# Report of the fifth National Biosafety Framework project Meeting on

# "Genetically Modified Plants applied to agriculture "

**Science, Technology and Environment Agency (STEA)**

**21-24 October 2003,**

**Vientiane Municipality, Lao PDR**

Organised by the

**Science, Technology and Environment Agency (STEA - Laos)**

and the

**Interdisciplinary Biosafety Network (RIBios - Switzerland)**

with the support of

**UNEP-GEF Project on Development of National Biosafety Frameworks**

and the

**Swiss Agency for Development and Cooperation**

**CONTENTS**



**Nota:**

**The lectures given during the workshop are available for download as Power PointÔ presentations**

**-> http://www.ribios.ch/teaching.html**

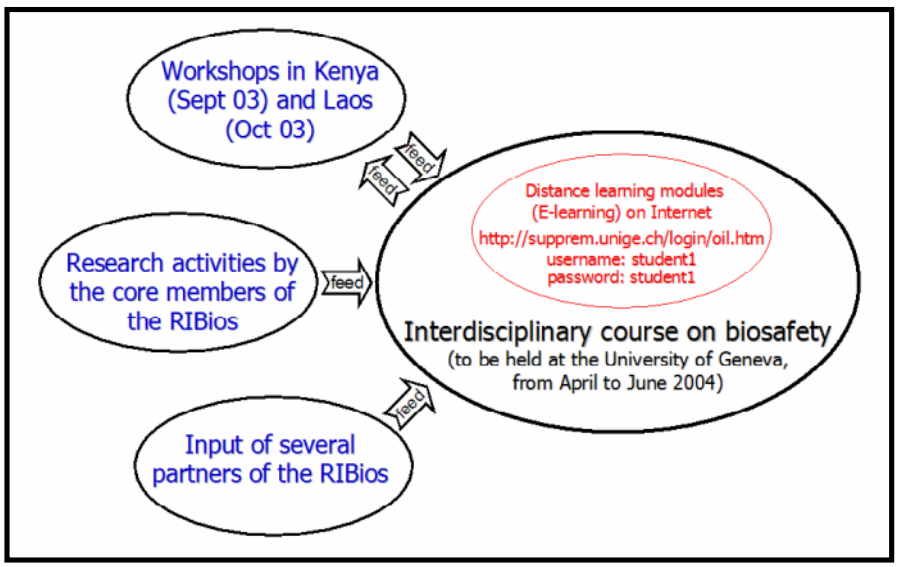
## INTRODUCTION

To participate to **capacity building** efforts in developing countries, the RIBios has co-organised a workshop in Vientiane (21-24 October 2003) with the Science, Technology and Environment Agency (STEA) of Lao PDR. This agency represents the National Executing Agency referred to in the UNEP/GEF project on the "Development of National Biosafety Frameworks" (http://www.unep.ch/biosafety/development.htm).

The **programme** of the workshop was designed by Sourioudong Sundara *(ICCP Focal Point and Cartagena Protocol National Focal Point for Lao PDR)* and Mirko Saam *(RIBios capacity building programme co-ordinator)*. The following table summarises the workshop objectives.

| Objectives | Achievements |
|---|---|
| answer specific questions related to GMOs raised by the National Biosafety Committee members | Workshop was judged interesting and useful (4/5) by the participants (*also see "evaluation"*) |
| foster national and regional networking | Laotian partners achieved no significant networking. The RIBios members established contacts with potential future partners in SE Asia |
| initiate a collaborative effort with some institutions in order to launch research partnerships | No partnership with Laotian institutions was designed so far, in spite of possibilities opened by local public participation implementation |
| test part of the RIBios interdisciplinary course in order to tailor it to specific developing countries' needs | Part of the content of the interdisciplinary course (see below) and e-learning modules prepared by the RIBios staff have been successfully tested |
| collect information to be integrated into the interdisciplinary course which will be given at the University of Geneva from April to June 2004 | Only a small amount of data regarding specific issues related to biosafety has been collected, given the current situation in Laos |

The figure herebelow summarises the links between several components of the RIBios project, in particular regarding SDC funded activities.



This workshop was held one month and a half after the "first national workshop on the development of National Biosafety Framework", attended by representatives from all over the country *(no report is available for this workshop).* It was the fifth meeting organised by STEA in Vientiane, within the above-mentioned "**Development of National Biosafety Framework**" project. Organising costs were shared between UNEP/GEF funds and SDC funds. Consequently, this workshop was perfectly integrated in the UNEP/GEF funded project implemented by STEA, and was scheduled in due time according to local needs.

75 **participants** attended the workshop. These were mainly policy makers, but there were also a number of scientists and researchers invited, as well as international organisations representatives and journalists. Participants came from the following organisations:

- National Executing Agency and members from the National Biosafety Committee (NEC+NCC+TWG) which include representatives from: National Council of Science, Ministry of Agriculture and Forestry, Ministry of Public Heath, Ministry of Education, Ministry of Industry and Handicrafts, Ministry of Trade, Ministry of Justice, Ministry of Propaganda Information and Culture, Ministry of Communication Post Transport and Construction, Lao Woman Union ;

- National research institutions: Lao National University (faculties of Agriculture, of Forestry, of Medicine and of Science), the Plant Protection Centre, the National Institute of Research on Agronomy and Forestry ;

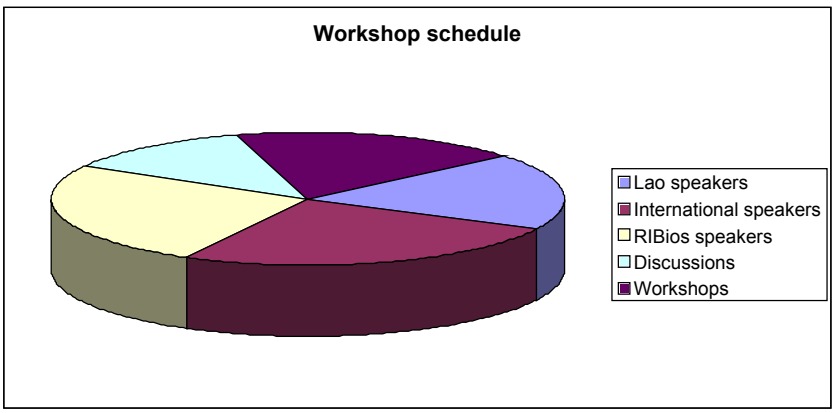
- Vientiane Municipality authorities: Department of Science, Technology and Environment ; Department of Agriculture ; Department of Public Health ;

- International organisations : FAO, UNDP, UNESCO ;

- Media : National Lao TV, KPL News Agency.

"NGOs" were also invited (such as CCL, CCSP, WCS, WWF and OXFAM) but none of them were represented during the workshop.

Sourioudong Sundara, *ICCP Focal Point and Cartagena Protocol on Biosafety National Focal Point for Lao PDR (sourioudong@yahoo.co.uk or science@laotel.com)* was the moderator.



## Day 1 (October 21, 2003)

## How are transgenic plants made and what are their potential benefits for the environment, agriculture and health? What is the current status of research and development on transgenic rice and papaya?

During his **Workshop Opening Speech**, the Minister of Science, Technology and Environment (Professor Bounteim PHISSAMAI) welcomed the participants and underlined the importance of a national biosafety framework for Laos, considering its neighbours' policies related to genetically modified organisms. Then, Sourioudong Sundara presented a short **summary of the objectives and activities of the "Development of National Biosafety Frameworks" project** funded by UNEP/GEF. He introduced the workshop as a significant contribution towards the drafting of a national biosafety law by March 2004. Then, Mirko Saam briefly presented the **RIBios programme** and its activities related to capacity building.

Viengpasith Vanisaveth did an **introduction to the database of the NBF project** (www.laobch.gov.la) which will constitute the official Lao Biosafety Clearing House. This website will make public all the information regarding transgenic plants and biosafety issues at the national scale. Barbara Bordogna Petriccione then explained **how to make a transgenic plant**. This lecture was also the occasion to introduce specific scientific terms (genome, GMO, biotechnology, etc.) some participants were not familiar with. Her presentation was based on the contents of an e-learning module prepared for the Swiss Virtual Campus. Titled "Technical Introduction to transgenic plants", this module is freely available on the SUPPREM website (http://supprem.unige.ch, username: student1, password: student1).

Srimek Chowponpang continued with a talk about the **potential benefits of transgenic plants for agriculture, health and environment**. Potential traits include fungi, virus or other diseases resistance, herbicide tolerance, nitrogen fixation, drought resistance, salt, temperature and flooding tolerance, fragrance or colour modification, delayed softening and long shelf life, increased nutritional value, production of vaccines or antibodies and bioremediation such as removal of heavy metals from the ground. He also exposed the use of transgenic plants worldwide, with 58 million hectares cultivated in 2002, mostly in the USA (68%), Argentina (22%) and Canada (6%). Soya (63%), maize (19%) and cotton (13%) were the most widely adopted transgenic crops, whereas herbicide tolerance (76%) and insect resistance (15%) were the most common traits.

Monthathip Chanphengxay ended the first morning by exposing **research and conservation of Biological Diversity of Rice variety in Laos.** She emphasised the significance of rice for Laos, as a food crop (170 kg/year/inhabitant are consumed, the country ranking 2$^{nd}$ worldwide considering the annual per capita consumption), and as a natural resource as well. Actually, Laos is a biodiversity centre for rice, and more specifically for glutinous (sticky) rice varieties. The country only reached self-sufficiency in rice production in 1999; that explains current official agronomic policies aimed at improving yields to secure indigenous production and compensate annual demographic growth (2,6%). Research activities at NAFRI led to the creation of several dozens of high yielding or nutritionally enhanced hybrids. In addition, Lao rice germplasm holds great

potential for variety improvement, through hybridisation or genetic engineering. NAFRI sees biotechnology as a potent tool to isolate and incorporate interesting traits into modern glutinous rice varieties.

The afternoon started with a presentation by Darshan Brar of **the development and deployment of transgenic rice at IRRI and related biosafety issues**. IRRI has a long experience in the development and sharing of transgenic rice, training in GM technology and associated biosafety considerations. Many transgenic *indica* rice lines carrying agronomically important genes such as resistance to bacterial blight (*Xa21*), sheath blight (chitinase), stemborer (*Bt*) and with beta carotene (*psy*, *ctrl*, *lcy*) in the endosperm (Golden Rice) have been produced (*Bt* and *Xa21* are already being field tested, whereas Golden Rice and other traits are still at the greenhouse stage). IRRI in its experiments on transgenic rice follows biosafety guidelines as prescribed by the National Committee on Biosafety of the Philippines (NCBP). The Institute is collaborating with national programs on implementation of biosafety guidelines and protocol development for field evaluation. Regarding access to modified crops, IRRI policies stipulate that the country acquiring a transgenic variety must have ratified the Cartagena Protocol, or have its own national biosafety regulation into force.

Srimek Chowponpang ended the afternoon with a presentation on **current research activities on transgenic papaya** in Thailand. The National Centre for Genetic Engineering and Biotechnology (University of Kasetsart) has developed a transgenic papaya resistant to viruses. The effectiveness against *ringspot disease* was achieved through "gene silencing", by inserting part of the gene coding for the coat protein of the virus. Preliminary results obtained on experimental plots (3200 $m^2$) were encouraging but further testing in the field and at other locations are necessary to validate these results. Transgene stabilisation is also a matter of concern. Depending on Thai legislation this papaya could potentially reach commercialisation in the near future.

## Day 2 (October 22, 2003)

### What are the potential environmental and health risks related to transgenic plants? What are the current scientific uncertainties in biotechnology? What is the "Precautionary principle" and how can it be applied?

Mirko Saam started the day with a presentation on the **potential risks of transgenic plants for health and environment**. Rather than exposing its own list of risks, he suggested the participants build their own. Many risks mentioned by the participants were in fact not directly linked to the use of transgenic plants, but rather to commercial and economic issues related to seed trade in general. He ended his talk with a short summary of the main potential risks, strengthening the fact that each transgenic plant has specific characteristics that differ from other transgenic plants. Thus, the risks of a particular GMO should be assessed on a case by case basis, taking into account the crop as well as the considered trait.

Then, Sourioudong Sundara presented the **ASEAN Guidelines on Risk assessment of agriculture-related genetically modified organisms**. He suggested these could be used as a starting point for risk assessment procedures in the Lao biosafety framework. He strengthened the fact that the national framework should cover other specific points not referred to in these guidelines.

Later, Barbara Bordogna Petriccione talked about the **current scientific uncertainties in biotechnology**. Whereas it is technically feasible to insert genes in many plants, we still do not fully understand most of the genome function, often dubbed « junk DNA ». Consequently, random insertion of the transgene and transgene instability often induce unexpected modifications of the transgenic plants characteristics. This makes rigorous nutritional safety assessment procedures highly complicated, not to say impossible, to design.

In the afternoon Barbara Bordogna Petriccione and Philippe Cullet did a brief **introduction to the precautionary principle and its applications**. This principle has many different formulations but its general purpose is to manage « hypothetical risks », i.e. when the link between a cause and a damage is not scientifically proved. Differences between « prevention » and « precaution » were also exposed, as well as concepts such as the « degree of proof » and « proportionality of the precautionary measures ». Then, precaution was presented in the framework of the Cartagena Protocol, emphasising that it is the overarching principle of this protocol.

Ashesh Kumar did a presentation of the potential and observed **socio-economic impacts of GMOs in developing countries**, with India as a case study. Starting with a description of the evolution of biotechnology through ages, he then presented the current status of biotechnology applied to agriculture. Participants were most interested in knowing what the real benefits and risks related to the use of transgenic plants are. Ashesh Kumar underlined the fact that only a few rigorous studies were conducted so far and that these studies present contradictory results; it is thus very difficult to draw any conclusion.

The second day afternoon ended with a **discussion on genetically modified plants and their potential risks in Lao PDR**, leaded by Souridoung Sundara. This discussion raised questions such as 1) the transit role of Laos, given its geographical location, 2) the fact that surrounding Thailand, Vietnam and China are developing GMOs, 3) the high biodiversity of the country, especially regarding rice, and the associated risk of releasing transgenic rice in the country, 4) the lack of human resources related to biosafety in the country and 5) the balance to find between conservation and development, the former being a potential tool for the latter.

Eventually, participants formulated the following priorities:

1. preserve *in situ* resources,
2. increase research & development,
3. adopt precautionary measures,
4. enforce adopted measures, and
5. increase public awareness and participation. GMOs can only be accepted in the country under strict control and if non-GMO and GMO crops can easily be traced and separated.

## Day 3 (October 23, 2003)

## What are the current biosafety policies and regulations in China, Vietnam, India, Europe and USA?

Jian Ying Guo started the third day with a presentation of **Chinese policies and regulations related to Genetically Modified Organisms**. Chinese research on GM crops started in the early 80's and first successes with tobacco and tomato were obtained in 1987. Since 1997 many field trials, environmental releases and commercialisations were approved in China. As of 2002, 13 different plant species were genetically modified, whereas over 70% of the crops were engineered for insect or herbicide resistance. Chinese scientists were also successful in developing new techniques for genetic modification, as for instance gene transmission through pollen tube, to produce Bt cotton. Jian Ying Guo reported a net income increase of 250 US$/ha and a drop in poisoning cases for farmers using Bt cotton commercially. From her own research, she also reported a very low impact of Bt cotton on non-target species and secondary pests.

In China, first regulations were issued in 1996, with the "Safety Administration Regulation on Genetic Engineering of Agricultural Organisms". A set of complementary regulations concerning safety evaluation, import and labelling was enforced in March 2002. China chose to impose a strict control on imported GM crops to protect its own national R&D institutions, which amount more than 80. After Ms. Guo's speech, the participants raised many questions such as: What is the IPR policy in China ? Which were the side effects or problems encountered so far with GM crops? Under WTO agreements, how could China maintain a restricted access to its market? Do we eat GM products from China in Laos? What is the import/export procedure for GM products in China? Are there any GM crops grown in China which could one day be of interest for Laos? Participants were especially interested in the status of Chinese transgenic rice.

Vu Duc Quang then presented the **policy in agro-biotechnology research and development in Vietnam and an introduction to the draft guidelines on biosafety regulations**. The agricultural sector is of paramount importance for fast-developing countries such as Vietnam, and the government decided to invest nearly 2 millions US$ per year in genetic engineering since 2001. Research is on progress with rice, maize, cotton, flowers, papaya, tuber and forest plants but no commercial release has been authorised so far. In September 2003, a draft of a "Decree on biosafety regulations for GMOs and their products" was issued by a group of experts and submitted to the Government for approval.

Then, Sourioudong Sundara introduced **the "ASEAN framework agreement on access to biological and genetic resources and fair and equitable sharing of benefits"**. This document provides basic guidelines to manage biological diversity at the national level. In particular, it reaffirms that the member states have the right to determine and adopt intellectual property regimes consistent with the objectives of the Convention on Biological Diversity, while ensuring mutual supportiveness with other international obligations.

The afternoon started with a presentation by Ashesh Kumar of **Indian policies and regulations related to Genetically Modified Organisms**. He exposed the importance of

agriculture for India and the government's will to foster national biotechnology research, which already aims at improving half a dozen different crops. But only Bt-cotton has been approved for commercialisation so far (in April 2002) in six southern states of India. Officially approved Bt-cotton in India in its first year of cultivation has not given any respite to the farmers. This Bt-cotton seeds were sold to the farmers at four times the best variety available in India and farmers were promised lots of benefits. The Government of Andhra Pradesh on listening to these cases have asked that farmers who have lost money shall be compensated by seed companies. Illegal Bt cotton seeds produced by a local company are sold without authorisation. Signatory of the Cartagena Protocol, India also has its own national regulations related to GMOs enforced since the 80's, but a clear biotechnology policy is missing. In the face of the central government, several state governments have announced their own biotechnology policy and regulation.

Horace Perret presented the **European Union and United States policies and regulations related to Genetically Modified Organisms**. The United States and Europe have devised regulatory approaches to GM crops that are based on two radically different perspectives towards this new technology. As a result, the US regulatory system ends up being more permissive than its European counterpart. This difference is reflected by public acceptance of GMOs in these two regions of the world: while GMOs are widely accepted by US consumers, they are still rejected by a vast majority of European consumers. By explaining the main points of each regulatory system, this presentation tried to shed some light on these differences.

## Day 4 (October 24, 2003)

### What does the use of commercial transgenic plants imply for agriculture, farmers rights and protection of traditional knowledge? What is "Public Participation" and how could it be applied in Lao PDR?

Philippe Cullet started the day with a presentation on **commercial transgenic plants and Intellectual Property Rights**. The introduction of patent rights served as an incentive for the private sector biotechnology industry. However, the patent system in general, and as proposed in the context of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organisation, poses a number of challenges to the realisation of sustainable development. Especially in developing countries, because it does not take into account socio-economic concerns (such as food security) or environmental concerns (such as agricultural diversity conservation or biosafety).

Then, Philippe Cullet continued with a presentation of **liability issues**, summarising three types of liability. First, the liability of the different actors involved in the release of transgenic organisms, in case these organisms harm the environment. Second, the socio-economic damage that the release of transgenic organisms can cause, even if there is no environmental damage. This includes, for instance, the problem of non-transgenic crops contamination by transgenic crops. Third, the liability of individuals, entities or states which involuntarily acquire transgenic organisms which are protected by patents. In an

ongoing case in Canada, a judge has ruled at the lower court level that a farmer is liable to pay a technology fee to the patent holder for a transgenic crop, even if the transgenic material made its own way onto his property. The potential ramifications of this case indicate that the question of 'patent liability' is an important issue that should be addressed by developing countries before they introduce transgenic crops.

Lavanh Soutisan did a short report of the **group discussion on the Public Awareness and Participation Issues from the First National Workshop on the Development NBF for Lao PDR, 03-05 Sep, 2003**. Unfortunately, this presentation was not translated into English because of time restraints.

Horace Perret did **an introduction to public participation**. Nowadays, many procedures are used to include various actors in participatory or deliberative processes, in order to discuss scientific and technological issues. Scientific developments and technological innovations generate risks that have been, until recently, managed by experts using a proven methodology called "risk assessment and management". This methodology has enabled the adoption of prevention policies by the States. It consists of two phases, risks assessment on one hand, and risks management on the other, and adopts a division of labour between experts and politicians. Experts have to make the scientific work of assessment, while politicians adopt and elaborate preventive measures on the basis of this scientific assessment.

But the classical risk management model has been challenged by the emergence of new technologies in the last 20-30 years, such as mobile phones, GMOs, the use of antibiotics or hormones in animals breeding, and more recently, nanotechnologies. These technologies entail risks, which give rise to scientific, and sometimes also social controversies. Participatory methods have several advantages that explain their recent success. They are a way of improving governance in a context of scientific uncertainty. Indeed, when risks cannot be assessed on a purely scientific basis, in other words when science does not know for sure, preventive policies cannot be adopted. As a result, risks generated by science and technology have to be negotiated by society as a whole. Participatory methods are also a means of developing instruments to improve the quality of decisions, by giving citizens and stakeholders the opportunity to have a voice in the orientation of science and technology.

The second part of the presentation on **public participation** dealt **with two case studies (Switzerland and India).** Since participatory methods involve a great variety of actors and procedures, a review of the potential actors and procedures was done. The two case studies (one in the North - where these procedures are in some cases already part of the normal process - and one in the South, where they are emerging) were used to illustrate what was said before.

At the end of the afternoon we had a **round table discussion on Public Participation obstacles and opportunities in Lao PDR**. In order to structure the discussion, some questions were submitted to the participants:

| Questions submitted | Summary of the answers |
|---|---|
| 1. Do you think that a public participation process on GMOs (Citizens' conference, citizens' jury) would be useful and desirable for Lao PDR as a complementary measure to the policy of Environmental Education, Training and Awareness? | Yes, it would be useful. We need to study this issue in order to inform the Parliament. |
| 2. Who should organise this participation process? | The government should organise this participation process, through STEA. The help of foreign advisors could be useful because there is a need of capacity building to monitor such a process. |
| 3. Which actors should be involved in the process? | ➢ Pros and Cons<br>➢ Mass organisations (women, youth)<br>➢ Resource persons and experts<br>➢ Media people<br>➢ Farmers's unions<br>➢ Chamber of Commerce and Industry<br>➢ Association of coffee growers<br>➢ Religious network (pagodas)<br>➢ Representatives of minority ethnical groups<br>➢ Foreign agencies and NGOs |
| 4. How to make sure that marginalised people (such as poor farmers) have their say in the process? | The government must take measures to involve poor farmers and ethnical minorities. |
| 5. If a participation process is organised, how would its recommendations be taken into account in the political decision-making? | The last decision maker will be the National Assembly. |

## CONCLUSIONS

Transgenic crops remain largely unknown in Laos, by scientists and farmers alike. Needs for **biosafety information and training** are huge. The low level of local technical means available and competencies make difficult the creation of national programmes for the development of transgenic crops in the near future.

The time lag of Laos in agricultural practices (**low rate of synthetic fertilisers and pesticides applied**) could constitute a commercial opportunity for the country. International market for organic products is growing, and Lao agriculture can be considered 80% organic at the national scale.

**National biosafety framework** formulation is a duty of the STEA (in particular of the Science Research Institute). Because of their lack of competencies and political weight, other actors and stakeholders are excluded from the process. The aim set by the STEA is to prepare a first draft of the national biosafety law by March 2004, and to have legislation into force by June 2004.

STEA lobbies the Ministry of Foreign Affairs in order to speed up the **ratification of the Cartagena Protocol**. The ratification should be acknowledged by the National Assembly in the coming months. Next meetings of the National Biosafety Committee should define needs for the effective implementation of the Cartagena Protocol.

According to Monemany Nhoybouakong (head of the Environmental Research Institute), **Bt cotton** is already used in Xagnabouri province, North West of the country near China. Samples should still be analysed to confirm this information.

In the near future, the **RIBios** could help STEA to implement public participation. IRRI-Lao or LEAP (two projects also funded by SDC) could constitute ideal partners to organise *participatory Technology Assessment* with the farmers, for instance.

*Prepared by Mirko Saam (March 2004)*

## PROGRAMME

**Day 1 (October 21, 2003): How are transgenic plants made and what are their potential benefits for the environment, agriculture and health? What is the current status of research and development on transgenic rice and papaya?**

| Time | Topic and Contents | Responsibility |
|---|---|---|
| 8:00-8:30 h | Registration of Participants | Workshop secretariat |
| 8:30-8:45 h | Opening Workshop Speech | Prof. Dr. Bounteim PHISSAMAI, Minister to Prime Minister's Office President of the Science Technology and Environment Agency, Lao PDR |
| 8:45-9:15 h | Summary of objectives and activities of NBF Project and objectives of the workshop | Dr. Sourioudong SUNDARA, Director General, Research Institute of Science, STEA, Lao PDR |
| 9:15-9:30 h | Introductory remarks on the RIBios | Mr. Mirko Saam, biologist, RIBios, University of Geneva, Switzerland |
| 9:30-10:00 h | **Tea and Coffee Break** | |
| 10:00-10:15 h | Introduction to the Data base of NBF project by formulation of www.laobch.gov.la | Miss Viengpasith VANISAVETH, Research Institute of Science, STEA, Lao PDR |
| 10:15-10:40 h | How to make a transgenic plant | Mrs. Barbara Bordogna Petriccione, biologist, RIBios, University of Geneva, Switzerland |
| 10:40-11:20 h | Potential benefits for agriculture, health and environment | Dr. Chowpongpang, Plant Genetic Engineering Unit, Kasetsart University, Thailand |
| 11:20-12:00 h | Research and conservation of Biological Diversity of Rice variety in Lao PDR | Dr. Monthathip CHANPHENGXAY Deputy Director General, National Agriculture and Forestry Research Institute, Ministry of Agriculture and Forestry, Lao PDR |
| 12:00-13:30 h | **Lunch** | **STEA** |

| Time | Topic and Contents | Responsibility |
|---|---|---|
| 13:30-14:15 h | Development and deployment of transgenic rice at IRRI: Biosafety issues | Dr. Brar, Plant Breeder & Chair Institutional Biosafety Committee, IRRI, Manila, Philippines |
| 14:15-14:30 h | Discussion | |
| 14:30-15:00 h | **Tea and Coffee Break** | |
| 15:00-15:45 h | Current research on transgenic papaya in Thailand | Dr. Chowpongpang, Plant Genetic Engineering Unit, Kasetsart University, Thailand |
| 15:45-16:00 h | Discussion | |
| 16:00-16:15 h | Workshop Information | |

**Day 2 (October 22, 2003): What are the potential environmental and health risks related to transgenic plants? What are the current scientific uncertainties in biotechnology? What is the "Precautionary principle" and how can it be applied?**

| Time | Topic and Contents | Responsibility |
|---|---|---|
| 8:30-9:15 h | Potential risks for agriculture, health and environment | Mr. Mirko Saam, biologist, RIBios, University of Geneva, Switzerland |
| 9:15-9:30 h | Questions and discussion | |
| 9:30-10:00 h | **Tea and coffee break** | |
| 10:00-10:45 h | ASEAN Guidelines on Risk assessment of agriculture related genetically modified organisms (GMOs) | Dr. Sourioudong SUNDARA, Director General, Research Institute of Science, STEA, Lao PDR |
| 10:45-11:15 h | Discussion | |
| 11:15-12:00 h | Current scientific uncertainties in biotechnology | Mrs. Barbara Bordogna Petriccione, biologist, RIBios, University of Geneva, Switzerland |
| 12:00-13:30 h | **Lunch** | **STEA** |
| 13:30-14:15 h | The Precautionary Principle and its applications | Mrs. Barbara Bordogna Petriccione, biologist & Dr. Philippe Cullet, lawyer, RIBios, University of Geneva, Switzerland |
| 14:15-15:00 h | Socio-economic impacts of GMOs in developing countries | Dr Ashesh Kumar, Biotechnology and Biosafety Issues Consultant, India |
| 15:00-15:15 h | **Tea and Coffee Break** | |
| 15:15-16:00 h | Discussion on Genetically Modified Plants and their potential risks in Lao PDR | GENERAL DISCUSSION leaded by Dr. Sourioudong SUNDARA, Director General, Research Institute of Science, STEA, Lao PDR |
| | Workshop Information | |

**Day 3 (October 23, 2003): What are the current biosafety policies and regulations in China, Vietnam, India, Europe and USA ?**

| Time | Topic and Contents | Responsibility |
|---|---|---|
| 8:30-9:15 h | Chinese policies and regulations related to Genetically Modified Organisms | Ms. Jian-Ying Guo<br>Institute of Biological Control<br>Chinese Academy of Agricultural Sciences, Beijing, China |
| 9:15-9:30 h | Discussion | |
| 9:30-10:00 h | **Tea and Coffee Break** | |
| 10:00-10:45 h | Policy in agro-biotechnology research and development in Vietnam and introduction to the draft guidelines on biosafety regulations | Dr. Vu Duc Quang<br>Institute of Agricultural Genetics, Hanoi, Vietnam |
| 10:45-11:00 h | Discussion | |
| 11:00-11:45h | The ASEAN framework agreement on access to biological and genetic resources and fair and equitable sharing of benefits | Dr. Sourioudong SUNDARA, Director General, Research Institute of Science, STEA, Lao PDR |
| 11:45-12:00h | Discussion | |
| 12:00-13:00h | **Lunch** | **STEA** |
| 13:30-14:15 h | Indian policies and regulations related to Genetically Modified Organisms | Dr Ashesh Kumar, Biotechnology and Biosafety Issues Consultant, India |
| 14:15-14:30 h | Discussion | |
| 14:30-15:00 h | **Tea and Coffee Break** | |
| 15:00-15:45 h | European Union and United States policies and regulations related to Genetically Modified Organisms | Mr. Horace Perret, sociologist, RIBios, University of Lausanne, Switzerland |
| 15:45-16:00 h | Discussion | |
| 16:00-16:15 h | Workshop Information | |

**Day 4 (October 24, 2003): What does the use of commercial transgenic plants imply for agriculture, farmers rights and protection of traditional knowledge ? What is "Public Participation" and how could it be applied in Lao PDR ?**

| Time | Topic and Contents | Responsibility |
|---|---|---|
| 8:30-9:15 h | Commercial transgenic plants and Intellectual Property Rights | Dr. Philippe Cullet, lawyer, RIBios, School of Oriental and African Studies, London, United Kingdom |
| 9:15-9:45 h | Liability issues: a case study | Dr. Philippe Cullet, lawyer, RIBios, School of Oriental and African Studies, London, United Kingdom |
| 9:45-10:00h | Questions and discussion | |
| 10:00-10:30h | **Tea and coffee break** | |
| 10:30-11:15h | Report of Group discussion on the Public Awareness and Participation Issues from the First National Workshop on the Development NBF for Lao PDR, 03-05 Sep, 2003 | Mrs. Lavanh SOUTHISAN, Deputy Director General, Cabinet of Lao Women's Union, Lao PDR |
| 11:15-12:00h | Public participation: an introduction | Mr. Horace Perret, sociologist, IMédia, Lausanne, Switzerland |
| 12:00-13:00h | **Lunch** | |
| 13:30-14:15 h | Public participation: case studies (Switzerland and India) | Mr. Roger Gaillard & Mr. Horace Perret, IMédia, Lausanne, Switzerland |
| 14:15-14:30 h | Questions and discussion | |
| 14:30-15:00 h | **Tea and Coffee Break** | |
| 15:00-16:00 h | Round table discussion on Public Participation obstacles and opportunities in Lao PDR | GENERAL DISCUSSION leaded by Mrs. Lavanh SOUTHISAN Mr. Khampadit KHAMMOUNHEOUG M. Perret & M. Gaillard |
| 16:00-16:15 h | Written evaluation by the participants | |
| | Closing of the workshop | |

## EVALUATION

At the end of the workshop, participants were asked to evaluate the topics presented as following:

1 = Not Useful or interesting
3 = Useful or interesting
5 = Very Useful or very interesting

| RATING | TOPIC |
|---|---|
| 4,4 | Summary of objectives and activities of NBF Project and objectives of the workshop |
| 4 | Introductory remarks on the RIBios |
| 3,7 | Introduction to the Data base of NBF project |
| 4,4 | How to make a transgenic plant |
| 4,3 | Potential benefits for agriculture, health and environment |
| 4,2 | Research and conservation of Biological Diversity of Rice variety in Lao PDR |
| 4,2 | Development and deployment of transgenic rice at IRRI: Biosafety issues |
| 4,1 | Current research on transgenic papaya in Thailand |
| 4,3 | Potential risks for agriculture, health and environment |
| 4,3 | ASEAN Guidelines on Risk assessment of agriculture GMOs |
| 4,2 | Current scientific uncertainties in biotechnology |
| 4,2 | The Precautionary Principle and its applications |
| 4,2 | Socio-economic impacts of GMOs in developing countries |
| 4,3 | Discussion on Genetically Modified Plants and their potential risks in Lao PDR |
| 4,2 | Chinese policies and regulations related to Genetically Modified Organisms |
| 4,1 | Policy in agro-biotechnology research and development in Vietnam and introduction to the draft guidelines on biosafety regulations |
| 4,1 | The ASEAN framework agreement on access to biological and genetic resources and fair and equitable sharing of benefits |
| 4 | Indian policies and regulations related to Genetically Modified Organisms |
| 4,1 | European Union and United States policies and regulations related to Genetically Modified Organisms |
| 4,2 | Commercial transgenic plants and Intellectual Property Rights |
| 4 | Liability issues: a case study |
| 3,9 | Report of Group discussion on the Public Awareness and Participation Issues from the First National Workshop on the Development NBF for Lao PDR, 03-05 Sep, 2003 |
| 4,1 | Public participation: an introduction |
| 4,2 | Public participation: case studies (Switzerland) |
| 4,4 | Round table discussion on Public Participation obstacles and opportunities in Lao PDR |
| | **GENERAL IMPACT OF THE WORKSHOP** |
| 4,1 | Improve your understanding of GMOs |
| 4,2 | Improve your understanding of biosafety |
| 4 | Improve your knowledge of the present situation regarding GMO in surrounding countries |
| 4,1 | Improve your knowledge of public participation |
| 4,1 | How useful was the workshop for you as an individual |
| 4 | How well organised was the workshop |
| 3,8 | Was the translation useful for your understanding of the presentations |
| 3,8 | How did you find the balance of presentations and discussions |
| 4 | Overall, how would you rate the workshop |

**INVITED PARTICIPANTS**

(absent)

## I. National Executing Committee (NEA)

| | Name and Family name | Position | Organization |
|---|---|---|---|
| 1. | Mr. Sitha POUYAVONG | Acting Director General, Cabinet | STEA |
| 2. | Mr. Khamphanh THAMPHITHAK | Director General, DOST | STEA |
| 3. | Mr. Soukata VICHIT | Director General, DOE | STEA |
| 4. | Mr. Nheune SISAVAD | Director General, DISM | STEA |
| 5. | Mr. Bouathong SINGHARAJ | D.D.G, RIS | STEA |
| 6. | Mr. Pho MUANGNALAD | Director General, TRI | STEA |
| 7. | Ms. Monemany NHOYBOUAKONG | Acting Director General, ERI | STEA |
| 8. | Dr. Sourioudong SUNDARA | Director General, RIS | STEA |

## II. National Co-ordination committee (NCC)

| | Name and Family name | Position | Organization |
|---|---|---|---|
| 1 | Mr. Somphone PANOUSITH | D.G Cabinet | National Science Council |
| 2 | Mr. Bounliep CHOUTHAVONG | D.D.G | DoA, MAF |
| 3 | Dr Monthathip CHANPHENGXAY | D.D.G | NAFRI, MAF |
| 4 | Mr. Bounfeng PHOMMALAYSITH | D.D.G Cabinet | MoH |
| 5 | Mr. Bouavanh KEODALA | D.D.G Cabinet | MoE |
| 6 | Mr. Chandeng KEOPASEUTH | D.D.G Cabinet | MIH |

| | | | |
|---|---|---|---|
| 7 | Mr. Silisamphane VORACHIT | D.D.G Cabinet | MoT |
| 8 | Mr. Ketkeo AXAKHONGMUANG | D.D.G Cabinet | MoJ |
| 9 | Mr. Bounhom CHANTHAMATH | D.D.G | DoMA, MIC |
| 10 | Mr. Bounsoum SOMSIHAKHOM | D.D.G | DoT, MCTPC |
| 11 | Ms. Lavanh SOUTHISAN | D.D.G Cabinet | Lao Women's Union |

## III. Technical Working Group (TWG)

| | Name and Family name | Position | Organization |
|---|---|---|---|
| 1 | Mr. Viengkhong SIHALATH | D.D of RDC | STEA |
| 2 | Mrs. Somvath KEOKHAMPOUI | Official | National Science Council |
| 3 | Mrs. Kongpanh KANYAVONG | Researcher | NAFR |
| 4 | Dr. Bouakham TOUNALOM | Staff | MoH |
| 5 | Dr. Keovivone OUTTHACHACK | Official | MoE |
| 6 | Mr. Virasack CHUNDARA | Deputy Head | MIH |
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| 8 | Ms. Vantthala DOUNGMANYVANT | Legal official | MoJ |
| 9 | Mr. Samlane LAUNGAPHAY | Deputy Head | MIC |
| 10 | Mr. Vanhthong SOMPHAVATH | Director of IWT Division | MCTPC |
| 11 | MS. Bouathip MANYVONG | Official | Lao Women's Union |

## IV. Lecturers and Participants

| | Name and Family name | Position | Organization |
|---|---|---|---|
| 1 | Mr Phetsana CHOUMMANIVONG | Chief cabinet | CMS/MOH |
| 2 | Mr Khamxay SANYKEO | Staff | MOD |
| 3 | Mr Thongvanh BOUNBOUATHONG | D.D Deputy | Lao T.V |
| 4 | Mr Soukaseum CHANTHAPANYA | Technical | ERI |
| 5 | Yong CHANTHALAVGSY | Deputy Director General | MOFA |
| 6 | Xayprani CHANTHALANGSY | Translator | KPL |
| 7 | Dr Manivone SISAVENGSOUK | Chief Quality Division | Factory N: 3 |
| 8 | Mr Syphone KEOSAMAY | Staff | MOD |
| 9 | Mr Monetry PHOTIMAMH | Deputy of off | CMS |
| 10 | Mr Lemthong LATHDAVONG | Teacher | NUOL |
| 11 | Mr Vaisana SICHALEUN | Technical staff | Section of Agriculture |
| 12 | Mr Suene SOUANG | Director of Agriculture of Extension v.t | |
| 13 | Khampha K.N | Chief of technical Section | NSC |
| 14 | Mr Sounnadeth SOUKCHALEM | officer | STEA |
| 15 | Dr Sing MENORATH | Vice dean | FMS(NOUL) |
| 16 | Lasamy VONGSACK | Dir. FDQCC | FDQCC |
| 17 | Dr Thiphavong BOUPHA | Economist | Lao IRRI |
| 18 | Mr Khampadith | Director | STEA |
| 19 | Mr Sisouphanh NAKASENE | Head of Animal feed | Ministry of |

| | | Laboratory | Agriculture |
|---|---|---|---|
| 20 | Dr hanesila PHOUDASEUT | Senior staff | Center for lab |
| 21 | Mr Vangkham SAYARACK | Official | Lao trade Union |
| 22 | Sithonh DAOPHASITH | Official | STEO |
| 23 | Mr Boualy VONGVISITH | Official | RIS |
| 24 | Mr Nakhonekham | official | RIS |
| 25 | Ms Khambang THIPPAVONG | official | RIS |
| 26 | Ms Chanhsamone KONGSAVANH | official | RIS |
| 27 | Mr Somsanith DUANGPASEUTH | official | RIS |
| 28 | Mr Khamsing L | Deputy chief of Div | FDD |
| 29 | Mr Bounmark | Staff | NA |
| 30 | Mr Louis | Teacher | NOL |
| 31 | Mr Thongvansy | Chief of environment | Health Department |
| 32 | Ms Viengkham SENGSOULIVONG | Staff | DOA |
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| 34 | Mr Vienthong | Official | |
| 35 | Ms Malaychanh PHOMMASATHITH | Official | DOA |
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| 38 | Ms Sivilay | official | M.TERIO |
| 39 | Tray KHOUANE | | Center for lab |
| 40 | Prenille M.DYG | Food Security and | FAO |

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| 41 | Ms Somsamay | Official | RIS |
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| 46 | Ms Somphavanh RADAVANH | Official | STEA |
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| 49 | Mr Kosonh | Official | STEA |
| 50 | Mr Sengchanh PHASAYASENG | Official | STEA |
| 51 | Mr Khamtume KEOHAVONG | Official | STEA |
| 52 | Mr Vanxay | Official | STEA |
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| 57 | Mr Manoluck VANTHANOUVONG | Official | TMRC |
| 58 | Mr Vichit LAMXAY | Teacher | Faculty of Science (NUOL) |
| 59 | Mr Waykham | | |
| 60 | Mr Phou MA | Official | STEA |
| 61 | Mr Thilaphong OUDOMSINE | Programme Analyst | UNDP |