

Utilisation of plants for non-food uses: Challenges and perspectives: Summary report of the ABDC-10 parallel session¹

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1- Ivan Ingelbrech - IPBO, Ghent University, Belgium

“Perspectives on non-food applications of biotechnologies”

2- Luis Herrera Estrella - Langebio, Cinvestat, Mexico

“Non Food/Feed Uses of GM Plants”

3- Jonathan Gressel -Weizmann Inst of Science & TransAlgae Ltd, Israel

“Marine microalgae for meeting global needs for feed & energy”

4- Antonio Paes de Carvalho – Extracta Moleculas Naturais SA, Brazil

“Biodiversity-related Bioenterprise Development in Brazil “

Participants: 45 persons

The first two contributors provided a general overview of non-food uses for plants and the last two are entrepreneurs in the field and presented two cases studies.

Ivan Ingelbrech discussed the perspectives of bioeconomy to address global challenges such as population growth and environmental degradation both in the OECD countries and sub-Sahara Africa.

Luis Herrera discussed the present and future applications of transgenic plants for non food/feed uses. He highlighted add value applications such as production of molecules of pharmaceutical and industrial uses, biodegradable polymers, biofuels, specialty oils, and also environmental sanitation applications such as bioremediation.

Jonathan Gressel presented the case study of genetic engineering marine microalgae for meeting global needs for feed and energy. He concluded that Marine microalgae are: (i) excellent fishmeal substitute; (ii) do not compete for land and water; (iii) can sequester industrial carbon dioxide; (iv) are efficient fertilizer; (v) have high productivity; and (vi) can generate multiple products.

However, to be used, microalgae need domestication for reliability, productivity and composition and this can be achieved via gene engineering.

Antonio Paes de Carvalho presented the case study of the development of a biodiversity-related bioenterprise in Brazil. He discussed the different steps to adding pharma value to biodiversity from the regulatory background to market and return of benefits.

Antonio submitted that biodiversity-related biotech projects are an excellent mechanism to operate the transfer of technologies to the farmer and to local biotech enterprises and that biotech companies arising as spin-offs of academia in developing countries should be regarded as a prime target for high-tech biotechnology transfer to these countries. In this way research, technological development and appropriate innovation would actually reach developing countries. He concluded that small biotech enterprises in developing countries share with the small farmers similar problem of growth and should be treated accordingly by international organizations that purport to make biotech a tool to help the poor.

¹ This is the summary report of the parallel session organized by the United Nations Industrial Development Organization (UNIDO) on the third day of the FAO international technical conference on Agricultural Biotechnologies in Developing Countries (ABDC-10) that took place in Guadalajara, Mexico on 1-4 March 2010 (<http://www.fao.org/biotech/abdc/parallel/en>).

During discussion the panelist and participants identified the following constraints for the adoption of 'white' biotech:

- 1- Current policies are not conducive for adding economic value to biodiversity and concomitant bio-business development
- 2- State funding and private venture capital are currently inadequate for bio-business development
- 3- There is considerable lack of awareness of the opportunities opened up by biotechnology for industrial applications

The general conclusions of the discussion are:

- 1- Non-food biotech applications are amenable for socio-economic development, particularly in rural areas, provided they do not compete with food production
- 2- Increasing crop production is only part of the solution to reduce poverty. There is need to move away from subsistence farming to systems that make agriculture a vehicle for generating higher standards of living and, thus better health.
- 3- Biotechnology offers new opportunities to add value to genetic resources and, therefore, inability to access genetic resources constitutes opportunity loss.

The recommendations to overcome constraints identified and other concerns are:

- 1- Industrial applications of biotechnology should not compete with food production.
- 2- Preferably non-edible products should be produced in non-food crops. Food crops for the production of industrial products should only be used provided they do not compromise human and environmental safety. Adequate safety assessment on a case by case basis is a necessary pre-condition.
- 3- Policies that promote the establishment of appropriate infrastructures for the adoption of new technologies through North-South and South-South partnerships should receive more attention by policy makers and international donors
- 4- Initiatives for generating awareness on the opportunities offered by new technologies and the management of intellectual property assets should become a priority in capacity building programmes.

Although not explicitly referred in this parallel section, it is worth to mention a recent initiative of UNIDO as it addresses the constraints and recommendations raised during the discussion. The International Industrial Biotechnology Network (IIBN) is dedicated to assist countries in accessing and developing biotechnologies for sustainable industrial development.

IIBN will achieve its goals through the following actions:

- 1-Developing demand-driven projects
- 2-Offering institutional capacity building through specialized training in research and areas deemed critical for product development and technology adoption, and,
- 3-Raising awareness of governments and industry of the opportunities and challenges posed by the emergence of bio-based industries.