

BIOTECHNOLOGY MUST BENEFIT ALL

(Extract from a report to the FAO Committee on Agriculture (COAG) delivered in Rome in January 2001)

While respecting ethical concerns, governments should recognise biotechnology's potential for increasing food supplies and alleviating hunger. Agriculture must feed an increasing human population forecast to reach 8000 million by 2020.

Although the rate of population growth is steadily decreasing, the increase in absolute numbers may be such that the carrying capacity of agricultural lands could soon be reached, given current technology. But if properly focused, new technologies – such as biotechnologies – offer a responsible way to enhance agricultural productivity today and in the future.

Biotechnology could help solve many problems limiting crops and livestock production in developing countries. For example, biotechnology-derived solutions for biotic and abiotic stresses, built into the genotype of plants, could reduce use of agrochemicals and water, thus promoting sustainable yields.

However the Food and Agricultural Organisation (FAO) says, national programmes need to ensure that biotechnology benefits all sectors, including resource-poor rural populations, particularly in marginal areas where productivity increases will be more difficult to achieve. A number of issues are of special concern to developing countries aiming at increasing their involvement in biotechnology and thus developing their agricultural sectors. For FAO, they include:

- **Setting priorities**

Biotechnology expertise should complement existing technologies and be output-driven. Since biotechnology is often more expensive than conventional research, it should be used only to solve specific problems where it has comparative advantage. In many developing countries, funding for research in agriculture is being reduced, and often research is being privatised, with the consequent risk that it could be aimed mainly at

resource-rich farmers. In addition to technical considerations, priority setting should take into account national development policies, private sector interests and market possibilities. Different stakeholders should be involved in the formulation of national biotechnology strategies, policies and plans.

- **Infrastructure and capacity**

For research to be truly productive there must be a critical mass of expertise, knowledge and facilities. Biotechnology is no exception. Biotechnology research requires skilled staff, backed up by well-equipped laboratories with proper working conditions, a constant supply of good quality water, a reliable electricity supply and organised institutional support. A minimal technology base is needed to adapt technology tried and tested elsewhere to local ecological and production conditions. Biotechnology research needs strong and organised outreach services and suitable institutions and infrastructures to facilitate its application.

- **Intellectual property rights (IRPs)**

Under the World Trade Organisation's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), most processes and many products of biotechnology research are patentable. Since most biotechnology research is conducted in industrialised countries, very often by private companies, developing countries may have to pay to use a new procedure or product. IPRs are critical for growth of the biotechnology industry, and lack of patent protection in a country can limit access to the results of biotechnology originating elsewhere. The issues are complex, with implications for trade, technical investment and access to biotechnology outputs. Countries need to evaluate carefully their positions and, as appropriate, introduce legislation foreseen in the WTO Agreement. In particular, they will need to evaluate the most appropriate form of protec-

tion for plant varieties.

- **Biosafety, food safety and the environment**

Potential environmental hazards from new products of biotechnology, mainly involving genetically modified organisms (GMOs), have raised concerns that companies may use developing countries as 'test sites' for their products. Some of the potential environmental risks concern plant pests, while gene escape from GMOs could result in increased weediness in the occurrence of weeds with resistance to certain agrochemicals. Another concern about GMOs is the possible inadvertent production of toxins and allergens. FAO says developing countries need assistance in developing appropriate legislation and setting up regulatory bodies for all aspects of biosafety. National legislation must be consistent with international instruments and reflect national positions.

- **Biodiversity issues**

Biotechnology can contribute to the conservation, characterisation and utilisation of biodiversity, thus increasing its usefulness. Some techniques such as *in vitro* culture are very useful in maintaining *ex situ* germplasm collections of plant species that have asexual propagation (e.g. bananas), important for the preservation of animal biodiversity through cryopreservation of semen and embryos, couples with embryo transfer and artificial insemination. At the same time, however, biotechnology may reduce genetic diversity indirectly by displacing landraces and their inherent diversity as farmers adopt genetically uniform varieties of plants and other organisms.

- **Export substitution**

Some products with a high export value for some developing countries, could be substituted by products with similar properties (e.g. copra-quality oil from grape seed) obtained by genetic modification of other crops or through *in vitro* techniques. Such

products could alter the competitive position of traditional crops, affecting existing trade patterns and consequently the food security of many developing countries that rely on agricultural export revenues.

- **Ethical aspects**

Biotechnology is more than just a scientific issue – it is seen by some as 'interfering with the workings of nature and creation'. In priority setting, all concerns must be clearly balanced, respecting ethical aspects but recognising biotechnology's

potential for increasing food supplies and alleviating hunger. Many ethical issues are now being debated in the context of IRP legislation but others remain unresolved. Since such issues are largely related to cultural background and levels of public perception and awareness, decisions on the use of specific technologies should respect socio-economic realities.

- **Marketing**

Biotechnology is increasingly market and demand driven, and most of its products result from research and

development investments by the private sector in developed countries. There is little point in developing a new technology if there is no market for the product. The same is valid for new varieties of plants and new breeds of animals, new vaccines and diagnostic kits. Market studies are fundamental in defining which ventures should be undertaken. Given that commercial considerations may not necessarily reflect social concerns and needs, there remains a pivotal role for public sector research.