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HUMAN RIGHTS AND SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS

The impact of scientific and technological developments on economic, social and cultural rights

Report of the Secretary-General

CONTENTS

GE.76-2132

INTRODUCTION

1. Three reports previously circulated by the Secretary-General have dealt with the impact of scientific and technological developments on economic, social and cultural rights; these reports have been contained in documents E/CN.4/1084, E/CN.4/1115 and E/CN.4/1141, and dealt with the impact of science and technology on respectively (i) the right to food and the right to clothing; (ii) the right to work, the right to just and favourable conditions of work, the right to just and favourable remuneration, the right to equal pay for equal work, the right to form and join trade unions and the right to housing, and (iii) the right to rest and leisure and the right to social security.

2. Although prepared in consultation with the specialized agencies concerned, each of these reports was said to be a "preliminary report". 1/ Consequently, letters were sent on 28 May 1974 to the ILO, UNESCO, WHO and FAO with a view to revising these documents. These letters indicated that it was hoped that it would not be necessary to issue complete revisions of these reports and that it might be possible to issue a supplementary report or reports containing revisions suggested by the specialized agencies approached. The letter added: "In any case it would be greatly appreciated if, in view of our limited staff resources, the revisions proposed constituted textual changes applicable to precise passages in the existing reports".

3. Replies to this invitation were received from the FAO, dated 30 April 1975, and from the ILO, dated 29 May 1975. The replies included textual changes applicable to the passages in the existing reports which dealt with the right to food and the right to work. In addition, both replies contained more general comments, publications and references to publications. The replies as a whole are available to members of the Commission for inspection.

4. The ILO suggests that paragraph 26 of document E/CN.4/1115 dealing with the right to work be substituted by the following:

> "Seven issues of the Labour and Automation Bulletin appeared between 1964 and 1968. The ILO's International Labour Review regularly publishes articles and reviews of books relating to the problems of technological change and from 1966-72 published a section entitled "Automation Abstracts" which dealt with selected books and articles on the subject. A bibliography of material on the social aspects of automation was prepared in 1962 and revised and updated in 1966 and 1969. The new educational requirements arising from technological change have also received close attention. To date, 12 volumes of abstracts on vocational training have been published by the Information Section of the Vocational Training and Guidance Branch of the ILO. Such abstracts will continue to be published by the Training and Development Publications Programme of the ILO. The International Labour Conference at its 59th Session in 1974 held a first discussion on the adoption of new international standards concerned with vocational guidance and vocational training".

1/ E/CN.4/1084, para. 4, E/CN.4/1115, para. 6, and E/CN.4/1141, para. 7.

5. The material appearing below under the heading "Right to Food" corresponds to paragraphs 12 to 57 of document E/CN.4/1084, subject to changes arising out of the comments communicated by the FAO.

RIGHT TO FOOD

1. Existing international standards relating to the right to food

6. The Universal Declaration of Human Rights includes food as one of the factors which make up the right of the individual to a standard of living "adequate for the health and well-being of himself and of his family" (article 25, paragraph 1). The International Covenant on Economic, Social and Cultural Rights similarly includes "adequate food" as part of "the right of everyone to an adequate standard of living" (article 11, paragraph 1). The Covenant, moreover, elaborates this concept further by specifying, in article 11, paragraph 2:

> "The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, which are needed:
>
> "(a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;
>
> "(b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need."

2. Favourable impact of recent scientific and technological developments on the availability and quality of food

7. The annual publication of the Food and Agriculture Organization of the United Nations, The State of Food and Agriculture, devotes a chapter of its 1970 issue to technological progress in food production. In contains the following statement:

> "Rapid technological progress has been one of the most striking features of the postwar period. Many of the developments have been highly spectacular, especially in atomic science, space technology and computer technology, and in genetics and the understanding of the basic processes of life. Each of these more spectacular fields has brought important advances in food and agricultural technology, although many of them have so far contributed much more to potential than to actual achievement." 2/

2/ The State of Food and Agriculture (Rome, FAO, 1970), p. 139. Attention may also be drawn to a report of 1961, entitled Current trends in scientific research - survey of the main trends of inquiry in the field of the natural sciences, the dissemination of scientific knowledge and the application of such knowledge for peaceful ends, prepared by Professor Pierre Auger (E/3362/Rev.1), part I, chapter IV, of which deals with the food and agricultural sciences. The report was prepared in pursuance of General Assembly resolution 1260 (XIII) of 14 November 1958.

8. The successes in the development of high-yielding wheat, rice and maize varieties have been so great as to warrant the hope that these advances, which have resulted in what is referred to as the "green revolution", may provide sufficient food for the hungry of the world. 3/ The progress made in breeding new strains for superior plant architecture, enhanced response to modern production technology, successful adaptation to new regions, improved resistance to cold, drought, wind and diseases, has come primarily through a better understanding of plant genetics and a more intensive and intelligent utilization of worldwide germplasm variability for major species as well as induced mutations. 4/ Radiation and chemical mutagens have recently been used to accelerate natural processes of biological change. 5/

9. Two other pillars upon which the green revolution rests are synthetic pesticides and fertilizers. The introduction of the new high-yielding food crops in developing countries has caused a new demand by farmers for fertilizers. At the same time, powerful pesticides and fungicides are widely used to protect crops against diseases and insect and rodent infestations.

10. The science of water and soil management has progressed greatly, enabling it to meet the challenge of the green revolution. Scientific water management will be the most powerful tool for increased effectiveness of water use for intensified agricultural production, conservation of water for expanded production, protection of water resources, protection of agricultural land against flood damage, and degradation from salinity and waterlogging, and includes measures for rational development of water resources, advanced irrigation and drainage technologies, use of brackish and waste water, technical and administrative control of water distribution. 6/

11. Work is also being done in the artificial inducement of rainfall, the control of evaporation from reservoirs, and the reclamation of saline and water-logged land. Research in the efficient use and re-use of water has been advanced by sophisticated scientific soil and water surveys using isotopes and aerial photography.

12. High-altitude craft and orbiting satellites can be employed to estimate crop yields, study cropping patterns, detect symptoms of insect and disease infestations of crops, map and classify soils, measure soil moisture, and survey

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3/ W.H. Pawley, Possibilities of Increasing World Food Production, Freedom from Hunger Campaign Basic Studies, No. 10 (Rome, FAO, 1967). For a summary of relevant FAO activities see also E/CN.4/1023/Add.2, annex B.

4/ Information furnished by the FAO; see also "Genetic technology and agricultural development", Science (USA), 9 July 1971, p. 119. R.A. Silow, ed., The Use of Induced Mutations in Plant Breeding (New York, Pergamon Press, 1965). Manual on Mutation Breeding, Technical Report Series, No. 119 (Vienna, International Atomic Energy Agency (IAEA), 1970).

5/ Nuclear Techniques and the Green Revolution, Joint Programme of the FAO and the IAEA on Nuclear Techniques in Food and Agriculture (Vienna, IAEA, June 1971), INFCIRC/146/Add.1. See also Nuclear Techniques for Increased Food Production, Freedom From Hunger Campaign Basic Studies, No. 22 (Rome, FAO and IAEA, 1969).

6/ Resolution VII, United Nations World Food Conference, Rome, 5-16 November 1974 (doc. E/5587).

forest, fishery, and water resources. The projected use of observation satellites for remote surveying of earth resources has been referred to in the Secretary-General's preliminary report, in the chapter on "Respect for the integrity and sovereignty of nations in the light of advances in recording and other techniques" (E/CN.4/1028/Add.5, paragraphs 58-61). 7/

13. A report on the implications of the green revolution (E/5012, part II) was prepared under the auspices of, and approved by, the Administrative Committee on Co-ordination (ACC) with the object of evolving a framework for harmonizing and concentrating interagency efforts in this area so as to enhance their impact. The study surveys the principal elements involved in the green revolution, including certain economic and social implications, and indicates current programmes and activities undertaken by the organizations within the United Nations system. 8/ The report of FAO's Special Committee on Agrarian Reform discusses the "green revolution" in the context of agrarian reform. 9/

14. The application of science to animal husbandry has made possible the artificial stimulation of growth in animals and provided sturdier livestock. The above-mentioned 1970 issue of The State of Food and Agriculture reports that "animal breeding has relied increasingly on artificial insemination, combined with improved techniques for the long-term preservation of semen. Much progress has been made in the production of balanced livestock feeds, including the use of protein supplements such as urea and synthetic amino acids". 10/ Veterinary science has developed to such a stage that it is now technically possible to control most of the more important animal diseases through preventive techniques and the use of the new combined or polyvalent vaccines. At the same time the use of tissue and culture mediums has made possible the rapid bulk production of better and cheaper vaccines; rapid communication and transportation techniques permit their quick distribution.

15. Industrial-type techniques have been developed for many areas of agricultural production. Large-scale broiler poultry and egg production may now be carried out on a "conveyor-belt" basis. The almost complete mechanization of the feeding and care of many animals has cut the costs of many farm products in certain parts of the world. Moreover, farm machinery has become sophisticated and specialized, as exemplified by advances in horticulture and fruit-harvesting equipment. This results in the replacement of capital for labour and the ability of one man to do the work of several; and larger production units become feasible and even

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7/ A Working Group on Remote Sensing of the Earth by Satellites has since been established by the Scientific and Technological Sub-Commission of the Committee on the Peaceful Uses of Outer Space (See Official Records of the General Assembly, Twenty-Sixth Session, Supplement No. 20 (A/8420), paras. 10-12).

8/ E/5012, part II.

9/ Forwarded by FAO on 10 February 1972.

10/ Op. cit., p. 140.

necessary with an accompanying increase in the degree of product specialization. In agriculture this may result in such phenomena as increased vertical integration and/or horizontal increases in scale involving more land. 11/

16. Sophisticated sonic and electrical equipment is now used to detect, attract and catch whole schools of fish. Large trawlers are equipped as factories which can freeze and process great quantities of fish before coming into port again. 12/ Also, a great deal more has become known about the habits of fish and about increasing fish reproduction. 13/

17. Computers and modern business machines are being used to great advantage at all stages of commerce, production, distribution and retailing of food and in the exchange of agricultural information. 14/ Computers have also been found to have a great potential for storing and processing data on the price and quantity of foodstuffs throughout the world and thus to assist in carrying out the requirement of article 11, paragraph 2 (b), of the Covenant, referred to in paragraph 6, above.

18. Advances in nutrition science make it possible to estimate more accurately the nature and extent of malnutrition, human nutritional requirements, identify the most efficient food sources and determine alternative sources. 15/ The general problem in more than one half of the developing countries is a food gap rather than a protein gap. 16/ People who do not get enough protein usually receive inadequate diets as a whole. Thus any programme to improve the food situation of low income groups would have to concentrate very largely on basic foods already in wide use, such as grains and pulses and much of their protein deficit would be met by the protein in such basic foods.

11/ Information furnished by the FAO; see also Agriculture and Industrialization, Freedom from Hunger Campaign Basic Studies, No. 17 (Rome, FAO, 1967).

12/ P.F. Meyer-Warden, Electrical Fishing, FAO Fisheries Studies, No. 7 (Rome, FAO, 1965); Modern Fishing Gear of the World, arranged from the papers and discussions of the second FAO World Fishing Gear Congress, London, 1963 (London, Fishing News Books, Ltd., 1964).

13/ E.D. Le Cren, The Application of Science to Inland Fisheries, FAO Fisheries Studies, No. 8 (Rome, 1958).

14/ I. de Sola Pool, Philip J. Stone and Alexander Szalai, Communications, Computers and Automation for Development, UNITAR Research Reports, No. 6 (New York, UNITAR, 1971), pp. 43-45.

15/ Information furnished by the FAO; see also Helen Charley, Food Science (New York, Ronald Press, 1971).

16/ Assessment of the World Food Situation - present and future. Document prepared for Item 8 of the Provisional Agenda, United Nations World Food Conference, Rome.

19. Breeding can improve quality as well as increase quantity and offers a long range promise for nutritional improvement. A significant agricultural breakthrough for nutrition was the identification and subsequent development of a strain of corn with protein value triple that of standard corn. Opaque-2 and floury 2 maize varieties have greatly improved protein qualities. IR 480-59 is a high yielding high protein variety of rice. Pulses are also being bred for better nutrient content. Success of plant geneticists in producing such improved strains of cereals and legumes would be akin to waving a magic wand over the production-income-diet complex, and protein and calorie intake could be improved at a very small cost. 17/ Natural products of low nutritional value or prepared foods which have lost vitamins during cooking and storage can be fortified by enriching them with complementary ingredients. 18/ New techniques of food processing, especially drying and freezing, together with the use of food additives have permitted the preservation and wider distribution of previously perishable foods with a minimal loss of nutritional value. Better understanding of the problems of food safety and more effective food control measures are providing a greater degree of consumer protection not only from hazards to health but also from commercial fraud and are assuring the consumer the best opportunity to procuring and utilizing food to fulfill his basic needs. 19/

3. Problems affecting human rights

20. The great potential of science and technology for increasing the world's food supply and thus for contributing to the implementation of the right to an adequate standard of living has been amply manifested. The new technologies, however, require appropriate adaptation on the basis of social as well as physical scientific and technological knowledge and adaptive research to increase the possibilities that their application will produce the maximum desirable developmental effects, and reduce the possibilities that they will seriously depress the very standard of living adequate for health and well-being they were intended to promote. Moreover, threats to the food supply may arise as a consequence of the application of science and technology in fields not related to food production. Reference has already been made in the preliminary report of the Secretary-General, under the subheading "Deterioration of the human environment", to the discussions at the twenty-third session of the General Assembly, where attention was drawn to various threats to the world food supply resulting from such indiscriminate use. 20/ These threats

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17/ Information furnished by the FAO.

18/ A.A. Pokrovsky "Qualitative and quantitative aspects of nutrition", Impact of Science on Society, (Paris, UNESCO), vol. XX, No. 3 (July-September 1970), pp. 226-227.

19/ Information furnished by the FAO.

20/ Cf. E/CN.4/1028/Add.3, para. 330, and A/PV.1732-1733. The discussion in the General Assembly, under the agenda item "The problems of human environment, led to the adoption of resolution 2398 (XXIII) of 3 December 1968, by which the Assembly decided to convene in 1972 a United Nations Conference on the Human Environment.

include such factors as erosion and other forms of soil deterioration resulting from over-exploitation of the soil due to faulty use of machinery or fertilizers; water pollution, not only by domestic sewage, but by industrial wastes, drained-off chemical fertilizers and pesticides and thermal pollution; other harmful secondary effects of pesticides and other biocides, chemical fertilizers and synthetic detergents; and oil pollution of the sea as a consequence of off-shore drilling and the use of larger oil tankers which can do great damage in case of accident. 21/

21. Considerable attention is being paid to these and similar problems by the competent organizations within the United Nations system. The Preparatory Committee for the United Nations Conference on the Human Environment is also concerned with these issues.

22. The Provisional Indicative World Plan for Agricultural Development of the Food and Agriculture Organization points out the following:

> "Several developed countries with a long history of use of organo-chlorines (DDT, Aldrin, etc.) have recently instituted a ban on their use because, although not acutely toxic to human beings, they are lethal to fish (for example the recent mass poisoning of fish in the Rhine by one such compound through an industrial accident) and have been shown to have cumulative effects to birds and mammals, particularly where a 'food-chain' is involved. They also break down relatively slowly in the soil. Some alternative compounds, whilst being rendered innocuous fairly quickly after application; are acutely toxic to human beings where adequate precautions are not taken during application, and there have been a number of cases of accidental poisoning (e.g., parathion)." 22/

The Food and Agriculture Organization has established a Committee on Pesticides in Agriculture, which has collaborated with the World Health Organization's Expert Committee on Pesticide Residues in issuing several reports on the dangers of pesticides. 23/

23. The previously mentioned special report prepared by the Administrative Committee on Co-ordination on the implications of the green revolution states:

> "Run-off from areas treated with massive doses of fertilizer or insecticide may pollute surface and groundwater and affect terrestrial environments and aquatic life in streams, rivers, ponds and lakes through poisoning and eutrophication. A case in point is the Lower Ganges Basin where in certain areas 'local' concentration of minerals and pesticides in the run-off could become quite serious in the immediate future." 24/

21/ See, e.g., O. Schachter and D. Serwer, Report on Marine Pollution Problems and Remedies (United Nations publication OPI/444-06208).

22/ Vol. I (Rome, FAO, 1970), para. 145.

23/ Cf. Evaluation of the Toxicity of Pesticide Residues in Food, report of the Joint Meeting of the FAO Committee on Pesticides in Agriculture and the WHO Expert Committee on Pesticide Residues, 1964; also Pesticide Residues in Food, report of the joint FAO/WHO meeting, 1968 (Geneva, WHO, 1969).

24/ E/5012, part II, para. 75.

24. On the other hand, the same report also expresses the view that the hazards of pollution from fertilizers and pesticides may be regarded as long-term ones and "should not give rise to panicky short-term palliatives, such as outright banning of DDT, which can only set back developmental efforts without touching the real core of the over-all pollution problem". 25/

25. In this connexion it may be recalled that in 1969, the World Health Assembly recognized that the "prolonged and large-scale use of persistent pesticides", in particular those of the chlorinated hydrocarbon type, in agriculture and public health may lead to an accumulation of certain of those substances in the environment, as well as in human and animal tissues, and to the development of resistance in vectors; it noted that currently there was no alternative method of vector control that could replace the use of persistent pesticides for the control of vector-borne diseases. The Assembly recommended that WHO stimulate and intensify research on the development of alternative methods of vector control. 26/ In 1970, the Director-General of WHO accordingly submitted to the twenty-third World Health Assembly a report on alternative methods of vector control, in which further research on biological, genetic and certain other methods of control were discussed and proposed as alternatives to control of insect vectors by chemical means. The World Health Assembly authorized such research. 27/

26. Warnings have been heard that the vast over-use of artificial nitrogen fertilizers may lead to serious health dangers, particularly for infants, who are highly sensitive to poisoning by nitrogen by-products. Some scientists also consider that there may be a causal relationship between the use of nitrate fertilizers which are building up large residues in green vegetables (especially spinach, celery and lettuce) and cancer in animals and man. 28/

27. Another problem requiring vigilance is the possibility of radioactive contamination of food. The Food and Agriculture Organization, the World Health Organization and the International Atomic Energy Agency have been concerned with this matter. A seminar on agricultural and public health aspects of radioactive contamination in normal and emergency situations was held in 1961, in Scheveningen, the Netherlands, at which one of its panels discussed the problems of establishing permissible levels of radioactivity in food in the light of steadily increasing radiation levels in the world and of the fears concerning their long-range effects. 29/

25/ Ibid., para. 74.

26/ Official Records of the World Health Organization, No. 176, Twenty-second World Health Assembly, part I, resolution WHA 22.40.

27/ Ibid., No. 184, Twenty-third World Health Assembly, part I, annex 9 and resolution WHA 23.33.

28/ See, e.g., the statement by Dr. Barry Commoner, cited in The Washington Post, 27 December 1968; William Lijinsky and Samuel Epstein, "Nitrosamines as Environmental Carcinogens", Nature (London), vol. 225, 3 January 1970, p. 21; André Vorson, Sol, herbe, cancer; la santé de l'animal et de l'homme dépendent de l'équilibre du sol (Paris, Maison rustique, 1959).

29/ Agricultural and Public Health Aspects of Radioactive Contamination in Normal and Emergency Situations, papers presented at the FAO/WHO/IAEA seminar, Scheveningen, the Netherlands, 11-15 December 1961, FAO Atomic Energy Series, No. 5 (Rome, FAO, 1964), pp. 160-188; see also Agricultural and Public Health Aspects of Environmental Contamination by Radioactive Materials, Proceedings of the FAO/WHO/IAEA seminar, Vienna, 24-28 March 1969 (Vienna, IAEA, 1969 (STI/PUB/226)).

The intentional irradiation of foods for preservation purposes also presents inherent dangers and must be carefully monitored, since, for instance, overdoses of radiation could produce stable substances possessing mutagenic effects. 30/ The problem of radioactive contamination was touched upon in the Secretary-General's preliminary report, under the subheading "Hazards arising from atomic radiation" (see E/CN.4/1028/Add.3/Corr.1, paragraph 338).

28. Artificial growth stimulants used on livestock and crops may have harmful consequences for human beings who eat such food if these chemicals manifest stability after intake. 31/ The addition of hormones to animal feeds has, in fact, been prohibited in a number of countries. 32/ The employment of strong antibiotics in animal feeds to protect the animal from various diseases has also come under considerable criticism. The danger lies in the development of resistant bacteria after extended application of these antibiotics. 33/ As stated by the United States Commissioner of Food and Drugs, Charles C. Edwards, "in most cases this resistance is transferable and presents a potential health hazard to humans" in that it establishes a bacterial population not amenable to normal therapeutics. 34/ The United States Food and Drug Administration has assigned a task force to review the use of antibiotics in animal feeds. 35/ The New York Academy of Sciences has also decided to study the dangers of drug-resistant bacteria being passed to humans by animals. 36/

30/ The Technical Basis for Legislation on Irradiated Food, report of a Joint FAO/WHO/IAEA Expert Committee, Rome 21-28 April 1964, FAO Atomic Energy Series, No. 6/WHO Technical Report Series, No. 316 (Rome, FAO, 1965); Microbiological Problems in Food Preservation by Irradiation, proceedings of a Panel Discussion, Vienna, 1966 (Vienna, IAEA, 1967 (STI/PUB/168)); Food Irradiation, Proceedings of the FAO/IAEA symposium, Karlsruhe, Federal Republic of Germany; (Vienna, IAEA, 1966 (STI/PUB/127)); Wholesomeness of Irradiated Food with Special Reference to Wheat, Potatoes and Onions, WHO Technical Reports Series, No. 451 (Paris, WHO, 1970).

31/ Pokrovsky, op. cit., pp. 232-233.

32/ Cf. Animal Feedstuffs: Regulations Governing their Manufacture and Sale in European Countries (Rome, FAO, 1963).

33/ "Concern at use of anti-biotic drugs for livestock", New York Times, 26 February 1971; "Resistant Bacteria Pose a New Danger", ibid., 19 October 1970, sect. IV; see also Specifications for the Identity and Purity of Food Additives and Their Toxicological Evaluation. Some Antibiotics. Twelfth Report of the Joint FAO/WHO Expert Committee on Food Additives. FAO Nutrition Meetings Report Series No. 45: WHO Technical Report Series No. 430 1969.

34/ Speech at annual meeting of Animal Health Institute in Boca Raton, Florida, April 1970, reported in Chemical and Engineering News (Washington, D.C.), 4 May 1970, p. 13.

35/ United States Department of Health, Education and Welfare, H.E.W. News, 70-79, 25 May 1970.

36/ New York Times, 15 October 1970.

29. The potential hazards of food additives have often been noted. An example of the prolonged use of a chemical substitute, subsequently considered to be harmful and removed from the market, is the case of an artificial sweetener, cyclamate, which was later reported to be capable of causing harmful consequences, e.g., disrupting the effects of anti-coagulants in humans, changing the way the body absorbs certain drugs, affecting the reproductive system and causing cancer. 37/ Chemical preservatives, such as boric acid and urotropine, and certain colouring additives have also been restricted in their commercial use because of their toxic effects and the cancer danger they represented. 38/ Some of the problems posed by the addition of chemicals to foods have been referred to in the Secretary-General's preliminary report within the context of "Experiments on human subjects" (See E/CN.4/1028/Add.2, paragraph 262). A Joint FAO/WHO Conference on Food Additives was held in 1955. Upon the recommendations of this Conference and the two subsequent ones in 1963 and 1973 a Joint FAO/WHO Expert Committee on Food Additives has been meeting almost once a year to consider the technical and toxicological problems involved in the use of food additives. To date the Expert Committee has evaluated about 400 chemicals used in food, covering a number of classes like preservatives, anti-oxidants, emulsifiers and stabilizers, anti-caking agents, solvents, flavours and flavour enhancers, non-nutritive sweetners, enzyme preparations, processing aids and others. Based on the recommendations of the Joint Expert Committee the Joint FAO/WHO Codex Alimentarius Commission has adopted the "General Principles for the Use of Food Additives" (Report of the 9th Session of the Codex Alimentarius Commission, November 1972). The laws of many States do not require the constituent ingredients to be indicated on food packages. The Codex Alimentarius Commission has recommended an International General Standard for the Labelling of Pre-packaged Food (Ref. CAC/RS/-1969) which provides for mandatory information on the list of ingredients including food additives - specific name or class name. However, the fact still remains that the names of chemicals may be meaningless to the average consumer and he has equally no means at his disposal to determine the long-term effects of constantly appearing new chemical ingredients. While the role of consumer education cannot be over-emphasized the main responsibility of ensuring safety from the use of food additives must remain with the national authorities of the country concerned. This implies not only the scientific evaluation of the chemicals meant for food use but the development of appropriate regulations for their use and the enforcement of these regulations through more efficient systems of food control. 39/

30. A related problem arises from certain industrial techniques used in food processing that may result in the formation of toxic, even carcinogenic, by-products, for instance where the product is subjected to prolonged or repeated heating. 40/

37/ James Turner, The Chemical Feast (New York, Grossman, 1970), pp. 14-16, 18.

38/ Pokrovsky, op. cit., p. 233.

39/ Information furnished by the FAO.

40/ Pokrovsky, op. cit., p. 233.

31. Modern processes make it possible, moreover, to disguise effectively substandard foods of inferior nutritional value by colouring additives, preservatives, seasonings and other technological aids.

32. Warnings have also been heard that food-borne diseases may be increasing in the more technically developed societies and that such diseases may spread more widely than previously. 41/ The populations of the world are gradually moving away from farms and are therefore becoming dependent on a longer chain of processors, packers, transporters, distributors and retailers, which may mean increased opportunity for contamination and deterioration of food, including such accidents as undetected bacterial contamination through breakdowns in refrigeration or canning processes. Mr. Kenneth Hennington has referred to a number of specific instances of food poisoning as follows:

> "Our mode of living and technology probably renders us more susceptible to food-borne infections today. The convenience foods, ready-to-eat items, and frozen prepared dinners requiring only minimum heating prior to serving open avenues for mass infection. Our production and distribution system is such that today the output of a plant may be distributed nationwide, or even worldwide. This means that an infected employee or a breakdown or deterioration of some phase of plant sanitation can infect thousands of consumers instead of a limited surrounding community. Our population concentration, human and food animal, with the resultant waste disposal and pollution problems, is likewise conducive to spread of infection ... Effective control of the food-borne infections, whether they be bacterial or viral in nature, entails a much higher and more rigid level of sanitation than generally has been practised, or required, by industry, or by health and regulatory officials." 42/

33. Technological and related developments, such as those mentioned in paragraph 15, have led, particularly in the absence of appropriate social and economic considerations, to increasing specialization of products and modern commercial, large-scale, capital intensive and labour saving production units.

34. This has resulted in many cases in over-use of the land and in greater susceptibility of crops to blight or other sudden adverse conditions and, therefore, to increased reliance on fertilizers and pesticides. This, in turn, may ultimately affect the ecological balance and thus the food supply for future generations.

41/ European Technical Conference on Food-borne Infections and Intoxications, Geneva, 16-21 February 1959, WHO Technical Report Series, No. 184 (Geneva, WHO, 1959); see also, Dr. H.P.R. Seeliger, "Food-borne infections and intoxications in Europe", Bulletin of the World Health Organization, vol. 22, No. 5 (1960), pp.469-484.

42/ Speech before the 54th annual meeting of the International Association of Milk, Food and Environmental Sanitarians, Miami Beach, Florida, United States of America, 15 August 1967.

Also, the indiscriminate use of modern fishing gear and techniques referred to in paragraph 16 above, may outstrip the capacity of fish to reproduce. 43/ With the increased size of ownership (production) units and labour displacing mechanization, particularly in the absence of adequate and secure provisions for alternate employment opportunities, income distribution becomes increasingly unequal which results in a growing segment of population lacking access to adequate food, clothing and other requirements for an acceptable standard of living. Often these effects are most pronounced among the growing segment of landless labourers and the increasingly disadvantaged smallholders. 44/

35. The Secretary-General of the League of Arab States, Mr. Abdel Khalek Hassouna, has written:

> "With the progress of biology and chemistry man was able to destroy some of the harmful plants using chemical compounds. He was also able to eliminate agricultural pests and insects. Such progress, however, may be misused thus leading to the destruction of food sources and useful cultivations on which man lives. There is no clear provision against such an eventuality in the Universal Declaration or the International Covenants on Human Rights. Some of the materials used may sterilize the earth or threaten man's life if he eats some of the plants treated with these materials. They may also cause deformation. The subject is, therefore, related to man's right to life and food, hence the need to prohibit the misuse of such chemicals and to take the necessary precautions when using them to ensure that man will not be harmed in any way.
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> " ...
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> "The progress in biology and chemistry may also be used in eradicating animal and aquatic wealth thus endangering man's life when he eats such meat or fish. Man may also suffer a deficiency in his food as a result of the destruction of such wealth. It is, therefore, proposed that the Universal Declaration or the International Covenants on Human Rights should include a provision in this respect." 45/

36. As mentioned in paragraph 15 above, food production in many countries is now being carried on by industrial techniques. 46/ The very processes of mechanization

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43/ The Effect of Fishing on Resources and the Selectivity of Fishing Gear, proceedings of the joint scientific meeting of ICNAF, ICES and FAO on fishing effort Lisbon, 1957, vol. 1; R. van Cleve, "The economic and scientific basis of the principle of absention" (A/CONF.13/3).

44/ Information furnished by the FAO.

45/ Communication dated 11 April 1970.

46/ "Food-Processing Industry", Industrialization of Developing Countries: Problems and Prospects, UNIDO Monographs on Industrial Development, No. 9 (ID/40/9); J. Volper, The Soviet Food Industry (Moscow, Foreign Language Publishers, 1958).

that have led to more efficient production and to greatly increased food supplies have, however, caused labour problems and social problems 47/ which, in turn, may act as a brake on efforts to increase the food supply by the application of modern technology. References to these problems may be found in the above-mentioned ACC report, which also lists studies concerning these problems under way in a number of States, 48/ and points out the following:

> "The 'green revolution' has also sharply highlighted the fact that technical research alone is not enough: success depends greatly on the human factor and there is need for a parallel effort in economic and social studies, and for a close dialogue between technical and socio-economic research. It will be apparent from later sections of this paper that some of the 'second generation' problems might have been avoided and technical progress speeded up if such research had been adequately undertaken." 49/ Thus it seems evident that mere international transfer of physical technologies does not necessarily result in the development of technologies most appropriate to the needs of the developing countries. Amongst the complex set of factors and policies that affect and that could improve on this situation, are the particular technologies adopted. The types of technology, embodied in machinery, implements, tools, animals, seeds, fertilizers and so on are not exogenous to the total situation but can be influenced by governments and other agencies through investment in most scientific and technical research and development including social sciences. Attention therefore needs to be turned to the development of existing or new technologies in the rural sector that, in the context of appropriate economic and social policies, will be economically efficient to adopt and will also provide increased possibilities for gainful employment, essential to assure access to adequate level of food and other necessities." 50/

37. The Economic and Social Council at its fifty-first session, taking note with appreciation of the ACC report, recommended that close attention be given to the impact of the new technology on "socio-economic development, including environmental aspects, taking into account the findings of the study of the social implications of the new agricultural technology being made by the United Nations Research Institute

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47/ Social consequences of technological developments in principal branches of the food products and drink industries, ILO tripartite technical meeting for the food products and drink industries, 1963, report II.

48/ See document E/5012, Part II, especially paras. 53-73. The Government of the Byelorussian Soviet Socialist Republic has reported that research was being carried out in that Republic on the social consequences of scientific and technological development in agriculture (Communication dated 26 March 1970).

49/ See E/5012, Part II, para. 22.

50/ Information furnished by the FAO.

for Social Development." 51/ The Council decided that a review and appraisal of progress in the application of the new technology would be made at the mid-term of the Second United Nations Development Decade. 52/

38. A serious problem affecting the provision of adequate food for the world has been the tremendous increase in population, itself caused in large part by progress in the health field. This question was referred to briefly in the preliminary report of the Secretary-General on human rights and scientific and technological developments, under the heading "Population explosion" (See E/CN.4/1028/Add.3, paragraph 333). The FAO provisional world plan states that "the population factor alone would ... require an increase of two thirds in food supplies over twenty years ... merely to maintain existing nutrition levels and patterns of consumption", 53/ which are generally considered inadequate. Moreover, the FAO study indicates that a 140 per cent increase in total food supply will be required by 1985 because of "urbanization and the growth of domestic market demand", itself a result of economic expansion stimulated by technological developments. The World Plan of Action for the Application of Science and Technology to Development indicates that food production for developing countries is presently increasing at a rate of only 2.7 per cent per year, a trend which, if continued, would "result in an overwhelming gap between supply and demand by 1985", and that any shortfall in supply "will post incalculable long-term threats to the physical as well as the mental capability of future generations". 54/

39. To identify and counter problems like those discussed above, affecting the right to food, it is necessary among other things to make provision for the collection of appropriate data both on the adverse effects, if any, of new food additives and other substances including processes, and their technological necessity and advantages. Evaluation of this information would enable regulating or planning where necessary their production, sale and use; and for educating, where appropriate, potential users in their proper utilization. In making such arrangements the national authorities may depend upon their own resources and advice of national experts or draw upon the results of evaluation and recommendation made by United Nations specialized agencies like FAO and WHO. In all cases, the national food laws should clearly define the nature and composition of the body or bodies that are to decide on the use or otherwise of the substance, and the necessary protocol. This might call for the promulgation of other protective regulations beyond the customary general standards concerning food purity, poisonous substances,

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51/ Cf. Economic and Social Council resolution 1495 (XLVIII) of 26 May 1970 on land reform. See also document E/5012, Part II, para. 70.

52/ Economic and Social Council resolution 1645 (LI) of 30 July 1971, on the green revolution.

53/ Provisional Indicative World Plan for Agricultural Development, vol. I (Rome, 1970), chap. 1, paras. 14 and 21.

54/ See United Nations publication, Sales No. 71.II.A18, p. 137.

etc., in force prior to the development of the new synthetic substances; whether compensation should be paid for harmful effects of new substances and if so, to whom and under what circumstances: and whether violations of such protective regulations should be subject to civil or criminal penalties. As already noted in paragraphs 20, 23 and 36, food production technologies may have far-reaching effects on the organization of agriculture, the agricultural labour force, and its access to adequate levels of food and nutrition. Therefore, appropriate bodies responsible for adequate early assessment and continuing or periodic monitoring of the social and economic requirements and consequences of those technologies need also to be established or such responsibilities assigned to existing social and economic research agencies. 55/

4. Legislation and other standards and guidelines

40. The information received from Governments under Commission resolution 10 (XXVII) does not contain specific data concerning legislation and other regulatory actions or court rulings on the matters discussed in this section. Some information on regulatory approaches to various problems, however, is contained in publications of the FAO and the WHO, including FAO's periodical publications Food and Agricultural Legislation and Current Food Additives Legislation (the latter issued under the joint FAO/WHO programme on food additives and pesticides). 56/ FAO also produces a Food Additives Control Series, examining food additives controls in individual countries, 57/ and has included in its Legislative Series two issues examining regulations governing the manufacture and sale of animal foodstuffs in European countries. 58/

41. Summarized below are a few recent examples of institutional and substantive approaches adopted to cope with problems affecting the right to food such as those discussed in paragraphs 20-39 above, particularly, legislative and other arrangements concerning the control of pesticides, of certain chemical additives to animal feeds, and of irradiated and pre-packaged foods.

55/ Information furnished by the FAO.

56/ References to enactments and regulations relevant to the present section are also listed in FAO's Legislative Report Series.

57/ Relating to Canada (No. 1), the United Kingdom (No. 2), the Netherlands (No. 3), Australia (No. 4), Denmark (No. 5), France (No. 6), the Federal Republic of Germany (No. 7), and the USSR (No. 8).

58/ R. Ricard and T. Threlkeld, Animal Feedstuffs: Regulations Governing Their Manufacture and Sale in European Countries, FAO Legislative Series, No. 1 (Rome, FAO, 1957), and R. Ricard and M. H. French, Animal Feedstuffs: Regulations Governing Their Manufacture and Sale in European Countries, FAO Legislative Series, No. 4 (Rome, FAO, 1963).

42. Finland's 1969 law on pesticides 59/ covers control of efficacy, utilization, manufacture, storage and transport of, and trade in, pesticides, as well as "the measures taken to prevent harmful effects of these substances on the health of man or useful animals, cultivated plants and cultivated land, and nature". Under the terms of this law, the control of pesticides to determine their biological effect and their effectiveness is undertaken by an Institute of Plant Protection, working in collaboration with the Finnish Agricultural Research Centre, the physical and chemical control of these substances being within the jurisdiction of the State Institute of Agricultural Chemistry. The sale (or other supply for use) of preparations intended as pesticides is subject to license, issued by the Institute of Plant Protection, whose decisions may be appealed to the Ministry of Agriculture. 60/ The Ministry, after having heard the Institute, has the power to prohibit the sale and use of pesticides found to be harmful to plants or animals or unsuitable or ineffective for the intended purpose. The Institute of Plant Protection is entitled to carry out inspections and investigations in premises where pesticides are manufactured, stored or sold. The Finnish Council of State appoints - on the nomination of the Ministry of Agriculture - a Pesticides Board which acts as the expert body in matters concerning pesticides. The Board is appointed for periods of five years.

43. Offences committed against the Finnish law on pesticides or regulations issued thereunder, including offences in the manufacture or importation of, trade in, or storage, transport or use of, pesticides are subject to punishment by fine or imprisonment.

44. Canadian legislation adopted in 1969 61/ provides that where inspection of an agricultural product under Canada's Food and Drugs Act discloses pesticide residues that would make the product unfit for sale, and where the pesticide was used in accordance with the relevant recommendations, the Minister of Agriculture may pay to the farmer concerned compensation for any loss thus incurred by him. The Minister, among other things, must be satisfied that the pesticide residue is not present because of any fault of the farmer, his employee or agents or a previous owner of the land on which the product was grown.

59/ Law No. 327 of 23 May 1969 (text in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part III/5), repealing Law No. 261/51 of 27 April 1951 on the Plant Protection Office.

60/ Preparations containing classes of poisons under Finland's poisons legislation may not be sold until the Ministry of Social Welfare and Health, on the proposition of the Ministry of Agriculture, has authorized their use as pesticides.

61/ An act to provide compensation to farmers whose agricultural products are contaminated by pesticide residue and to provide for appeals from compensation awards, 8 May 1969. Text in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part III/5.

45. Before payment can be made under this act, the farmer must take any steps deemed necessary by the Minister of Agriculture for the purpose of pursuing any action he may have in law against the manufacturer of the pesticide or against any person whose act or omission resulted in, or contributed to, the presence of the pesticide residue. The Minister, where he deems such legal action necessary, may, as a condition for payment of compensation, require the farmer's consent for the Minister to pursue that action on the farmer's behalf.

46. Appeals from compensation awards are heard and determined by an assessor or deputy assessors (who act in the event of his absence or incapacity), appointed by the Governor in Council from among the judges of the Exchequer Court of Canada and the superior courts of the provinces. Appeals may be brought by farmers, where no compensation was awarded or the compensation awarded was less than the maximum prescribed by law, on the ground that the amount awarded or the failure to award compensation was unreasonable. The assessor's decision is not subject to appeal or review by any court.

47. Action has also been taken in a number of States to regulate the addition of various substances to animal feeds, which was referred to in paragraph 28, above. For example, Austria, Belgium and Switzerland have prohibited the addition of hormones to feeds. They also require licences or special authorizations for the addition of antibiotics to feeds. Belgium specifies the dosage of antibiotic that may be used for different species of animals. 62/ The European Economic Community has issued a directive concerning additives in livestock feed which specifies the substances that may be used as additives and the conditions which must be observed in their use. 63/

48. France has issued regulations concerning trade in irradiated food. 64/

49. The United Kingdom has prohibited the application of ionizing radiations for the preparation of food for human consumption and the sale or importation of irradiated food, except for food treated with not more than a specified dose. 65/

62/ Ricard and French, op. cit., pp. 11, 23-24 and 195.

63/ 70/524/CEE: Directive of the Council concerning additives in livestock feed, 23 November 1970; reference in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part IV, chap. 2.

64/ Decree No. 70-392 of 8 May 1970, embodying administrative regulations for the implementation of the Act of 1 August 1905, on the prevention of fraudulent practices in trade in irradiated food likely to be used as food for human beings and animals. Abstract in FAO, Current Food Additives Legislation, 143 (30 April 1971), No. 1973.

65/ The Food (Control of Irradiation) Regulations 1967 of 13 March 1967, and amendment 1969 of 28 July 1969: reference ibid., 144 (31 May 1971), No. 1988. Exception is also made for certain patients requiring a sterile diet.

50. In the USSR, 66/ food standards known as All-Union Governmental Standards are issued by the Council of Ministers' Committee for Standards, Measures and Measuring Instruments. The individual republics also have authority to promulgate standards, which are brought into line with All-Union Standards. Where there are insufficient grounds for the establishment of All-Union Standards, the practice is to work out technical specifications jointly for a number of republics, or within a republic, or provisional specifications, which are binding on all industries to the same degree as All-Union Standards. Proposed governmental standards for a new food additive are approved only upon favourable advice of the Medical-Epidemiological Service of the Ministry of Health. The principle followed is that food additives which have not been authorized are forbidden.

51. The conformity of foods with the standards for health and hygiene is verified through random analysis by the Medical-Epidemiological Stations of the Ministry of Health, which exist at the republic, municipal and local levels. Whenever a new method for preservation, colouring or other technological food process is elaborated by the food industry, calling for the introduction of an additive, preservative, colouring substance etc., for which no authorization has yet been issued by the health inspection bodies, the food industry concerned submits the case for decision to the Ministry of Health. The Ministry makes a decision on the basis of the conclusions arrived at by the research institutes and, if necessary, orders toxicological analysis and an evaluation of the carcinogenic risks from the newly proposed additives. The results of the investigations make it possible to determine whether the substance shall be permitted in food production and, if need be, its maximum permissible concentration in foods.

52. The United States has adopted nutritional guidelines for certain processed foods. The United States Food and Drug Administration issued guidelines on 30 November 1971 for frozen "convenience dinners", specifying the amounts of protein per 100 calories, vitamin levels and other ingredients which such packaged meals should contain to ensure a balance of essential nutrients. The guidelines will not be mandatory, but a product which complies will be allowed to carry a label saying that it conforms to federal nutritional standards. 67/

53. In 1970, the World Health Assembly, being concerned about the potential hazards of food additives to the consumer and agreeing that there was an urgent need for rapid dissemination of the results of toxicity research on food additives, requested member States of WHO to communicate immediately to that organization any decision to limit or prohibit the use of a food additive and to supplement such information as soon as possible with the data in support of the decision taken. It also requested the Director-General of WHO, where such action would be useful, to transmit immediately to WHO members information received concerning decisions to limit or prohibit an additive; to take expeditious steps to evaluate any significant new evidence of toxicity of a specific food additive; and to inform member States of any conclusions reached. 68/

66/ The following summary is based on information contained in A.I. Stenberg, J.I. Schillinger, M.G. Shevchenko, Food Additive Control in the U.S.S.R., FAO Food Additive Control Series, No. 8 (Rome, FAO, 1969), pp. 8, 10-12.

67/ The New York Times, 1 December 1971, p. 55. Guidelines for other processed foods, including breakfast cereals and meat substitutes, were reported to be in preparation.

68/ Official Records of the World Health Organization, No. 184, Twenty-third World Health Assembly, part I, res. WHA 23.50.