

FAO
Viale delle Terme di Caracalla
00100 Rome, Italy

Tel.: (+39) 06 57051
Fax: (+39) 06 57053152
Internet: www.fao.org

Report of the
PANEL OF EMINENT EXPERTS
ON ETHICS IN
FOOD AND AGRICULTURE

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Foreword

In a world that boasts the productive capacity to feed its entire population, the persistence of chronic food insecurity and widespread poverty is an unacceptable reality. The failure to provide basic needs and access to adequate food for 800 million people is perhaps the most urgent human problem today – all the more so because the possible solutions have many ethical dimensions. If we are to succeed in building a food-secure world for both the present and future generations, it is essential to approach the vitally important subjects that fall within FAO's mandate – food security and sustainable management of the earth's productive resources and ecological systems – with a deeper understanding of their ethical dimension.

A year ago, I established the independent Panel of Eminent Experts on Ethics in Food and Agriculture to advise FAO on key ethical issues of relevance to its work as well as to help raise the level of public awareness and understanding of ethical considerations. I am delighted that an eminent and authoritative group of experts, representing all regions of the world and a range of relevant disciplines, has agreed to serve on the Panel. Their contribution to the work of our Organization and to the broader public debate is highly significant at a time when major developments in food and agriculture, including accelerating technological advances, changes in the resource base and evolving economic and market mechanisms, have brought a variety of ethical questions to the top of the international agenda. Today's rapid technological advances are producing very powerful tools, some of which are capable of bringing about changes that could prove irreversible. Science offers us many new technologies; humanity demands serious ethical consideration of why and how they are to be applied, particularly with respect to food security and poverty reduction measures.

Following its first session in September 2000, the Panel of Eminent Experts prepared the present report, which is at once measured and thought-provoking. In it, the Panel addresses the major ethical issues and challenges that the world faces and that concern FAO's fields of expertise, including questions related to genetically modified organisms in food and agriculture, forestry and fisheries.

Our understanding of ethics and human rights in the context of hunger and poverty is in a relatively early stage of development. By providing a neutral forum for the deliberations of the Panel, therefore, FAO has taken

a positive step forward. The views expressed – some of which may be controversial – and the conclusions reached in this report are those of its independent members, and are not necessarily shared by the Organization or its member countries. Nevertheless, I am convinced that the points raised will make an important contribution to international discussion and public appreciation of the important global issues involved.

I am determined that FAO's expertise, knowledge and experience, and above all the neutral forum it offers, should continue to stimulate an informed, rational debate that furthers our understanding of relevant ethical questions and facilitates full consideration of their implications by decision-makers at all levels. Furthermore, I trust that serious and objective reflection on the ethical dimension of food and agricultural development will spur immediate and lasting advances in world food security and poverty alleviation. ●



Jacques Diouf
FAO Director-General



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Abbreviations

DNA

deoxyribonucleic acid

ECOSOC

Economic and Social Council (UN)

GMO

genetically modified organism

GNP

gross national product

GURTs

Genetic Use Restriction Technologies

IPRs

intellectual property rights

LMO

living modified organism

NGO

non-governmental organization



Introduction

ESTABLISHMENT AND TERMS OF REFERENCE

The Panel of Eminent Experts on Ethics in Food and Agriculture was established by the Director-General in accordance with Article VI.4 of the FAO Constitution and Rule XXXV of the General Rules of the Organization, for a period of four years as of 1 January 2000. Its Terms of Reference, to raise public awareness and advise the Director-General on ethical issues in food and agriculture, are provided in Annex 1.

MEMBERSHIP

The Director-General appointed eight eminent experts from different scientific and other disciplines to serve on the Panel in their personal capacity for four years. The members of the Panel are Mr Francisco J. Ayala from the United States, Ms Chen Chunming from China, Mr Asbjørn Eide from Norway, Ms Noëlle Lenoir from France, Mr Mohammed Noor Salleh from Malaysia, Mr Mohammed Rami from Morocco, Ms Lydia Margarita Tablada Romero from Cuba and Mr Melaku Worede from Ethiopia. A summary biography for each Panel member is contained in Annex 2.

ORGANIZATION OF WORK

The Panel held its first session at FAO headquarters in Rome from 26-28 September 2000. The Director-General had requested Mr Asbjørn Eide to serve as Chair of the first session. At the end of that session, the Panel requested Mr Eide to continue to function as Chair for the four-year duration of the Panel.

The Panel adopted the draft agenda with the understanding that slight revisions could be made during the session. It discussed three main themes: i) the basic ethical concerns flowing from its Terms of Reference; ii) ethical issues in food and agriculture; and iii) biotechnologies and genetically modified organisms in relation to the consumer, food safety and the environment.¹ Future work was also discussed. The Agenda of the Panel's first session is provided in Annex 3. ●

¹ The secretariat provided the Panel with draft versions of the FAO Ethics Series Nos 1 and 2, entitled *Ethical issues in food and agriculture* and *Genetically modified organisms, consumers, food safety and the environment*.

Basic ethical concerns

In its Terms of Reference, the Panel is requested both to reflect on and to promote reflection on ethical issues arising from food production and consumption practices and on agricultural development, including forestry and fisheries. This is to be done in the context of food security, sustainable use of natural resources, the safeguarding of biodiversity and a balanced mix of traditional and modern technologies to increase food security and sustainable agriculture.

The Panel considered that the fundamental ethical commitment of FAO is to ensure humanity's freedom from hunger and the access of everyone to adequate food, as stated in the Organization's Constitution and subsequent commitments. It also noted that, while the aim of conservation and sustainable management of natural resources for present and future generations was not expressly stated in the Constitution, in practice it has become a major concern of FAO.

The Panel noted that some differences of opinion exist in the world today concerning ethical values, including *utilitarian* versus *libertarian* approaches and ethical assessments of *actions* versus ethical assessments of *consequences* or *outcomes*. Cultural differences also influence ethical positions. Common ground, however, can be found in the Universal Declaration of Human Rights; since this was adopted in 1948, there has been one basic value framework that spans cultures, religions and ideologies.

The Universal Declaration of Human Rights is a comprehensive package of concerns in which the separate rights encompassed are considered to be interdependent and indivisible. Among them is the right to an adequate standard of living, including food. The Declaration also includes the right of everyone to benefit from the achievements of modern science and technology.

Article 1 of the Declaration lays the foundation by stating not only that everyone is born free and equal in terms of dignity and rights, but that everyone is endowed with reason and conscience and should act towards one another in a spirit of brotherhood. Particularly relevant to the ethical assessment of the Panel are the values of food, human health, natural resources and nature itself. In sum, ethics requires people to go beyond self-interest and to care for one another. It requires people to care for the earth and to be prepared to share common resources. However, it must be taken into account that, in practice, these values can be conflicting. The respect for life is fundamental to ethics. Therefore, food and the guarantee of access to adequate supplies by everyone are among the top priorities in the hierarchy of human values.

The Panel took into account the comparative advantage of FAO in addressing ethics in food and agriculture, and it also considered the division of labour among different UN agencies. Central to FAO's mandate is the realization of the right to food, which is defined by the UN Committee on Economic, Social and Cultural Rights² (General Comment No. 12, paragraph 8) as follows:

The availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, a free from adverse substances, and acceptable within a given culture. Such food should be accessible in ways that are sustainable and that do not interfere with the enjoyment of other human rights.

Despite the fact that the international community has frequently reaffirmed the right of everyone to be free from hunger, the stark fact is that more than 840 million people throughout the world, most of them in the developing world, are chronically hungry. The root of this immense problem of hunger and malnutrition is not a global lack of food, but rather a *lack of access* to food. Inadequate access to food is mainly due to poverty and the vast income gap between the rich and the poor in the world, and it is exacerbated by situations of armed conflict and environmental degradation.

The most urgent ethical task is to assess activities relating to food and agriculture in the light of their actual and potential impact on the reduction of poverty, hunger and malnutrition. ●



² The UN Committee on Economic, Social and Cultural Rights is a body of independent experts set up by the Economic and Social Council (ECOSOC) to monitor the implementation of the International Covenant on Economic, Social and Cultural Rights. It adopts from occasional General Comments, which serve as an interpretation of, or guidance to, the obligations by states under the Covenant. Such interpretative General Comments have been adopted on, *inter alia*, the right to food, the right to health, the right to housing and the right to education. The texts of these General Comments are available on the Web site of the Office of the UN High Commissioner for Human Rights, <http://www.unhchr.ch/>.

Ethical issues in food and agriculture

In conformity with its terms of reference and the considerations set out in the preceding section, the Panel explored a number of areas where ethical considerations may contribute substantially to the alleviation of widespread hunger and food insecurity in the world. The term “ethical consideration” implies that the guiding motivation is not the performer’s own benefit but the benefits afforded to others. The “performer” may be an individual or a group, such as a corporation, a non-governmental organization (NGO) or a government. Those whose benefits are taken into account may be other individuals or groups, whether or not they transcend national boundaries.

OBSERVATIONS AND ISSUES OF CONCERN

The impact of human population growth and demographic shifts

■ The world’s population is projected to reach approximately 9 billion by 2050. Global population growth has already contributed to a serious loss of biodiversity and will pose serious ethical challenges to food production and distribution in the future. Family planning measures are urgently needed but should be implemented in ways that are compatible with human rights. The Panel noted with concern that some religious and political leaders remain opposed to effective family planning and related measures.

■ The Panel observed that overpopulation in developing countries is both a function and a cause of poverty. Reducing the gap between the affluent and the poor within and among countries, and ensuring that everyone has access to education are two ways to assist in controlling population growth. Further measures would also be of help – an important one being to ensure that women are granted equal access to schooling and equal opportunities to participate in the economy. With increased educational opportunities for women, population growth rates have been significantly reduced.

The impact of disease on food and agriculture

■ Diseases such as malaria and AIDS have a direct impact on the ability of human communities to carry out activities related to food and agriculture. In addition, indirect impacts of disease can result from poor handling and post-harvest processing, etc. in food production, often brought about by intensification and changes in agriculture that may be inappropriate to local conditions and practices.

Pressure on natural resources

■ In many areas of the world, plant and animal genetic resources and land, air, water, forest and wetland resources – the renewable natural resources on which human life depends – are being rapidly degraded. Pressures on natural resources arise because of conflicts between long-term and short-term interests, economic and social interests, local and regional priorities, and between the needs of present and future generations. There is a propensity to short-term approaches, whereas the management of resources calls for a long-term approach. Furthermore, current market and political forces may not take sufficient account of future generations, as they do not consume or vote. Corrective measures need to be implemented to secure rights for people in the future, for example an ombudsman or similar institution that can safeguard the interests of future generations.

Gaps and differences

■ The Panel considered many gaps and differences that could generate inequities and conflicts: the gaps between the affluent and the poor; between the food-secure and the food-insecure; between those with access to education and technology and those without; between the winners and the losers in the process of globalization. Cultural differences must also be taken into account. Action aimed at improving conditions for the present generation can conflict with the needs of future generations. Ethics calls for efforts to reduce these gaps and to balance the different interests in a fair way.

Economic globalization requires cooperation in global governance

■ Far too many of the world's people remain marginalized, and the gap between the poorest and the most affluent groups is growing. The Panel noted there are serious power imbalances arising from the concentration of economic power in the hands of a few. Institutions are not yet in place to ensure that these imbalances are properly addressed and existing international mechanisms are too weak. UN Member States should cooperate through the UN system, including FAO, to develop a rule-based framework for global governance based on ethical considerations. Increased linkages with civil society, facilitated by modern communication technologies such as e-mail and the Internet, can strengthen the decentralized global governance system that is now emerging.

■ The aim should be to move towards a decentralized global society, where interdependence is recognized but where individuals can enjoy their personal autonomy and dignity and states can preserve their sovereignty within a framework of global cooperation. An ethical food and agriculture system must also move away from unrestricted free trade, in which powerful forces are able to impose their rules in the marketplace, towards an ethics-based trade system that provides for a participatory mode in the establishment and implementation of rules.

ADVICE AND SUGGESTIONS

Ecosystem management



The Panel noted that agro-ecosystem management is not addressed comprehensively, either in FAO or elsewhere. The different sectors involved are too isolated, and additional problems arise when land use planning is discounted or not respected and when planning is biased in favour of immediate gains. Consequently, there is a need for corrective mechanisms. Multinationals sometimes pressure governments to abstain from enacting or enforcing required national legislation, under the threat of investing elsewhere. The Panel noted the efforts now under way in the UN Sub-Commission on the Promotion and Protection of Human Rights to develop a code of conduct for multinational corporations, and called upon FAO to assist the Sub-Commission in its work so as to ensure the inclusion of guidelines concerning the operations of such corporations in food and agriculture. The Panel also noted that FAO is continuing to work on a draft Code of Conduct on Biotechnology as it relates to Genetic Resources for Food and Agriculture, requested by member countries.



When short-term interests take precedence, the result can be a loss of long-term benefits and the need for costly restoration work in the future. But short-term and long-term benefits may be compatible if both receive adequate recognition in the management of the resource. Natural resources must be managed for multiple objectives, including economic, social, ecological and dietary factors. Another problem arises from the fact that decisions are often made remotely by persons who are not directly dependent on or knowledgeable about the resources concerned. Ethical considerations require that, to the extent possible, those who are affected by decisions should participate in the decision-making process, which must be open and transparent. Such considerations may need to be enforced by international agreement. In this case, FAO's work on criteria and indicators for sustainable forestry could serve as an example.

Buffering the negative consequences of agricultural intensification



Once largely the province of smallholders, today agriculture is becoming an increasingly large-scale business in many parts of the world. Among the many issues involved in this process is the concern that input providers may gain too much control over the rights of local farmers. The improvement of sustainable production in agriculture, including forestry and fisheries, should generally be beneficial to all. In this respect, the Panel pointed out that the way in which intensification is undertaken is critical. Participation in the overall process, including decision-making, needs to be broad and equitable.



During the process of change, various factors need to be addressed. For example, alternatives for displaced workers and other community members need to be found. In the face of

unpredictable environmental changes and human needs, traditional and modern farming methods need to be reconciled in order to maintain indigenous knowledge of diversified farming systems and biodiversity.



If they are properly empowered, farmers can make their plant varieties and animal breeds more competitive. Data banks may be developed to record cultural traditions of agriculture. Traditional technologies may be combined with new technologies so that farmers can advance beyond subsistence farming in a sustainable manner. Ethical guidelines for decision-making during the process of change are needed, and ways should be sought to make productive use of available human resources. There should be more direct links between farmers and policy-makers; in this context, the Panel referred to the text on Farmers' Rights, agreed on by governments during the current negotiations for the revision of the International Undertaking on Plant Genetic Resources. The text stipulates that States Parties shall take measures to protect and promote Farmers' Rights, including the right to participate in decisions on matters related to plant genetic resources for food and agriculture.



It is important to recognize the additional values arising from farming beyond the monetary gains, but which regrettably are sometimes neglected in the intensification of agriculture: farming contributes to the conservation and development of biodiversity, and to the adaptation of biodiversity with changing conditions.

Counteracting the negative consequences for agricultural research of the concentration of economic power



Economic power is becoming more concentrated – the world's 200 largest transnational corporations now account for a quarter of the world's economic activity. The Panel noted that this huge disparity in economic power negatively affects funding for development. Resources are moving towards private interests and away from public institutions. There is even a growing risk, strengthened by contemporary policies in many areas, of public resources being diverted to support private sector priorities. An example is when limited funding from industry leads to changes in the priorities of university research, while the university continues to use the infrastructure and professional staff paid by the government. The Panel also expressed concerns about the concentration of proprietary rights and the overextension of intellectual property rights (IPRs).



Economic power is accompanied by power over, and access to, technological development and research. To an increasing extent, research supports economic rather than social interests, and the results achieved are sometimes made exclusive through excessive claims of intellectual property. It is essential for FAO to continue to promote and safeguard Farmers' Rights and to encourage equal distribution of the benefits of research related to genetic resources in developing countries.



The public sector needs to receive more funding in order to secure broad coverage of open and generally accessible agricultural research. Furthermore, research should not be focused solely on topics where economic profits are foreseen. Social issues also need to be addressed in agricultural research. Research and development should be directed more towards food production and distribution in developing countries, and the benefits generated should be shared with poor farmers in these countries. Farmers should also be enabled to participate more actively in such research, and information should be shared widely – the Panel noted that there is a lack of North-South cooperation and sharing of resources and information.



The Panel called upon FAO to encourage greater investment of public resources in agricultural research and to increase countries' awareness of the advantages in carrying out research that will enhance economic development of the poorer sections of agriculture and make it possible to share the results achieved. Given that changing the concentration of power will be a difficult task, continued efforts are needed to raise the alarm and awaken multinationals to their social responsibilities. A suggestion was made to consider taxing multinationals in support of more balanced research. The Panel also recommended that FAO should encourage rich countries to fulfil their commitment to increase their development assistance to 0.7 percent of their gross national product (GNP).



NGOs are often strong advocates of balanced agricultural research. FAO should document alternative methods and approaches and disseminate this information widely. Although it may be difficult to influence economic policy, history has shown that, with time and commitment, dramatic changes can take place and situations gradually be improved.

Information and education



The universal human right to education is essential for the achievement of food security. Information flows and education can be harnessed to meet the ethical imperative of empowering those who are currently vulnerable. Access to information is highly unequal at present, but it can and should be broadened. In this respect, education institutions can be of great help. Although education is important, it is rarely neutral, and usually has aims and directions built into it. However, provided ethical considerations are taken into account in the structuring of its content and methodology, education may influence people to make the right ethical choices later in life. It also has an important role in helping people to make informed decisions regarding new technologies. Education needs to be adapted to different cultural contexts, and it is important for local communities to have more voice in the planning of education systems.



Farmers' field schools can contribute to the exchange of information among farmers. As part of its responsibility to promote agricultural education, FAO can assist in enabling local

communities to produce a greater variety of crops and to use more efficient methods, since a diversity of farming systems and crops is conducive to greater food security. FAO should encourage the formation of technological research institutions in developing countries and enhance these countries' capacity for technological independence.



FAO can play a role in promoting local species that offer increased productivity and it can provide information in support of food and livelihood security and dietary diversity. Documentation is needed on different farming strategies for *in situ* conservation and on ways to minimize risks, thus building on the existing knowledge of farmers.



In the transmission of information and the facilitation of education, certain ethical considerations should be kept in mind:

- Balancing the gap in terms of material goods will be difficult, as cultures may place different values and priorities on material goods. One culture should not impose its values, standards, products, food customs or practices on another. Support should be given to the continued use and further development of locally adapted varieties and farming systems, allowing local communities to produce food products suitable for their own cultures more effectively.
- Different concepts of landownership need to be addressed. There may be an ethical dilemma regarding the respect that should be paid to traditional cultures while, at the same time, seeking to enhance the opportunities for traditional societies to benefit from progress. Such societies should be free to change and they should be allowed to direct their own dynamic development. The evolution of biological and cultural diversity is interlinked, and the development of agriculture should take this linkage into account.
- Increased crop production does not necessarily mean increased food security for all. To achieve consolidation of diversified agriculture and food security, practical approaches are needed, especially at the community level – in the form of community-owned seed banks, for example – so the community helps to ensure its own food security.

GUIDELINES FOR AN EQUITABLE SYSTEM BASED ON ETHICAL CONSIDERATIONS

The Panel endorsed the following guidelines and measures, directed at the national and the international level, for implementing the recommendations discussed in the previous sections:

Creating the mechanisms necessary to balance interests and resolve conflicts. The Commission on Genetic Resources for Food and Agriculture was mentioned as a useful example: the Commission has been successful in providing a forum for discussing difficult issues, including the compatibility and complementarity between Plant Breeders' and Farmers' Rights. In the Codex Alimentarius Commission, governments negotiate difficult decisions

relating to food standards. The framework for sustainable fisheries management, conservation and development is provided by the Code of Conduct for Responsible Fisheries.

Supporting and encouraging broad stakeholder participation in policies, programmes and projects. Ways must be found to ensure involvement at the national level by all sections of society, including poor farmers and vulnerable groups in developing countries, and also to ensure that their voice is heard in international bodies, through wider participation by NGOs and in other ways.

Designing incentives that will encourage individuals, communities and nations to engage in dialogue and, ultimately, to do what is ethical. This also requires the preparation and wide dissemination of information and analyses necessary to make decisions that are wise and ethical in character.

Ensuring the transparency of information and decision-making. It is essential that decision-making procedures in international food and agricultural policy as well as the content of deliberations be well understood and open to public scrutiny. Public scrutiny and understanding of decision-making processes and the content of actual decisions will contribute to the development of a more ethical and effective global food and agriculture system.

Fostering the use of integrated and empirical science and technology in the service of a more just and equitable food and agriculture system. Multidisciplinary approaches, combining social and natural sciences, are required. Furthermore, technical and social expert knowledge must be reconciled with cultural beliefs and values. Experts can to some extent inform others about the level of risks connected with a given activity, but only those affected can determine whether the risks are worth taking, based on their own cultural values and their assessments of the risks and benefits expected.

Encouraging cooperation and solidarity among institutions engaged in research and development, making it possible to take appropriate action more quickly.

Ensuring the incorporation of ethical considerations in all programmes, policies, standards and decisions, thereby contributing to improved human health and well-being and environmental protection. Certain activities may be beneficial for some people and negative for others. This has to be spelled out so that all those affected can make their own assessments and be heard before decisions are made. Additionally, a given line of action may increase productivity but degrade the environment or carry a risk to human health. These are factors that must be clarified so that, whenever possible, the necessary compromises have the support of all those affected.

Developing codes of ethical conduct where they do not currently exist. Individuals, states, corporations and voluntary organizations involved in building an ethical global food and agriculture system need guidance as to what constitutes appropriate behaviour. Codes of conduct can provide that guidance.

Periodically reviewing ethical commitments and determining whether or not they are appropriate on the basis of new knowledge and changes in circumstances. Even when decisions and actions are based on ethical considerations as spelled out in this report, they must be ethically reviewed at a later stage in the light of their consequences, new evidence in general and new ethical demands. ●



Biotechnology, including genetically modified organisms

Many biotechnologies have been developed by people in most cultures. Some of them are thousands of years old, others are of very recent origin. New and modern biotechnologies developed over the last 30 to 40 years – such as tissue cultures, cell isolation, molecular diagnostics and genetic engineering – are powerful instruments that can be used for different purposes. Most of these biotechnologies are not controversial and can be used safely to increase food security. An important subset of modern biotechnologies is genetic engineering, or the manipulation of an organism's genetic endowment by introducing, rearranging or eliminating specific genes through modern molecular biology techniques. A genetically modified organism (GMO), otherwise referred to as a living modified organism (LMO) or

transgenic organism, is understood to mean any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology.

The Panel agreed that science and technology have provided great benefits in the past and are likely to do so in the future, as long as they are properly managed and applied. It noted in this connection that international human rights stipulate that everyone has the right to share in the benefits of scientific progress and its applications (Universal Declaration of Human Rights, Article 27).

Considering that classical plant, animal and fish breeding and modern biotechnologies comprise sets of tools that depend on naturally occurring genes as raw materials, the maintenance of biodiversity or genetic resources is a global concern of major importance to FAO.

The accelerating rate of developments within the field of modern biotechnology has given rise to an intense public debate, in which adversarial positions are often taken. Care should be taken to distinguish between different aspects of the debate. One set of concerns relates to the risks and uncertainties as well as the potential benefits that are directly associated with the biological consequences of the use of products generated by such technologies. Another set relates to the doubts, fears and hopes concerning the social and economic context in which these biotechnologies are introduced and used, and the consequences they may have for social and economic development. While the Panel was not in a position, during its first session, to examine all issues involved, it decided to proceed by following three main steps: i) indicating the risks, uncertainties and doubts involved; ii) reflecting on the potential benefits that the products of modern biotechnologies, including GMOs, may yield in the future; and iii) examining some of the conditions that would have to be fulfilled in order to ensure that the benefits, if any, are obtained by the most needy, in particular the developing countries and, within them, the poorer farmers and other vulnerable groups.

The Panel pointed out that biotechnology in its wide sense provides many alternatives to

the production of GMOs and that such alternatives should be preferred where there are significant risks or uncertainties at present concerning the use of GMOs, particularly when the expected benefits of the latter are few. Preference should be given to the most appropriate technology.

RISKS, UNCERTAINTIES AND DOUBTS IN THE USE OF GMOs

■ While the impacts of most biotechnology products are relatively predictable, GMOs do present risks to human health and the environment and raise considerable uncertainties, in particular regarding their environmental impact. Here, the precautionary principle should be respected. When there are reasonable grounds for concern, even without complete scientific documentation, countries should be reluctant to introduce a GMO until more knowledge is available.³ With regard to developing countries, there is also a danger arising from the fact that field testing of GMOs is being undertaken in countries that still have little or no policy on GMO releases. GMOs need proper control and appropriate testing. They should not be released without risk analysis and the assurance of subsequent monitoring and risk management, or without accountability for possible harm arising from their use. The Panel underlined that a blanket endorsement should not be granted in the case of GMOs.

■ The risks to human health include the possible transfer of food allergenic compounds to products that did not previously contain them, and uncertainties as to other consequences. Regarding environmental issues, a fundamental concern is the protection of biodiversity. This is of general importance for future ecosystem equilibrium and is essential for poor farmers and local communities to be able to secure food and livelihoods for vulnerable groups. In turn, the conservation and development of biodiversity carried out by these communities – as part of a continuous adaptation to changing environmental conditions and human needs – is crucial for the sustainability of agriculture and the interests of future generations. The risk of losing this type of biodiversity management is becoming obvious where conventional agribusiness is expanding. If GMOs are developed and applied without consideration for biodiversity protection, particularly if they are developed exclusively for intensive monocultures, they will further undermine diversity-based agriculture.

■ The Panel expressed concern about the context in which GMOs are promoted. Many developing countries have two kinds of agriculture: one for subsistence and one for export. Because GMOs are likely to be used in the subsector that produces products only for export, local populations might not be able to buy the product. As an example, the introduction of high-technology and high-input monoculture cotton in Africa was mentioned, as this practice is of no benefit to small farmers who cannot afford the technology. The context in which this

³ A comparable precautionary principle has been adopted by the European Commission.

technology is being developed does not necessarily address the problems faced by food-insecure and vulnerable groups. In addition, poor countries might not benefit from GMOs as they currently exist, since a dependency on imported seeds could be created.



Modern biotechnologies, including the less sophisticated ones such as tissue culture technology, are currently being employed mainly to promote monocultures. For example, oil-palm clones are now spreading in parts of Latin America where various corporations employ this technique, thereby adversely affecting biodiversity. Conversely, tissue culture techniques could benefit biodiversity conservation and breeding programmes in several ways in developing countries (e.g. germplasm movement, collection and preservation).



Another risk is that, whatever their intended use, transferred genes may escape into weed relatives and wild relatives of cultivated plants, with potential negative effects on the fields and, especially, on the equilibrium of the local ecosystem. Special attention should be paid to the use of a given genetically modified crop in the area of origin, where most of the crop's wild relatives are present.



Developing countries face additional difficulties in assessing the risks of these technologies because the technological knowledge related to them often forms part of the exclusive intellectual property of corporations in developed countries.



The Panel discussed the ethical aspects of the Genetic Use Restriction Technologies (GURTs), which appear initially to have been designed to protect corporate property rights physically (by making harvested seeds infertile) where legal restrictions preventing farmers from planting harvested seeds may not work in practice. Following strong criticism, the corporations concerned have not commercialized GURTs, also called "terminator technologies", but they still hold patents and seek new ones, suggesting that they may still seek to market GURT products. The very nature of GURTs would render patents over seeds unnecessary. Moreover, while patents provide only a limited period of legal protection, GURTs could provide a perpetual form of physical protection. The Panel unanimously stated that the "terminator seeds" are generally unethical, as it is deemed unacceptable to market seeds whose offspring a farmer cannot use again because the seeds do not germinate. GURTs are not inherent in genetic engineering. While corporations are entitled to make profits, farmers should not be forced to become dependent on the supplier for new seeds every planting season.



There are situations where the assessment can be different, however. Where the concern is with possible outcrossing of crops, for example GMOs that could damage wild plant populations, GURTs might be justified. This may also apply elsewhere: when the primary concern is to prevent reproduction of farmed fish with wild populations, for example, then GURTs could be useful in protecting wild populations.



In relation to the issue of GURTs, the Panel expressed concern about potential risks of the inadvertent or unintended spread, through pollen, of gene complexes responsible for sterility traits; the possibility of the sale or exchange of non-viable seed for planting; and the potential negative impacts that the use of GMOs has on genetic diversity. It stressed the importance of farm-saved seed, particularly for resource-poor farmers, and the importance of farmers' selection and breeding for sustainable agriculture.



It was suggested that GMOs could be compared with nuclear technology in that such technology can be applied for peaceful purposes, although its risks have proved to be real and could be lethal for humankind and the biosphere. Every possible effort should be made to ensure that the risks are avoided.

POTENTIAL BENEFITS AND PROBLEMS FACED



The Panel recognized that there is considerable potential for food security and for developing countries in the use of appropriate biotechnologies, and that there is room for optimism. A distinction should be made between the production of GMOs and the other biotechnologies. Modern biotechnology, even without genetic engineering, makes it possible to breed plants and animals faster and in a more controlled way than before. In the case of GMOs, the Panel agreed that, rather than aiming at dramatic changes, progress in this field should be achieved through small, incremental developments, with the modification of single genes, possibly within the same or closely related species, for very specific improvements.



The Panel also stressed the need to work more with tropical and subtropical plant varieties and animal races. Biotechnologies should not be developed exclusively for major commercial crops and animals. In many cases, appropriate technologies could enhance promising but underutilized species to produce more and cheaper products and to improve local consumption. Appropriate efforts could enhance these traditional plants and increase their yields, market and processing value, thus making them more competitive and contributing to dietary diversity. The Panel noted that, should these crops and animals be more productive at a lower cost under marginal conditions, there would also be potential environmental benefits. Furthermore, in specific local conditions, there might be fewer risks than those associated with conventional intensification technology.



There is potential for maintaining, introducing and conserving crops and animal breeds from diverse cultures that may otherwise be diminishing. Certain biotechnologies could be used to protect and even develop biodiversity, particularly if they were applied to locally adapted and culturally valued crops and animals. Biotechnology offers the potential to enhance a range of crops and animals.



There may be potential for companies as well as public research institutions in developing countries to harness technology through strategic alliances with corporations in developed countries, while avoiding the exploitation of public research for the benefits of private corporations. With proper ethical commitments, corporations could help developing countries to use this technology.



It is too early to know what specific benefits GMOs can provide for developing countries, in particular for small-scale farmers and other vulnerable groups. Nevertheless, the Panel agreed that genetic engineering technologies are changing fast and, with this rapid development, the technology is likely to become less expensive. A possible consequence of this accelerated development is that, within 10 to 15 years, the technology could be out of the hands of large companies and be available to developing countries.



The Panel considered the particular example of molecular biology applied as a diagnostic tool in human health at a low cost in Central and South America. It also appreciated similar applications of DNA technology as a diagnostic tool in agricultural plant and animal pathology and in the production of vaccines, drugs and diagnostic kits for human health in Cuba. It likewise appreciated the results achieved through the sequencing of phytopathogen genomes and the sugar cane obtained in Brazil. However, a major problem is that, at present, the commercialization of biotechnology, including GMOs, is mainly pursued by major corporations which, understandably, seek to maximize profits. This is one of the reasons why the poorest and most vulnerable groups have not benefited from genetic engineering and are unlikely to do so unless important conditions are put in place. Part of the criticism directed against GMOs, while cast in terms of risk, flows from the fact that the benefits appear to be low or non-existent for poor farmers or poor consumers. It is necessary to look beyond the interests of corporations and the research institutions associated with them, and to bring into consideration the welfare of the poor, particularly in developing countries.



The fact that intellectual property rights (IPRs) include patents means that developing countries cannot easily gain access to technology. Mechanisms are required to facilitate developing countries' access to technology, including on preferential and/or concessionary terms. The Panel considered that there is an overuse of IPRs, which affects the production of food and the development of agriculture. It also considered that broad patents providing protection beyond the proven utility of a product discourage research and favour the development of monopolies.



The Panel held that IPR systems that restrict the use of naturally existing genetic material over a wide spectrum, from genes to organisms and species, should not be allowed. Access by international and national agricultural research institutions to basic enabling technologies and processes that are important for sustainable agriculture and food security should not be restricted through the use of patent systems.

■ The Panel expressed concern that existing IPR regulatory systems are effectively promoting varietal uniformity, as this quality is often explicitly required by the legal provisions of the system. The Panel also expressed concern that the unintended consequence of this is a progressive loss of agrobiodiversity.

■ The Panel appreciated the consensus that is forming among FAO Member Nations in the course of the revision of the International Undertaking on Plant Genetic Resources, which aims at a negotiated multilateral system for access to, and the sharing of benefits derived from the utilization of plant genetic resources, including provisions for the realization of Farmers' Rights as an incentive for the conservation and continuous development of agrobiodiversity.

ENABLING CONDITIONS TO REALIZE THE POTENTIAL AND AVOID THE RISKS OF MODERN BIOTECHNOLOGIES, INCLUDING GMOs

It was impossible for the Panel, during this first brief session, to carry out the analysis necessary to make firm recommendations. More work needs to be done by the Panel. Nevertheless, some preliminary conclusions, based on the ethical perspective set out in the introduction to this report, are outlined below.

■ Science has benefited humanity in the past and can continue to do so in the future, provided there is a real concern for equity. The results of scientific research must be shared fairly. The assessment of the Panel is based on the ethical imperative to give priority attention to the impact and use of science for the poor, the hungry and the vulnerable, including small-scale farmers in the developing countries. Corporations are normally concerned with the interests of their shareholders, not the needs of the poor, the hungry or small-scale farmers. Those needs are more likely to be addressed by public, non-profit research, but the private sector should also be encouraged to address the ethical considerations mentioned in this report. A reference was made here to the efforts under way to draft a code of conduct for transnational corporations. FAO should be involved in this process in order to ensure that the concerns discussed by this Panel are taken into account. Reference was also made to the draft FAO Code of Conduct on Biotechnology as it relates to Genetic Resources for Food and Agriculture.

■ From the human rights perspective whereby everyone is entitled to benefit from the achievements of science and technology, the Panel noted with much concern that public research funding is being continually reduced, both at the national and the international level. At a time when new and powerful technologies are drastically increasing the efficiency of research, public funding for non-commercial research is essential in order to develop, transfer and utilize appropriate biotechnologies. It is also essential to ensure, through social science research, that such biotechnologies are harnessed to serve the interest of poor farmers, poor consumers and local communities, especially in developing countries – for example, by

enhancing local, underutilized and sometimes marginal but promising crops and animals. The Panel is convinced that there is much room for research that can improve indigenous and other local crops and animals and thereby enhance dietary diversity and food security.



It is important to ensure that such research is multidisciplinary and covers the social and economic context and consequences of the introduction of such technologies as well as ways to remedy unintended, negative social consequences. The research should, at least in part, be explicitly and institutionally directed to the needs and benefits of poor farmers, herders, foresters and fishers. Participation by the intended beneficiaries should be sought where possible. Science should be open and scientists should be accountable regarding the aims and potential benefits or risks of their research output. Without broad, multidisciplinary and independent research and action to implement that research, the widening gap between the rich and the poor will become an inescapable trend.



The Panel underlined the advisability of conducting a comparative study of national regulations concerning biotechnology, including GMOs, exploring the possibility and desirability of harmonizing such regulations.



Information on the results of research in the public and private sectors should be disseminated and enter into the public domain as soon as possible. Developing countries need to be involved and to have access to technology so that they can harness its benefits. Biotechnologies can benefit the developing world if proper choices are made and if there is an ethical use of materials and a spirit of solidarity and cooperation. Worldwide cooperation should be pursued to ensure that the use of biotechnology meets everyone's needs. Developing countries should be enabled to make full use of biotechnology to increase agricultural productivity, while preserving diversity through the promotion of appropriate combinations of modern, traditional and local methods.



FAO should support developing countries in increasing research and development related to socially useful and environment-friendly biotechnologies, including – as appropriate – the possible development of certain GMOs. Consideration must be given to the potential benefits for food and nutrition security, and thereby for human health and well-being, on the one hand, and to the need to avoid risks to human health, social justice and the environment, on the other hand. Adequate safeguards must be put in place to ensure that all concerns are protected, including environmental concerns, while leaving options open for future generations.



FAO should support programmes designed to bring the benefits of biotechnology to small-scale farmers, especially in developing countries, while seeking to ensure that the aims and the effects of the use of such technologies serve to reduce hunger and malnutrition. Such programmes may also be directed towards the enhancement of farmers' varieties or landraces that are already well adapted to local growing conditions, thereby adding specific value of interest to farmers. •

Future work

FUTURE SESSIONS

The Panel recognized that it would be impossible during the first session to examine the issues in sufficient depth to provide detailed advice on the sometimes rather difficult ethical issues currently arising from activities in food and agriculture. Further and more detailed work is required. The members of the Panel agreed to remain in contact between sessions. It noted that sessions had been planned to take place at intervals of no more than two years. However, if funding can be found, the Panel would already like to hold its second session in 2001, in order to maintain the momentum reached with the first session, to build on the very constructive team spirit and mutual trust that was established among the Panel members and, in particular, to deepen its examination of the ethical issues under discussion – for which there is a great urgency.

Preparation

The members of the Panel will remain in contact, for example through the use of e-mail, to deepen its reflection on the issues raised as well as others that might need attention. Members have offered to prepare working papers on specific topics, including:

- the ethical implications of *intellectual property rights* in the context of *Farmers' Rights and food security* (Mr Eide) and for *biotechnology research and development institutions in developing countries* (Mr Salleh);
- the ethical implications of *dual production systems* in developing countries, in particular how monocultural cash crop production affects diversity-based agriculture (Mr Rami);
- harnessing *new technologies for local needs* (Mr Ayala and Mr Worede);
- a description and analysis of the *debate and developments in China and Cuba regarding the use of modern biotechnology, including GMOs* (Ms Chen and Ms Tablada, respectively).

It was also proposed that developments in the area of proteomics (protein engineering) and their ethical ramifications for food and agriculture should be monitored (Mr Ayala).

FAO was requested to prepare an update on the *status of regulations* in different countries concerning the *application of biotechnology and GMOs*. •

ANNEXES



TERMS OF REFERENCE of the Panel of Eminent Experts on Ethics in Food and Agriculture

The Panel of Eminent Experts on Ethics in Food and Agriculture shall advise the Director-General on ethical issues in food and agriculture, including forestry and fisheries. The eminent experts shall be appointed by the Director-General under the terms of Article VI.4 of the FAO Constitution and Rule XXXV of the General Rules of the Organization and the guidance provided by the Conference.

Composition

The Panel shall consist of eight Eminent Experts designated in their personal capacity by the Director-General, in accordance with established procedures and practices for a period of four years. The eminent experts shall be of high moral authority and public standing. The Panel shall represent different scientific and other disciplines, and varied geographic, cultural and religious backgrounds.

Terms of Reference

1. The Panel of Eminent Experts shall reflect on and promote reflection on ethical issues arising from food production and consumption practices and on agricultural development, including forestry and fisheries, in the context of food security and sustainable rural development and in an environment of rapid global change.
2. The Panel shall, in particular, consider ethical issues relating to the interests of present and future generations regarding the sustainable use of natural resources, the safeguarding of biodiversity and a balanced mix of traditional and modern technologies to increase food security and sustainable agriculture.
3. Based on the above considerations, the Panel shall:
 - a) promote an overall sense of international responsibility with regard to the development of necessary policies and instruments aimed at maximizing global benefits, while minimizing the risks, arising from the application of modern technologies to food and agriculture;
 - b) seek to increase the awareness of states, intergovernmental organizations, NGOs, civil society and public opinion worldwide with regard to ethical issues in food and agriculture in order to promote international understanding and appropriate action on such issues, bearing in mind that

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- different communities have different cultural values;
- c) advise on possible international, regional or national action or the preparation of instruments, as appropriate, to respond best to ethical issues arising from food and agricultural practices, with due regard to interdependence among generations, among countries and between food security and other community needs;
 - d) encourage the exchange of information on all issues of an ethical nature arising from food and agriculture.

4. The Panel may consider any other issue related to the above.

5. In its consideration of the above, the Panel shall advise the Director-General on the possible role and policies of FAO. ●



BIOGRAPHIES

of the Panel of Eminent Experts on Ethics in Food and Agriculture



Francisco J. Ayala, United States

Born in 1934 in Madrid, Spain. A citizen of the United States since 1971. Professor of Biological Sciences and of Philosophy at the University of California, Irvine (United States). Former President and Chair of the Board of the American Association for the Advancement of Science. Member of the President's Committee of Advisors on Science and Technology. Author of more than 700 articles and 15 books. Mr Ayala's scientific research focuses on population and evolutionary genetics, including the origin of species, genetic diversity of populations, the origin of malaria, the population structure of parasitic protozoa, and the molecular clock of evolution. He also writes about the interface between religion and science and on philosophical issues concerning epistemology, ethics and the philosophy of biology.



Chen Chunming, China

Born in 1925. Founding President of the Chinese Academy of Preventive Medicine from 1983 to 1992. Continues to serve as a Professor of Nutrition and Senior Advisor to the Academy. Currently Chair of the National Expert Committee on AIDS Prevention and Control and Vice Chair of the National Consultation Committee on Food and Nutrition. A member of the World Health Organization Expert Advisory Panel on Nutrition since 1979. Chair of the Committee for Ethics of the Chinese Academy of Preventive Medicine and a member of the Ethics Committee of Biomedical Research in Asia. Awarded the FAO Certificate of Achievement in Nutrition in 1992. Ms Chen has focused on population nutrition and nutrition policy studies since 1982. She designed the current National Nutrition Surveillance System in China and is the key supervisor of the system. She is an expert on the nutrition status of children and the general population, and on the food consumption behaviour of Chinese people during economic development.



Asbjørn Eide, Norway

Born in 1933. Former Director and now Senior Fellow of the Norwegian Institute of Human Rights, attached to the University of Oslo. Former Secretary-General of the International Peace Research Association. Member and former Chair of the United Nations Sub-Commission on the Promotion and Protection of Human Rights, and former Special Rapporteur of the Sub-Commission on the Right to Food as a Human Right. Mr Eide is currently Chair of the United Nations Working Group on Minorities. He has published extensively on human rights issues and is Doctor Juris of the Lund University.

■
Noëlle Lenoir, France

Born in 1948. Jurist, Member of the French Constitutional Court (first woman to be appointed to this court). President of the European Group on Ethics of the European Union. Former President of the United Nations Educational, Scientific and Cultural Organization's International Bioethics Committee. Member of the Consultative Forum for Dialogue between Europe and the United States on Biotechnology. Ms Lenoir is an Associate Professor at the Law School of University of Paris II on Bioethics and Human Rights.

■
Mohammed Noor Salleh, Malaysia

Born in 1940. Forester and former Director-General of the Forest Research Institute of Malaysia. Former President of the International Union of Forest Research Organizations and former Chair of the Asia Pacific Association of Forest Research Institutions. Former member of the Technical Advisory Committee for the Consultative Group on International Agricultural Research and for the Scientific Technical Advisory Panel of the Global Environment Facility. Mr Salleh is currently a member of the Malaysian Human Rights Commission, President of the Malaysian Nature Society and Secretary-General of the Academy of Sciences, Malaysia. He manages a research company on biotechnology and a forestry consultancy company.

■
Mohammed Rami, Morocco

Born in 1952. M.Sc. in Quantitative Sciences and Fisheries Management, University of Washington, Seattle, United States. Former Director of the Moroccan Fisheries Research Institute, Casablanca (1986-1992). Former Director of Fisheries and Aquaculture, Ministry of Fisheries, Rabat (1992-1998). Mr Rami is currently Adviser to the Prime Minister of Morocco on External Economic Affairs and Fisheries Policies.

■
Lydia Margarita Tablada Romero, Cuba

Born in 1947. Doctor in Medicine and Director-General of the National Center of Animal and Plant Health and Professor of Microbiology at the Havana Agricultural University. Until 1998, a member of the State Council and National Assembly in Cuba. Ms Tablada Romero is an emerit member of the Cuban Academy of Science.

■
Melaku Worede, Ethiopia

Born in 1936. Geneticist and former Director of Plant Genetic Resources Centre of Ethiopia. Former Chair of the African Committee for Plant Genetic Resources. Vice-Chair, and later Chair, of the FAO Commission on Genetic Resources for Food and Agriculture. Mr Worede was the recipient of the Right Livelihood Award (also referred to as the Alternative Nobel Prize) in 1989, Stockholm, Sweden, for achievements in genetic resource work. ●

AGENDA of the Panel of Eminent Experts on Ethics in Food and Agriculture

FIRST SESSION

LEBANON ROOM

Rome, 26-28 September 2000

Tuesday, 26 September

- 9.30-10.15 Opening and welcome statements
10.30-12.30 Adoption of the agenda and organization of the work
14.30-17.30 *Topic 1: Ethical issues in food and agriculture*

Wednesday, 27 September

- 09.30-12.30 *Topic 2: Genetically modified organisms, the consumer, food safety and
the environment*
14.30-16.15 Proposed procedures for future sessions of the Panel
16.30-17.30 Other business

Thursday, 28 September

- 09.30-11.30 Adoption of the Report of the Panel
11.45-12.30 Closing session

OTHER EVENTS

IRAN ROOM

Thursday, 28 September

- 14:30-17:30 Press conference