1. Profile of Awardee

Name: Dr. Xiaoyuan YAN
Affiliation: Prof. Institute of Soil Science, Chinese Academy of Science

2. Outline of Research Achievements

Title of Research Achievements:

Developing greenhouse gases emission inventories for croplands and evaluating their environmental impacts

Outline of Research Achievements

Dr. Yan has carried out extensive scientific researches on greenhouse gases (GHG) emission from agriculture, which contributes over 20% of the total global anthropogenic GHG emissions. In particular, 55% to 60% and 65% to 80% of total emissions of methane (CH_4) and nitrous oxide (N_2O), respectively, are derived from agricultural sources. After many years' field studies, Dr. Yan compiled a comprehensive database of CH_4 and N_2O emitted from rice fields and statistically identified the major factors influencing the emissions. Based on this statistical analysis, he developed a simple method and derived emission factors and scaling factors to estimate methane emission from rice cultivation at regional/national scale. The method, emission factors and scaling factors were fully adopted by the revised 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines as Tier 1 methodologies, which are to be used collectively for the default method to calculate methane emission from rice cultivation within at least the next ten years, including the first commitment period of the Kyoto Protocol.

Application of the method to global rice fields yielded lower estimation of methane emission from global rice cultivation, which is helpful to explain the discrepancy between satellite observation of atmospheric methane column and atmospheric modeling results using earlier estimation. With scaling factors to account for the effect of different water management or organic management, the study further estimated the mitigation potentials and the geographic distribution of periodic draining of rice fields and the application of rice straw off-season on methane emission from rice fields globally.

Main Publication and Patents

(1) Statistical analysis of the major variables controlling methane emission from rice fields. *Global Change Biology*, 11:1131-1141 (2005)

(2) Estimation of nitrous oxide, nitric oxide and ammonia emissions from croplands in East, Southeast and South Asia. *Global Change Biology*, 9:1080-1096 (2003)

(3) Development of region-specific emission factors and estimation of methane emission from rice fields in East, Southeast and South Asian countries. *Global Change Biology*, 9:237-254 (2003)

3. Reason of Awarding

This study made significant improvements to the evaluation process of the environmental impacts of agriculture on global warming, which is one of the most serious issues for our civilization in this century. It has also been highly evaluated by the international bodies such as the IPCC and UNFCCC, and is highly applicable and beneficial to agricultural sectors in developing countries. The awardee has played a leading role in conducting the study and is expected to promote further collaborative studies with Japan.

1. Profile of Awardee

Name: Ms. Mariyam Ambundo IMBUMI
Affiliation: Botanist, Kenya Resource Center for Indigenous Knowledge (KENRIK)

2. Outline of Research Achievements

Title of Research Achievement:
Promotion and research of African leafy vegetables for improved nutrition, health and incomes

Outline of Research Achievements

Ms. Imbumi, a botanist affiliated with KENRIK in Kenya, was in a team that received the CGIAR Outstanding Science Award from Washington D.C. in December, 2006, in recognition of their great work of research and promotion on local vegetables in Kenya.

Ms. Imbumi was motivated to join this research because indigenous vegetables had been neglected. Locals preferred cabbage and *sukuma-wiki*, a local kale because traditional vegetables were perceived as poor man's food. In mid-2004, the research team in the project, "Dietary Diversity for improved Nutrition, Health and Incomes", led by Bioversity International, started to work with peri-urban farmers to grow vegetables for the Nairobi market. Her research was on seed collection, bulking and dissemination to farmers. She also documented recipes and developed training material in the form of posters, radio programs, and booklets showing how to grow and use the vegetables and food value leaflets, as part of an educational and awareness campaign on the importance of local vegetables. She organized street campaigns, exhibitions and cooking competitions and was involved in a team led by FORMAT (a forum on organic resource management in Kenya), that went round the country once every year training farmers on how to grow and use local vegetables. She contributed to PROTA (Plant Resources of Tropical Africa) and SEPASAL (Survey of Economic Plants for Arid and Semi-arid lands) database. By the end of 2004, most vegetable markets including supermarkets were already selling vegetables from contact farmers. It had been a major breakthrough.

Main Publication and Patents

(1) *Coccinia grandis* (L.) Voigt (Ivy gourd) – a chapter in *PROTA 2 Vegetable Book* published by Plant Resources of Tropical Africa (PROTA) 2. 2004.
(2) The food and food culture of the peoples of East Africa (Kenya, Uganda, Tanzania, Rwanda, Burundi, Sudan, Ethiopia, Eritrea, and Somalia). *In* Encyclopedia of foods and culture. Solomon H. Katz, (editor in chief), William Woys Weaver (Asst. Editor). Vol. 1 pp 27-34. Charles and Scribner's Sons. 2003.
(3) Forests of Mount Kulal, Kenya: source of water and support to local livelihoods. *Unasylva* No. 229, Vol. 58. Food and Agriculture Organization (FAO) of the United Nations, Rome. 2007.

3. Reason of Awarding

Ms. Maryam Imbumi was a key person in the research and promotion of traditional foods in Kenya as well as in Uganda, Sudan, Ethiopia, Somalia, Tanzania, Rwanda and Burundi through her research on "Foods of the East African Peoples". The "Dietary Diversity and Traditional Programme" with which she is currently involved is being implemented in Kitui District, Eastern Africa, where she is presently assessing traditional diets for macro and micronutrient sufficiency. The project aims to improve the local people's nutritional status and health by utilizing traditional or indigenous crops. Staff members from ICCAE and Graduate School of International Development (GSID) of Nagoya University are likewise involved in this research.

1. Profile of Awardee

Name: Dr. Thuy Thi Thu NGUYEN
Affiliation: Coordinator, Genetics and Biodiversity Program, Network of Aquaculture Centres in Asia-Pacific

2. Outline of Research Achievements

Title of Research Achievements:
Application of molecular genetics in aquaculture and fisheries management

Outline of Research Achievements

Dr. Nguyen's research has contributed significantly to the successful delivery of the mandate of the Network of Aquaculture Centres in Asia-Pacific (NACA), an intergovernmental organization, in assisting its 17 member governments in improving aquatic resources management. Her work on the genetic characterization of wild and captive stocks of major cultured species as well as on species of special conservation value have led to, for the first time, very comprehensive science-based management plans pertaining to the minimization of negative impacts of aquaculture, stock enhancement and restocking activities on local biodiversity. Her work also provides a good model for any new aquaculture development, especially those on indigenous species. Dr. Nguyen's initiatives have enabled extensive capacity-building in these techniques and uses or applications thereof in a number of developing countries in the region that would correspondingly have a long- term impact on sustainable aquaculture development in the region.

Dr. Nguyen has published 22 papers in reputed international peer-reviewed journals, co-authored one book chapter, spearheaded production of four manuals and three guidelines, amongst a number of popular articles. This achievement is rather rare amongst young scientists in the developing world in the Asian region.

Main Publication and Patents

(1) A study on phylogeny and biogeography of mahseer species (Pisces: Cyprinidae) using sequences of three mitochondrial gene regions. *Molecular Phylogenetics and Evolution*. 48, 1223-1231 (2008)
(2) Population structure in the highly fragmented range of *Tor douronensis* (Cyprinidae) in Sarawak, Malaysia revealed by microsatellite DNA markers. *Freshwater Biology*, 53 (5) 924-934 (2008)
(3) MtDNA diversity of the critically endangered Mekong River giant catfish (*Pangasianodon gigas*) and closely related species: Implications for conservation. *Animal Conservation*, 9 (4) 483-494 (2006)

3. Reason of Awarding

Dr. Nguyen's research has been instrumental in bringing about much needed awareness of the interphase between aquacultural development and biodiversity conservation. Her research has laid the foundation for the genetic management of indigenous species and is in accordance with the shift in aquaculture research paradigm from exotic to indigenous species and towards biodiversity conservation.