

WASTE-ECON

Making Waste Work for the Economy through
the Development of Integrated Waste Management
Capacity in Cambodia, Lao PDR and Vietnam

Volume 02 February/2004

Two-Week Training Workshop in Siem Reap Town

The Cambodian Waste-Econ Project had conducted a 2-week training workshop on the Waste-Economy in Siem Reap town on 01-13 September 2003 in order to promote capacity building in waste management for government officers as well as NGO personnel, who are working in SOLID WASTE. Thirty trainees, which took part in this course, are from the provincial departments of Public Work and Transportation, and the Provincial Department of Environment, and NGOs. Representatives of eight provinces in North-West region of the country were invited to attend, namely: *Siem Reap (8 including 1 from FAO, 1 from Seila Program and 1 from MICC), Kampong Thom(4), Preah Vihea (3), Odor Meanchey (2), Pailin (2), Banteay Meanchey (3), Battambang (5 including 1 from World Vision) and Pursat (3)*. The training topics delivered were: Waste Management Planning and Technology, Solid Waste Management and Public Health, Methodologies for Researching the Waste Economy, Introduction to Economics of Waste Management, Industrial and Hazardous Wastes, and Theories and Principles of the Waste Economy.

(by Sour Sethy)

Exchange Experiences with Waste-Econ Program Partners

Vientiane, Lao PDR

March 28-29, 2003

The project had sent 7 persons to participate in the first Waste-Econ International Conference in Vientiane, Lao PDR. The purpose of the meeting was to share information and experiences in implementing training courses and pilot projects relating to Integrated Waste Management. Cambodian attendees were: H.E. To Gary, Secretary of State of Ministry of Environment, Dr. Neth Barom, Director of Cambodian Waste-Econ and Vice-Rector of RUPP, Sour Sethy Waste-Econ Project Manager and lecturer of RUPP, Heng Lay Orn, of Phnom Penh Municipal Waste Management; Heng Yong Kora, Director of CSARO; Saneth Vathna Lecturer of RUPP; Lay Chanthy Lecturer of RUPP Dr. Neth Barom, Director of Cambodian Waste-Econ Program and Vice-Rector of RUPP, Mr. Sour Sethy, Waste-Econ Project Manager and lecturer of RUPP, Mr. Heng Lay Orn, Governor of Phnom Penh Municipal Waste Management and member of Waste-Econ Project Steering Committee, Mr. Heng Yong Kora, Director of CSARO and member of Waste-Econ Project Steering Committee, Mr. Saneth Vathna, lecturer of RUPP and Mr. Lay Chanthy, lecturer of RUPP. *(by Sour Sethy)*

Hanoi, Vietnam, November 10-11, 2003

The Vietnamese partner of Waste-Econ hosted an international meeting in Hanoi in November 10, 2003. The meeting reviewed activities in each country during the year and discussed opportunities to carry on IWM activities during the remaining of the program and beyond its end 2006. Cambodian participants were also invited to a follow-up workshop in Hanoi in November 11, 2003, which focused on implementation of the material learned during the Waste-Econ 6- week training course in Vietnam in 2000. Suggestions were also made for following-up activities to enhance the training experiences and to increase implementation of the concepts, which had been learned. Three Cambodians had joined the workshop; those are Dr. Neth Barom, Director of Waste-Econ and Vice-Rector of RUPP, Mr. Sour Sethy, Waste-Econ Manager and Lecturer of RUPP and Mr. Lay Chanthy, Pilot Project Team Leader and Lecturer of RUPP. *(by Sour Sethy)*

News and Students Activities related to WASTE

In 2003, the Royal University of Phnom Penh held a Science Fair for students of all science departments at the University. There were many displays at the fair, many of which were from the Department of Environmental Science. One group of students presented research on Short-Term Composting. The students involved in this project were: Ms. Thon Chansophea, Ms. Sam Sreymom and Ms. Seth Sopheak, supervised by Mr. Sour Sethy, Royal University of Phnom Penh. A second group presented their research on Small-Scale Paper Recycling. The students involved were: Mr. Nob Sokhay, Ms. Sao Sambathmorokot and Ms. Heng Chenda. The objective of the science fair was to develop their research skills and to demonstrate the links between practice and theory.

Short-Term Composting

The study examined two methods of composting, as follows:

- *First Method:* using raw resources of compost materials from water hyacinth, chicken and pig dung (dry), vegetable market wastes and waste-water from toilet. The water hyacinth and market wastes were chopped primarily to help and speed the decay. The group mixed 10 cm thick of chicken and pig dung and 10 cm thick of the chopped water hyacinth and market wastes. The pile was turned after 1 week to expose more to air (O₂) and moisture.

- *Second Method:* using raw sources of material from grass-trimmings or garden waste, cow dung, kitchen scraps and waste-water from toilet. The compost was produced by putting 10 cm thick of cow dung and 10 cm of kitchen wastes into a dirt pit (or tank) and mixing it with finely chopped grass. The pile was turned after 1 week to ensure sufficient air and moisture. This process took only 16 days to produce compost.

The compost products were then tested in using and growing of long bean plant. The results are summarized in the table as follows:

Results after 10 days growth			
Long bean	First compost product	Second compost product	“Control” (no compost)
Row 1	Growth 6 cm	Growth 5 cm	Growth 4 cm
Row 2	Growth 5.5 cm	Growth 5 cm	Growth 4.5 cm
Row 2	Growth 6 cm	Growth 5.5 cm	Growth 4 cm

Small Scale Paper Recycling

Population growth and individual consumption increase negatively affect on natural resources, and produce huge amounts of waste that have a negative impact on the environment and, in turn, public health. Recycling can help reduce the quantity of solid waste disposed and can create new products by using certain wastes as raw materials. The main objective of this study was to demonstrate paper recycling aiming to produce quality paper for postcards, envelopes, and other uses, on a household or community scale. The methodology used was simple. First, 20-gram of waste paper was put into 1 liter of water and kept overnight in order to dispel written ink. Then, it was shredded into small pieces and mould it.. It could also be pounded to make it easier to grind. Then, the pounded or molded paper was mixed with 0.8 liter of water and ground it for 30 to 60 seconds. The ground mixture was diluted with 3 liters or 1 liter of water to produce thin and thick paper respectively. Color agents, pieces of flower or fragrant could also be added into the solution which must also be well mixed in order to get a fine paper. Excess water was removed and the paper was allowed dry from 3-4 hours if there was good sunlight. The paper was blotted to remove additional water during this time.

It was found that recycled paper produced from a mixture of waste printing paper and newspaper was better than one produced from waste printing paper alone. The recycled paper was suitable for making envelopes and paper folders. The fragrant, colored and flowered paper was good for producing postcards and souvenir books. The thin paper produced with different colors could be used for beautifying furniture such as table electrical lamp.

(by Vadany)

International Study Tour

Cambodian Waste-Econ Program had conducted an international study tour to Dhaka, Bangladesh and Ranchi, India from 29 Dec 2003 to 06 Jan 2004. The purpose of this tour was to visit some successful community-based waste management and recycling projects that may have useful information for us to consider for initiating our pilot project on Community Based Waste Management and Recycling in Siem Reap Town. Three pilot project team members were invited to join the trip: Mr. *Lay Chanthy*, pilot project

leader, Mr. *Sour Sethy*, Waste-Econ program manager in Cambodia and Ms. *Sor Nyphana*, a program officer of community sanitation and recycling organization (CSARO) in Cambodia.

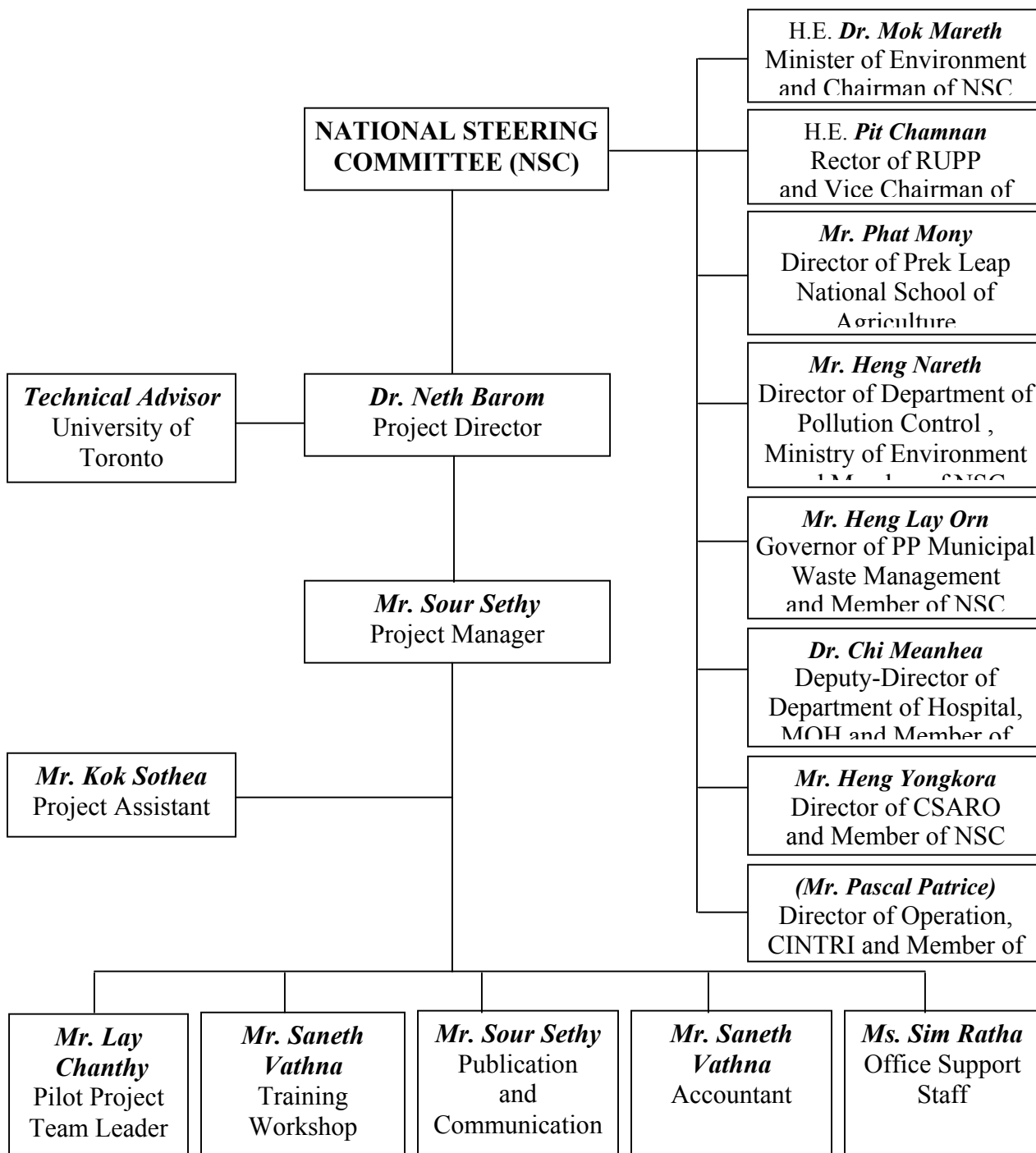
In Dhaka, the team arranged to visit a small community-based waste management project, which covers around 120 households. This project was conducting primary waste collection consisting of daily collection from house to house and street sweeping. At the beginning of the project implementation, participation was very low. However, participation was gradually increased due to the efficiency of the collection service and improved cleanliness of the community. Keeping the community clean (through waste removal) can help change people's attitudes to waste disposal. The second project we visited was the *Waste Concern Project*. Waste Concern provides primary collection and composting at a community level. Waste Concern used Effective Microorganism (EM) technology in the production of their compost to speed up production. As a result, compost production can be produced in 45 days.

In Ranchi, India, the team arranged to visit Clean Jharkhand Project, which is implementing a program on community based waste management. This program had been operating for one year and is funded by the Government of Canada through the Government of India. One objective of this program is to increase community involvement in solid waste management in Ranchi. The project provided primary waste collection from house to house, street sweeping, and conducted training and education campaigns. Similar to the project in Dhaka, there was a low rate of participation at the beginning of the project, which was improved quickly due to the efficiency of collection and efforts to make sure the community was always clean. One of the factors contributing to the program's success was identifying key persons (who can influence others in the community) for communication, training, information dissemination and the investigation of waste collection services in his or her community. *(by Lay Chanthy)*

WEBSITES RELATED TO INTEGRATED WASTE MANAGEMENT

- 1) Waste-Econ Project Website:**
<http://www.ots.utoronto.ca/users/wasteEcon>
- 2) Waste Wise Resource Center:**
www.wwresourcecentre.net
- 3) Community Sanitation and Recycling
Organization:**
<http://www.bigpond.com.kh/users/csaro/>
- 4) WASTE/Urban Waste Expertise Pro
gramme:**
<http://www.waste.nl/>

ORGANIZATIONAL CHART OF CAMBODIAN WASTE-ECON PROGRAM



NATIONAL CAPACITY AND NETWORK DEVELOPMENT THROUGH WASTE-ECON PROGRAM IN CAMBODIA

