



IAEA

International Atomic Energy Agency

Atoms for Peace

FOOD FOR THE FUTURE

**Meeting the Challenges
with Nuclear Applications**

International Atomic Energy Agency

SCIENTIFIC FORUM

18–19 September 2012

Vienna, Austria



International Atomic Energy Agency **SCIENTIFIC FORUM**

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Foreword

The population of the world is expected to grow by a third to nine billion by 2050. In order to feed this growing population, global food production will have to increase significantly. It is vitally important to make optimal use of the latest modern technology to help farmers to produce more food, to protect animals and crops against diseases and pests, and to ensure that food is safe and wholesome.

Nuclear techniques can help to achieve all three of these goals. The IAEA, working closely with the Food and Agriculture Organization of the United Nations, makes these techniques available to farmers and food producers in developing countries.

The 2012 IAEA Scientific Forum brings together experts and policy-makers from all over the world to consider how best to use nuclear techniques to increase food production, to control animal and plant diseases that threaten food supplies, and to guard against food contamination.

A key goal of this two day meeting is to make Member States more aware of the important contribution that nuclear applications, made available through the IAEA technical cooperation programme, can make in this area and to help countries to improve food security for their people.

Nuclear techniques developed and applied by the IAEA, such as plant mutation breeding, are effective in increasing the quantity and quality of

food and feed crops. Radioisotopic technologies help countries to make optimal use of water and soil resources.

Other nuclear techniques help to eliminate pests, such as the tsetse fly, thereby reducing cattle deaths, and the fruit fly, enabling countries to increase production and exports of fruits such as oranges and lemons. The IAEA played an important part in eradicating the deadly cattle disease rinderpest. Nuclear techniques also help to reduce the need for pesticides and drugs in food production.

Exposure to chemicals and pathogens in the food supply represents a serious threat to the health of millions of people, particularly in developing countries. Food irradiation is a proven and effective treatment to improve food safety. It reduces bacterial contamination, extends the shelf-life of foodstuffs and controls insect pests.

These are just a few examples of the work being carried out by the IAEA through hundreds of projects throughout the world. I warmly welcome all participants to the 2012 IAEA Scientific Forum. I am confident that your input and ideas will make an important contribution to improving world food security in the coming decades.

Yukiya Amano
IAEA Director General



International Atomic Energy Agency **SCIENTIFIC FORUM**

Tuesday, 18 September 2011

10.00–12.00

Opening

Performance of the Men's Choir of the Russian National Research Nuclear University 'MEPhI'

Inaugural address by the IAEA Director General, **Mr Yukiya Amano**

Mr José Graziano da Silva, Director General, Food and Agriculture Organization (video message)

Mr Gusti Muhammad Hatta, Minister of Research and Technology, Indonesia

Ms Margaret Kamar, Minister of Higher Education, Science and Technology, Kenya

Mr Nguyen Quan, Minister of Science and Technology, Vietnam

12.00–14.30

Lunch break

14.30–17.00

Food for the Future: Increasing Food Production

Ms Luz Gómez-Pando, National Agrarian University La Molina, Peru

Mr J. Perry Gustafson, University of Missouri, United States of America

Mr Winfried E.H. Blum, University of Natural Resources and Life Sciences, Austria

Mr Ren Wang, Chinese Academy of Agricultural Sciences, China

Mr Oswin Perera, University of Peradeniya, Sri Lanka

Mr Bob Orskov, International Feed Resources Institute, United Kingdom

18.00–20.00

Reception at the VIC restaurant

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Wednesday, 19 September 2012

10.00–12.30

Food for the Future: Ensuring Food Protection

Mr Martyn Jeggo, Animal Health Laboratory, Australia

Mr Modibo Traoré, Food and Agriculture Organization

Mr Kazuaki Miyagishima, World Organisation for Animal Health

Ms Miriam Kinyua, Moi University, Kenya

Mr Pedro Rendon, Guatemala-Mexico-USA Moscamed Cooperative Programme, Guatemala

Mr Kenneth Bloem, United States Department of Agriculture, United States of America

Mr Hassane Mahamat Hassane, African Union

12.30–14.30

Lunch break

14.30–16.40

Food for the Future: Enhancing Food Safety

Mr Arun Kumar Sharma, Bhabha Atomic Research Centre, India

Mr Craig Nessler, Texas A&M University, United States of America

Ms Karen Hulebak, Resolution Strategy, LLC, United States of America

Mr Frans Verstraete, European Commission

Ms Elizabeth Carazo Rojas, University of Costa Rica, Costa Rica

Mr Ezzeddine Boutrif, Consultant in food safety policy, Tunisia

Mr Chris Elliott, Queen's University Belfast, United Kingdom

16.40–17.00

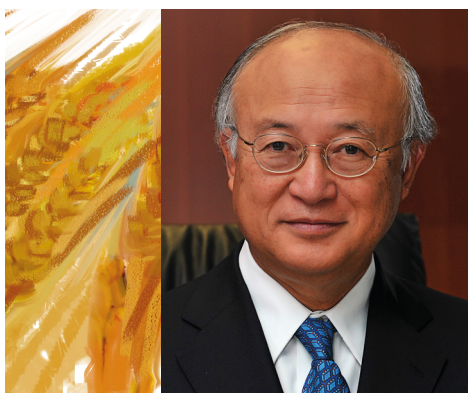
Closing Session

Addres by the IAEA Director General, **Mr Yukiya Amano**



International Atomic Energy Agency **SCIENTIFIC FORUM**

Opening



Mr Yukiya Amano
IAEA Director General



Mr José Graziano da Silva
Director General, Food and Agriculture Organization

Mr José Graziano da Silva of Brazil is the Director General of the FAO. Mr Graziano da Silva has worked on issues of food security, rural development and agriculture for over 30 years. Prior to his election in June 2011 as FAO's Director General, Mr Graziano da Silva headed the organization's regional office for Latin America and the Caribbean between 2006 and 2011. In 2001, he led the team that designed Brazil's 'Zero Hunger' (Fome Zero) programme. In 2003, he was charged with its implementation by President Luiz Inácio Lula da Silva who named him Special Minister of Food Security and the Fight against Hunger. An academic by training, Mr Graziano da Silva started teaching at Brazil's State University of Campinas (UNICAMP) in 1978. He also chaired the Master's and Doctoral Programme in Economic Development and Environment of UNICAMP's Institute of Economics. He has written and edited 26 books on rural development, food security and agrarian economics. Mr Graziano da Silva holds a Bachelor's degree in Agronomy and a Master's degree in Rural Economics and Sociology from the University of São Paulo (USP) and a PhD in Economic Sciences from the State University of Campinas.

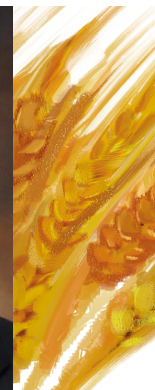


FOOD FOR THE FUTURE

Meeting the Challenges with Nuclear Applications

Mr Gusti Muhammad Hatta Minister of Research and Technology, Indonesia

Mr Gusti Muhammad Hatta was appointed Minister of Research and Technology of Indonesia in 2011 after two years as Minister of Environment. He had previously been a faculty member of the Faculty of Forestry at the University of Lambung Mangkurat (UNLAM) in Banjarmasin, where he served as Head of the Silviculture Study Program, Deputy Dean of the Faculty of Forestry and Vice Chairman of the Study Center for the Environment. He was also Chairman of the Forestry Post Graduate Study Program, Chairman of the Research Institute, and finally Vice Rector for Academic Affairs. He has been actively involved in scientific activities related to forestry. Born in 1952, Mr Hatta obtained his Bachelor's degree in Forestry from the Faculty of Forestry at UNLAM and a Master's degree in Silviculture from the Gadjah Mada University in Yogyakarta. He was awarded a PhD in the same field by Wageningen University of the Netherlands in 1999.



Ms Margaret Kamar Minister of Higher Education, Science and Technology, Kenya

Ms Margaret Kamar is the Minister of Higher Education, Science and Technology of Kenya. She previously served as an Assistant Minister in the Ministry of Environment and Mineral Resources. She was also a member of the Speaker's Panel at the Kenya National Assembly. From 2001 to 2006, Ms Kamar served as a member of the East African Legislative Assembly. Before entering politics, Ms Kamar was a lecturer and assistant professor of soil science at Moi University in Eldoret, Kenya. In 2002, she was appointed Deputy Vice Chancellor in charge of Research and Extension at the University, a position she held until 2006. From 1997 to 2002, Ms Kamar was the principal of Moi University's Chepkoilel Campus. Ms Kamar holds a PhD degree from the University of Toronto, Ontario, Canada.



Mr Nguyen Quan Minister of Science and Technology, Vietnam

Mr Nguyen Quan became Minister of Science and Technology of Vietnam in 2011, having been Vice Minister since October 2007. From 2003 to 2007, he was Director General for Personnel and Organization in the same Ministry. Before joining the Ministry of Science and Technology, he worked as a lecturer at the Ha Noi University of Technology and as technical adviser at the Vietnam Air Force. From 1989 to 2003, he was Vice Chancellor and Chairman of the Trade Union of the Ha Noi University of Technology. Mr Quan is a member of many national committees and councils, including the National Council for Science and Technology Policy, the National Trademark Council, the National Steering Committee for Nutrition, and the Organizing Board for the International Fair for Vietnam Industrial Goods. Mr Quan was educated at the Ha Noi University of Technology, where he completed a BSc in Electrical Technology, and at the Asia Institute of Technology, where he earned a PhD in Thermo-electric Technology. He was born in 1955.





Increasing food production

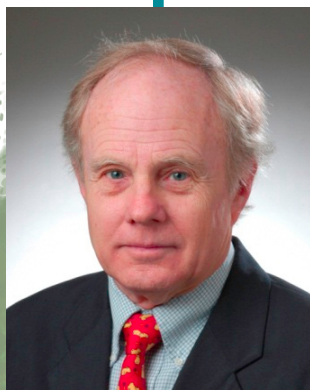
Ms Luz Gómez-Pando, Peru

Ms Luz Gómez-Pando, Head of the Grains Program, National Agrarian University, La Molina, Peru, is a specialist in the mutation breeding of cereals, such as barley, wheat and local native grains. A leading breeder and scientist, she has received a number of awards, including the 2006 Peruvian Prize for Good Governmental Practices, the 2007 INCAGRO Award in Agriculture Innovation, the 2007 and 2008 Peruvian Engineers of Peru Award, the 2010 L'OREAL Peru Award, the 2010 UNESCO and CONCYTEC Award for Women in Science, and the 2011 Jules Gaudron Award for Teaching and Research by the Alumni Association of the Universidad Nacional Agraria La Molina.



Mr J. Perry Gustafson, United States of America

Mr J. Perry Gustafson, Adjunct Professor of Genetics, Division of Plant Sciences, University of Missouri, USA, focuses in his research on gene manipulation in cereals for crop improvement. From 1972 to 1981, he worked as a geneticist/breeder at the University of Manitoba, Canada. From 1981 to 2011, he was a Research Geneticist with the United States Department of Agriculture's Agricultural Research Service. He has a BSc in Crop Science and an MSc in Agronomy from Colorado State University and a PhD in Genetics from the University of California, Davis.



Mr Winfried E.H. Blum, Austria

Mr Winfried E.H. Blum, Professor emeritus of soil science, University of Natural Resources and Life Sciences, Vienna, Austria, has, throughout his career, undertaken diverse research and consultancy activities in Africa, Asia, Australia, Europe and Latin America. He is a former member of the Executive Board of the International Council for Science; Secretary General of the International Union of Soil Sciences and Founding President of the European Confederation of Soil Science Societies. He published some 550 publications in 11 languages in the field of soil science, agricultural and forest land use and environmental protection.

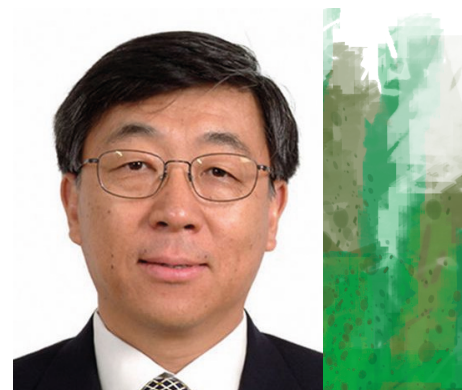


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Meeting the Challenges with Nuclear Applications

Mr Ren Wang, China

Mr Ren Wang, First Vice President of the Chinese Academy of Agricultural Sciences (CAAS), responsible for international cooperation and technology transfer, also serves as a member of the Standing Committee of the China Science and Technology Association, Vice Chair of the China Association for Agricultural Technology Extension, and Vice Chair of the China Rural Technology Services Association. As a researcher at the CAAS' Institute of Biological Control from 1985 to 1993, he pioneered China's programme of managing invasive exotic plants using the classical biological control approach. He was the funding Director of the joint Sino-American Biological Control Laboratory. He obtained his PhD in Entomology in 1985 at the Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA.



Mr Oswin Perera, Sri Lanka

Mr Oswin Perera teaches and supervises research as a visiting professor in Sri Lanka and provides consultancy services to international and national organizations on livestock production, wildlife management and veterinary education. His areas of specialization include cattle, buffalo and elephant reproduction, reproductive biotechnologies, smallholder livestock production systems and wildlife biology. He was Professor of Farm Animal Production and Health at the University of Peradeniya in Sri Lanka and retired in 2011. He is a former IAEA staff member of the Joint FAO/IAEA Division. He obtained a Bachelor's degree in Veterinary Science from Sri Lanka and a PhD in Animal Reproduction from Glasgow.



Mr Bob Ørskov, United Kingdom

Mr Bob Ørskov, Head, International Feed Resources Institute, Macaulay Land Use Research Institute, Aberdeen, United Kingdom, works with many organizations, including the United Kingdom's Department for International Development, the European Union, FAO, IAEA, and the International Livestock Research Institute on project identification and evaluation in feed resource management and rural development with an emphasis on livestock nutrition. He has worked in many countries in Asia, Africa, Eastern Europe and Latin America. He is the author of five books and is author or co-author of more than 600 publications. Mr Ørskov obtained his PhD at the University of Reading and continued his career at the Rowett Research Institute, Aberdeen.





Ensuring food protection



Mr Martyn Jeggo, Australia

Mr Martyn Jeggo, Adjunct Professor, Deakin University, Australia, was appointed in 2002 Director of the Australian Animal Health Laboratory, the world's most advanced high containment laboratory, where he manages an extensive programme of research, and the delivery of diagnostic services for all the major diseases affecting livestock. From 1996 to 2002, Mr Jeggo was the Head of the Animal Production and Health Science Section, Joint FAO/IAEA Division of Agriculture, where he oversaw the management of FAO/IAEA laboratory networks dealing with the control of many livestock diseases. He has obtained a Bachelor of Veterinary Medicine, Master of Tropical Veterinary Science and a PhD.



Mr Modibo Traoré, Food and Agriculture Organization

Mr Modibo Traoré, Assistant Director-General responsible for the FAO Agriculture and Consumer Protection Department since 2008, has served as the National Director of Mali's Livestock and Veterinary Services, and was the Malian Minister for Rural Development (Agriculture, Livestock and Fisheries) between 1994 and 2000, and responsible for the Environment and Water Resources. Mr Traoré was the Head of the African Union's Inter-African Bureau for Animal Resources from 2005 to 2008 and Mali's Ambassador to the People's Republic of China between 2000 and 2005. Mr Traoré holds an MSc in Veterinary Medicine and a PhD in Animal Production and Health.



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Mr Kazuaki Miyagishima, World Organisation for Animal Health

Mr Kazuaki Miyagishima has been the Deputy Director General of the World Organisation for Animal Health (OIE) responsible for Animal Health, Veterinary Public Health and International Standards since 2009. After having taught public health and health policy at Kyoto University, Japan, he was appointed Secretary, FAO/WHO Codex Alimentarius Commission in 2003. From 1994 to 1998 he was seconded to the Food Safety Programme at the WHO headquarters, Geneva. In 1986 he joined the Japanese Ministry of Health and Welfare and occupied various positions as a medical officer. He studied medicine at the University of Tokyo, Japan, and later received an international diploma of public administration from the Ecole nationale d'administration, France, and a PhD in Medical Sciences from Showa University, Japan.



Ms Miriam Kinyua, Kenya

Ms Miriam Kinyua, Associate Professor, Biotechnology, Moi University, Eldoret, Kenya, is a well-known plant breeder and the Chairperson of the Plant Breeders' Association of Kenya (PBAK). Before her appointment to Moi University, she was the Director of the Kenya Agricultural Research Institute. She has released over 10 wheat varieties for commercialization in the region and she is a recipient of the 2007 Presidential Award of the Order of the Grand Warrior for her significant contributions to agricultural production through research. She has been appointed as the chairperson of the recently launched National Biosafety Authority.



Mr Pedro Rendon, Guatemala

Mr Pedro Rendon is Head of the Research and Methods Development Station, Guatemala-Mexico-USA Moscard Cooperative Programme in Guatemala. He is a specialist in large scale mass rearing and sterile insect technique (SIT) operations. For many years he has been working in applied research and method development for improved mass rearing, quality control, sterilization, release and field control of fruit flies in operational suppression and eradication programmes. For the past decade, he has been the president of the working group on fruit flies of the western hemisphere. He has also served as a member of the scientific committee for the International Symposia on Fruit Flies of Economic Importance. He holds a PhD in Entomology/ Insect Genetics.





... Ensuring food protection



Mr Kenneth Bloem, United States of America

Mr Kenneth Bloem, National Biological Control Coordinator, Centre for Plant Health Science and Technology, United States Department of Agriculture's Animal and Plant Health Inspection Service's Plant Protection and Quarantine Program (USDA-APHIS-PPQ), coordinates method development activities related to insect mass-rearing, sterile insect technique and biological control in support of area-wide programmes for invasive insect pests and weeds. Before moving to North Carolina, he represented USDA-APHIS-PPQ as Co-Director of the Interagency Centre for Biological Control at Florida A&M University in Tallahassee from 1998 to 2005, and was Program Director of the Okanagan-Kootenay Codling Moth Sterile Insect Release Programme in British Columbia, Canada from 1992 to 1998. Mr Bloem began his career in entomology as a research fellow for the IAEA in Guatemala in support of Mediterranean fruit fly management efforts. He holds a PhD in Entomology.



Mr Hassane Mahamat Hassane, African Union

Mr Hassane Mahamat Hassane, Coordinator, African Union Pan-African Tsetse and Trypanosomiasis Eradication Campaign (AU-PATTEC) at the African Union Commission, has previously served as the FAO National Programme Officer in Chad, as well as Deputy Director General in charge of livestock development in the Chadian Ministry of Livestock. He was also Director of the Veterinary and Zootechnological Research Laboratory in N'djamena, Chad. Mr Hassane held research associate, post-doctoral and scientist research positions at the International Laboratory for Research on Animal Diseases in Kenya, the Department of Zoology, University of Washington, Seattle and the International Centre for Insect Physiology and Ecology (ICIPE) in Kenya. He holds a PhD in Veterinary Medicine and also in Insect Science.



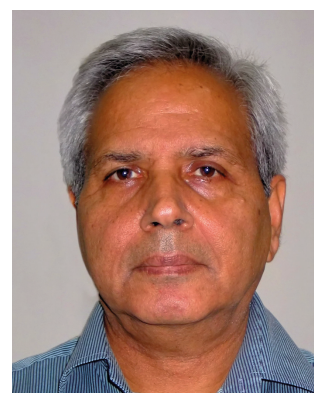
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Enhancing food safety

Mr Arun Kumar Sharma, India

Mr Arun Kumar Sharma has been engaged in food irradiation research since 1976. His work is devoted to demonstrating the microbiological safety of irradiated foods. He showed that irradiation was an effective sanitary measure for improving the microbiological quality of Indian spices and herbs. Along with his team, Mr Sharma facilitated the approval of the Indian KRUSHAK irradiation facility by the United States Department of Agriculture's Animal and Plant Health Inspection Service for the phytosanitary treatment of mangoes for export to the USA. As a result, Indian mangoes could be exported to the USA in 2007, after a gap of 18 years, and India became the first country to use irradiation as a phytosanitary measure in international trade.



Mr Craig Nessler, United States of America

Mr Craig Nessler, Director, Texas A&M University System's Texas AgriLife Research, the state's leading research agency in agriculture, natural resources and the life sciences, began his 30 year research and teaching career at the biology faculty of Texas A&M University. His research focused on plant metabolic engineering of pharmaceuticals including opiates and anti-cancer alkaloids. In addition, his lab was the first to engineer an increase in ascorbic acid resulting in improved yield, longer shelf life and increased nutritional value of a variety of crops. From 2004 to 2009, he served as Director, Virginia Agricultural Experiment Station. He earned his Bachelor's and Master's degrees in Biology and his PhD in Plant Science with a minor in Pharmacology.



Ms Karen Hulebak, United States of America

Ms Karen Hulebak, Principal, Resolution Strategy, LLC, has served as the Chief Scientist in the United States Department of Agriculture's (USDA) Office of Food Safety from 2005 to 2011. From 2008 to 2011, Ms Hulebak was the Chair of the Codex Alimentarius Commission and its Vice Chair from 2005 to 2008. She also chaired the Codex Committee on Food Hygiene from 2001 to 2008. She was an Assistant Administrator for Public Health Science at the USDA's Food Safety and Inspection Service from 2002 to 2004 and Director of the Office of Policy Research, Office of the Food and Drug Administration's Commissioner. She has a doctorate in toxicology from The Johns Hopkins University School of Public Health.





... Enhancing food safety



Mr Frans Verstraete, European Commission

Mr Frans Verstraete is working at the European Commission's Directorate General for Health and Consumers in the Chemicals, Contaminants and Pesticides Unit. He is responsible for the elaboration, development and management of EU-legislation concerning certain contaminants in feed and food. He has been working for the European Commission since 1997, where he has held various functions. He also held positions at the Belgian Ministry of Agriculture where he was, among others, technical adviser to the Belgian Minister of Agriculture. He also worked at the University of Ghent, Belgium, where he graduated in 1985 as an agricultural engineer.



Ms Elizabeth Carazo Rojas, Costa Rica

Ms Elizabeth Carazo Rojas, Director, Senior Researcher and Professor at the Centre for Research in Environmental Pollution at the University of Costa Rica, with 18 years of research experience, works with an interdisciplinary team of professionals and researchers involved in the study of environmental and food contamination in Costa Rica, especially pesticides and other agrochemicals, toxic metals, and recently emerging contaminants. She received her PhD in Agronomy at the University of Costa Rica and the University of Maryland, USA.



Mr Ezzeddine Boutrif, Tunisia

Mr Ezzeddine Boutrif, consultant in food safety policy in the organization and management of food safety systems, served as Director, FAO Nutrition and Consumer Protection Division, responsible for the FAO's programme in nutrition and food safety from July 2007 to December 2010. From 2004 to 2007, he was Chief of the Food Quality and Standards Service, responsible for the management of all FAO activities related to food safety. Mr Boutrif joined the FAO as a Food Control Officer within the Food Quality and Standards Service in 1978. From 1974 to 1978, he headed the Food Science Department at the Tunisian National Institute of Nutrition and Food Technology. Mr Boutrif is the author of over 80 publications, monographs and scientific papers. He received his PhD in Food Science in 1974.

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Mr Chris Elliott, United Kingdom

Mr Chris Elliott, Professor of Food Safety, Queen's University, Belfast, is also Director of the Institute of Agri-food and Land Use and Director of the Centre for ASsured, Safe and Traceable food or ASSET Technology Centre, a state-of-the-art research facility focused on food safety and traceability. Mr Elliott has authored over 200 peer reviewed scientific publications in the areas of animal health and food safety. He has led a number of highly successful and high profile multinational research projects aimed at delivering the means of detection of chemical contamination of animal feeds and human food. Mr Elliott is also part of an international network of researchers aiming to connect global food security stakeholders by means of developing a unique web portal. He is also a founding member of the international food safety training school (SARAF) based in France.





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