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Report on methods of systems analysis for studying and forecasting population-environment interactions

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Report on

**Methods of Systems Analysis for Studying and Forecasting
Population-Environment Interactions**

Bangkok, Thailand

13 – 24 November, 2000

Organised by The Asian MetaCentre
 for Population and Sustainable Analysis

By
H.T. Abdullah Khan

The Asian MetaCentre, headquartered in the Centre for Advanced Studies of the National University of Singapore organised a recent workshop on 'Methods of Systems Analysis for Studying and Forecasting Population-Environment Interactions' which was held at the College of Population Studies (CPS), Chulalongkorn University, Bangkok (Thailand), 13-24 November 2000. The topic 'population, development and environment interactions' is a new arena of research and is not well understood, especially for developing countries. This is a real concern to the policy makers and a challenging issue now-a-days.

This high-level training workshop was led by Warren Sanderson, International Institute for Applied Systems Analysis (IIASA), Austria, with tutorial assistance from Molly Hellmuth of IIASA. Altogether 20 (twenty) scholars from various parts of the world were officially registered and participated in the workshop.

Country	Participants	Affiliations
Austria	Wolfgang Lutz	Leader, Population Project, IIASA; Principal Investigator, Asian MetaCentre
	Warren Sanderson	Population Project, IIASA
	Molly Hellmuth	Population Project, IIASA
	H.T. Abdullah Khan	Population Project, IIASA;and Wellcome Trust Postdoctoral Fellow, Asian MetaCentre
India	Subhash Chander Gulati	Institute of Economic Growth, Delhi
	Suresh Chandra Sharma	Institute of Economic Growth, Delhi
	Rekha Krishnan	Tata Energy Research Institute, Delhi
	Subrahmanya Nairy	Tata Energy Research Institute, Gao
Indonesia	Sri Moertiningsih	Demographic Institute, University of Indonesia

Asian MetaCentre for Population and Sustainable Development Analysis

	Adioetomo	
	Chotib	Demographic Institute, University of Indonesia
USA	Brian O'Neill	Watson Institute for International Studies, Brown University
China	Tong Yufen	Population Research Institute, Xinjiang University
	Jiang Leiwen	Institute of Population Research, Peking University
Singapore	Kannan Navaneetham	Centre for Advanced Studies, National University of Singapore; Wellcome Trust Postdoctoral Fellow, Asian MetaCentre
Philippines	Socorro A. Gultiano	Office of Population Studies, University of San Carlos
	Victorina H. Zosa	Office of Research, University of San Carlos
	Maritess G. Manalo	Philippine Centre for Population and Development, Manila
Thailand	Vipan Prachuabmoh	Director, CPS, Chulalongkorn University; Principal Investigator, Asian MetaCentre
	Chutchawal Prabhavitya	Royal Irrigation Hospital
	Ong-Arj Viputsiri	Faculty of Medicine, Chulalongkorn University
	Siriwan Siriboon	CPS, Chulalongkorn University
	Rachanok Kruabut	CPS, Chulalongkorn University

On the first day of the workshop, Vipan Prachuabmoh, host of the workshop, delivered her welcome speech to the participants with special emphasis on her continuing concern over population, development and environmental issues. Next, Wolfgang Lutz described IIASA's current population research and the prospects of collaborative research with Asian countries under the umbrella of the newly established Asian MetaCentre with Headquarters at the National University of Singapore. He acknowledged the financial support from the Wellcome Trust in London, which helped to establish the Asian MetaCentre in Singapore. He mentioned the names of the current principal investigators: Brenda Yeoh, Director, Centre for Advanced Studies, National University of Singapore; Vipan Prachuabmoh, Director, CPS, Chulalongkorn University; and himself (Wolfgang Lutz, Leader, Population Project, IIASA).

He highlighted the activities of the Asian MetaCentre and its future role in this region and around the world. He went on to explain that the purpose of the workshop was to share modelling techniques developed at IIASA and to write up drafts of proposals regarding issues concerning population, development and environmental (PDE) interactions in the Asian region. He indicated possible areas of research on PDE, such as water and air pollution, deforestation, and population forecasting by education - all very important to Asian countries - as well as global warming. He also illustrated IIASA's past experience with PDE modeling in Mauritius and the Yucatan Peninsula, and ongoing research in Namibia, Botswana and Mozambique.

Warren Sanderson highlighted the purpose of the workshop and discussed what would be done during the course of the workshop. He also clearly explained the importance of PDE research in this region with financial and technical support from the Wellcome Trust and the Asian MetaCentre, respectively. After his speech and formal introduction of the participants, the floor was opened for questions and discussion.

During the second half of the day, Warren Sanderson formally began his lecture on the framework of population and sustainable development modeling. He illustrated the concepts of IIASA's PDE model and elaborated on the VENSIM dynamic modeling software using a very simple example of the 'Wonderland Model'. In the afternoon, participants were asked to discuss the structure of their proposals. The ideas for six proposals were formed from the Indian side (Group 1: Gulati & Sharma, and Group 2: Krishnan & Nairy); from the Philippines group (Gultiano, Zosa & Manalo); from the Indonesian group (Adioetomo, Chotib & O'Neill); from China (Yufen & Leiwen); and from Thailand (Prachuabmoh, Siriboon, Kruabut, Viputsiri). Khan and Navaneetham were present as the Wellcome Trust post-doctoral fellows to extend assistance to the group regarding methodological issues, learning new ideas and participating in daily discussion.

November 14-16: Warren Sanderson delivered his lecture on VENSIM, covering the most fundamental ideas about how to work with VENSIM and how to incorporate variables in modeling with VENSIM. In the afternoon each group was asked to work on the structure of their proposal and dynamic models. During the next day, sufficient time was given to write up draft proposals and to make a group presentation. Each group had incorporated the suggestions made by the participants. On November 16, Warren Sanderson instructed how to make multistate population projections and extended modeling with migration. In the afternoon, each group was instructed to put complete models of population change into their proposal.

On November 17, Molly Hellmuth gave a day long lecture on water and air pollution and how to incorporate environmental factors into the dynamic systems modeling. She also illustrated some practical examples and the reality of her recently developed water models. The next day, groups were asked to incorporate environmental factors into the dynamic models and work with VENSIM.

On November 21, groups were given time to add all elements to their models before another presentation of their work. They were asked to do so in a flexible way so that anybody could focus on pieces that still need to be completed. After presentation, they were given enough time to write their second drafts. The next day they continued to add missing pieces of the models and discussed with other individuals.

November 23 was the day for writing the third draft of the proposal. Each group spent all their time getting their five-page proposals ready, apart from the one-page summary proposals written

earlier. Finally, groups were given ample time to present their proposals and receive feedback from participants and incorporate the feedback into their final proposals.

Almost everyday there was a round table discussion about the development of their proposals. Warren Sanderson has given enough time to each group individually to discuss their problems and also given enough time for group discussion. He made it clear that necessary changes (such as searching relevant literature and discussing with other researchers) must now be made in their own country. The next draft should reach no later than early January 2001 to him at IIASA's address.

The titles of the six final proposals are:

1. *Population pressure and air/water pollution in selected Metropolitan cities of India*
(Written by group 1: Gulati & Sharma)
2. *Population-development-environment nexus in semi-arid regions in southern India*
(Written by group 2: Krishnan & Nairy)
3. *Dynamics on population, development and water resource in Cebu, Philippines*
(Written by Group 3: Gultiano, Zosa & Manalo)
4. *Population dynamics, economic development, and transportation in greater Jakarta: Implications for air quality and health*
(Written by Group 4: Adioetomo, Chotib & O'Neill)
5. *Interrelationships among population, development and air pollution in Bangkok, Thailand*
(Written by Group 5: Prachuabmoh, Siriboon, Kruabut & Viputsiri)
6. *Population changes and land degradation in Xinjiang, China*
(Written by Group 6: Yufen & Leiwen).

-- The End --