FAO / IFOAM MEETING ON ORGANIC AGRICULTURE

FAO, Rome, 19-20 March 1998

REPORT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, June 1998

CONTENTS

FAO / IFOAM [1] MEETING ON ORGANIC AGRICULTURE

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(Lebanon Room, D205)

1. Background, purpose and organization of the meeting

IFOAM obtained liaison status with FAO in July 1997. Subsequently, Mr. Hervé la Prairie, IFOAM President, visited the Director-General and several FAO persons. Because FAO is a relative newcomer in the field of organic agriculture and increasing NGO and countries demand for FAO's involvement in this field, it was proposed to organise a joint FAO/IFOAM meeting on organic agriculture. Organic agriculture has been included on the agenda of the Committee of Agriculture (January 1999) and will be part of the FAO Report on Agriculture for the Commission on Sustainable Development in 2000.

The meeting was perceived as a brainstorming exercise that will contribute to defining FAO's future involvement in organic agriculture and will identify areas of potential collaboration between FAO and IFOAM.

The meeting was attended by over 50 FAO staff members and 7 IFOAM representatives (see Annex 1 for List of Participants). Ms. Louise O. Fresco, Director, Research, Extension and Training Division, opened and closed the meeting. Facilitation of the meeting was ensured by Ms. Nadia Scialabba (SDRN), Mr. Rainer Krell (REUS), Ms. Anne Aubert (SDRN) and Mr. Bernward Geier, IFOAM. The Report has been prepared by Nadia Scialabba and Anne Aubert, in consultation with the meeting participants.

During the opening session, Ms. Fresco briefed the meeting on the background and purpose of the meeting and Mr. Hervé La Prairie informed on IFOAM's status and outreach.

Thursday morning was devoted to the presentation of IFOAM's views on organic agriculture and FAO's presentation of work relevant to this subject. Because the morning session was aimed at the exchange of information and sharing of perceptions, only questions of clarification were sought. Both sides were "testing" the other's positions.

During the afternoon of Thursday, four working groups were constituted to discuss: i) sustainability of farming systems; ii) research and extension; (iii) standards and certification; and iv) genetically modified organisms, risk assessment and ethics (see Annex 2 for Working Group Composition).

On Friday, working groups reported on their findings and plenary discussions were held. In the afternoon, ideas and concerns deserving further in-depth development were summed-up, including areas where FAO could collaborate with IFOAM.

[1] International Federation of Organic Agriculture Movements (IFOAM).

At the closing session, participants expressed their appreciation for the opportunity offered to start debating organic agriculture. Ms. Scialabba, focal point for organic agriculture indicated that all ideas and concerns expressed throughout the meeting will be reflected in the Report as well as in follow-up actions.

The Agenda and Timetable are in Annex 3.

Although there were no background papers specifically prepared for the meeting, FAO staff members distributed short notes related to their respective areas of expertise, SDRN and REUS distributed a few documents related to organic agriculture, and IFOAM made available a number of their publications (see list of Documents in Annex 4).

2. Opening of the meeting

The meeting was opened by Ms. Louise O. Fresco, Director, Research, Extension and Training Division. She welcomed the participants and invited them to constructively and critically evaluate the various dimensions of organic agriculture. She mentioned that low-input farming systems such as organic agriculture could have had a multi-functional role, namely economic, social and environmental, and a lot could be learned from its experience. She stressed that organic agriculture was one of the alternatives for sustainable agriculture and that FAO had a crucial role in field testing this type of approach in different agro-ecological regions before mainstreaming it in agriculture, where appropriate. She welcomed IFOAM and the NGO community to collaborate with FAO in preparing documents on organic agriculture for consideration at the Commission on Sustainable Development in 2000.

Mr. Hervé La Prairie, President, IFOAM, gave an brief overview of the Federation, which was created in October 1972 with five organizations. It is now composed of more than 650 member organizations and institutions in 101 countries, including NGOs and developing countries. IFOAM membership is currently increasing at a rate of 25% per year, of which two thirds are from developing countries. International networking, coordination and promotion of organic agriculture are the main tasks of the Federation, which is democratically structured and grassroots based. Mr. La Prairie stressed the importance of a holistic approach in the development of organic agriculture systems, including maintenance of a sustainable environment and respect for the needs of humanity. The approach includes three main dimensions: techno-economic, environmental and ethical. The latter dimension is being tackled only recently and includes social rights, fair trade, and gender issues. Thus, organic agriculture cannot be considered only as a technique, but as a whole way of living and a means to increase food and quality of life. Although organic agriculture represents only about 1% of world-wide agriculture, it has tremendously developed in the last few years. In Switzerland, organic agriculture represents 7.8% of total farming systems, in Finland 7% and in Austria 10% (in some states it can reach 50%). Organic agriculture is also developing rapidly in Latin America, Africa and Asia. In Uganda, 7,000 farmers choose to cultivate organic cotton, and in Mexico 10,000 *campesinos* (small farmers) produce organic coffee. In the past, IFOAM had concentrated on establishing the knowledge basis for its approach and more recently, it has started to intervene in the policy arena. Mr. La Prairie thanked the FAO Director-General for his message of encouragement on the occasion of IFOAM's 25th

anniversary, published in the special issue of Ecology and Farming, January 1998 (see Annex 5). IFOAM seeks to better understand FAO's work and welcomes cooperation.

Mr. Ulrich Köepke, Director, Institute of Organic Agriculture in Bonn, Germany, presented the mission and objectives of his Institute that aim at establishing the scientific basis of organic agriculture knowledge. In particular, he illustrated some of the Institute's research activities that include: strategies of nutrient management under different conditions of soil and climate; identification of strategies increasing availability of nutrients; strategies to conserve and increase soil organic matter; understanding the role of soil organic matter in different soils and climate; evaluating the nitrogen cycle and its role in pasture productivity; identification of limiting factors to the maximisation of biological nitrogen fixation in forage legumes, grain legumes and mixtures with non-legumes; identification of mechanisms of infection and association of rhizobia with tree legumes; identification and use of nitrogen-fixing bacteria in cereals, forage grasses, including sugar-cane and other non-legume plants; and others.

Mr. Urs Niggli, Director, Research Institute for Organic Agriculture (FiBL), Switzerland, presented the research efforts of his institute on organic agriculture technologies. The FiBL, founded in 1973, is presently the biggest centre of research, advice and inspection devoted to organic farming (with 70 full-time and 100 part-time employees). Four research departments cover plant and animal production, veterinary medicine, food quality research, economic and market studies and landscape analysis. An advisory service, training and documentation is offered to farmers, advisors and inspectors in Switzerland and in Eastern European and Third World Countries. The certification service is inspecting 5,000 organic farms in Switzerland and 450 food processors and traders. The FiBL was head office of the IFOAM in the 70s, organised the 1st Scientific Conference of the IFOAM in 1977, and is in charge of preparing the 13th Conference in 2000 (Basel).

Mr. Bo van Elzakker, Agro-Eco Consultancy, the Netherlands, described his involvement with IFOAM's work on standards and certification and his coordination role of projects in developing countries (i.e. Organic Agriculture until 1999). Agro Eco, established in 1990, originally operated as a foundation. At present, it is a Ltd with 15 employees and with branch offices or associated offices in Argentina, Zimbabwe, Uganda, Hungary, and soon in the Czech Republic. Agro Eco works in over 35 countries world wide, but half of its business is in the Netherlands. Countries where Agro Eco worked or still work include several countries in the Mediterranean basin, Central and Eastern Europe, Africa, Latin American (e.g. Argentina, Paraguay, Brasil, Bolivia, Mexico), and Asia (e.g. India, Sri Lanka, Thailand, Philippines, China). Initially, Agro Eco provided advice to importers of organic coffee, tea, bananas and cotton for export to European markets. Today, assistance extends to local exporters and trade development agencies, UN organizations, farmers organizations, national and local governments, environmental and animal welfare NGOs, fair trade organizations, development agencies, the World Bank, investment groups and even churches. Work ranges from feasibility studies, project formulation, conversion plans, research and funding proposals, NGO capacity training, participatory technology development, setting up farming organizations, publications, market and product development, norm-setting, setting-up local certification groups, project management, financing, and project evaluation. An important strenght of Agro Eco is that we work through the whole supply chain, from primary production, via processing, transport to blending, final processing, packaging until market introduction.

Mr. Ranjith de Silva is a member of IFOAM-ASIA and has established in Sri Lanka an NGO (Gami Seva Sevana) which aims to promote organic agriculture by running a demonstration farm in a region where former intensive tea cultivation has left degraded and eroded soil.

Mr. Coen van Beuningen, Treasurer, IFOAM, reminded the meeting that the Federation is independent from any subsidies.

Mr. Bernward Geier, Executive Director of IFOAM since 1987, was formally a research scientist at the Division of Organic Agriculture of the University of Kassel, Germany, where he specialized in non-chemical weed control. He mentioned his involvement in the Earth Summit in Rio, and in its follow-up. He stressed the priority which IFOAM gives in its outreach activities and referred to cooperation with other international NGOs such as Greenpeace, the World Conservation Union, the World Wildlife Fund, and others.

3. Principles and objectives of organic agriculture

Mr. Ulrich Koepke presented IFOAM's perception of organic agriculture and its relation to sustainable agriculture. He also illustrated his experience in Brazil.

Sustainable agriculture

Sustainable agriculture was defined along its six important facets, namely:
- inter-generational equity;
- preservation of the resource base of agricultural production and prevention of pollution;
- protection of biological diversity, through minimal interference with natural ecosystems;
- guaranteed economic viability of the farm, and enhanced job opportunities in farming, and preserved structure of the rural community;
- responsibility for the society as a whole to produce sufficient and highly nutritious food;
- responsibility for a global sustainable development.

Defining organic agriculture

Within this overall framework of sustainable agriculture, organic agriculture is one form of agriculture that can be equated to an "organisational principle". The main approach of organic agriculture is to manage a mixed farm, as much as possible, like an organism within a closed system. Since site-conditions are individual properties by definition, a farm can be conceived as an individual entity. Compared to other types of agriculture, organic agriculture depends more on specific site-conditions and is therefore forced to combine the best adapted elements to an holistic approach.

The aims and principles of organic production are:

- nearly closed cycles of nutrients and organic matter within the farm;
- predominantly farm-produced manure and compost;
- if needed, slowly soluble minerals for fertilising only (P/K);
- if possible, self-produced seeds;

- weed control by crop rotation, cultivation, thermal methods and competition effects;
- pest control based on homeostasis and inoffensive substances, use of predators promoted by structures like hedges, flowering plants, etc.;
- lasting fertility due to efficient "reproduction of soil organic matter";
- encouraging and enhancing biological processes (N_2 fixation);
- for animal welfare, appropriate housing systems and suitable feeding with farm grown crops (10-15% of daily ration in dry matter can be imported).

The aims and principles related to social implications of organic agriculture are:

- within the national economy, optimum input to output ratio regarding material and energy;
- within the household economy, stable monetary results;
- within the market system: fair trade and prices; regional mixed production; transparent consumer-producer relationship; quality of produce; and satisfaction to work in harmony with laws of nature;
- minimised negative impacts on producers, consumers, and environment;
- maximum conservation of soils, water, air and wildlife.

Organic agriculture relationship with environmental quality is enhanced through mix of crop and livestock farming that creates diversified production systems. Flora and fauna needs are fulfilled, and diverse landscapes are maintained, through wide crop rotation with flowering forage legumes, linked with hedgerows, pasture, shading trees, and other biotops.

Organic agriculture aims at building soil fertility and vitality within a more or less closed system and the systematic target-oriented organization of nutrient flows is far more important than avoidance of synthetic inputs.

In brief, the main principle of organic agriculture is to feed the soil rather than plants and to be "bio-intensive" instead of "chemio-intensive". It promotes environmentally, socially and economically sound production of food and fibres. These systems take local soil fertility as a key to successful production. By respecting the natural capacity of plants, animals and the landscape, it aims to optimise quality in all aspects of agriculture and the environment. Organic agriculture dramatically reduces external inputs (and therefore dependence on exogenous resources) by refraining from the use of synthetic fertilisers, pesticides and pharmaceuticals. Instead, it allows the powerful laws of nature to increase both yields and disease resistance. Organic agriculture adheres to globally accepted principles, which are implemented within local social-economic, geo-climatical and cultural settings. Therefore, IFOAM stresses and supports the development of self-supporting systems at local and regional levels.

Brazil's potential for organic agriculture

Brazil is the country with the greatest diversity of life forms. Climatic and edaphic variation is tremendous, and the greatest single economic activity is agriculture, in all its diverse forms. The general philosophy amongst many research workers of the very large and effective National Agricultural Research Corporation is to develop appropriate home-grown solutions to problems in agricultural production, and adapt technologies from other countries or create new ones.

There is a strong movement for agriculture that conserves the soil and the environment, and yields products free of agro-chemicals. The process in the area of biological control of crop pests (used widely in maize, soybean, and sugar cane), the great success in breeding of plant genotypes resistant to disease and soil acidity, as well as the replacement of nitrogen fertilisers by biological nitrogen fixation, are all evidence of this movement.

4. IFOAM's experience and perception of trends

The growing reality of organic trade

Mr. Bernward Geier showed a series of pictures of conventional and organic fields around the world to illustrate the life quality that organic agriculture can bring and the possibility for this form of agriculture in different regions of the developing world. He also referred to the current boom of organic agriculture, by specifying that developments were not restricted to Northern countries (buying of organic food in the US amounts to 3.5 billion US$ a year and is growing) but also to developing countries (e.g. organic tea in Egypt). The faster the organic market develops, the more the organic movement will be confronted with finding answers to the farmer's “temptation” to specialize, and thus to sacrifice the diversification principle on which organic agriculture is based. Within the globalisation trend, seasonal and regional priorities for nutrition and food security should be established to promote exchanges from field to field, farm to farm, shop to shop, village to village and region to region.

IFOAM's aims and objectives

IFOAM also offers many opportunities for information exchange, for example through numerous international, continental and regional IFOAM conferences and through publications such as conference proceedings and the magazine “Ecology and Farming”.

IFOAM’s major aims and activities are to:

- exchange knowledge and expertise among members and inform the public about organic agriculture;
- represent the organic movement internationally in parliamentary, administrative and policy making forums (IFOAM has a consultative status with the UN);
- set and regularly revise the international “IFOAM Basic Standards of Organic Agriculture and Food Processing” (these standards are translated into 18 languages, including Thai and Swahili);
- internationally guarantee organic quality. The International Organic Accreditation Services (IOAS) runs the IFOAM accreditation programme to ensure equivalence of certification programmes worldwide.

Extension and Training

Mr. Ranjith de Silva advised that, since the inception of IFOAM, a great part of its membership has been engaged in education and training. Training in organic production involves the whole production chain, from the field to the consumer. Processing, quality of food and fibres, and marketing are equally important, and all these aspects may be relevant to study at the local, regional and global levels. The need for agricultural advice concerns both farmers converting to organic agriculture and experienced organic farmers when a problem occurs in their farm.

IFOAM carried out a project and survey of training and educational facilities in the field of organic agriculture in tropical and temperate climate zones. A number of questionnaires were sent to various organic organizations and institutions around the world, which had to complete and return a "curriculum" on their training activities. The result was the publication of two booklets – "Directory of Training and Education Opportunities for Tropical Organic Agriculture" (1995) and "Directory of Training Opportunities in Organic Agriculture for Temperate Climate Zones" (1996).

The Asian wing of IFOAM has been active in the field of extension and training, in particular in trying to bring together the organic organizations involved and in developing a Programme for Action for training centres.

The participatory and farmer-centred approach to training and extension, pioneered by FAO, on integrated pest management was praised. IFOAM seeks to learn from this particular FAO experience.

Indicators for economic and environmental analysis of organic agriculture

Mr. Coen van Beuningen mentioned that because the information basis is not sufficient in organic agriculture, it is difficult to make projections on its role in food security. Among the studies which IFOAM carried out on organic and low-input agriculture, he referred to IFOAM’s inputs to the UNDP publication “Benefits of Diversity”.

IFOAM started in 1996 a project on data collection and comparison and the project is still on-going. This project, implemented in collaboration with the Institute for Low External Input Agriculture (ILEIA), is active in 22 developing countries, covering 74 case studies, each case involving 20-50 farmers. The aims of this project are to compare and analyse traditional, organic and conventional production in African, Asian and Latin American ecosystems and raise awareness on sustainability issues in agriculture. Data analysis is supported by software that allows for both plot and farm level analysis of activities and enterprises. In order to ensure comparability of data at the global level, a unified methodology has been developed by an Indian NGO (Agriculture, Man and Environment).

Organic principles are compared with other indicators for sustainable agriculture, especially those used by ILEIA. The 11 ecological, economic, and social indicators include the following: maintenance of biodiversity, soil, water, efficient use of energy, minimal negative environmental impacts, efficient use of production factors, low relative value of external inputs, sustained farmer livelihood systems, enhanced food security, labour absorption capacity, and potential for widespread and equitable adoption.

The model could further be refined and FAO collaboration in this endeavour would be greatly appreciated.

Standards and Certification

Mr. Bo van Elzakker presented IFOAM Basic Standards, of which the main objective is to provide guidance in organic production and in the development of an ecologically sound farming system, as well as a common international and worldwide definition of organic agriculture. General principles and minimum requirements cover conversion to organic agriculture, crop production, animal husbandry, storage and transportation of products, processing, social justice, and labelling and consumer information. These are minimum standards, which give a basis to certification programmes for developing their own national or regional detailed standards.

The Basic Standards also contain guidelines on coffee, cocoa and tea, as well as guidelines on evaluation of inputs to organic agriculture. The latter include, *inter alia*, specification on inputs ingredients (essentially organic or mineral products) that may be used in the production process, more specifically: mechanical, physical and enzymatic processes, processes by means of (micro) organisms (such as composting and digestion) and, only in exceptional cases, chemical processing.

At least one hundred regional or national standards have been developed so far. They adapt to socio-cultural, economic and geo-climatic conditions and are therefore very varied. They concern all aspects of food and fibre production. Specific and product related standards have also been developed, e.g. for coffee, tea, cotton, timber/wood, apiculture, aquaculture, flowers, tree nurseries, inspection, packaging and processing. Standards are also taking into consideration the wider aspects of food and fibre production with, for example, the importance of social and fair trade issues.

There is a problem with some countries developing their own organic regulation, with very little consultation with the organic industry and farmers. As a result, governments can establish standards that are not adapted to the local situation and that can slow down the development of organic agriculture, especially in developing countries.

IFOAM also developed criteria for Organic Certification Programmes. The criteria are specifically designed to include oversight of the way in which certification programmes implement organic standards and deal with specific organic issues like parallel production and grower groups. The problem is that official regulations, existing in some countries, differ in content and effectiveness. While they may provide some protection in the domestic market, they are unlikely to provide the kind of global assurance of equivalency, which the international market requires. It was therefore decided to establish, in 1992, the IFOAM Accreditation Programme (IAP) in order to provide international equivalency of organic quality claims. In March 1997, IFOAM established a US-based non-profit company called the International Organic Accreditation Service (IOAS) which was licensed to operate the accreditation programme.

IFOAM and the organic community should be considered for participation in Government decision-making regarding the establishment of organic standards within the framework of the Codex Alimentarius Commission.

Economic aspects of organic agriculture

Mr. Ulrich Koepke developed the economic dimension of organic agriculture. He noted that farmers' choice for organic agriculture cannot be separated from economic benefits and constraints. While market opportunities in high income countries offer good incentives for practising organic agriculture, the main constraint in low income countries is lack of knowledge and managerial capacities.

Organic agriculture has high labour requirements. Local differences make economic and social standards difficult to establish. It is also difficult to create a system that guaranties fair prices, especially because organic agriculture is based on a system, rather than a product, approach. In evaluating economic viability of organic systems, a cost-effectiveness analysis is required, independently from subsidies.

There is a lack of data on these economic factors and there is an urgent need to establish a better statistical basis in order to be able to make projections and compare organic systems with traditional and conventional ones.

GMOs within the organic agriculture context

Mr. Urs Niggli stressed the inherent incompatibility between organic agriculture and genetically modified organisms (GMOs). Organic agriculture focuses on the interactions between organisms and systems (holistic approach), as well as on very low external input and high internal process activity. The organic movement does not therefore support:

- one way solutions which weaken the system approach;
- technology that is difficult to access or expensive to farmers;
- unnecessary risks for the environment or health;
- universally used “super” cultivars (regional breeding and selection of crops are preferred instead);
- unnecessary risk of resistance (e.g. the very useful Bt toxin could become ineffective as a natural insecticide, if the Bt modified plants provoke resistant pests);
- patenting of genetically engineered resources.

The philosophy of organic agriculture is to produce "natural" food. Moreover, the organic community has ethical and social concerns with GMOs and opposes them in order to ensure future development of reliable organic products that meet consumers demand (65% of the European population apparently does not want GMOs).

IFOAM filed with Greenpeace a legal petition against the US Environmental Protection Agency (EPA), demanding that EPA withdraw the approval of transgenic plants carrying the Bt toxin and abstain from any new registration of such plants.

The rapid development of GMOs raises new problems such as the setting of tolerance limits (tolerable contaminations of GMOs in organic food and foodstuff between 0.1 and 1% have been discussed in Europe during the last months). This rapid development has consequences on current certification requirements for organic products and will therefore increase prizes of organic food. In the short term, the supply of enzymes, ingredients and processing aids could become difficult, and in the long term, the sufficient supply of seeds and plantlets, veterinary vaccines, etc., could also be endangered. IFOAM requests FAO to endorse its position on GMOs for organic agriculture.

Points of clarification put forward by the meeting

FAO staff raised a number of questions on the IFOAM presentations. Issues raised were recorded for discussion during the working group sessions or the next day. These points of clarification included queries on:

- where is the boundary between organic and semi-organic;
- extent of prohibition of synthetic inputs use;
- whether homeopathic and bio-dynamic techniques were considered;
- IFOAM's position on hydroponics and substrate cultures;
- IFOAM's views on mechanical/zero tillage;
- IFOAM's position on conventional breeding;
- IFOAM's position on exotic species that do have the same effects as GMOs;
- what would be the position of farmers if new GMOs improve nutrient fixation;
- whether quantitative data existed on nutrient flows in semi-closed systems;
- whether studies existed on the quality of organic inputs (NPK);
- whether information was available on the extent of soils nutrient depletion;
- what the sources of renewable energy promoted;
- whether data existed on amount of energy use by product (and not by unit of land);
- whether the future demand for organic food had been assessed;
- whether principles and values are discussed when settling controversies;
- what are the decision-making criteria of farmers when choosing a particular technique;
- whether the organic industry can regulate itself.

It was mentioned that, in organic agriculture, the benefits and risks to different social groups should be kept in mind, as well as differentiated energy and labour constraints, and most importantly, food availability to the poor.

5. FAO's current work of relevance to organic agriculture [2]

Global Integrated Pest Management Facility

Mr. Kevin Gallagher, facilitator of the Global IPM Facility, Plant Protection Service, informed the meeting that the major goal of integrated pest management (IPM) is to develop ecologically sound and sustainable agricultural practices and to strengthen farming communities' participation in that development. In essence, the Facility aims to promote IPM

[2] Full briefs are in Annex 6

programme development in order to reduce the environmental and health impacts of agricultural activities while improving profitability. Although IPM legally allows the use of pesticides and chemical fertilisers, many techniques and methods of organic agriculture apply to IPM. Organic agriculture and IPM in general share many long-term values and goals and collaboration is welcomed, especially the extension of the Farmer Field Schools approach to organic farmers.

Post-harvest storage and handling of organic products

Mr. François Mazaud, Senior Post-Harvest Officer, Agro-industries and Post-harvest Management Service, cautioned that focusing only on production (and thus only on research to improve production) might create problems downstream in the food production chain. Many of these problems could be anticipated through a greater emphasis on post-harvest technologies. The objective of the post-harvest group of FAO is to provide technical assistance to selected developing countries enabling them to explore the potential of organic products, and to improve handling and processing operations for these products. Activities undertaken so far are mainly related to handling and processing of organic fruits and vegetables, and using aromatic plants in traditional storage. He welcomed IFOAM's collaboration to further improve organic post-harvest practices.

Farming systems development

Mr. Felix Moukoko, Senior Resource Economist, Farm Management and Production Economics Service, informed the meeting that the main concerns of his Service include sustainable intensification of farm household systems and institutionalisation of analysis and development of such systems, with due consideration to economic and ecological sustainability. He referred to some similarities of the farming system approach with organic agriculture, namely the holistic approach, and suggested that joint efforts could involve promoting biologically-friendly technologies and assisting small farmers to adapt, transform and enter into markets.

"Sustainability" indicators

Mr. Jeff Tschirley, Senior Officer, Environment and Natural Resources Service, highlighted a number of issues that should be addressed when developing indicators. These include formulating the right questions that one wishes to answer before collecting data and information, and ensuring that the indicators have acceptable levels of technical accuracy, measurability, predictability and consensus among users. How indicators will be used (e.g. assessment, monitoring, evaluation and also whether for projects, programmes or policy formulation and planning) and who will be using them (e.g. international conventions, national governments, NGOs) should be clearly delineated. He reviewed several initiatives related to indicators in FAO including those relating to sustainable forest management, land quality and farming systems development. He noted that the IFOAM indicators emphasised bio-physical measurements but did not address the more complex and controversial economic

and social aspects. He recommended that more dialogue be underaken with different interest groups to develop an initial, integrated set of working indicators that included environmental, social and economic measures. The FAO statistical database might be a useful starting point for developing "sustainability indicators" for organic agriculture.

Electronic Information System for the Dairy Sector

Mr. Ali Gurkan, Senior Commodity Specialist, Basic Foodstuffs Service, presented the FAO Information System for the Dairy Sector as an example to establish a similar system for organic commodities production and trade. The aim of the information system is to disseminate and exchange information on the world dairy economy. Two services have been established: a Dairy Outlook (which consists of a regular newsletter, distributed mainly by e-mail) and a Dairy Bulletin (available only in e-mail; it allows registered users to post questions and answers). A similar system for organic agriculture would be important to develop and exchange information on technologies available and on the situation of the organic agriculture system.

Organic agriculture documentation

Ms. Theresa Connaughton, Chief, Reference and Documentary Information Group, David Lubin Memorial Library, described the Library as a major world agricultural information resource with materials covering agriculture in developing countries collected for over a century. The FAO Library Catalogue had been searched to identify FAO work in the field of organic agriculture. About 50 publications and reports by FAO were identified. As indexing practices for organic farming terminology has varied over the years, it is likely that more information in this field could be identified. She stressed the value of the grey literature published in organic farming and the need to acquire, index, and store this hard to find information. Also stressed was the need for publishing in the conventional, peer-reviewed journals.

Food quality and safety of organic food products

Ms. Selma Doyran, Food Standards Officer, Food Quality and Standards Service, presented the Codex Alimentarius Commission activities related to organically produced food, concerning food labelling, pesticide residues, food additives and contaminants, and food hygiene. The safety aspects are related to microbiological and chemical contamination, which is a very critical problem. Recently, the Codex considered biotechnology safety and standards for aquaculture. Most of the IFOAM Basic Standards have been included in the Codex, although the Codex focuses on the quality of the end-product rather than on the process of production.

Animal production systems

Mr. Manuel Sanchez, Animal Production Officer, Animal Production Service, presented his Service's efforts towards improving livestock production by relying, to the extent possible, on

local resources. Animal resources can contribute to a better integrated farming approach, and one of the main objectives is to optimise the use of all local resources, including local manpower and good, rational management of crops, animal, trees and fish resources. Animals also contribute to the recycling of on-farm residues and wastes, provide manure (that can be used as soil amendment or for energy production) and offer work opportunities.

Biotechnology

Ms. Maria Zimmerman, Senior Agricultural Research Officer, Research and Technology Development Service, described biotechnology as any technique that uses living organisms to make or modify a product, to improve plants or animals or to develop micro-organisms for specific uses. Biotechnology holds many promises, particularly more efficient breeding, more adapted varieties, improved medicines and bio-remediation, better fibres, more disease resistance, and more resistance to environmental stresses (e.g. cold, drought). Excessive use of GMOs could also present risks of losing traditional goods, environmental hazards or unknown consequences. As for all innovations, GMOs might not be the best answer but a chance should be given for science to improve its results. The divergence between the US and EU positions on GMOs was mentioned, noting that each situation has its particular case. Biotechnology is a tool: it may help solve the food problem in the future and its value cannot be denied, nor can its risks. Impacts will ultimately depend on how this tool will be used.

Research in organic farming

Mr. Rainer Krell, Environment Officer, Sustainable Development Department Group of the Regional Office for Europe, informed that the Regional Office has been supporting meetings of researchers working with organic farming in the past and in 1997 it completed a study on "Research on Biological Farming Methods in Europe: Perspectives, Status and Requirements". The study was followed up by an expert roundtable during which future action for research cooperation under the European System of Cooperative Research Networks in Agriculture (ESCORENA) was decided. A working group on Research Methodologies in Organic Farming is being formed with a first technical meeting in 1998. The proceedings resulting from the 1997 meeting include the study and were presented during the meeting. There is sufficient interest by European researchers to establish a full ESCORENA network. However, such new activities require new outside funding.

Agricultural tools and implements for organic farming

Mr. Theodor Friedrich, Agricultural Engineer and Farm Mechanization Officer, Agricultural Engineering Branch, pointed out that mechanical tools and implements for agricultural production are, with the exception of some specific considerations, widely identical for both conventional and organic farming approaches. However, if there would be a need for more specifically looking into techniques and technologies, machines and implements for e.g. mechanical/thermal weeding techniques, mechanical/pneumatic pest control, mechanized application of beneficial insects and others, AGSE/FAO could be utilised as a platform for further investigations on this issue.

6. Working groups reports and discussion [3]

Working Group 1: Sustainable Farming Systems

Long-term soil fertility

IFOAM reiterated that, in organic agriculture, the organisational principles of "feeding" the soil were far more important than the use of inputs per se (external/internal, natural/synthetic). Examples of organisational systems include avoiding excess and mining of nutrients, unlocking nutrients from lower levels of the soil and different rooting systems. As such, organic agriculture is more concerned with processes than individual elements.

The group recognised that a strictly closed nutrient and energy system was not possible. Organic agriculture aims at optimising flows in "nearly" closed-systems.

The group acknowledged that the starting point for soil fertility management should remain flexible. In poor and depleted soils, there will be need to amend the soil above minimum levels of NPK and micro-elements, and eventually to balance pH. In tropical conditions, nutrient management involves enhancing processes that mobilise available nutrients and induce slow mineralization.

IFOAM recognised that there are less problems in sourcing nitrogen and potassium than sourcing phosphate and micro-nutrients. Where losses existed via exports from the farming system, phosphate and potassium will need to be supplemented (e.g. bone meal). Under special site conditions, synthetic phosphate can be used while remaining under the organic agriculture banner.
The group recognised that while organic matter could be easily maintained in temperate regions, it was rapidly depleted in tropical soils. Tropical soils, however, can be managed in a way that enhances and maintains their organic content by: amending soil with organic matter, creating sufficient shade, or low tillage. For this end, burning organic matter should be avoided.

Economic viability and labour

IFOAM informed that the energy output/input ratios are generally higher for organic products (but that variations existed, depending on products). Maximum labour input enhances non-renewable energy efficiency and creates employment in countries with high unemployment levels. Although labour availability could be constrained in periods of peaks, labour requirements during the year will be more balanced in diversified farms. Shortage of labour during peak seasons could be overcome by introducing adequate equipment (e.g. such as the slide shown on equipment in sugar cane fields). Variations in labour availability should however be considered case by case, by also taking into consideration off-farm activities (often more attractive because better remunerated) and their impact on the labour/employment relationship.

[3] Working group composition is in Annex 2

Certified organic products receive a premium in Northern countries that corresponds to the higher costs involved in producing organic products. Most farmers receive a better income after conversion to organic agriculture. The cost-price difference is smaller or non-existent in low income countries, but data is very limited on this issue. Furthermore, certification is less important for local markets in these countries, except in countries (e.g. Latin America) where organic production is growing rapidly for export.

Economic cost and benefits analysis usually fail to account for important investment factors such as developing management capacity and supporting farmers during the conversion phase to organic agriculture. Long-term environmental benefits and avoided costs (e.g. environmental clean-ups, health-related problems) are "externalities" which are rarely accounted for in establishing economic feasibility of production systems.

It was agreed that the economic benefits of organic production cannot be generalised, because they depend on local conditions (e.g. prices, access to markets, consumer demands, etc.).

Role of organic agriculture in food security

IFOAM mirrors its members' needs and these are essentially concerns with increasing market difficulties. At present, over-production and low prices in some countries are high on the agenda. IFOAM members are not interested in global food availability. The situation may, however, change in the longer term.

IFOAM acknowledged that the present statistical basis for long-term projections regarding organic agriculture was weak to respond to the question concerning the potential of organic agriculture to feed the world. It was recognised, however, that under the present conditions of agricultural knowledge and state of degradation of natural resources, organic agriculture cannot respond to certain food needs such as rice in Asia.

It was, however, noted that limited needs for external inputs in organic agriculture were favourable for food security because they reduce dependency on external inputs and factors. The difficulty of access to synthetic agricultural inputs in many places is the main trigger to conversion to organic systems. It was recognized that many traditional farms fulfil organic agriculture standards by "default" because they do not have access to synthetic inputs. Even in these cases, they are considered as organic.

Issues covered by other working groups but of key importance to sustainability

IFOAM standards apply to the farming system as a whole and not to a specific crop/commodity. Global standards are being diversified for different countries, agro-ecosystems and cultures. Organic standards will continue to be developed, according to new needs.

Suggestions for FAO/IFOAM cooperation

The group was of the view that the integrated plant nutrition approach of FAO and the organic approach had great similarities. It, therefore, seemed interesting to join knowledge and experiences on integrated soil and nutrient management.

Additional issues raised in plenary discussions

It was recognised that lack of data prevented meaningful economic comparisons between organic and conventional farms. It was stressed that although higher productivity and economic benefits are possible in organic agriculture, evidence is not sufficient to generalise this statement. The potential of organic agriculture will, therefore, need to be qualified according to different regions of the world. The meeting recognised that more data can be generated on sustainable farming systems if FAO cooperated with IFOAM's Project 1 on "In-Depth and Participatory Data Collection and Farm System Comparison".

It was stressed that, even where organic matter was available in sufficient quantity for soil fertility management, there could be competition for use of organic matter (e.g. production of energy for household purposes). This constraint should be considered and alternative strategies proposed.

IFOAM's confidence in the ability of organic systems of being able to source the nitrogen necessary for soil health and crop requirements was questioned. Is was agreed that in-depth studies are required to establish whether organic systems could be self-sufficient in nitrogen in the various agro-climatic conditions.

Energy and labour were recognised as being key indicators for evaluating farming systems sustainability: it was, therefore, recommended that global energy and labour indicators be elaborated.

To supplement the working group considerations on economic viability, it was highlighted that economic benefits of organic agriculture also result from avoided costs (such as purchasing external inputs) and value-added on the farm. Although premiums are important in some cases, organic and conventional commodities often have equal prices. It was also stressed that, although organic farms are labour intensive, the overall return ratio was also high.

It was noticed that the group did not consider important factors such as efficiency of water consumption.

Working Group 2: Research, Extension and Training

Extension

The Farmer Field School (FFS) approach is a well accepted approach that could be extended to organic agriculture. FAO and IFOAM could collaborate by developing appropriate curricula and research. FAO could initiate pilot programmes in FFS in selected countries. IFOAM member training centres (e.g. China, India, Kenya, Korea, Nepal, Philippines, Sri Lanka, Thailand, Vietnam, and other African and Latin American countries) could be used to this end but an evaluation of these centres should precede (or be part of) this exercise. It seems that donors have expressed interest in this activity.

It was agreed that handbooks be developed and translated into different local languages for extension purposes. In addition, FAO's experience in the participatory rural appraisal

approach could be applied in extension for organic agriculture, especially since the latter is holistic by nature.

Education and learning

It was recommended that FAO encourage its member governments to include organic agriculture education at higher learning institutions, for better targeting of scientists and trainers. IFOAM could assist in curriculum development.

Youth education programmes, at different school levels, would particularly benefit from promotional and educational material developed specifically for organic agriculture.

The group suggested that FAO use the TCDC mechanisms to exchange knowledge among the various IFOAM resource centres for training.

FAO and IFOAM could jointly identify, collect and disseminate technical and resource information on education (e.g. training material, roster of resource centres and experts, contacts for support).

Research

The group identified the following research gaps as critical for the advancement of organic agriculture: improved local crop varieties; evaluation of organic agriculture performance in extreme situations; identification of the factors (e.g. subsidies and tariff, non-tariff and other barriers) that keep organic pest management and integrated pest management non-feasible in developed countries; selection and elaboration of best management systems which are acceptable in developing countries; and fertiliser quality control, including those allowed in organic agriculture.

A general evaluation of the potential of organic agriculture for responding to world food needs is important to make estimates on the return of investment in related research and development. This information is not only useful to policy decisions but to all players involved.

It was agreed that a handbook on the specific approach and methods for organic agriculture research would be useful. Such a handbook should cover items such as methods and training for on-farm research and comparable methodologies.

Statistics and information

FAO could expand its annual questionnaires to governments by seeking information on organic fertiliser use; pest prevention techniques; and production statistics (including use, production, consumption and tariffs information). In particular, data on botanical pesticides should be included for their identification, local use and production, food quality evaluation, and simple statistics (e.g., yes, no, names, hectares planted).

For data collection purposes, a national focal point system could be established for organic agriculture. Existing certifying bodies could be considered as a practical means for serving this function. The potentially extended mandate of certification centres, which would work

within an agreed FAO/IFOAM data base, support and facilitate standardisation and easier data transfer. Organised data collection will also offer the basis for sound policy making, indicator verification, crop selection, and input use efficiency.

IFOAM and FAO could jointly produce a Farmer's Series on Organic Agriculture to promote information transfer to farmers. It was noted that the demand for such a product already exists.

It was agreed that consumers, farmers and trainers' education campaigns should have the available information on organic agriculture benefits, and more specifically information on why its methods are more sound for human, environmental, plant and animal health. To obtain this information, more comparative trials and data collection under different conditions are needed. IFOAM's Organic Agriculture until 1999 is a good means to create this information basis.

Networking

It was recognised that FAO can play a significant role in supporting increased networking and promoting information transfer to tropical countries. Local links and support can be provided by IFOAM members.

Besides the national focal points on organic agriculture, contact points within FAO and IFOAM should be identified for each of the areas mentioned above (i.e., extension, farmers field schools, training, education, research and marketing).

In addition, the need was expressed that NGOs (and in particular organic agriculture NGOs) be informed on how to make contact with FAO field offices, at country and regional levels, when seeking information, and preparing proposals for collaboration and support from FAO (TCDC, TCP, or participation in existing programmes).

Additional issues raised in plenary discussions

Among areas deserving research, it was recommended that nutrient contents of organic fertilizers be investigated.

It was suggested that FAO web information on post-harvest operations include a chapter on organic agriculture.

FAO was invited to consult the IFOAM web page Green Trade Net.

Working Group 3: Standards and Certification

Standards

IFOAM standards are not limited to food only, but also include fibres and cosmetics. IFOAM is developing guidelines to define standards for emerging "sectors" (e.g. textiles, aquaculture, forestry) in order to ensure that the term "organic" is used properly. This is done in

cooperation with organizations which are not members of IFOAM. The aim is to develop standards for all natural products.

IFOAM encourages regional groups to develop regional standards, adapted to local situations. These standards need to be (at least) equivalent to "international" standards. FAO could play a key role in this process. In particular, IFOAM proposes that FAO offer its inter-governmental platform to facilitate discussions on standards equivalence. In case organic agriculture is seen as an option for sustainable agriculture development, representatives of developing countries civil society should be offered the possibility to voice their concerns in standard setting fora. The possibility of including NGOs and civil society members in governmental delegations should be seriously considered.

IFOAM stresses that, when regulations are developed, the organic movement organizations must have an active role in the process of decision making. IFOAM argues that the organic movement should define itself, and not be defined by those who are not subject to the standards, like governmental bodies or conventional agribusiness.

The issue of standards harmonisation was raised. Although IFOAM wants to harmonise standards, it is inevitable that there will be differences between its own Basic Standards, national regulations and the Codex Alimentarius related standards, especially because these standards have different dynamics and objectives. As organic agriculture is developing fast, standards are also developing fast. It is feared that regulations "fix" organic agriculture because they are too slow in following the rapid evolution that characterises the organic agriculture trend.

If organic agriculture becomes considered as a feasible option for developing countries, these countries should be encouraged to participate more actively in IFOAM's activities. Furthermore, awareness should be raised on the potential benefits of organic agriculture, training of trainers should be provided to facilitate local standards setting, curricula should be developed (as currently done in Asia by IFOAM), and advice provided to farmers. In cases where governments wish to develop organic agriculture in their country, they should create the necessary conditions to this end.

The inclusion of socio-economic standards in organic agriculture standards was discussed. Certification programs, however, have difficulties in verifying social justice standards. In addition, it is expected that governments will most likely resist accepting socio-economic standards for obvious political reasons, especially since such standards might highlight comparative disadvantages in some developing countries. In any case, socio-economic standards should always be locally adapted.

Certification

Certification is most relevant for exports and less so for domestic production. Special guidelines have been developed by IFOAM for smallholder group certification. Foreign inspection/certification is relatively expensive, and IFOAM policy is to build capacities of local certifiers. FAO may play a role in the establishment of local certifiers, including their acceptance by their government. Within a country, certifiers can be NGOs, companies or even state governments (e.g. Denmark, Washington State), provided they all apply the same criteria.

The cost of certification can be seen as a "penalty" for organic producers. Although organic farmers have tried in many places to internalise several external costs, they still need to pay for certification for proving that they have followed the requirements. Eventually, such costs could be compensated by a premium.

Suggestions and recommendations for FAO/IFOAM cooperation

FAO proposed to develop crop protocols. IFOAM cautioned about a reductionist approach in organic agriculture and recommended that a holistic approach be maintained (crops should always be seen as part of a farm system and not singled out) as well as site-specificity. Protocols could be formulated for groups of crops and/or for particular farming systems.

IFOAM suggested that FAO participate in its standard setting process, by attending meetings of the Standards Committee and/or by networking between IFOAM and FAO experts.

IFOAM proposed that FAO acknowledge the substantial effort made by IFOAM in setting standards for organic agriculture and accept to cooperate in future revisions of the Basic Standards.

Additional issues raised in plenary discussions

The different processes and purposes of IFOAM standard setting and the Codex Alimentarius was debated and understanding of respective aims and objectives diverged. IFOAM advocated the role of FAO in providing the scientific basis for inter-governmental decision-making in fora such as the Codex Alimentarius Commission and the World Trade Organisation.

More empathy and understanding of potential and constraints of both IFOAM and FAO procedures in standards setting is needed for future joint initiatives. SDRN will try to facilitate this process. IFOAM is ready to assist FAO in establishing the scientific basis necessary for standard setting.

Working Group 4: GMOs, Risk Assessment and Ethics

The case of genetically modified organisms (GMOs)

The group agreed to address the related topics of GMOs from the wider perspective of biotechnology. IFOAM recognised that while organic standards define border lines, there is a lot of flexibility and diversity therein.

As regards conventional breeding, IFOAM indicated that the ideal would be that each farm have its own breeding programme. The use of hybrid seeds is not banned in organic agriculture but there is a debate about their acceptance. The group recognised the dilemma that exists on “scientific base and evidence” for decision-making and policy purposes. This leaves the floor open to the diversity of conclusions that can be drawn from scientific evidence.

It was agreed that the danger of resistance build-up potentially brought about by GMOs is similar to natural breeding risks. In the case, however, of Bt-toxin introduced by GMOs, there is permanent exposure and rather rapid selection. When natural Bt organisms are used in organic agriculture, it is done very selectively. Naturally, released Bt also starts to break down after a few hours; thus, the time aspect is essential in such considerations.

The potential of GMOs for nutrient fixation in non-leguminous plants has been considered. The organic movement community raises the question on the purpose of such manipulation. It is argued that diversified crop rotations (7-9 years), coupled with an appropriate manure and compost strategy, could bring the necessary nitrogen supply within cropping systems. Actually, there is a danger that the availability of nitrate fixing (wheat for example) would "seduce" organic farmers in giving up the benefits of diversified crop rotations that have positive contributions to the whole organic agriculture system (e.g. improving soil structure, mobilising nutrients from lower levels, weed control/thistles).

IFOAM questions the fundamental reason behind the use of GMO: growing strawberries in Newfoundland or wine in Greenland? IFOAM is of the view that there are several other possible means to achieve common objectives such as improved food security.

The growing need for risk assessment

Risk-prone technologies like pesticides and atomic energy have demonstrated that there is an urgent need of risk assessment and evaluation before introducing and sometimes developing new technologies.

The group agreed that biological control organisms, as well as introduced species, may carry a greater risk than those related to GMO use. In particular, the spread-out risk of released biological control organisms requires a very critical assessment of the perceived potential solutions associated with the use of biological control.

IFOAM stressed that, instead of focusing on increased risk assessment, it might be more constructive and productive to invest efforts and resources in more research for developing alternatives that have a very low risk potential.

Ethics

The main reason identified for the negligence of considering ethical aspects in decision- and policy-making was that the issue is overwhelmingly holistic. "It calls for a mix of disciplines and a dialogue between particularly enclosed cultures" (Ms. Lenoir, International Committee on Bioethics). The group discussed ethics not only in relation to GMOs but in its wider context.

The liberal philosophy looks at ethics as the ability to choose a technology and its products (e.g. fair trade coffee). An essential question in this context is: how much choice is left? The example of GMO soya showed the limitation of the right to choose, because soybean is to be found in almost half of the food sold in markets.

The example of the Swiss law for a right of a biocentric approach for the "dignity of creatures" provoked questions such as: whether it is ethical to breed "blue dogs" or

genetically modify fish with growth hormones that lead to deformations preventing fish from eating, in cases of delayed harvest.

These striking examples led to the more fundamental question as to how society could agree on some basic ethics across religions, political positions and personal opinions. It was mentioned that Unesco had recently established a World Commission on Ethics of Science and Technologies and that an International Committee on Bioethics has existed for a few years.

Although the group did not focus on recommendations for cooperation between FAO and IFOAM on ethics, the need was expressed for FAO to start information collection on agriculture-related GMOs as well as mediating the debate on bioethics in agriculture. IFOAM inquired whether FAO, within its mandate (i.e. to collect and disseminate information related to food and agriculture), could provide such a platform, especially since a number of governments have already started to invest in further GMO development.

Additional issues raised in plenary discussions

The meeting agreed that equity and empowerment are "ethical" issues which are part of FAO's field of work. Within the overall biodiversity framework, intellectual property rights and patenting are the main concerns in equity considerations.

FAO stressed that it concentrates on the right to food (for humans) and therefore the right of animals was not a priority in its work. It was recommended that a distinction be made between biotechnology and animal welfare.

7. Conclusions and recommendations

The results of the two day discussions, including the working group reports were summed-up. It is to be stressed that the implementation of the recommendations is subject to availability of funds, although many could start without particular implications on current financial allocations. The recommendations fall into five broad categories of FAO's type of intervention, namely: information services, normative studies, policy advice, field projects, and liaison and consultation. The recommendations below are not prioritised but the need to focus on activities that generate an improved information basis was unanimously stressed by the meeting.

Information services

Although standards setting for organic agriculture is voluntary, countries require technical information and knowledge that FAO is in the best position to provide.

FAO could assist IFOAM's efforts by preparing handbooks on organic agriculture approaches and methods, namely by creating a series targeting farmers that is translated into local languages.

The FAO proposal for establishing an information system on organic agriculture, similar to the E-mail ESC dairy outlook was welcomed. Through this system, the collection and analysis of statistics related to organic agriculture production and trade offers great benefits. Such a system would also serve as a networking vehicle for field workers interested in organic agriculture.

The work initiated by the David Lubin Library in collecting organic agriculture documentation was commended. It was recommended that proper key words be established to facilitate information searches on this subject.

IFOAM recommended that FAO/TCDN considers dedicating a special issue of DEEP (a liaison bulletin produced by NGLS) to organic agriculture, especially since DEEP targets the NGO and grassroot community.

Normative studies

Among the technical issues discussed, overall nutrient and energy balance was the main concern for FAO staff. In-depth investigations were felt necessary for means of sourcing organic matter and minerals in different agro-ecological settings, especially as regards on-farm availability and use.

It was suggested that strategies be devised for conditions where conflicting and competitive demands are put on organic matter.

The adoption of organic and integrated pest management practices was recognised as being hindered by macro-policy factors that deserved to be evaluated.

FAO expressed interest in collaborating with IFOAM on post-harvest methods, techniques and standards. It was recommended that organic agriculture not be limited to the farmgate.

It was recommended that, for evaluating socio-economic sustainability, indicators be developed for fossil fuel use and labour dynamics. In addition, SDRR work on institutional sustainability was found helpful in developing related sustainability indicators and criteria for organic agriculture systems.

In order to clarify the debate on food security and the potential contribution of organic agriculture to respond to increased food needs, it was recommended that studies be made in various agro-ecological regions of developing countries, especially to establish the conditions where organic agriculture is viable. A first study should focus on tropical areas where there are difficulties in maintaining soil fertility.

It was agreed that FAO and IFOAM should work together to refine organic agriculture standards, according to different agro-ecosystems and cultures. In particular, it was recommended that the option of developing cropping protocols through case studies be investigated.

Policy advice

The position of FAO was recognized as being of key importance to promote research for organic agriculture, especially as regards production and post-production technologies for local crops and animals.

In its advisory role to Governments, FAO should develop normative work that assists countries in undertaking risk assessment before developing or using new agricultural technologies. To this end, countries should be encouraged to adopt a proactive approach, based on precaution and prevention.

FAO would be in an ideal position to create, through the provision of information, the conditions to discuss ethics of agro-industry. Within its mandate, FAO could function as a platform where pros and cons of different agricultural alternatives are evaluated.

With a view to inviting independent advice, it was suggested that FAO establish an Expert Panel on organic agriculture, perhaps following the example of the IPM Panel established in the 70s-80s.

Field projects

Because the dearth of data was found to be the main constraint for evaluating organic agriculture viability, establishing priorities in policy decision, research, extension, training, and defining the contribution of organic agriculture to food security and environmental sustainability, the meeting agreed that data collection and analysis for all types of farming systems was an essential starting point. Project 1 of the IFOAM's Organic Agriculture until 1999 (OA '99) Programme is an ideal means for FAO to start collaboration in this field. Within FAO, the following Services expressed interest in participating in this project: AGSP, AGP, ESA, TCI, and SDRN. An internal working group will be constituted to examine the project document (distributed at the meeting) and consider areas of involvement in its second phase (starting in June 1998).

The FAO Farmers Field Schools (FFS) approach was found to have great similarities with IFOAM's promotion of in-situ research for organic agriculture. It was agreed that joint pilot FFS be established in selected developing countries, by building on IFOAM existing training centres. Again, IFOAM's OA' 99 Project 6 on "Education and Training" could serve as a starting point for such activities.

Because certification costs are prohibitive for many developing countries, especially for small farmers, FAO and IFOAM could work together to build local certifying capacities.

FAO should consider providing technical assistance to small farmers in tapping niche-markets for their organic commodities.

Liaison and consultation

With a view to strengthening IFOAM's participation in FAO activities, it was recommended that a few key members of IFOAM be included in the internal FAO E-mail network on organic agriculture.

It would be desirable to identify FAO contact points for each of the specific areas of expertise required for organic agriculture.

IFOAM expressed interest in participating in FAO's current efforts in preparing a document on organic agriculture, to be presented to the Committee on Agriculture (January 1999) and other documents for the 2nd Den Bosch Conference on Agriculture and the Environment (tentatively scheduled for October 1999) and the Commission on Sustainable Development (2000).

IFOAM would welcome FAO's consideration of its members field experts within the Technical Cooperation among Developing Countries (TCDC) and Academic Agreement Schemes.

Summary of potential cooperation

SUBJECT AREAS (main FAO Services involved)	**ACTIVITIES** **(not prioritized)**
Sustainable farming systems (AGSP, AGP, ESA, TCI, SDRR, AGL, SDRN)	1. Collect and analyse data through OA'99 Project 1 2. Establish indicators for labour and energy 3. Develop guidelines for technologies' evaluation and risk assessment 4. Select best management practices 5. Study potential and constraints of OA in different agro-ecological regions (starting by tropical climates)
Input management (AGL, AGP, SDRN)	6. Investigate similarities of IPNS and OA in integrated soil and nutrient management 7. Study nutrient and energy balance in different agro-ecological regions, especially in the tropics 8. Develop strategies for on-farm organic matter sourcing and use 9. Evaluate policy constraints to adoption of IPM and organic pest management
Research, extension & training (AGP, REUS, SDRE, SDRR)	10. FFS pilot projects (follow-up to Project 6 of OA'99) 11. Education curricula development 12. Farmer Series on OA methods for TOT 13. Include OA in research agenda (e.g. local crops)
Standards & certification (ESN, AGP, TCDN, FIR)	14. Facilitate standards equivalence/harmonisation 15. Participate in revisions of Basic Standards and attend meetings of the Standard Committee 16. Find means to voice civil society concerns in the framework of the Codex Alimentarius 17. Build capacities of local certifiers 18. Develop crop protocols through selected case studies
Information (GIL, ESC, ESN, TCDN, SDRR, SDRN, FIR)	19. Develop OA statistics on production and trade 20. Enhance FAO Library collection on OA documents (grey literature, key words, etc.) 21. Issue a special edition of DEEP on OA 22. Consult with IFOAM during preparation of OA papers (COAG, den Bosch 2, CSD 2000) 23. Provide the scientific basis for decision-making in standard setting (Codex and WTO) and biotechnology (GMOs) 24. Consider establishing an advisory Expert Panel on OA
Networking (OCD, SDRN)	25. Include IFOAM members in TCDC and AA schemes 26. Establish a general OA information service 27. Include selected IFOAM members on FAO internal E-mail network 28. Identify FAO contacts on specific OA themes

8. Closure of the meeting

Ms. Louise O. Fresco supported the meeting's recommendation to strengthen data and information collection and analysis, highlighting that the costs and benefits of organic agriculture, including its contribution to food security, should keep in sight location specificity. There is definitely a need for more cooperative research on organic agriculture. FAO's Committee on Agriculture and the Consultative Group on International Agricultural Research (CGIAR) could possibly influence future research agenda in this direction. She informed the meeting of the creation of the Global Forum for Agricultural Research, which includes the CGIAR, NGOs, farmer's organizations, national agricultural research leaders, the private sector and regional research networks in the process. Biotechnology will remain a main issue and this reality should be accepted, without however shying away from environmental implications and related preventive actions. She noted that the US National Academy of Sciences, as well as many others, have guidelines on biotechnology risk assessment. Sub-regional institutions could eventually assist national efforts in this direction. She stressed that FAO's role was to provide information in all its different dimensions, including the potential of organic agriculture and related policy needs. She advised that the Dutch Government is considering to support a second Den Bosch Conference on Agriculture and the Environment (fall 1999) to prepare, among other things, the review of the agriculture sector for the commission on Sustainable Development special session on agriculture in year 2000. Within this framework, organic agriculture will be addressed.

Mr. Tim Aldington, Senior Advisor, AGD, congratulated the meeting for the interest generated and noted that organic agriculture was on the agenda of the Committee on Agriculture that will meet in January 1999. He recommended that the input-output issue for tropical climates, and the applicability of organic agriculture in difficult situations be investigated. Consideration should be given to assisting traditional farmers, seeking access to markets, to move into organic agriculture. As regards ethics in agriculture, he welcomed collaboration with IFOAM to look into related issues for a wider range of commodities.

Mr. Hervé La Prairie was pleased with the positive atmosphere of the meeting and indicated that IFOAM's priority was to collect and analyse data more thoroughly. He was, therefore, pleased that IFOAM's interests coincide with those of FAO.

Mr. Bernward Geier mentioned that, although he had been critical in the past towards FAO, he was very happy with the cooperative spirit of the participants. He hoped that this momentum would be sustained. He recognized that, although all recomendations cannot be implemented in the short-term, a few should be selected for actual follow-up.

Ms. Nadia Scialabba thanked the IFOAM guests and FAO colleagues for their active and committed involvement during the meeting, stressing that time was ripe to move ahead on organic agriculture in FAO. Although legitimate doubts have a useful place, investigation and reflection are essential to be able to advance in sustainable agriculture. The meeting is only a beginning, and it is hoped that the process of report preparation and clearance, and especially the start-up of activities will help to build a common understanding, clarify divergences, and develop ways to bridge gaps.

ANNEX 1: LIST OF PARTICIPANTS

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Environment and Natural Resources Service (SDRN)

Anthony WHITEHEAD
Senior Officer
Food Quality and Standards Service (ESNS)

Maria José ZIMMERMANN
Senior Research Officer
Research and Technology Development Service (SDRR)

ANNEX 2: COMPOSITION OF WORKING GROUPS

Working Group 1: Sustainable Farming Systems

Participants: Fletcher-Paul (AGLN), Rabindra Roy (AGLN), Hassan Nahban (AGLS), Benites (AGLS), Felix Moukoko (AGSP), Doyle Baker (AGSP), Josef Kienzle (AGSE), Theodore Friedrich (AGSE), Juan Carlos Chirgwin (AGAP), Rachel Nugent (ESAC), Michelle Gautier (FORC), Albert Tacon (FIRI), Stefano Gavotti (TCI), Alexandre Borde (SDRN), Pascal Liu (SDRD), Ulrich Köepke (IFOAM).

Facilitator: Nadia Scialabba (SDRN).

Rapporteur: Coen van Beuningen (IFOAM).

Working Group 2: Research, Extention and Training

Participants: Kevin Gallagher (AGPP), Dominic Ballayan (ESS), Theresa Connaughton (GIL), and Ranjith de Silva (IFOAM).

Facilitator and rapporteur: Rainer Krell (REUS).

Working Group 3: Standards and Certification

Participants: Anna Maria Bruno (ESN), Selma Doyran (ESN), Bel Amakeletch Tafei (SDR), Jose Machado (AGS), Wielfried Baudoin (AGP), Hervé La Prairie (IFOAM).

Facilitator: Anne Aubert (SDRN).

Rapporteur: Bo van Elzakker (IFOAM).

Working Group 4: GMOs, Risk Assessment and Ethics

Participants: Maria Zimmermann (SDR), Stephane Bauzon (SDR), Devin Bartley (FIRI), Juan Carlos Chirgwin (AGAP), Urs Niggli (IFOAM).

Facilitator and rapporteur: Bernward Geier (IFOAM).

ANNEX 3: AGENDA AND TIMETABLE

THURSDAY 19 MARCH

9.00 a.m. **1. Opening**
Welcoming address (Louise O. Fresco, SDRD)
Introductory remarks (Hervé La Prairie, IFOAM)
Introduction of IFOAM participants

9.30 a.m. **2. Principles and objectives of organic agriculture**

10.30 a.m. (coffee break)

10.45 a.m. **3. IFOAM's experience and perception of trends**
- IFOAM aims and objectives (Bernward Geier);
- Extension and training (Ranjith de Silva);
- Indicators for economic and environmental analysis of organic agriculture (Coen van Benningen);
- Standards and certification (Bo van Elzakker);
- Economic aspects of organic agriculture (Ulrich Köepke);
- GMOs within the organic agriculture context (Urs Niggli).

11.45 a.m. **4. FAO's current work of relevance to organic agriculture**
- Global Integrated Pest Management Facility (Kevin Gallagher, AGPP);
- Post-harvest storage and handling (François Mazaud, AGSI);
- Sustainable farming systems (Felix Moukoko, AGSP);
- Sustainability indicators (Jeff Tschirley);
- Dairy information exchange system (Ali Gurkan, ESCB);
- Organic agriculture documentation (Theresa Connaughton, GIL)
- Food quality and safety of organic food products (Selma Doyran, ESNS);
- Livestock contribution to better integrated systems (Manuel Sanchez, AGAP);
- Biotechnology (Maria Zimmerman, SDRD).

12.30 p.m. **5. Working groups arrangements**
(i) sustainability of farming systems;
(ii) research and extension/training;
(iii) standards and certification;
(iv) GMOs, risk assessment and ethics.

12.45 p.m. (lunch break)

2.00 p.m. **6. Thematic working groups sessions**

3.30 p.m. (tea break)

3.45 p.m. 6. Thematic working groups (continued)

5.00 p.m. (end of session)

FRIDAY 20 MARCH

9.30 a.m. **7. Plenary discussion of findings of working group 1**

10.30 a.m. (coffee break)

10.45 a.m. **7. Plenary discussion of findings of working groups 2 and 3**

1.00 p.m. (lunch break)

2.00 p.m. **7. Plenary discussion of findings of working group 4**

2.30 p.m. **8. FAO's potential involvement in organic agriculture and collabration with IFOAM**

4.00 p.m. (tea break)

4.30 p.m. **10. Closing session**
Louise O. Fresco, Director, SDRD
Timothy Aldington, Senior Advisor, AGD
Hervé La Prairie, President, IFOAM
Bernward Geier, Executive Director, IFOAM
Nadia Scialabba, focal point for organic agriculture, SDRN

5.00 p.m. (end of meeting)

ANNEX 4: DOCUMENTS DISTRIBUTED

IFOAM, 1992. Proceedings of the 9th IFOAM International Scientific Conference on Organic Agriculture, a Key to a Sound Development and a Sustainable Environment, Sao Paulo, Brazil, 16-21 November, 1992.

IFOAM, 1994. Directory of Training and Education Opportunities for Tropical Organic Agriculture. First Edition.

IFOAM, 1995. Directory of Training Opportunities in Organic Agriculture for Temperate Climatic Zones.

IFOAM, 1995. Proceedings of the 4th International IFOAM Conference on Trade in Organic Products, Frankfurt, Germany, 28 February-2 March 1995.

IFOAM, 1996. Basic Standards for Organic Agriculture and Processing and Guidelines for Coffee, Cocoa, and Tea; evaluation of Inputs.

IFOAM 1997, The Future Agenda for Organic Trade, Conference Proceedings of the 5th IFOAM International Conference on Trade in Organic Products, Oxford, England, 24-27 September 1997.

IFOAM 1998. Directory of the Member Organazitions and Associates of IFOAM, 1997/98.

IFOAM, 1998. 25 years of IFOAM - Uniting the Organic Movement Worldwide. Special Issue of Ecology and Farming no. 17.

Geier Bernward, 1996. Organic Agriculture - Part of the Food Security Solution (article).

Geier Bernward, 1998. Organic Agriculture Worldwide - A Fast Growing Reality for 100% Pesticide Risk Reduction. A keynote speech presented at the International Conference on Pesticide Use in Developing Countries, San Jose, Costa Rica, February 1998.

FAO, 1997. Biological Farming Research in Europe. REU Technical Series no. 54. FAO Regional Office for Europe.

Wynen Els, 1998. A Framework for Analysis of Organic Farming Contribution to Food Security and Sustainability. FAO/SDRN draft document, March 1998.

ANNEX 5: MESSAGE FROM THE DIRECTOR-GENERAL, ON THE OCCASION OF IFOAM'S 25th ANNIVERSARY

It is a particular pleasure for me to offer IFOAM my congratulations on the occasion of its 25th anniversary. It is also a source of satisfaction that in the past year IFOAM joined other international non-governmental organizations that have official status with the UN Food and Agriculture Organization (FAO). Contacts and collaboration between IFOAM and FAO have been growing and I was very pleased that IFOAM joined other NGOs in contributing to preparations for the *World Food Summit* in Rome in November, 1996.

The Summit spelled out the problem facing the world today in stark terms: more than 800 million people suffer chronic hunger and undernutrition, 200 million of them children under five. And this in a world that can produce enough food to satisfy the needs of everyone.

The philosophy of FAO is to help the hungry to help themselves: that is, to grow enough for their families and communities, to diversify their agricultural activities to protect themselves better against crop failure or livestock diseases, to manage better what water resources are available to them, and to do all this in a way that protects their land and the environment for succeeding generations.

In the *Rome Declaration on World Food Security*, the leaders of the 186 countries attending the World Food Summit stated: "We recognize the importance for food security of sustainable agriculture, fisheries, forestry and rural development." The *World Food Summit Plan of Action* recognized the importance of "appropriate input technologies, farming techniques and other sustainable methods, such as organic farming, to assist farming operations to be profitable, with the goal of reducing environmental degradation, while creating financial resources within the farming operation."

Several of the management practices evolved by the organic farming movement have a direct relevance to the battle to achieve food security: examples include diversification and crop rotation, as well as the use of natural means to combat pests, which is a fundamental part of the Integrated Pest Management programme promoted for several years by FAO.

Ensuring that the rural poor have access to the necessary means for producing, handling and processing adequate food also means ensuring they have access to the information they need to make choices about the best agricultural methods to employ in their particular circumstances. In certain circumstances, these farmers may not be able to afford expensive external agricultural inputs such as synthetic fertilizers and pesticides, but the transfer of knowledge about agricultural techniques that rely on local resources, including those developed by the organic movement, is a practical possibility. This is one area that has potential for increased collaboration between FAO and IFOAM. Others include normative work such as the collection and analysis of production and market information and statistics for organic commodities, and continuing work on standards and guidelines.

Another possible area is research into sustainable management of natural resources for agriculture that responds to the need of farmers to make a living while conserving the ecological foundations essential for continuous advances in crop and animal productivity. This could be successfully carried out through research projects on the farm, specific to particular locations, or through farmer field schools (or both), where partnerships, extension and communication are integral parts of the process of research and knowledge sharing.

"Food for All" is a goal that can be achieved. The 5.8 billion people in the world today have, on average, 12 percent more food per person than the global population of four billion people had 20 years ago. But the world's population is forecast to increase by another 2.5 billion in the coming three decades, and to keep pace with their needs and at the same time solve existing problems of hunger, global food production must increase by another 75 percent in that time, while conserving the regenerative and reproductive capacity of the natural resource base. It is a daunting challenge. But if all those concerned -- NGOs, national governments and international organizations such as FAO -- work together as partners, I am convinced that it can be successfully met.

ANNEX 6: FAO BRIEFS RELATED TO ORGANIC AGRICULTURE

Plant Protection Service, FAO

Global IPM Facility

"Urgent attention is required to reduce excessive and costly pesticide use, which poses a threat to both human health and the environment. The importance of IPM is widely acknowledged for the development of ecologically sound and sustainable agricultural practices and for strengthening farming communities' participation in that development." - First sentence of the Global IPM Facility project document.

The key activities of the facility, as given in the project document, are to:

- Create awareness and a conducive policy environment through study tours, exchange visits and briefings demonstrating the potential of IPM to farmers, technical leaders and policy-makers;

- Help promote, design and facilitate funding for pilot activities to demonstrate the feasibility of a farmer-oriented approach;

- Assist countries with successful pilot activities to move into a full-scale project phase;

- Help establish, strengthen and expand national and regional IPM programmes by providing linkages to other national IPM programmes and facilitating access to relevant models, experts, research findings and studies;

- Establish co-operative linkages with relevant officers, both technical and policy, within aid agencies, international agencies and NGOs and offer assistance in project identification, project proposal screening and policy development with regard to IPM.

In essence, the Facility is to promote IPM programme development in order to reduce the environmental and health impacts of agricultural activities while improving profitability. Although IPM legally allows the use of pesticides and chemical fertilisers, many techniques and methods of organic agriculture apply to IPM. Organic agriculture and IPM in general share many long term values, and goals.

In terms of contributions to potential FAO-IFOAM collaboration, the Facility is working with national programmes on farmer education programmes, especially with the "Field School" approach which has been promoted in many IPM programmes, and could possibly provide some useful tools for organic agriculture programmes. A great limitation of the Field School approach for organic agriculture, however, is the organic certification process of each farm. Field Schools are typically developed around a central study field within a community to provide a basic introduction to ecological management methods characteristic of IPM. While this may be a useful first step, organic farmers must begin in the own fields organic methods for the number of years required previous to complete certification. Longer term methods than typically used in IPM are obviously required.

The Global IPM Facility applauds the work of IFOAM, and hopes to work more closely in the future with IFOAM and its members.

Contacts: Dr. Peter E. Kenmore, Coordinator *[Peter.Kenmore@fao.org]*
Dr. Kevin D. Gallagher, IPM Specialist *[Kevin.Gallagher@fao.org]*

Food and Agricultural Industries Service, FAO

Post-harvest storage and handling of organic products

1. Objectives

- Technical assistance to selected developing countries to explore export potential of organic products;
- Improvement of handling and processing operations for organic products.

2. Activities undertaken

- Consultancy on handling and processing of organic fruits and vegetables (i.e. review of the literature; compilation of standards and guidelines; "state of the art" in the storage, handling, processing and packaging of organic products);
- Internal discussions on FAO involvement in this "new" subject;
- E-Mail Conference on the use of aromatic plants in traditional storage (e.g. importance for organic agriculture, as substitute of methyl bromide and other chemicals)

3. Activities to be undertaken

- Consultancy on handling and processing of spices, aromatic and medicinal plants;
- Pilot project in a selected developing country for technical assistance in the export of organic products.

4. Issues for eventual discussion

- The need to consider post-harvest issues in organic agriculture;
- Research to be extended to the post-production sector;
- Irradiation;
- Concern about genetically modified products and its post-harvest consequences;
- Certifying offices in developing countries.

Farm Management and Production Economics Service, FAO

Farming systems

1. Purpose, expected outputs and concepts

The main concerns of the Farming Systems Development Programme are sustainable intensification of farm household systems and institutionalisation of analysis and development of such systems due consideration given to economic as well as ecological sustainability.

The purpose is to:

- generate and apply improved knowledge about production and consumption decisions in farm households;
- undertake vulnerability assessment in rural households, particularly those headed by women;
- assess the impact of changes in national policies on small farms and farm households food security;
- formulate and apply multi-disciplinary approaches and programmes to ensure sustainable settlement and development of lands freed from riverblindness in West Africa.

Main outputs expected are:

- Methodologies and guidelines for, *inter alia:*
  - farming systems typologies;
  - small farm participation in export crop and market;
  - importance of off-farm, on-farm income possibilities.
- Publications on:
  - farmers strategies under high and poor conditions;
  - economics of water harvesting.
- Support to Member Countries concerning:
  - constraints, opportunities and stakeholder analysis, including the SPFS;
  - support to networks for farming systems development (FSD);
  - application of FSD through regional programmes.
- Training:
  - NGOs and farmer resource management workshops.

Keys concepts:

A basic concept underlying the farming systems approach to development is the emphasis on the farm household production systems as opposed to crop/farming systems. This holistic approach implies the analysis of socio-economic as well as of biophysical conditions surrounding the operation of the farm. It stresses diversification including, *inter alia*, all on-farm and off-farm income earning opportunities.

Participatory constraints analysis and planning relying on RRA methodologies are other key characteristics.

2. IFOAM/AGSP Cooperation

General:

- Because Organic Agriculture (OA) is associated with farming systems that "promote environmentally, socially and economically sound production of food and fibres", it appears to share some common goals with AGSP;
- The emphasis of organic farming on reducing external inputs by refraining from the use of chemo-synthetic fertilisers and pesticides may be compared to FAO's advocacy, in certain circumstances, for low-input, low-cost technologies/farming systems. However, the emphasis on refraining from the use of mineral fertilisers, pesticides and other external inputs mainly to respond to a specific niche market in developed countries tends to show that means used and ends to be achieved diverge somewhere.

Opportunities:

- Taking advantage of the market premium for biological products: with reference to AGSP's effort for promoting small farm participation in export crop and market and farm structural transformation, join exploration of the potential for small farmers to participate in particular niche markets could be envisaged.
- Promoting biologically-friendly technologies and related farming systems: farming systems relying primarily on green manuring and recycling of organic matter where possible.

Constraints and issues:

- Requirements of OA in technical, financial and marketing terms not easily accessible to the small farmer;
- high labour requirement/cost;
- general inadequacy of technical know-how;

high marketing costs linked to insufficient scale for packaging; and inadequate demand management.

Farming systems: constraints and issues

- Organic farming methods generally are labour- and management-intensive. Farmers more readily adopt in areas where there is land-use pressure (e.g. higher population density and/or near markets and urban centres). Targeting is therefore needed to specific locations. Targeting to specific household types within locations might is also needed.

- Rates of return to organic farming technologies rarely are higher than for non-organic techniques, and often are lower. Data and information are needed on whether and under which circumstances specific technologies are profitable. Profitability assessment should take into account enterprise complementarity (e.g.

crop residues used for livestock feed) and secondary products (e.g. firewood from alley farming). Technical research is needed on specific nutrient requirements and susceptibilities of crops over their life cycle in order synchronise timing with organic farming technologies (thereby optimising efficiency and increasing profitability).

- No all crops are equally responsive to organic soil fertility management techniques or equally susceptible to pests and diseases which can be controlled using organic techniques. There is as a result an interaction between cropping systems and value and acceptability of organic-farming technologies. Different strategies are needed, for example, for maize-based systems in savannah ecologies versus cassava-based systems in humid forest ecologies.

- Farming systems are highly dynamic, with identifiable general trends such as simplification of crop mixtures, field type differentiation (e.g. wetland fields managed differently than distant upland fields), increasing market integration. Intervention strategies for organic farming should take into account dynamic trends in cropping and farming systems. For example, work on maize in humid forest zone of West Africa would not have been a priority in the 1980s but would be now due to dramatic increases in maize production.

- In few places and for few farmers is organic farming seen as an end in itself. Rather, for most farmers the goal in organic farming is to reduce reliance on external inputs while increasing sustainability of productivity overtime. Reduction, but not necessarily complete elimination, of non-source pollution is an objective many farmers as well, at least in developed agricultural economies. Except for the small minority, however, complete elimination of non-organic inputs is not an objective or essential requirement. At the same time, there is substantial scientific evidence that selected, timely and minimal use of inorganic amendments can add significantly to the productivity and profitability of organic farming techniques. Promotion of organic farming should not be limited to “organic-only” methods and strategies. Rather, continuing work is needed on optimising complementarities between organic and inorganic inputs.

Environment and Natural Resource Service, FAO

"Sustainability" indicators

1. Issues

- Defining the questions - policy, institutional, production / productivity.
- Scaling - spatial, hierarchical.
- Predictability - variation between and within agro-ecosystems.
- Aggregation - individual measures vs. indices, incompatible methods.
- Measurability - cost, time/space, technical complexity, data quality.
- Capacity - institutional, individual.
- Relevance - who will make the decisions? What decisions?

2. Uses

- Assessment, monitoring, evaluation - Conventions ... farm productivity
- Policy formulation and planning - setting targets, monitoring performance, allocating financial resources, investment.

3. Users

- Countries - Internationally (e.g. Conventions - Biodiversity, Climate change, Desertification; Uruguay Round, ...).
- Countries - Domestically (e.g. Ministries, Research institutes, Extension services, NGOs, ...).

4. Selected FAO work

- Land quality - bio-physical resources, production systems, projects, policy.
- Agro-biodiversity - social and economic indicators (e.g. distribution of benefits, ex-situ vs. in situ conservation, risk management, food security, productivity, production constraints [bio-physical, inputs, processing, markets]).
- Forestry - Criteria and indicators for sustainable forest management.

Basic Foodstuffs Service, FAO

Electronic Information Systems for the Dairy Sector: FAO's Dairy Outlook and Dairy Bulletin Services

1. Objective

The aim of FAO's information system is to disseminate and exchange information on the world dairy economy. A similar system could be considered for the organic commodities production and trade.

2. Types of information exchange

Two services have been established - Dairy Outlook and Dairy Bulletin. The Dairy Outlook consists of a regular newsletter, which is edited by FAO's Basic Foodstuffs Service and is distributed mainly by e-mail. The Dairy Bulletin is available only in e-mail and allows registered users to post questions and answers, in the same way as a bulletin board. Access to both Dairy Outlook and Dairy Bulletin is free-of-charge. Further details of each service are presented below.

Dairy Outlook. It is a regularly updated situation and outlook newsletter covering production and trade developments in the dairy sector. Areas covered include:

- market commentary;
- production and trade data;
- international export prices;
- new dairy products;
- country specific developments.

Users are invited to enhance the scope of the information provided by supplying reports on developments in the dairy sector in their own countries or regions.

Dairy Bulletin. The system allows for the free discussion of topics of interest to members. Typical topics, which have been dealt with, include production, consumption, trade, prices, policies, new products and forthcoming events.

3. Experience to date

a) The information services

The Dairy Outlook service began publishing its regular newsletter in November 1996. Since then, seven issues have been produced. Circulation is currently over 400 copies via e-mail and 60 copies via the post. Dairy Outlook can also be accessed on FAO's internet site at: **http://www.fao.org/waicent/faoinfo/economic/esc/escp/dairy.htm**
The service has been very well received by users and has coverage throughout the world, including both developed and developing countries. A particularly positive

feature of the system has been the willingness of users to contribute information for publication in the newsletter. Often, this has meant that participants have had access to previously unpublished information on developments in the international dairy market. Information submitted by members is compiled and edited by the Basic Foodstuffs Service of FAO and is then re-transmitted as the Dairy Outlook.

The Dairy Bulletin service allows e-mail users to send messages to one another. The messages and discussions on the Dairy Bulletin are moderated to a certain extent by FAO. The way the system works is that one user will send an e-mail message asking a question or making a comment to which other users are then free to respond. In this way, several messages will be circulated through the system on any given topic. For example, a question posed by a member of the Dairy Bulletin list in South Africa regarding the comparative pricing of milk versus soft-drinks and fruit juice received replies from Uruguay, Peru, the United States, the United Kingdom, Italy, Kenya, India and Australia. The service began operating in mid-May 1997 and to date other subject areas, which have been discussed by, members of the list include, among others:

- cost of milk production in the major dairy exporting countries;
- trends in world producer prices;
- cost of producing milk powder;
- market for dairy products in North Africa and the Middle East;
- market development strategies of multi-national companies;
- dairy product prices in the major dairy exporting countries;
- stray electricity on farms;
- proposal for a two-tier milk quota system in the European Union;
- generic milk promotion campaigns.

Messages passed via the Dairy Bulletin service have averaged ten a week since its inception. Users of the system may choose to reply directly to another user who asks a question, rather than sending their replies to all the addresses on the list. Indications are that for every message sent through the system, the person raising the query receives a further response sent directly to his or her address. Nevertheless, users are encouraged to use the list for sending their replies, in order to allow others to participate in the discussion.

b) Benefits of the system

The development of these information services has significantly increased the accessibility of current information on the world dairy market. In particular, it has provided the opportunity for people throughout the world working in the dairy industry to be in contact with one another: something which was previously only possible through travelling to international conferences. From the point of view of FAO's commodity work, the development of this system has greatly expanded direct contacts with members of the dairy industry. This has allowed the Commodities and Trade Division to better assess the type of information, which it can usefully supply to the dairy sector.

Furthermore, the use of electronic media has accelerated the speed with which information can be disseminated. An additional aspect is that, by using electronic

media, there is a substantial saving in distribution costs such as printing and postage. Also savings are made on staff time associated with these activities (printing reports, putting documents into envelopes). On the other hand, a significant amount of professional staff time has gone into developing and administering these services. This is considered to be a justifiable investment on the part of the FAO and to be in keeping with the organization's objective to establish itself as a centre of excellence and a focal point for the dissemination of information on the world agriculture.

c) Accessibility

One criticism, which is sometimes voiced regarding the electronic dissemination of information, is that it places developing countries at a disadvantage, as they are perceived as having greater difficulty accessing such media. While this may be the case for some countries, the experience of the Dairy Outlook and Dairy Bulletin services would suggest that it is difficult to generalize. For example, messages sent via the Dairy Bulletin service have come in the approximate proportions of 40 percent from developing countries (with a heavy emphasis from South America) and 60 percent from developed countries (mainly North America and Europe). Furthermore, direct experience would suggest that many organizations in developing countries are better equipped to receive electronic information than their counterpart organizations in the developed countries. Here, important points in favour of the development of an e-mail based information service, as opposed to one relying solely on the internet, are the low-cost of receiving information and the lower investment costs required in terms of purchasing a computer and software. This having been said, for countries where access to e-mail is not widespread, it is foreseen that FAO's information will be accessed by focal points - co-operatives, dairy associations, the press - and thereby disseminated to interested persons.

d) Language

For both services, users are encouraged to submit contributions in any language, which they feel, will be understood by a sufficient number of list members. In practice, while there have been a small number of messages in Spanish, virtually all the correspondence for the Dairy Bulletin has been in English. For Dairy Outlook, contributions have mainly been in English; however, articles have been received in Spanish, French, Italian and German. For the last four languages, the FAO Secretariat translated into English these contributions for inclusion in the Dairy Outlook newsletter.

As FAO uses English, French and Spanish as its main working languages, the Secretariat would like to encourage the use of all three. To this end, information produced by the Basic Foodstuffs Service on the dairy sector is summarised in French and Spanish on FAO's internet site (see address above). In the case of Spanish, FAO is collaborating with the Pan-American Dairy Federation (FEPALE), based in Uruguay, which has agreed to translate selected articles from Dairy Outlook. These, together with articles submitted in Spanish by users, are then compiled as the Spanish version of the Dairy Outlook (Boletín Lechero) which is available on FAO's internet site. In the future, it is hoped to establish a similar service in French. More recently a Spanish language discussion groups, working in the same way as the Dairy Bulletin list, has been established.

Library and Documentation Division, FAO

Organic farming documents at the David Lubin Memorial Library

1. General Information

The David Lubin Memorial Library is a major world agricultural information resource with materials covering agriculture in developing countries collected over a century. Grey literature, that is, information not published through conventional, refereed research journals or monographs, is a particular strength. The Library also provides access to the FAO institutional memory to serve member countries.

2. Organic farming documentation

Organic farming is a field where "grey" literature predominates. For this reason, it has been a field where information often has been lost or, at least, unrecognized. The development of the World Wide Web today provides an additional platform through which this grey literature is distributed. However, much information in the field has made it into libraries and databases, including those of FAO. Again, FAO's particular asset in this field is the documentation from the developing world.

3. Organic farming documentation created by FAO

The FAO Library catalog was searched to identify FAO work in this field from the beginning of the Organization to the present. About 50 publications and reports done by FAO in this field were identified. As indexing practices have varied over the years it is highly likely that more information in this field done by FAO could be identified.

4. Organic farming documentation in AGRIS

AGRIS is the FAO-coordinated bibliographic database of world-wide agricultural documentation as exhibited through publications in documents, journal articles and monographs. One of the principal strengths of this information resource is that it tracks the country of input into the database. This information almost always tracks very closely with the country of origin of the documentation itself. Thus, one can search the database to discover where publishing in certain subject areas is occurring. For the period 1986 to the present, the AGRIS database contains almost 700 references to organic or biological farming. Again, "exploding" indexing terminology would identify much larger numbers of relevant materials.

5. DOCEA Program

DOCEA is a concerted action funded by the European Union in which various documentation
centers and user-representatives are working on better availability of literature relevant to ecological agriculture. It will result in a strategic plan for the future. Participation of

the international database producer CABI provides for a tight connection to bibliographic sources for conventional literature. The FAO Library and Documentation Systems Division is participating in DOCEA as an expert guest partner. This collaboration anticipates the expert contribution of FAO in electronic document publishing and conversion as well as bibliographic database management for FAO information products. Communication between centers and representatives occurs through a DOCEA listserve.
See: http://www.bib.wau.nl/docea/

Food Quality and Standards Service, FAO

Food quality and safety of organic food products

Codex activities related to organically produced food

- Codex Committee on Food Labelling

The Codex Committee on Food Labelling is currently considering the Draft Guidelines on the Production Processing Marketing and Labelling of Organically Produced Foods, which define the principles of organic production and include requirements relating to the production and preparation process (including lists of substances which may be used in organic agriculture), labelling and claims, inspection and certification, storage and transport.

- Codex Committee on Pesticides Residues

The Codex Committee on Pesticide Residues establishes Maximum Residue Limits (MRLs) for pesticides on the basis of the advice provided by the Joint FAO/WHO Meeting on Pesticides Residues (JMPR), an expert committee responsible for risk assessment in the area of pesticide residues.

- Codex Committee on Food Additives and Contaminants

The Committee on Food Additives and Contaminants establishes or endorses maximum levels for food additives and contaminants in food (such as heavy metals, mycotoxins..). It can also consider codes or practice on related subjects, such as the reduction of contamination

The scientific basis for the decisions of the CCFAC is provided by the recommendations of the Joint FAO/WHO Expert Committee on Food Additives (JECFA), which is responsible for conducting risk assessment as regards food additives, contaminants and residues of veterinary drugs.

- Codex Committee on Food Hygiene

The Committee on Food Hygiene has recently revised the basic text in the area of Food Hygiene, the International Recommended Code of Practice - General Principles of Food Hygiene, which include recommendations concerning the prevention of contamination at all stages of the food chain, including primary production.

Safety aspects of organically produced food

- Microbiological contamination

Presence of microorganisms in irrigation water, in organic fertilizers (manure); improper handling, transport, storage, etc. of organically produced food. Possible health risks may occur as a result of primary products excessively contaminated with micro-organisms or toxins that could affect the health of consumers, or excessively damaged by insects. Control strategies should be developed, these might include such interventions as avoiding fertilising with manure containing viable pathogens and avoiding sewage contaminated growing areas, etc.

- Chemical contamination

Presence of contaminants due to environmental and industrial contamination of soil, water and air used in cultivation. Control strategies could include analysis of soil and water for chemical contaminants which could affect crops and to collect samples for analysis of primary products to assure safeb levels of toxics chemicals.

Animal Production Service (AGAP), FAO

Promoting Sustainable Animal Production

1. **General**

Although The Feed Resources and Livestock System Groups have not had a specific proposal or activity in relation to "organic animal production" within the new farming systems structure of the Animal Production and Health Division, the emphasis for many years has been to improve livestock production with local resources.

In collaboration with several other divisions of various departments: various activities have been carried out to study and develop livestock production in integrated systems.

2. Livestock contribution to the human community.

Highly industrialised countries control many key activities on a world wide scale: markets, international trade, science and technology, communications, etc. This gives certain selected groups a very powerful leverage to "direct and create public opinion". Once this is accepted by the media, it becomes consolidated as "an unquestionable fact" quite quickly.

Livestock has enjoyed a bad press for well over two decades, if not more. This is unfortunates because most of the "factual evidence" concerning serious faults do no relate to livestock per se but to certain systems that are used in highly developed countries; these production systems are well represented by industrial management systems to produce poultry, pigs**,** to manage dairy cattle and to operate large scale beef-

fattening in feed-lots. They can produce very large outputs in short time, produce highly standardised products, save on manpower cost, but all this has major drawbacks. These are: it does not contribute to solve employment problems, it has serious animal welfare problems, it does contribute to major pollution risks, it is also very wasteful in terms of fossil fuel, etc. But communities in developed countries do benefit from t 4 relatively cheap" livestock products (not cheap if assessed by the fossil energy they have consumed in production, processing and distribution activities)- and these communities, although they will criticise "livestock", they show little restriction in their consumption of fast-food hamburgers and ice-cream.

However, animal resources can be used in many other ways and can contribute to a better integrated farming and a well balanced programme for rural development.

Animal resources can be used to strengthen an integrated farming approach, in which one of the main objectives is to optimise the use of all local resources. These resources include local manpower (stable employment and adequate annual revenue/earnings) and good, rational management of crops, animals, trees and fish resources.

The multipurpose use of animal resources will further strengthen the integrated fanning approach. Animal will contribute to the recycling of on-farm residues and wastes, they will contribute livestock products, they will provide manure and they can be a source of work output (transport, traction, trampling, etc).

Livestock can thus make a major contribution to efforts that aim at the establishment of a balanced and stable development programme. And the main pillars for a balanced development programme are:

- Productivity levels of farming enterprises
- Sustainability levels of operations
- Equity issues in the community**,** country and at international level
- Empowerment of local communities, very specially rural communities and poor urban sectors.

Livestock resources, if properly managed, can contribute to these fours key aspects.

3. Issues

Some of the main topics which could contribute towards agriculture with low external inputs are:

- Increase the number of plan and animal species in integrated system (biodiversity) profiting from three-dimensional space (e.g. tree strata) and the complementarity of species.
- Promotion of the multi-purpose use of animals for the production of protein rich foods (milk, meat, eggs), fibres (hair, wool), hides and skins, traction, transport, manure, weed control etc.
- Reduction of environmental impact of intensive animal production by providing alternatives for animal waste management in industrial system.

- Substitution of fossil fuels by local energy alternatives and the export of energy surplus from agricultural systems.

4. Activities

Some of specific examples of activities promoting sustainable agriculture with low external inputs are:

- Weed control in industrial and fruit tree plantations with sheep and horses
- Duck-Fish-Rice integrated systems
- Dairy production under:
  - * Silvopastoral systems (e.g. *Prosopis-Leucaena-Cynodon)*
  - * Cut-and -carry agroforestry systems with high quality forages (e.g. *Morus alba)*
- Rural (family) poultry production

During the coming two months (April-May 1998) AGA will organise an electronic conference on "Agroforestry for animal production in Latin America" where successful techniques and systems for intensive animal production with low external inputs will be presented and discussed.

Research Development Service, FAO

Biotechnology

1. Definition

Biotechnology is defined as any technique that uses living organisms to make or modify a product, to improve plants or animals or to develop micro-organisms for specific uses.

2. Main procedures that are broadly included under biotechnology

- **Tissue culture: c**ell culture, meristem culture, embryo rescue (all those - very old - techniques are helper techniques for plant breeding/inter-specific crosses);
- **Molecular markers:** this includes DNA markers (PCR, RFLPs, AFLPs, RAPDs) and isozymes and they are used for gene mapping and ultimately for marker assisted selection. Marker assisted selection is a highly precise and sophisticated selection procedure that acts over the DNA of the plant or animal, to produce an improved plant or animal that is technically **absolutely equal** to what could be obtained through the traditional plant and animal breeding procedures. The difference is the amazing precision of the selection that can be achieved even for traits that are invisible to the eyes of the breeder, and the speed with which the procedure can be finalized. Through marker assisted selection, breeding for many difficult traits (such as root growth which is correlated to drought resistance) can be done without much problems. The only limiting step is the mapping of those characteristics which has to be done carefully in a combination of lab work and precise phenotypic evaluation;
- **Gene cloning and obtention of GMOs:** this is a procedure whereby pieces of DNA of an organism are transplanted to another in order to perform an specific function. This procedure can be used for any living being and it allows the combination of genes among very unrelated taxa which would in some cases, not be possible through the normal procedures of crossing.

3. Most common biotechnology products for agriculture currently in place

- Plants that carry genes for herbicide resistance (the farmer who grows those plants has also to use the corresponding herbicide, otherwise there is no advantage);
- Plants that carry genes for the toxin of Bacillus thuringiensis. That is a gene for insect resistance which, combined with adequate practices, allows the farmer to substantially reduce the insect problems of the crop or to reduce insecticide applications. The gene is not 100% effective and as any resistance gene that is used for breeding, if used solely in a large area, will lead to a build-up of insects that brake its resistance. The same sort of problem arise with resistant varieties obtained by the traditional breeding procedures. The difference in this particular case is that the plant makes a toxin that affects insects;

- Plants that carry genes for quality and or flavor. There are many different genes being used in those, mainly to improve storage (and thus, to decrease post-harvest losses).

4. Benefits and risks

There are many projects being proposed with different objectives in different institutions to use the transformation techniques that allow to obtain GMO's. Many of those are proposing the cloning of genes from a plant into another to improve disease resistance, resistance to environmental stresses (cold, drought, etc.). Sometimes a gene is more easily found in one species than in another, due only to the fact that the species has developed and evolved in an environment where those environmental conditions did not exist.

Modern life is based on a small group of crops that are cultivated in areas different from those where they evolved. Most of those GMO's will not be harmful to human health nor to the environment of cultivation, and in many cases, they help to make the crop more adapted to the new environmental conditions and reduce the need of water, fertilizers and other chemicals.

In the absence of scientific evidence on potential long-term effects of GMOs, a precautionary approach and risk assessment need to considered before the use of GMOs, according to specific conditions.

Investment Centre Division, FAO

World Bank/FAO Soil Fertility Initiative for Africa, West Africa Region

1. Guiding principles of the Soil Fertility Initiative (SFI)

- aims to accentuate, or introduce, a focus on the maintenance of soil productivity into existing/ongoing national programmes or projects;

- operates primarily through these programmes and projects and is not a project in its own right;

- creates mechanisms and mobilises resources, in the first instance from existing sources, but from complementary sources if no others exist, to facilitate the introduction of the soil fertility focus;

- identifies and levers policy changes, in cases where existing policies are key constraints to the maintenance/enhancement of soil fertility;

- builds on a decentralised, demand-led approach to the selection and introduction of new fertility-enhancing measures at field level,

recognising that actions must be tailored to location-specific social, economic and technical circumstances;

- involves a forum of all relevant stakeholders (including donors/lenders), with the government's role focused on facilitation of stakeholders' participation and contributions, essential policy decisions and the supply of essential public goods;

- ideally and eventually, devolves the facilitating role to a non-government organisation, or to several if operating at decentralised levels;

- aims in the first instance to achieve rapid and concerted action on a few key topics/constraints/issues which when attended to will open the door for wider progress in improving soil fertility management;

- may promote flexible pilot exercises in the first instance, with intensive monitoring and evaluation to prepare for potential replication and scaling up.

2. Modalities of SFI interventions

Reports of FAO missions will offer suggestions and options for consideration by local stakeholders. Action plans will then be evolved from them by a process of stakeholder consultation/workshops, using the FAO reports as the starting point. In order to become more cost-effective and build local commitment to the SFI faster, consideration will be given to:

- an experienced FAO mission leader visiting the country alone or with one other experienced colleague or consultant would initiate local contacts and review relevant ongoing/planned activities;

- this initial mission would identify critical issues or themes and set up a local team to work on the key identified issues affecting soil productivity;

- specialised consultants would then be mobilised by FAO to backstop the national team in most needed areas of expertise that are not available locally;

- the national team and consultants would present their findings to stakeholder workshops (national, regional or local depending on the subject);

- the mission leader would return to participate in these events as necessary;

- on the basis of outcomes, FAO would help the national team prepare a report which would present a first set of priority SFI actions on which agreement had already been reached.