BCIL. They covered the following topics in their presentations:



Laboratory visits at PBTI & DF TCML.

- a. Development of LMOs: Global and Indian status
- b. Biosafety regulatory framework in India
- c. Salient features of the CPB
- d. Safety assessment of GM foods
- e. Biosafety Clearing House and Useful Information Resources/Databases
- f. BCH: Practical demonstration and exercises
- g. Detection of LMOs: Overview of Principles and methods

These were followed by case studies wherein participants learnt how to use various online information resource databases for safety assessment of GMOs.

Laboratory visits were made to Punjab Biotechnology Incubator (PBTI), Mohali and DNA Fingerprinting and Transgenic Crop Management laboratory (DFTCML), Hyderabad by the food safety officials and seed inspectors respectively to give them a practical demonstration on detection techniques being used for identification of LMOs.

Hands on Training Programs on Detection of LMOs at National and International Laboratories



In continuation to the training programs initiated for capacity building of identified laboratories engaged in detection of LMOs, hand on training programs were organized in Sweden and India as a part of the Phase II Capacity Building Project on Biosafety.

Four scientists in two batches attended practical trainings at IntertekScanBi Diagnostics, Alnarp, Sweden from December 7-11, 2015 and January 18-22, 2016. The faculty included Dr. Anders Delquhist, CEO, Dr. PatrikStolt, Global Production Manager, Seed Technology and Dr. Line Sandager, Technical Director from Intertek ScanBi Diagnostics.

The trainings were conducted in a systematic manner so as to impart extensive practical know-how on GMO testing and laboratory operations, molecular biology validation processes, traceability and Laboratory Information Management System (LIMS), ISO17025:2005 operations. The practical sessions included sample homogenization, DNA extraction and purification, qualitative and quantitative real-time PCR targeting screening elements and specific GM events, followed by interpretation and analysis of data. Use of LIMS system in the traceability of progress of testing and theselection of appropriate methodology to be employed for testing a sample was also demonstrated.

The training program also included informative and interactive presentations on current scenario on need of GM detection, methodologies to be employed in GMO testing of samples,

along with reporting of results and measurement of uncertainty.

This was followed by another one week hands on training program at the Export Inspection Agency (EIA), Kochi, Kerala by faculty from Intertek ScanBi Diagnostics from February 29 to March 4, 2016. It was attended by 15 participants.

The faculty comprised of Dr. Patrik Stolt, Dr. Line Sandager, and Dr Lalitha Gowda, Chief Scientist (Retired), Central Food Technological Research Institute (CFTRI).

The training program comprised of theoretical and practical sessions on GMO detection and quantification, advanced theoretical information and practical exercises with regards various areas of detection of LMOs/ GMOs including training on maintenance of routines and calibration of major laboratory equipments were provided

Case specific assignments were conducted in various groups wherein guidelines, standard operating procedures and routines for validation, verification and proficiency testing were undertaken. Participants in groups of two also made presentations on "Guidelines & routines for method development and implementation" and "Guidelines and routines for validation, verification and proficiency testing for quantification of Golden Rice II Event". The training program provided an opportunity to gain in depth knowledge on screening, qualitative and quantitative analysis of LMOs.

CEPA Fair on National Experiences at the COP13-MOP8

To encourage countries that are Party to Convention on Biological Diversity (CBD) and Cartagena Protocol on Biosafety (CPB), to share their experiences with respect to the implementation of the obligations, a fair for the same is scheduled to be held alongside the COP13-MOP8 from December 4-17, 2016 Cancun, Mexico. This fair provides an opportunity for Parties to showcase their work, national experiences and contribution in implementation of the CBD. The CEPA Fair of 2016 is expected to highlight a number of overarching themes for the CBD and its Protocols and Parties are required to submit proposals that reflect the following:

- **CBD:** Measuring the progress of implementation of the Strategic Plan for Biodiversity 2011-2020.
- **Cartagena Protocol on Biosafety:** Best practices and experiences in implementing Article 23 on public awareness and participation of the Cartagena Protocol on Biosafety.
- **Nagoya Protocol:** Tools and activities that support the Awareness-Raising Strategy for the Nagoya Protocol

The CEPA fair features an exhibition of outreach materials and a thematic side event. The modalities for participation are accessible at www.cbd.int/cepa/cepafair/cepa-fair-guide.pdf.



NEW RELEASES

Biosafety Protocol News: A Special Issue on Progress in Implementing the Strategic Plan of the CPB

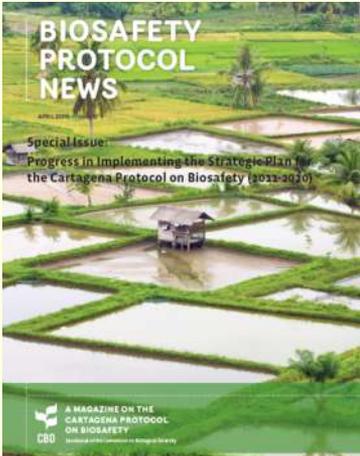
Biosafety Protocol News is a newsletter published by CBD Sceretriat covering news related to CPB. Recently, the new issue of Biosafety Protocol News released with a focus on the progress towards implementation of the Strategic Plan for the CPB (2011-2020). The newsletter covers the various topics under the CPB along with the operational objectives of the Strategic Plan. The issues include: National Biosafety Frameworks, risk assessment and risk management, handling, transport, packaging and identification, liability and redress, socio-economic considerations, unintentional transboundary movements, information sharing and the Biosafety Clearing-House (BCH), communication and outreach, including public awareness, education and participation and compliance

This special issue coincides with the mid-term

evaluation of the Strategic Plan, in conjunction with the third assessment and review of CPB. The issue offers an in-depth review of the progress made and challenges encountered towards implementation of CPB. It has been highlighted that there is a need to integrate biosafety into existing national, regional, and inter-

national environmental and sustainable development initiatives.

A copy of the above can be downloaded from [http:// bch.cbd.int/protocol/e-doc/?news=108392](http://bch.cbd.int/protocol/e-doc/?news=108392)



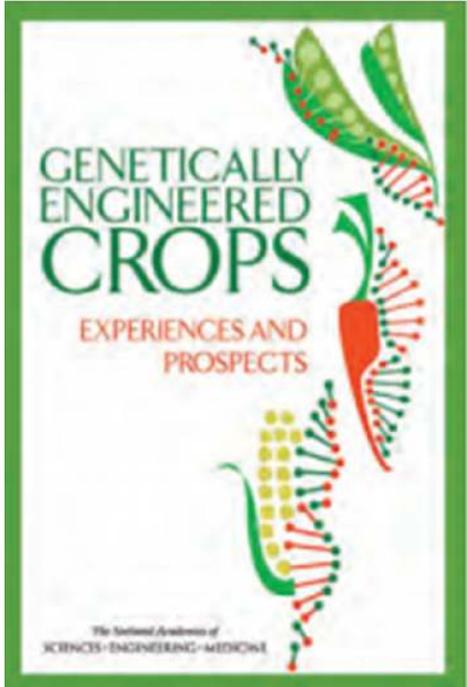
Genetically Engineered Crops: Experiences and Prospects

The United States National Academies of Sciences, Engineering and Medicine recently released a report entitled: "Genetically Engineered Crops: Experiences and Prospects", prepared by a Committee on Genetically Engineered Crops constituted by the Academies. The report is a culmination of a study that began in September 2014 for examining a range of questions & opinions about economic, agronomic, health, safety and other impacts of GE crops.

The report addresses various aspects of regulation, technology development, associated risks and benefits, safety assessment process, socio economic issues and other aspects of GE crops. It also assesses emerging GE

technologies that might contribute to future crop improvement and technical and regulatory challenges they may present. The 9 chapters covered in the report are:

Chapter 1: The Study of GE crops by the National Academies of Sciences, Engineering and Medicine

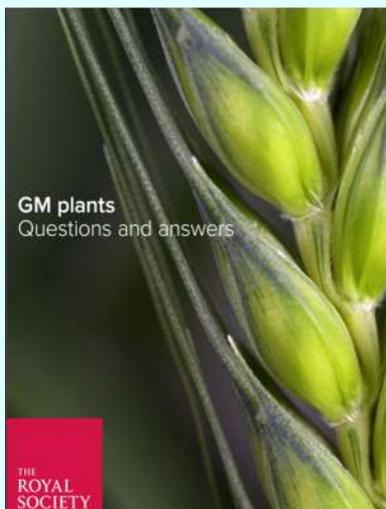


Contd... *Genetically Engineered Crops: Experiences and Prospects*

- Chapter 2: The Framework of the Report
- Chapter 3: GE Crops through 2015
- Chapter 4: Agronomic and Environmental Effects of GE Crops
- Chapter 5: Human Health Effects of GE Crops
- Chapter 6: Social and Economic Effects of GE Crops
- Chapter 7: Future Genetic Engineering Technologies
- Chapter 8: Future Genetic Engineered Crops

Chapter 9: Regulation of Current and Future GE Crops
More than 900 research publications were reviewed, hearing from 80 diverse speakers at three public meetings and 15 webinars were held prior to public consultations wherein 700 documents were received and reviewed as part of the information gathering phase by the committee towards developing this report.
The complete report can be accessed at <http://www.nap.edu/23395>

Genetically Modified Plants: Questions and Answers



The Royal Society of United Kingdom has released a report on "Genetically Modified Plants: Questions and Answers", which answers a number of questions about scientific and technological issues relating to GM crops. The report presents 18 regularly/commonly asked questions and the answers to which have been written in user-friendly language to be easily understood by people from non-scientific backgrounds. The 18 questions and answers covered in the report are:

1. What is genetic modification of crops and how is it done
2. How common are genes in food
3. How does GM differ from conventional plant breeding
4. What about unforeseen consequences of GM

5. Which genes have been introduced into GM crops so far and why
6. What GM crops are currently being grown and where
7. Where are GM crops being eaten
8. Is it safe to eat GM crops
9. Could eating GM food have an effect on my genes
10. Have GM crops caused damage to the environment
11. If we grow GM crops will they cross breed with other plants
12. What can be done to prevent cross breeding of GM crops
13. GM crops have only been around for 20 years, might there still be unexpected and untoward side effects
14. How are GM crops regulated
15. Who is paying for GM crop development and who owns the technology
16. Are there examples where GM has not delivered the promised improvements in crops
17. What new GM crops are being developed
18. What methods other than genetic improvement can improve crop performance.

These questions have been derived through a public survey and the answers have been provided by a multi-disciplinary group of experts. The report is available online at the academy's website at:

<https://royalsociety.org/~media/policy/projects/gm-plants/gm-plant-q-and-a.pdf>

Upcoming Events

Title	Organized/ hosted by	Date and Venue	Website
National			
Series of Awareness Workshop on Guidelines for Access to Biological Resources under the Biological Diversity Act, 2002	Department of Biotechnology, Biotech Consortium India Limited and National Biodiversity Authority	July 15, 2016, Hyderabad July 28, 2016, Bangalore	-
International Conference on Agriculture, Food Science, Natural Resource Management and Environmental Dynamics: The Technology, People and Sustainable Development	Bidhan Chandra Krishi Viswavidyalaya, Nadia	August 13-14, 2016, Nadia, West Bengal	http://www.bckv.edu.in/userfiles/file/Brochure-BCKV-2016.pdf
International Conference on Food, Water, Energy Nexus in Arena of Climate Change	Anand Agricultural University and National Council for Climate Change Sustainable Development and Public Leadership (NCCSD)	October 14-16, 2016, Anand, Gujarat	http://www.aau.in/sites/default/files/webClimatechangebroucher12.15.pdf
1st International Agrobiodiversity Congress (IAC 2016)	Indian Society of Plant Genetic Resources (ISPGR) and Biodiversity International	November 6-9, 2016, New Delhi	http://www.iac2016.in/
International Conference on "Pulses for Nutritional Security and Agricultural Sustainability"	Indian Society of Pulse Research and Development in association with Indian Institute of Pulses research, Kanpur	November 12-14, 2016, New Delhi	http://www.iipr.res.in/pdf/events_201115.pdf
International Conferences on Nutraceuticals and Functional Foods - The Challenges and Opportunities along with The XIII Convention of the Indian Society of Agricultural Biochemists	Indian Society of Agricultural Biochemists, C.S. Azad University of Agriculture and Technology, Kanpur and Anand Agricultural University, Anand, Gujarat	December 6-8, 2016, Anand, Gujarat	http://www.aau.in/sites/default/files/Broucher_1_seminar_biochem_baca_dec_15.pdf
International Conference on Technological Advancement for Sustainable Agriculture and Rural Development (TASARD - India, 2017)	Society for Plant Research (VEGETOS), African-Asian Rural Development Organization (AARDO) and AIMT, Amity University, Noida	February 20-22, 2017, Noida	http://www.amity.edu/aimt/tasard
International			
4th International Conference on Biotechnology Engineering (ICBioE 2016)	Kulliyah of Engineering International Islamic University Malaysia	July 25-27, 2016, Kuala Lumpur, Malaysia	http://www.iium.edu.my/icbioe/2016/
7th International Crop Science Congress	Institute of Crop Science Chinese Academy of Agricultural Sciences	August 14-19, 2016, Beijing, China	http://www.7icsc.com.cn/home.html
4th Annual South Asia Biosafety Conference	South Asia Biosafety Programme, ILSI Research Foundation and Biotech Consortium India Limited	September 19-21, 2016, Hyderabad	http://sabc.biotech.co.in/
8th International Plant Tissue Culture & Biotechnology Conference	Bangladesh Association for Plant Tissue Culture & Biotechnology (BAPTC&B) and University of Dhaka	December 3-5, 2016, Dhaka	

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Disclaimer : The information in this newsletter has been compiled from various sources and does not necessarily depict views of the Ministry of Environment, Forest and Climate Change, Government of India.