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UNESCO INTERNATIONAL SCIENCE, TECHNOLOGY & ENVIRONMENTAL EDUCATION NEWSLETTER

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Food & Agricultural Education in the 21st Century

Agriculture is the largest private sector enterprise in the world. It is intended to provide sufficient, safe, high quality food to make life healthy and fulfilling. It is a complex enterprise because it is transforming and interactive, People and capital must be employed outdoors, exposed to the elements, to harvest solar energy as fixed by plants. Governments throughout the world underinvest in agriculture, including research and education, although the high rate of return on capital invested in it shows its value.

In spite of abundant literature, much agricultural education is tacit - from father to son, from primary school teacher to pupil or from scholar to doctoral trainee. Agricultural education is also imparted to farmers, ranchers, fishers and foresters through primary, secondary and tertiary schooling. At colleges and universities in developed countries, the four most studied subjects are agricultural economics, plant production, food technology and animal production, in that order, whereas in developing nations, plant and animal production are emphasized. Today, issues of rapid urbanization, global trade and financial interdependence, ecotechnology, efficient sustainable agricultural production and productivity and rural development are sharing attention with the strong

commodity production focus of previous times. Some of the specific ecotechnological concerns are: soil sustainability, harvesting and conservation of rain water, crop and livestock pest management, post-harvest technology and worker sanitation. In addition to theory and methodology all these concerns require practical training in agriculture and awareness of various international patent conventions, national laws, and Farmers' Rights developed by the FAO.

Much of the international trade in food and other agricultural commodities is driven by technology and scientists play key roles in negotiating agreements. In a competitive climate with rapidly changing job assignments, doctoral or equivalent graduate-level agricultural curricula should require multidimensional, comprehensive, cross-cultural content and systems approaches. At lower educational levels, specialized training remains essential.

In developing countries also, agriculture will become increasingly technology driven. Production technologies will continue to dominate until food production is scaled up to reach the efficiencies of developed societies. Negotiators of international trade agreements, including government and non-government policy planners, will need rigorous training in the agricultural sciences and humanities.

Urban populations are growing rapidly. The United Nations projects a world population of about 8.5 billion by the year 2025 with the urban population attaining 5.1 billion - from 2.5 billion in 1994. What does this increase of over 50% mean to the food systems of the world, particularly when most of it will occur in the developing nations? When consumers become separated from the producers, as it happened during industrialization in the West, qualified persons are needed for food production, efficient transportation, processing to reduce waste and preservation to maintain food quality and safety during shipment over long distances.

In developing nations, rural-to-urban migration in search of jobs and education is significant. But the health and diets of immigrants usually decline in the cities and malnutrition is increasing among the urban poor. Ruralists are much less educated than urbanites due to underinvestment in rural infrastructures, Ironically, the primary producers are in the rural communities and it is their surplus production that began urban civilizations about 10,000 years ago. Improved rural economic conditions through modernized agriculture and development may moderate migration to cities. The World Food Summit (WFS) of 1996 estimated that there are 841 million hungry and malnourished people, i.e. one

Nutrition Education in UNESCO

Access to and uptake of education must be a key driver of all development policies with many countries needing to reset their social and economic priorities and considerable progress has been made over the last quarter century in expanding the capacity of primary school systems in all region of the world. Unfortunately, growth in enrolments and school capacity has not been matched by gains in ensuring that pupils persist in their schooling and emerge from primary school with the knowledge and skills they need to function as workers, parents and citizens. Today, in the less developed regions as a whole, only three out of four pupils can be expected to reach grade 5, i.e. completing at least the four years of schooling generally considered necessary for achieving sustainable literacy skills. For the least developed countries, these figures are only 1 out of 2 pupils (**Wasted Opportunities: When Schools Fail**, Education for All, Status and Trends 1998, UNESCO).

Past efforts to improve the accessibility and quality of schooling focused primarily on school-related factors such as location of schools, teacher quality availability of teaching materials and institutional management, little attention being placed on quality characteristics of children, such as their nutrition and health status and the way in which poor nutrition and health may be rendering children <<unteachable>>. However, there is growing recognition that

malnutrition and poor health may be important underlying factors for low school enrolment, absenteeism, poor classroom performance and early school dropout, as also reflected in the **World Declaration on Education for All and Framework of Action**.

The adverse effects of malnutrition and poor health on education may indeed jeopardize children's readiness to enter school, their ability to learn and the duration of their schooling. Addressing children's nutrition and health could make a difference in terms of improving educational performance. There are now studies that underscore a high prevalence in developing countries of damaging nutrition and health conditions among school-age children, such as under-nutrition and short-term hunger, lack of essential micro-nutrients and parasitic worm infections that are inhibiting children's learning and thus directly hindering many countries' efforts to provide effective learning opportunities to all their children.

To promote better awareness and understanding of the relationships between nutrition health and education performance at the primary level, UNESCO is involved in several actions to attempt to situate problems of nutrition and health within the complexity of factors determining educational participation and performance. Efforts have been undertaken on the one

hand to gather sufficient developing country experiences in analyzing how nutrition and health problems affect educational participation and on the other, to test different types of approaches to address such conditions through cost-effective school-based interventions at primary level. Future actions will involve fostering nutrition and health education activities at primary and secondary levels within the context of science and technology education, based as they are on similar aims and pedagogical principles and possessing a dynamic nature oriented towards a problem-solving approach based upon observation and questioning as well as provision of knowledge and skills for lifelong learning.

Science and technology education comprising nutrition and health education has the potential to improve the present and future well-being of all and is fundamental to the improvement of economic and life-sustaining activities. By providing pupils with qualified awareness of the relationship between individuals, health and society it can enable them to contribute actively to the promotion of health.

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in every five individuals in developing countries; Vitamin A deficiency is a public health problem in 60 countries with around 40 million children suffering from this deficiency; most obesity has resulted from excess food consumption by wealthy urbanites in both rich and poor countries; and that inadequate knowledge of nutrition and sanitation were among the factors responsible for hunger and malnutrition, the latter leading to losses in productivity and reduced fulfilment of human potential. Women worldwide are the main purchasers of food for the family (and in some countries also the largest food producers), and WFS in its technical reports forcefully recommends more education for them. Demand for knowledge about food nutrition and thus job opportunities is likely to increase, particularly in promoting healthy eating habits for children in schools. Public employment of nutritionists is also likely to increase in the developing societies.

Much food value is lost by consumers due to inadequate general education about nutrition, balanced diets, proper cooking and hygiene. We know of at least 50 micro-nutrients, each of which has special functions in the body. Most nutrients perform best when they are available in the presence of certain other essential nutrients. Since no one food contains all the necessary nutrients for vigour and health, we must eat a variety of different kinds of food i.e. have a balanced diet. "Daily food guides" have been available in the developed nations for a long time, perhaps as long as consumer preference surveys. However, nutritional facts, such as total fat, protein and carbohydrate content, calories from fat, amount of cholesterol sodium, potassium, vitamins and other nutrients were not printed on food packages until recently. Millions of consumers in the developing world, with diverse eating habits and available foods, also need

such information. It can only become available through agricultural research and consumer education.

Globalization since the end of the Cold War has greatly influenced all economic sectors, including food and agriculture. Under the General Agreement on Tariffs and Trade (GATT), globalization is opening up economies to private enterprise and market forces: removal of or reducing trade barriers and subsidies, promoting exports against substitution of imports, foreign capital and technology. Acquisition of foreign technology and services, in many cases through purchase or licensing arrangements, is often cheaper and quicker than indigenous efforts. Modern communications and declining export controls under GATT worldwide have accelerated globalization. Holistic education in the agriculture sector is the basic "commodity" needed for its development within the context of globalization.



How has the privatization model affected food and agricultural education and practices? In the developed world two phenomena are radically changing the education market: (1) expansion and diversification of formal and non-formal education, and (2) a shift to intellectual services from material products, with a decreasing unit cost of labour, capital and resources. Privatization impacts the attitudes of both academic and corporate managers, educators, scientists and trainees worldwide. In food and agriculture, multinational corporations of industrialized countries vigorously buy and sell their patent-protected products, such as seeds and biotechnology, to their own advantage. They establish their R&D (Research and Development) departments overseas to better service their customers. At the same time, exploiting the cheap local labour and raw materials available with their patented knowledge and techniques they develop new products to be sold locally or exported abroad. Researchers in the private sector frequently feel that the enforcement of stricter standards of scrutiny and accountability impinge on their creativity, that expectation of short-term gains sacrifices long-term research benefits and that their

tenures are tenuous because of frequent layoffs (down sizing), caused by mergers. Scientists may withhold publishable information, treat their discovery as a "market good or wealth" and seek patents to earn their keep. This policy inhibits free knowledge exchange with the world via publications for the common public good. In a few countries, privatization has reached such an extent that state departments of agriculture no longer have an extension wing to advise farmers and ranchers. Researchers and university teachers continue to cooperate in multidisciplinary agricultural research and publish their important discoveries. However, the past few years have been demoralizing for them. There has been inadequate tenured employment opportunity, in both industrialized and developing economies. Post-doctoral fellowships and short-term contract employment have been prolonged and field-switching is common. Accurate forecasts about demand and supply of trained personnel are not available. However, there will always be demand for workers in the most basic industry of all - sufficient, safe and high quality food production. The impact of privatization on developing countries' research and education policies

has reduced support to this sector, slowing advancement in agriculturally significant areas, such as biotechnology. Seventy to eighty percent of their R&D support comes from public funds, as against 60-70% private support in developed countries. Persons entering agricultural professions and job markets should be aware of the philosophical debate about "knowledge being a marketable asset" or "a public good". Such perceptions will affect the kinds of skills they ought to have: specialized knowledge of particular disciplines or broad, interdisciplinary backgrounds, long-term training under a university colleague conducting basic research, or on-the-job training in a team of profit-motivated colleagues who are working in a highly structured corporate environment. People need to be trained to abstract concrete ideas from a matrix, from a glut of trivia and hyperbole and to explain them in lucid prose.

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Challenges For Nutrition Education In Developing Countries: The FAO Response

Nutrition educators in developing countries are routinely challenged by rapidly changing social, economic, demographic and technological conditions. Foremost among the challenges are widespread poverty, inadequate food supplies and lack of information. These remain the main causes of hunger and nutritional problems affecting some 500 million people in developing countries. Anaemia or iron deficiency affect two billion people worldwide, one billion people are at risk of iodine deficiency disorders and 190 million children remain vitamin A-deficient. In the developing world, the addition of some 80 million people each year will require increasing public and private sector investment to improve and expand food supplies, environmental sanitation, health care, education and employment opportunities. Nutritional problems stemming

from either deficient or excess food consumption have tangible economic and social costs. By supporting nutrition education and investing in human development, governments of developing countries can assist their people by improving welfare and increasing productivity. Health care and medical costs could be reduced considerably through adoption of more appropriate diets and lifestyle choices. The high rate of urban growth in developing countries is also significant for nutrition educators. As urban residents depend on food supplied by others, it is crucial that they have the ability to choose healthful diets. In addition to these demographic and lifestyle changes, new foods are becoming available as a result of new agricultural practices, new technology and trade. The demand for traditional local foods is changing. The challenge is to

ensure that new dietary behaviours are consistent with nutritional needs. Nutrition education messages will vary for different population groups-the poor need information to ensure that they make the most effective use of their scarce resources to meet their nutrition needs, while those with greater purchasing power need accurate information to help guide their food choices. It is against this background of rapid changes that nutrition educators have an important social, economic and intellectual role to play.

Major Principles and Issues

Four principles should underlie nutrition education messages for the public.

- The adaptability of the human body implies that a wide variety of dietary patterns and food intake can lead to good health and well-being.

- From a nutritional perspective, there is neither an absolute requirement for nor a proscription of any given food. In fact, there are no good or bad foods per se - only good or bad diets.
- The adequacy of the quantity and quality of a given diet is determined by a number of variables, including physiological status, activity level, lifestyle and environmental conditions and nutrient/non-nutrient interactions.
- Dietary intake, except in extreme conditions, is primarily a matter of choice calling for nutrition education which helps the consumer to make well informed and healthful food choices.

Based on its experiences in technical assistance, discussions and recommendations of the FAO/WHO International Conference on Nutrition (1992), the Expert Consultation on Nutrition Education for the Public (1995), and the FAO/WHO Expert Consultation on Dietary Guidelines (1995), FAO has distilled **nine main issues** which professionals working in research, teaching or extension of nutrition education for the public should consider. If these issues are not addressed adequately, nutrition improvement programmes may be rendered ineffective with severe consequences for both individuals and society as a whole.

1. All the public needs to be reached - Traditionally nutrition education, particularly in developing countries, has been intended primarily for expectant women and young mothers. This limited focus resulted in the exclusion of many other population groups who are in need of nutrition education be it for promoting optimal growth, development and performance or for controlling diet-related non-communicable diseases. While government policies may focus primarily on addressing the needs of the poor, the better off segments of the population need to be considered as well to reduce the risks of nutrition related non-communicable diseases.

2. Total diet versus single nutrients - The formidable strides made by biochemistry and nutritional sciences in identifying nutrients and understanding their actions have often led to a trend among researchers, educators and the public to adopt a reductionist view of nutrition, which simply dissects a diet into nutrients. The many different food cultures worldwide and their large numbers of healthy, well nourished people are empirical proof that societies have adjusted their eating patterns accord-

ing to social, cultural, environmental, economic as well as physiological conditions. There is a need to reinforce this concept of total diet and to help the public look beyond single foods or nutrients.

3. Providing rational, food-based dietary guidance - To be useful, dietary guidance needs to be 'consumer friendly' and acknowledge the reality of consumers' food situations and socio-economic environments. The principle of such dietary guidance should be to ensure that the public can produce, select and purchase foods which lead to adequate consumption for nutritional well being. The diets should be affordable, palatable, socially acceptable and safe.

4. Informing and motivating - Nutrition education should be an on-going element in public service programmes. New information is constantly becoming available which needs to be transmitted to the public, new generations are born and they need to learn good practices. Nutrition educators should be assisted by social scientists and behavioural psychologists to combine information with the motivation necessary to bring about behavioural change.

5. Building trust and self-reliance - The complexity of nutrition education, the neglect of some of the basic principles mentioned above, have all resulted in widespread public confusion. For nutrition education efforts to be worthwhile, the public must have confidence in the messages and the messengers. Only then can people become self-reliant in making healthful dietary choices and be freed from unjustified fears regarding their foods and diets and enjoy eating.

6. Stimulating collaboration among sectors - Comprehensive nutrition education programmes cannot be undertaken solely by a Ministry of Health although this is commonly attempted. Dealing effectively with food and nutrition problems and different audiences requires the participation and collaboration of other ministries and sectors such as Education; Trade, Commerce and Industry; Agriculture; Information and even Youth and Social Affairs. The involvement of private and voluntary groups, consumer organizations as well as public and privately owned media is essential. Nutrition educators must stimulate this collaboration.

7. Using the mass media - Notwithstanding the value of face-to-face nutrition education, in order to truly reach all the public,

the use of mass media - especially radio/television and new computer technologies which strongly appeal to the younger generations - needs to be fully developed. This is particularly true in developing countries where large segments of the population have low literacy skills. In light of the observed need to train nutrition educators worldwide, distance learning is an option which requires serious consideration.

8. Acknowledging strengths and limits of nutrition education - Successful promotion of food products provides evidence that the public can be influenced to change dietary behaviour. Social marketing to promote better nutrition has borrowed valuable elements from commercial advertising techniques and most nutrition educators would be well served by learning more about effective communication techniques. Yet it would be a fallacy to overestimate what nutrition education alone can achieve. Understanding the limitations of nutrition education will help to direct resources more carefully and cost effectively.

9. Human resource development for nutrition education - Without a certain number of well-trained professionals at central, regional, district and community levels who can make use of advancements in concepts and technology for nutrition, effective changes in dietary improvement will be slowed down or not come about at all. Thus, training must go beyond the traditional group of medical staff and include school teachers, youth group leaders, social and community workers as well as academics and researchers in the fields of nutrition and food sciences.

FAO' Role in Promoting Nutrition Education

Since its foundation in 1945, FAO has been working to eliminate hunger and malnutrition by promoting agricultural development, alleviating poverty, improving nutrition and food security, i.e. securing access of all people at all times to the food they need for an active and healthy life. FAO offers direct development assistance; collects, analyzes and disseminates information; provides policy and planning advice to governments and acts as an international forum for debate on food and agriculture issues. Its action is based on:

Neutral Forum and Consensus Building
Technical and governing meetings of FAO, complemented by inter-country meetings



in the different regions of the world to inform high-level government staff and technicians about the food and nutrition situation of the world and to discuss technical matters including nutrition education for the public. Following the 1992 International Conference, FAO has expanded its work in the field of nutrition education, increased its advocacy and information sharing activities and supported the formulation of nutrition education programmes for the public.

Expert consultations which link results of scientific research with operational field application build international consensus and lead to recommendations for national programmes on which governments can build policies and programmes geared towards nutrition education in the light of the realities of their countries.

Information, Dissemination and Policy Advice to Governments

In addition to disseminating technical reports of consultations to countries, an integral part of FAO's programme on nutrition education for the public is to prepare various publications: books, manuals, guidelines, pamphlets, etc. for programme development and implementation. An example of this is the book "Social Communication in Nutrition: A Methodology for Interventions", addressed to nutritionists, communicators, health personnel and extension staff from different sectors responsible for planning, implementing and evaluating nutrition education activities for the public. Another example, is the educational package "Get the Best from Your Food" which addresses professionals as well as the public.

Development Assistance

A large number of FAO-supported rural projects in agriculture, fisheries and forestry, provide a good opportunity to integrate nutritional considerations and specific nutrition education elements into development programmes. Integration of nutrition education with food production and economic projects has a double advantage: they bring nutrition education to a needy section of the population and make learning about foods and diets realistic, practical and often economically beneficial. In Kenya, a large-scale nutrition education component will be included in a soya bean promotion and production programme; in Malawi, soya bean is being promoted for home consumption; in the Sahel countries, nutritionists and communication specialists worked together for disseminating messages to the rural public to enrich their traditional dishes with fat and foods rich in vitamin A and beta-carotene to address vitamin A-deficiency; and in Cote d'Ivoire, street food vendors received education on the hygienic preparation and presentation of foods and how to purchase and store foods used in dishes which are sold to the public from open spaces, food stalls or in the street.

Conclusion

Nutrition education programmes have often been undertaken in a limited fashion and frequently have not been very effective because they failed to take a comprehensive, intersectorial approach. Emphasis on special food groups or nutrients to address clinically manifested nutritional problems have distracted attention from promoting the prevention of such prob-

lems and maintaining healthful dietary practices and adequate consumption of all population groups. The vast potential of modern mass media has not yet been adequately exploited, particularly for reaching all population groups in developing countries. While the concepts and technologies for undertaking more effective programmes exist, they will need to be reviewed regularly to accommodate new scientific knowledge as well as operational experiences. Those working in the field of nutrition education for the public need to come to a consensus so that they can speak with one voice to avoid confusion among consumers and to simultaneously maintain their professional standards. The full application of what is known now could make nutrition education more acceptable to the public and motivate them to improve their dietary practices. Continued research in this field is necessary to learn how to better inform and motivate people to adopt or maintain good dietary and lifestyle practices and how to ensure that nutrition education does not contribute to increasing the distance between knowledge of nutrients and the diets that people actually eat.

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Emphasis On Schoolchildren

An FAO Programme on Nutrition Education for the Public

Nutrition education has, for many years, been seen as an important strategy for improving human nutrition. In the past, emphasis was directed primarily to special risk groups, mainly women of childbearing age who bear the important responsibility of feeding infants and young children. More recently, the scope of nutrition education has broadened

to include providing nutrition information to the general public on the prevention of diet-related, non-communicable diseases. In all periods, however, nutrition education has been considered a necessary element for any practical programme set up to maintain healthful dietary practices while tackling the existing nutritional problems of different population groups.

In 1996, FAO launched a nutrition education initiative for the general public, whose concepts also hold true within the school environment and can be adapted to the different educational levels of schoolchildren. Entitled "Get the Best from Your Food", it promotes four basic messages:

1. Enjoy a variety of foods
2. Eat to meet your needs

3. Protect the quality and safety of your food
4. Keep active and stay fit

**Nutrition Education In Schools:
A Community-Based
Approach**

Basic to FAO's Nutrition Education in Schools programme is the recognition that children learn best in a supportive environment that embodies and reinforces the principles taught. The approach is thus comprehensive and includes the community, schools and homes which produce, process and market food as well as those who select, prepare, serve and consume it. The programme aims to accomplish this by recognising schoolchildren, teachers, schools, parents and the larger community as parts of an integrated whole and calls for the provision of nutrition education, information and communication to students, teachers, parents and, when feasible, the community.

The approach is to go beyond the introduction of a course in the curriculum, addressing the broader socio-cultural, economic and environmental issues relevant to food security and nutrition in the home and community and includes:

- advocacy and promotional activities that emphasise nutrition as one of the key factors for physical and mental development, both for the current well being of schoolchildren and for their future as adults;
- providing children with basic knowledge about food and nutrition by including food and nutrition topics in the school curriculum;
- providing a wide range of practical, community-based learning opportunities aimed at creating positive attitudes, skills and behaviours;

- engaging nutrition and education officials, teachers, students, parents, and community leaders in the process of school nutrition education;
- implementing policies, practices and measures that encourage the acquisition of life skills and self-esteem for pupils; and
- striving to provide a healthy school environment with, for example, good school catering.

The final aim is to give schoolchildren a lifelong sense of responsibility for their own well being.

**Current Strategies to Promote
Lifelong Healthy Eating
Habits through Schools**

Results from a recent questionnaire distributed by FAO to 50 countries' worldwide reconfirm the continuing need for assistance to member countries to strengthen nutrition education in schools. Accordingly, the following activities are currently being undertaken by FAO:

• **Advocacy and Promotion**

Continued stress on the importance of school-based nutrition education in various fora worldwide and vigorous encouragement of the development and strengthening of such programmes.

• **Formulation and Support of Technical Assistance Projects**

Assistance in the formulation and support of country-level projects, which aim to review nutrition education materials and update school curricula, assess the need for teacher training in this field and develop pilot activities in schools which will be evaluated and repeated on a larger scale. Similar support is also being given to nutrition education in schools as a component within large-scale, FAO-assisted rural development projects.

* **Development of Nutrition**

Education Materials

Materials for teachers, schools and the community aimed at strengthening nutrition education, will continue to be developed. A planning guide for nutrition, health and education officials is being prepared to allow them to initiate, support and guide nutrition education activities in schools in developing countries. Complementary materials for teachers are also being developed.

• **Collaboration with Research and Training Institutions and UN Organizations**

FAO collaborates actively with various institutes in both developed and developing countries in producing teaching and training materials and assists member countries in formulating technical cooperation projects in collaboration with institutions and relevant government authorities. In addition, special efforts are being made to actively collaborate in WHO's School Health Initiative (v. Connect, 7998, no. 2) and its regional networks for health promoting schools as well as in the field of nutrition education with UNESCO and UNICEF.

• **Training of Teachers in Planning and Implementing Nutrition Education**

Provision of skills training being necessary for teachers to plan and implement effective nutrition education in their schools, such training will be made available in the form of short-time, in-service courses which are closely linked to the technical material being prepared by FAO.

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1. Food Nutrition and Agriculture, Issue 22, FAO, 1998.

CURRENTLY AVAILABLE FAO PUBLICATIONS

Providing technical materials is a key element in FAO's programme for nutrition education for the public. The following major publications are available or in preparation:

- *Social Communication for Nutrition, 1994 (English, French, Spanish)*
- *Nutrition Education for the Public; Report of an Expert Consultation, No. 59, 1995*
- *Nutrition Education for the Public -*

Discussion Papers of the Expert Consultation, No. 62, 1997 (English, French)

- *Get the Best from Your Food 1996 (English, French, Spanish, Arabic, Chinese, Portuguese and several national languages)*
- *Food Nutrition and Agriculture: Nutrition Education for the Public, Issue No. 16, 1996*
- *Handbook for Curriculum Planners:*

Nutrition Education in Primary Schools in Developing Countries (expected October 1999)

- *Planning Guide for Intermediaries and Teachers: Nutrition Education in Primary Schools in Developing Countries (expected October 1999)*

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The UN System's Forum for Nutrition: Sub-Committee on Nutrition

(ACC/SCN)

Following the World Food Conference of 1977, the Administrative Committee on Coordination (ACC) comprising the heads of the UN Agencies recommended the establishment of the Sub-Committee on Nutrition (SCN). This was approved by the Economic and Social Council of the UN (ECOSOC). The role of the SCN is to serve as a coordinating mechanism for exchange of information and technical guidance and to act dynamically to help the UN respond to nutritional problems around the world.

The UN members of the SCN are FAO, IAEA, IFAD, ILO, UN, UNDP, UNEP, UNESCO, UNFPA, UNHCHR, UNHCR, UNICEF, UNRISD, UNU, WFP, WHO, the World Bank and the Asian Development Bank. From the outset the SCN has brought together the UN agencies, civil society including academia and donor governments in a tripartite forum.

The SCN sponsors working groups on specialized areas of nutrition; promotes coordinated activities - inter-agency programmes, meetings, publications - aimed at reducing malnutrition, primarily in developing countries; compiles and disseminates information on nutrition; issues regular reports on the world nutrition situation; assesses external resources to address nutrition problems and produces Nutrition Policy Papers to summarise current knowledge on selected topics. It also organises annual Horowitz lectures on relevant topics and issues a biannual publication SCN News distributed directly to individuals in 180 countries worldwide.

Fourth Report on the World Nutrition Situation, planned for publication December 1999, is part of a series of SCN reports on nutritional status of populations in developing countries. The Report will present new knowledge on global and regional food and nutrition trends and implica-

tions for advocacy and policy-making and include new topics such as trends in diet-related non-communicable disease, food safety and food trade, urbanization and food insecurity, as well as follow-up to global conferences. In addition the report will include a feature chapter on the costs and benefits of investing in nutrition.

The ACC/SCN has a web site at <http://www.unsystem.org/accscn> with the latest publications and news items.

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UNESCO Activities Worldwide

First Seminar on Science, Technology and Environmental Education in the Aral Sea Region

Uzbekistan, 1-3 December 1998

The First Seminar on Science, Technology and Environmental Education (EE) in the Aral Sea Region was held in Tashkent, Uzbekistan, from 1-3 December 1998 within the framework of UNESCO's Programme on Science and Technology Education.

The Seminar was organized by UNESCO and hosted by the USTOZ Foundation in Tashkent. It brought together curriculum developers and teacher-trainers from the 5 Central Asian Republics - Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan - in the field of Science and Technology Education, in order to discuss

the development of EE within the science curriculum in schools and training of trainers for teaching EE in the countries of the Aral Sea Basin.

Participants included one senior representative of each Ministry of Education responsible for EE and one curriculum developer specialized in Science, Technology and Environmental Education. Representatives of the concerned UN agencies, observers from the USTOZ Foundation, the International Fund ECOSAN, the World Bank, TACIS and some regional/local NGOs also attended. Mr Orlando Hall-Rose, Chief, Science and Technology Education Section,

UNESCO, Paris, acted as facilitator throughout the seminar.

The objectives of the seminar were as follows:

1. To provide a forum for discussion on the specific challenges and problems facing science, technology and EE in the Aral Sea region;
2. To share national experience in the field of EE in general secondary schools;
3. To build institutional capacity through training of specialists in curriculum development for EE;
4. To develop the national EE curriculum for Uzbekistan;

5. To explore the possibility of establishing a UNESCO Network on science, technology and EE in the Aral Sea Region within the Project .X700+.

Prior to the seminar, information on curriculum development in each of the participating countries was collected with the assistance of the Republican Education Centre under the Ministry of Public Education of Uzbekistan, through a specially designed questionnaire. In addition, Country Reports were prepared by each delegation on the situation of ongoing educational reforms.

Training materials for curriculum developers on EE were distributed during the seminar in order to familiarise the participants with different approaches for renewing and/or developing EE curriculum appropriate for the countries of the Aral Sea Basin. The set of training materials included translations into Russian of selected UNESCO/UNEP International Environ-

mental Education Programme (IEEP) publications, examples of EE curriculum from different countries, posters, etc.

The staff of UNESCO Tashkent Office and the Executive Board of ECOSAN International Ecological Fund provided all necessary technical and logistic support to the national officials and to the educational experts for the purpose of planning and organisation of all phases of the Seminar. The outcomes of the Seminar were the following:

- 12 educational experts in curriculum development from Aral Sea countries shared experiences and learned new approaches on EE curriculum development with a common regional approach;
- Publication of a Final Report including country reports and comparative analysis of the situation in the educational sector of each country;
- Two alternative Integrated curricula for EE for Uzbekistan prepared by a mobile

team of national experts created with UNESCO assistance within the Republican Education Centre.

The tentative curricula are being introduced and pre-tested in selected schools at present, and the revised and approved curriculum will be implemented in all schools in Uzbekistan from 1 September 1999.

The participants unanimously agreed that a Regional Network on science, technology and EE in the Aral Sea Region within the Project 2000+ should be created with the assistance of UNESCO's Science and Technology Education Section.

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Latin American Subregional Project on Science for All

The coordinating committee of the project *Cultura Científica para Todos* (Science for All) met in Montevideo on 11-12 February 1999 to consider the advantages of using a sub-regional approach for the implementation of this project in place of the currently used national approach and to analyse the possibility of setting up a Latin American Association of Science Teachers.

The objective of the project *Cultura Científica para Todos* is to bring science to the disadvantaged communities of the concerned countries through the action of

teachers and students, the main link between the school and the family.

The participants consisted of representatives from NGOs, Science Teacher Associations and universities from Argentina, Bolivia, Chile, Paraguay and Uruguay as well as UNESCO/OREALC.

The participants reached the conclusion that a sub-regional approach based on the similarities of the communities concerned and at the same time taking account of the diversity, would be far more useful than a piecemeal approach. Accordingly, a work plan was developed for the implementa-

tion of the project. At the same time it was also decided to set up a network of Latin American Science Teacher Associations (Red LADCi) which would be officially launched in August 1999.

For further information contact:
*Ms Beatriz Macedo, Regional Specialist,
 UNESCO/OREALC, Enrique De/piano
 2058, Casilla 127 Correo 29, Santiago,
 Chile. Fax: (56-2)655.1046/4 7
 E-mail: unesco@unesco.cl*

STEE Activities in Ecuador

The following activities were organised by UNESCO/Quito in collaboration with the Universidad Central and the Colegio Miguel Angel Zambrano respectively:

1. Forum on Development of Science and Technology, 18-20 August 1998; and
2. Workshop on Science and Technology

Education for Development, 14-15 October 1998.

The Forum took place within an International Workshop on Industry, Environment and Innovation. It was attended by 44 representatives from ministries (Trade, Social Welfare, Agriculture and Public Health), universities, the industry and specialized institutions.

The major objectives of the forum were to reinforce academic training of professionals in science-linked sectors; facilitate interchange of scientific information and experience and technological innovations to increase competitiveness and to strengthen industry-university cooperation.

The Proceedings of the Forum/Workshop have been published and are available at



UNESCO/Quito office (address below). The Workshop on Science and Technology Education for Development was organised in the framework of Project 20&I+ and was attended by 40 secondary school teachers from the Tungurahua province.

The main objectives of the workshop were to promote science teaching in

schools; define strategies for the use of scientific methods at all levels of teaching; benefit from community resources to organize 'open houses' and fairs for pupils and encourage teachers and students to participate in *Project 2000+*.

The major outcome of this workshop was an Action Plan with a time-table for the

implementation of various activities in the school year 1998-I 999.

For further information contact:

Director, UNESCO/Quito,
*Edificio de las Naciones Unidas, Foch 2,
Apartado 17-07-8998, Quito, Ecuador.*

Fax: (593.2)504.435.

E-mail: uhqui@unesco.org

Worldwide Activities

Environmental Training for Local Leadership in Africa UNEP/UNCHS Subregional Pilot Training Workshop

Mombasa, Kenya, 7-I 8 March 1999

In assessments conducted by the United Nations Environment Programme (UNEP) and the Government Training Institute (GTI) of Mombasa, Kenya, the need to offer environmental training to local government elected officials and other local leaders in Sub-Saharan African countries was found to be very urgent. Yet this has been the least delivered kind of training in most countries of the region. Environmental education and training (EE&T) of local government politicians has tended to be relegated to the lower priorities while more emphasis was given to training professional, administrative and technical staff.

This was reason enough for UNEP and the United Nations Centre for Human Settlements - UNCHS (Habitat) to develop a pilot training of trainers (TOT) programme for Sub-Saharan Africa on the councillor's role as guardian of the environment. It was implemented in collaboration with the Kenya GTI in a subregional workshop held in Mombasa, 7 - 18 March 1999. In the first week participants received training based on the UNEP/UNCHS training manual (1997) which they used in the following week to train a group of 16 councillors from the Mombasa, Malindi, Voi and Mavoko regions of Kenya. The remaining days were used to discuss immediate feedback received from the councillors; to review UNEP/UNCHS training materials and to determine needs for further adaptation. Action plans for national/local follow-up training programmes were also elaborated.

The workshop scored excellent ratings from participants on its success in achieving a break-through in enabling trainers from the African region to provide environmental training to local leaders. Participants also commented on the urgency and importance, particularly for African countries, of including the subject of sustainable agriculture, food production and land care systems into the curricula of those workshops. Consequently, the Tlhologo Development Project (TDP) in Rustenburg, South Africa, arranged in May/June 1999 a "Keyline Design Workshop" to introduce the Australian Keyline System to the African region. The development of this system arose from a need for on-farm water storage and rich fertile farm soil and TDP wants to make it known to local authorities, individual farmers and to the general public to achieve objectives such as:

- To build skills in a proven sustainable land use system for comprehensive whole farm design and community based land management.
- To implement demonstration projects of good land care.
- To provide training in a successful technique for soil conservation, building of soil fertility and erosion prevention.
- To develop capacity for implementation of on-farm water storages that may be used for agricultural irrigation, supply of water to civil works or as community water harvesting system.
- To illustrate the use of Contour Strip Forests as an economic rural asset to

empower communities through soil building, provision of forage systems, appropriate wind and fire breaks and high value timber production on a sustainable basis.

- To ensure a direct transfer of technology from pioneer sources in Australia to Africa.
- To implement physical models of the Keyline Design system, including farm dams, roads, and contour forests that may be used for further sustainable land care training.

During the UNEP/UNCHS pilot workshop there were numerous requests for similar training workshops throughout the African region. These will be facilitated by the participating trainers of the workshop belonging to national/sub-regional training institutions such as the Kenya GTI, the Kenya Institute of Administration, the Kenya Polytechnic, the Uganda Management Institute (UMI), and the Institute of Development Management (IDM) Mzumbe in Morogoro, Tanzania.

For further information contact:

*Dr. Christian Holger Strohmann, Head,
Environmental Education and Training
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NAIROBI, Kenya, Tel: +254-2) 623145
Fax: + (254-2) 6239 17*

*E-mail: Christian.Strohmann@unep.org
Web-site: <http://www.unep.org>*

STEE Centres, Networks, Associations

Science Teaching Center Hebrew University of Jerusalem

Israel

The Hebrew University's Science Teaching Center was established in 1969 as part of a nation-wide programme based on the need for an integrated system for training science educators. From its inception the Center has specialized in the varied aspects of science and technology education and is involved in a wide range of activities both within and without the University. The guiding belief upon which its work is based is the need to focus first and foremost on the educational needs of the children from kindergarten through the end of high school, in formal and informal settings, to build on children's natural sense of curiosity about the world. The kinds of activities and materials devised by the Center are thus dictated primarily by the needs of the children and are also responsive to the requirements of the teachers who will guide them through the learning process. The Center is active in applied research in the teaching of natural sciences. Most of the research topics have direct impact on

how children get involved with, comprehend and enjoy science studies. Planning, organising and participating in special enrichment programmes for various populations are integral parts of the Centre's work. Among the current programmes developed and offered in cooperation with a number of other institutions - municipal, governmental and private, are the following:

- **Biology, A Bridge to Science** - aimed at high school students from disadvantaged communities
- **Programs for Gifted Children**
- **Why?** - for 4 -5 grade pupils from disadvantaged areas
- **Children want Science** - an extra-curricular programme for 3-12 graders in natural and social sciences as well as arts and humanities
- **Science Tutorial** - for disadvantaged high school students in physics and chemistry
- **Together in Science** - where sixth graders help third graders

In its almost 25 years of existence, the Science Teaching Center has developed and produced over 250 textbooks, teacher's manuals, computer software and other non-textual computer- and video-based study materials in biology, mathematics, physics, chemistry and computer science. Its personnel also serve as consultants to local, national and international institutions and groups in various phases of science education development, improvement and innovation.

The Center is currently involved in the creation of curricula such as *Integrated Science and Technology in Society for Middle School* and *Science for All for High School*.

For further information contact:
*Science Teaching Center,
Hebrew University of Jerusalem,
Givat Ram Campus,
Jerusalem 99 104, Israel.*

Explora: A Science & Technology Promotion and Popularisation Programme

Chile

Explora was launched in 1995 by the CONICYT (Chilean National Commission for Science & Technology Research) to generate innovative and participative responses on the part of the public - notably children and youth - to the advances in the field of Science and Technology (S&T). Its creation was based on the rationale that harnessing scientific advances and their technological applications has become fundamental for all nations who wish to maintain a level of growth compatible with an appropriate quality of life. Thus the major objectives of the programme are:

- Popularisation of S&T
 - Awareness spreading of the importance of S&T for improving the quality of life and as an essential part of the cultural heritage
 - Stimulating the use of critical thinking and technological applications
 - Improving knowledge of S&T and fomenting scientific vocations in children and youth
 - Promoting innovation in the field of Science & Technology Education (GTE)
- Its principal activities are:
- Organisation of a National S&T Week
 - Holding a competition on S&T popularisation and awareness spreading
 - Organising and participating in S&T workshops and seminars
 - Publication of S&T documentation and a trimestrial newsletter "Explora y Diviertete"
 - Maintaining a video library as well as a website
 - Supporting diverse other S&T activities

For further information contact:
*Haydée Domic 7;
Directora, EXPLORA, Bernarda Morin 566,
Providencia, Santiago, Chile.
Fax: (56-2)655.1386
E-mail: explora@conicyt.cl
<http://www.conicyt.cl/exp/ora>*



Doing It & Telling It

Energy Audit in the School

Spain

Place: Xelmirez | Secondary School (Spain) - as well as in its partner schools: Holbein Gymnasium (Germany), Kattula Gymnasium (Finland) and B.G. Ingeborg Bachmann (Austria).

Target Groups: Secondary school students and their parents.

Introduction: Energy is the real motor of the Universe. Whether in the past, present or future, it is central in all the key events of our society: industrial revolutions, resource depletion, fuel crises, climate change etc. through all the traditional subject matters: geography, mathematics, biology, ethics... Its study and analysis can thus be an educationally integrating factor. Moreover, our dependence on energy for all our daily tasks makes it a very interesting topic for developing EE projects to promote energy saving strategies at school and in the homes.

According to the information collected, our school building has 700 fluorescent tubes and 50 incandescent lamps. The total power amounts to 100 kilowatts, average voltage value being 238.5 volts. Mean annual cost amounts to 2 million pesetas.

Objectives:

- Making students and teachers aware of the environmental implications in the production and consumption of energy
- Evaluating energy consumption - both electric and oil - in the school
- Proposing measures for energy saving and quantifying the annual cost of such saving
- Organizing a workshop on renewable energy including physics, technology and biology activities.

Resources: The programme is partially financed by funds from the European Union (Action Comenius 1). Ten teachers and sixty pupils are currently involved in the activities and campaigns, with the help of a Green Library, two laboratories, an E-mail set and a small kit of renewable energies electrical appliances donated by the local network "Voz Natura".

Methodology:

- Initial evaluation by means of a test of the knowledge and attitudes of the students towards energy consumption and its influence on the environment

- Diffusion of guides and other educational packs on energy saving
- Visits to coal power stations, wind farms and hydropower stations
- Inventory of the electric installations in the school building for light and energy
- Study of the electric bills of the last two years
- Study of the central heating boiler with the help of local government technicians.

Evaluation/ Expected Results: Through the application of low-cost measures such as reduction of hired power, adjustment of the tension, replacement of incandescent lamps by low consumption discharge lamps, we hope to make a 10% energy saving. In the long run we expect to make a total annual saving of 1/2 million pesetas (3,000 Euros).

Sent by:

Manuel Antonlo Femhndez Dominguez.

*1. E. S. Xelmirez | Experiencia Pedagógica,
Pza de Bar s/n, 15701 Santiago, Spain.*

Tel: 98 1-58432 1

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Information and Education for Sustainable Fur Trade

Canada

Place: Canada (nation-wide).

Target groups: Primary and secondary schoolchildren, general public.

Introduction: Canadian fur trade is a working example of sustainable use of renewable resources. It has been practised commercially for some 400 years and all the animals are still abundant. Moreover, it provides income for those living in remote regions (half the trappers are aboriginals), who have a direct interest in preserving wildlife habitat - the key to protecting wildlife. Using this as a successful example of a sustainable industry the Fur Council of Canada has begun an

educational programme using a newsletter. An activity kit containing questionnaires and topics for discussion is included with each copy.

Objectives:

- to increase students' understanding of the role of the fur trade in wildlife management
- to highlight the importance of the fur trade to the people living in northern and rural settings who depend on it
- to promote commercial Canadian fur trade as a positive, ecologically sensitive and sustainable industry

Resources: The Fur Council of Canada,

the Federal Department of Aboriginal and Northern Development (DIAND) and the Quebec Ministry for the Environment and Wildlife.

Methodology: A colour newsletter, Eco+ News, was developed in English and French to explain the positive social, economic and environmental contributions of the fur trade, using cartoons to tell the story. Copies of Eco+ News were mailed to over 8,000 Canadian schools together with a question/answer activity kit. A complementary in-school programme uses fur bearing species to explain the principles of adaptation of terrestrial and semi-aquatic

animals to different habitats, the carrying capacity of habitat and the concept of sustainable use. A new video is also being developed for the school programme explaining the sensitive relationship between trappers and their surroundings as well as their role in maintaining a balance between wildlife populations, available habitat and human needs. The Fur Council's Internet site (www.furcouncil.ca) is also being developed into an interactive teaching resource.

Evaluation: No formal evaluation has

been undertaken but the feedback from participating teachers, principals, educational consultants and interested members of the general public has been very positive.

Results: **Eco-News** has given students and the general public an opportunity to appraise the fur trade's positive role in maintaining a healthy environment.

P.S. The Fur Council will be pleased to send copies of their educational kit to interested *Connect* readers.

Sent by:

Alan Herscovici,
Executive Vice-President,
Fur Council of Canada,
1435, rue St-Alexandre Street,
Suite 1270, Montreal
(Quebec),
Canada H3A 2G4.
Fax: (514) 844-8593

Readers are invited to send us their **FIELD experiences in Science, Technology, Environmental Education activities** involving the teaching/learning process but not necessarily limited to students and teachers. They should be **as brief as possible** and set under the following headings:

Place: Locality where the activity was carried out

Target groups: For whom the activity was intended

Introduction: Background information - reasons for initiating the activity

Objectives: What was the activity expected to achieve?

Resources: Materials/funds needed for the activity

Methodology: The way in which the activity was carried out

Evaluation: How was the activity judged? By whom?

Results: Did the activity produce any concrete changes in the target group(s)?

*Selected experiences will be published with the name and address of the author. Please address your contributions to: **Doing it and Telling it** (address on last page)*

News & Publications

Convinced that the success of science is based upon shared knowledge, UNESCO and the Russian Academy of Sciences have launched the **Journal of Journals**, a semestrial review dedicated to providing an overview of the most significant trends in science, technology and the humanities. Federico Mayor, UNESCO's Director General, has written in the preface to the first issue *"The gap between what scientists know and what the public understands is one of the greatest threats to clear-sighted science and public policy"*. The *Journal* will publish a representative selection of the most significant scientific articles found in a wide range of other academic journals. The first issue includes articles by leading Russian scholars in the fields of mathematics, physics, chemistry, biology, earth sciences and humanities. The coming issues will include articles on research work being carried out by the international scientific community. For further information contact: *Interperiodica*, PO Box 1831, Birmingham, AL 35201-1831, USA. Tel: 1-800-633-493 /1-205-995- 1588

Internet Cafe is a set of electronic modules developed by UNEP's Industry and Environment Centre (UNEP IE) in cooperation with its International Environmental Technology Centre (UNEP IETC), UNCTAD and UNIDO to provide information on both specific and broader environmental issues associated with a number of industrial production processes. Its rationale is that the environmental consequences of any industrial activity rarely

affect just one medium. It is therefore important to understand the impact of an activity on the environment as a whole.

The **Internet Cafe** is structured around three key questions:

- What is the source of the environmental problem?
- How should the problem be analysed?
- What measures will help avoid/reduce the impacts?

Yellow **Pages**, another UNEP IE publication, is a resource guide to international directories and trade shows providing information on environmentally sound technologies. For more information on both contact: *Laura Williamson, UNEP If, 3943 Quai Andre Citroen, 75739 Paris Cedex 15, France. Fax: 133-1W37. 14. 74 E-mail: unepie@unep.fr <http://www.unepie.org>*

Following 1998 International Year of the Ocean (IYO), UNESCO's Intergovernmental Oceanographic Commission (IOC) presented at its 31st Executive Council session the results of its action concerning the achievement of the goals of the IYO. It analysed the experience gained, identified problems and drawbacks in programme implementation and made suggestions to explore fields where follow-up activities can be undertaken jointly with Member States or other international organisations. The Recommendations made by the Executive Council are available on the IOC website: <http://ioc.unesco.org/iocweb> or on contacting: *Dr I. Ollouine, Deputy Secretary IOC, UNESCO, 1 rue Miollis, Paris 75352 Cedex 15, France. Fax: (33-1)45.68.58.12 E-mail: io@rounine.unesco.org*



The Final Report of the **UNESCO Sub-regional Training/ Writing Workshop on Project 2000+** organised by UNESCO/Lagos for science and technology educators from the West African sub-region (Winneba, Ghana, 16-24 June 1998), has been published and is available on writing to: Director, UNESCO/Lagos, 9 Bankole-Oki Road, Ikoyi, PO Box 2823, Lagos, Nigeria. Fax: 23412693758 E-mail: /agosOunesco.org

The Flexible Learning Approach to Physics (FLAP) is a self-study teaching resource covering higher secondary/basic university level physics and mathematics. It is mainly text-based with photocopiable texts but also includes audio tapes, video cassettes and a range of CAL (computer assisted learning) packages. Funded by four UK Higher Education Funding

Councils under their Teaching and Learning Technology Programme, it has been produced by The University of Reading and the Open University drawing on the experience of physics educators from more than 20 institutions. It is designed to allow students to study in an active, enjoyable and interactive way through supported self study with much more control of the learning, developing deeper understanding and increased motivation. For further information on prices and order contact: Dr Stuart Windsor, FLAP project co-ordinator, J. J. Thompson Physical Laboratory, University of Reading, Whiteknights, PO Box 220, Reading, RG6 6AF; UK. Fax: 0118-975.0203 E-mail: S.A. Windsor@reading.ac.uk <http://physics.open.ac.uk/flap>

Forthcoming Conferences, Courses, Workshops....

The **International Water Office (IWO)** has brought out its 1999 catalogue containing 136 training courses on various aspects of water-related professions. IWO also organises training courses for specific needs of municipalities/industries. For further information contact: Le Centre National de formation aux Metiers de l'Eau (CNFME/O/Eau), Rue Edouard Chamberland, 87065 Limoges Cedex, France. Fax: (33-5)55.77.71.15 E-mail: cnfme@oieau.fr <http://www.oieau.fr>

17th International Conference on Technology and Education, Preparing for a New Century of learning: Technology, Education, and the Internet, Tampa, USA, 10-13 October 1999. Further information from: /CTE Tampa, Conference Secretariat, PO Box 195349, UTA Station, Arlington, TX 76019-0001, USA. **For US:** Fax: +1-817-534-0096 E-mail: icte@icte.org **For Europe:** Fax: +44-1592-596210 E-mail: d.walker@icte.org.uk <http://www.icte.org>

3rd International Symposium Environmental Geochemistry in Tropical countries, Rio de Janeiro, Brazil, 25-29 October 1999. For further information contact: Departamento de Geoquímica, Universidade Federal Fluminense, Outeiro de Bo JoBo Batista s/n, Centro, Niterói, RJ, Brazil CEP 24020-007 Fax: 55.21.6207025 E-mail: isegtc@vm.uff.br

Pan-African Workshop: African Women in Science and Engineering: A Vision for the 21st Century, Nairobi, Kenya, 26 November - 3 December 1999 jointly sponsored by UNESCO, International Women in Science and Engineering (IWSE) and International Foundation for Science (IFS). Further information from: The Secretary, AWSE Workshop Ctee, PO Box 30677, Nairobi, Kenya. Fax: 254-Z-52 1001 E-mail: awse@cgjar.org

Second Sub-regional Conference on Public Understanding of Science and Technology on the theme *Science, Technology and Mathematics Education in Africa*, Gaborone, Botswana, 6 - 9 December 1999. Further information from: Department of Mathematics and Science Education (DMSE), University of Botswana, Private Bag UB00702, Gaborone, Botswana. Fax: 267-355.2088 E-mail: yandi/ac@noka.ub.bw or adeyinka@noka.ub.bw

15th International Conference on Solid Waste Technology and Management, Philadelphia, USA, 12 - 15 December 1999 for researchers, educators, government officials, community

leaders, managers and others with interest in solid waste. Further information from: Dr Ronald L. Mersky, Program Chair, Department of Civil Engg, Widener University, 1 University Place, Chester, PA, 19013-5792, USA. Fax: 610.499.4059 E-mail: solid.Waste@widener.edu

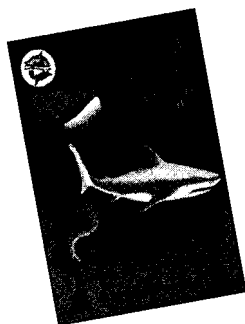
The **Association for Science Education (ASE)** will hold its Annual Meeting in Leeds, U.K. with an International Programme of Conferences on *Forging the Future in Science Education* from 4 - 6 January 2000. The programme includes talks, academic lectures, practical workshops and pre-booked courses as well as exhibitions, visits and social events. For all information contact: Conference Office, college Lane, Hatfield, AL10 9AA, UK. Fax: +44(0) 1707-266532 E-mail: mbrookman@ase.org.uk

ICRA has announced its 19th Training **Course in Interdisciplinary Team Research for Agricultural Development**, to be held in France and the Netherlands, 10 January - 20 July 2000 (English), 26 February - 7 September 2000 (French). For further details contact: Jon Daane, ICRA, PO Box 88, 6700 AB Wageningen, The Netherlands. Fax: (31(0)317-427046 E-mail: icra@iac.agro.nl <http://www.icra.agropo/is.fr>

Smart Partnerships in Science and Technology Education: The challenge in the 21st century is the theme of the **IOSTE South-East Asian Regional Symposium** to be held in Penang, Malaysia, 30 March - 2 April 2000. It will focus on: Educational-industrial cooperation for sustainable economic development and environment; science and technological literacy for improvement of the quality of life; and cultural studies, pedagogical strategies as well as regional cooperation in STE. For further information contact: Dr Suan Yoong, School of Educational Studies, University of Malaysia, 11800 Penang, Malaysia. Fax: ++604-657.7888 E-mail: syoong@usm.my

The Fifth **Global Conference on Health Promotion, Health Promotion: Bridging the Equity Gap**, organised by the World Health Organisation (WHO), Pan American Health Organisation and the Ministry of Health of Mexico, will be held in Mexico City, Mexico, 5 - 9 June 2000. Further information from: WHO, Avenue Appia 20, 1211 Geneva, Switzerland. Fax: (47) 22-791.4186 E-mail: ligchp@who.ch or Ministry of Health, PO Box 6-1 015, 06600 Mexico City, Mexico. Fax: (52)5-511.0169 E-mail: 5gchp@cenids.ssa.gob.mx Conference Website: www.who.org/hpr/conference

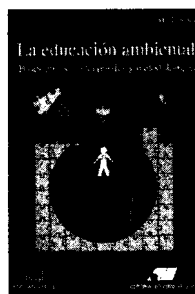
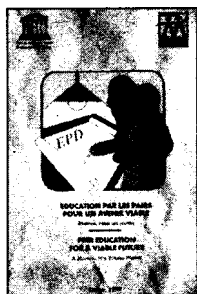
Publications



Mundo Azul (The Blue World, 16 p.) and **Tortugas Marinas** (Marine Turtles, 26 p.) are the first two booklets in the Information Series "Conozcamos N Maf (v. Connect, Vol. XX/, No. 2, June 1996) meant' for 6-14 yr. old children. **Spanish** only. Contact: *Acuario Nacional de Cuba, Ministerio de Ciencia, Tecnologia y Medio Ambiente, Ave. Ira y Calle 60, Miramac Playa, C&dad Habana, Cuba. Fax: (537)24 1.442 E-mail:acuario@cidea.unepnet.inf.cu*



Peer Education for a Viable Future: A Manual for Young People (1999, 78 p.) is the result of a sensitisation exercise for adolescents in Environment & Population Education and Information for Human Sustainable Development (EPD) carried out by UNESCO/Dakar in collaboration with an NGO working on population and education, Groupe pour l'Etude et l'Enseignement de la Population (GEEP), on forty young people at a holiday camp in Senegal, 5-13 August 1998. The manual treats notably 4 aspects of EPD: Significance/importance; scope; approach and messages. **Bilingual (E/F)**. Contact: Director EPD, UNESCO, 7 Place de Fontenoy, 75352 Paris 07 SF? France. Fax: (33-1) 45.68.56.35/6 E-mail:epd@unesco.org

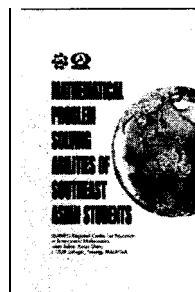


La Educacion Ambiental: Bases Bticas, conceptuales y metodoldgicas (Environmental Education: Ethical bases, concepts and methodologies) by Maria Novo. 1998, 290 p., US\$27/155FF. Conceived as a tool for educational planning, management and training, thus book presents the three dimensrons - ethical, conceptual and

methodological - of the principles that form the basis of Environmental Education. **Spanish only**. Contact: UNESCO Publishing, 7 Place de Fontenoy, 75352 Paris 07 SI? Fax: (33- 1)45.67.16.09



Henri Becquerel and the Radioactivity, ed. David Sang (1997). Written for 14-16 year olds, this book consists of 8 units covering various aspects of radioactivity, including the underlying science, its applications and its social and environmental consequences. A variety of activities are suggested in each unit including questions, data analysis reading comprehension and discussion. Price f9.40. Contact: The Association for Science Education CASE), College Lane, Hatfield, Herts AL 70 9AA, UK. Fax: (0 1707) 266532 E-mail:ase@asehq. telmecom



Mathematical Problem Solving Abilities of Southeast Asian Students (1998, 74 p.) is the result of a research study of the Regional Centre for Education in Science and Mathematics (RECSAM) of the South East Asian Ministers of Education Organisation (SEAMEO) conducted on randomly selected secondary school students of both sexes from 6 Southeast Asian countries: Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand. Contact: SEAMEO RECSAM, Jalan Sultan AZ'an Shah, 11700 Gelugor, Penang, Malaysia.



Les O.G.M. arrivent! - Apprenez a /es connaitre. (Getting to know Genetically Modified Organisms) by Jean Fourmentin-Guilbert (1999, 110 p.) is an informative book presented in a simple and synthetic manner with a profusely illustrated text highlighted with cartoons. Though primarily aimed at the French public, the scientific information it contains would be of interest to people of all horizons. **In French only**. Available from: Fondation Fourmentin-Guilbert, 2, avenue du Pave-Neuf, 93760 Noisy-k-Grand, France.



Against the grain: *The Genetic transformation of Global Agriculture*, by Marc Lappe and Britt Bailey (1999, 176p.). In this EarthScan publication the authors challenge the abrupt transformation of food crops through genetic engineering and raise disturbing issues of failed government oversight and an industry underestimating or ignoring potential dangers in its rush to exploit the new technologies. Available from: *Librairie ECOSPHERE*, 11 Rue Albert Einstein, B?8-Champs-sur-Marne, 77421 Mame-La-Vallee, France. Fax:133-0j64.73.95.35.

MEDAGRI (1999) the Yearbook of Agricultural and Food Economies in the Mediterranean and Arab countries, deals with the evolution of Mediterranean countries covering various aspects notably of demography, agriculture and food. It contains over 100,000 items of quantitative data from 35 Mediterranean and Arab countries covering a period from 1961-1997. Price 500 FF. Available from: *CIHEAM - Institut Agronomique Mediterranean de Montpellier*, 3191, route de Mende - BP 5056, 334033 Montpellier Cedex 1, France. Fax:(33-4)67.54.25.27.

Play Physics, Play Math and **Play Earth & Space** are virtual and interactive simulation software targeted at both teachers and students of science. They are especially useful for the classroom environment that does not have all the equipment for experiments so that students can visualise the concepts that have been difficult to experience. For more information contact: *JasonTech, Inc.*, 181-3 Hansang B/D 5F Bangyi-dong, Songpa-gu, Seoul 138:050 KOREA. Fax: +82 2 419-3801 e-mail: sinfo@jat.co.kr

Earth Matters: *Studies for Our Global Future* (2nd edition, 1998, 208 p., \$19.95 + shipping and handling) is a high school level teaching resource designed for use in several curriculum areas including science, social studies, mathematics, language arts and family life education. Through 12 new readings and 34 activities, it helps students understand notably the complexities of population pressures, global climate change, natural resource use, distribution of wealth and food, gender equity... and how all these are interrelated. Order from: *Zero Population Growth Publications*, 1400 16th Str, NW, suite 320, Washington, DC 20036. USA. Tel:(202)332-2200; (800)767- 1956.

Acid Rain, Lyme Disease and **Ozone** are three new sourcebooks for teachers of the **Changes in the Environment Series** produced by the SCI-LINK and GLOBE-NET projects of the **North Carolina State University**. They are the result of a cooperative venture between scientists and teachers and include a conceptual outline; frequently asked questions with answers; major developments in scientific research; interdisciplinary and inquiry-based activities; Internet suggestions; glossary and references as well as masters for overhead transparencies. **Acid Rain** comes in three volumes: for grades 4-8; grades 6-12 (life and earth sciences) and grades 6-12 (physical and social sciences). Price: \$22.90 each. For further information/orders contact: *Kendall/Hunt Publishing Company*, 4050 Westmark Drive, PO Box 1840, Dubuque, Iowa 52004-1840, USA.

Enviro Media have announced the publication of: *Practical Methods in Ecology and Environmental Science* (370 p.,

US \$40); *Water and Water Pollution* (180 p., US \$30); *Ecotechnology for Pollution Control and Environmental Management* (300 p., US \$40) and specifically for the Indian context: *Career Development in Environmental Science and Engineering* (200 p., US \$300) and *Hand Book of Environmental Laws, Acts, Rules, . . .*(1 000 p., US \$200). They also publish two international quarterly journals: *Ecology Environment and Conservation and Pollution Research*. For further information contact: *Enviro Media*, 2nd Floor, Rohan Heights, PO Box 90, Karad 415 110, India. Fax: 71645

Environmental Science and Technology: *Concepts and applications* (1998, 480 p., US 579 + S&H) by F. R. Spellman and N.E. Whiting. Designed for professional and student use, the aim of this book is to serve as an introduction to environmental science and technology using simple, jargon-free language to provide clear explanations and illustrations of the interconnection between the concepts and their applications. Order from: *Government Institutes*, 4 Research f/ace, Suite 200, Rockville, MD 20850-3226, USA. [Http://www.govinst.com](http://www.govinst.com) E-mail: gjininfo@govinst.com

The Ministry of Environment of Israel has published **The Environment in Israel** (1998, 380 p.) compiled and written by Shoshana Gabbay, which gives a complete picture of the environment in Israel, measures taken to protect environmental resources and ideas for the future. It is divided into three main parts: Environmental Resources and Pollution Control; Environmental Management; New Trends towards Sustainable Development. Also comprises appendices on environmental legislation as well as a description of environmental administration at the local, district and national levels. For copies contact: *Ministry of the Environment*, POB 34033, Jerusalem 95464, Israel. Fax: 972-2-655.37.52 <http://www.environment.gov.il>

Environmental Education Research is an international refereed quarterly journal which publishes papers and reports on all aspects of EE. It also carries conference reviews, retrospective analyses of activities in a particular field, commentaries on policy issues as well as critical reviews of EE provision in specific regions. Price: US 5260/yr. (institutions); US 576/yr. (individuals). Order from: *Carfax Publishing Ltd*, 875-81 Massachusetts Ave, Cambridge, MA 02139, USA. Fax: +1-617-354.6875. or *Carfax Publishing Ltd*, PO Box 25, Abingdon, Oxfordshire OX14 3UE, UK. Fax: +44(10)1235-40 1550. E-mail: sales@carfax.co.uk

WWF Centroambrica is a newsletter (**Spanish only**) of the Communications Department of the Central American Regional Office (CAR01 of the World Wide Fund for Nature (WWF) devoted to news and information on the natural resources of the region, as well as related training workshops, conferences and events. WWF has also published a very informative and well documented. **Let's Help Costa Rica's Endangered Animals** (1998, 70 p.) aimed at a young public (bilingual English/Spanish) as well as a brochure on WWF action in Central America (English and Spanish). For copies contact: *WWF-CARO*, Apdo 70, 7170 CAT/E, Turrialba, Costa Rica. Fax:(506) 556.1421 E-mail: arios@catie.ac.cr

Viewpoint

Dear Sir,

I am a biology teacher at the Geo Milev Secondary School since 1992 and my students have always participated in environmental projects. I am personally committed to the environmental cause and many students too have become deeply involved in the projects through the Ecoclub of the Blue Danube Project. But at times we lack information, ideas and materials. So after reading Ms Gallego's letter

(v. *Connect*, Vol. XX//, No. 2, 1998) we decided to join in her appeal for resources, materials, information... which would play an important role in our further education. With best wishes,

Yours sincerely,
Ms Zhivka Nikolova and Students of the Ecoclub, Geo Milev Secondary School, Rousse, Bulgaria.

CHILDREN'S VIEWS ON SCIENCE & TECHNOLOGY

The need for a scientifically and technologically literate population is now more important than ever. However, interest among youth to study science and technology is decreasing. To reverse this tendency, revision of science and technology education programmes and popularization of science and technology - notably among children - is of vital importance.

The section for Science and Technology Education, in cooperation with *Jeanne Develle Edition*, thus intends to launch an event in 2000 asking children (under 16) to send contributions for illustrated stories on science and technology. The objectives are to raise the motivation of children for science and technology education and related careers and to collect information on their interests and needs for information in this field.

The most interesting contributions will be printed by UNESCO and exhibited in various public places.

THE THEMES:

- What does science mean?
- What kind of science do you like?
- Where does science affect your life?
- How can science improve the quality of your life?
- Why should girls and women use science?
- How can science bring about peace?

For more information, please contact: *Section for Science and Technology Education, (address be'low)*

CONNECT is also available on the Science & Technology Education homepage:

http://www.unesco.org/education/educprog/ste/index.html

N.B. For all changes in the mailing list, it is **imperative** to mention **your subscription number** (top right of the address label)

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