

WASTE-ECON

"Making waste work for the economy"

Volume 5 - 1/2003

A. NEWS AND ACTIVITIES

1. Midterm evaluation mission of the Waste-Econ Project

A midterm mission to evaluate the Waste-Econ Project was carried out by Dr. John Titus and Doug Hickman, two independent international consultants hired by the Canadian International Development Agency (CIDA) from the 23 to the 30 of November 2002.

As part of the evaluation, a series of meetings and interviews took place between the two consultants and those involved with the project, including officials from the Vietnam based CIDA office, leaders from local partner agencies, representatives from the Project Steering and Coordinating Committees, and the Pilot Research Groups. Also consulted were host institutions, instructors and participants associated with the waste-econ training courses.

Upon completion, a midterm evaluation report will be forwarded directly to concerned officials at CIDA headquarters in Canada.

(Tang The Cuong)

2. The Meeting of the Project Steering and Coordinating Committees

At the December 6 meeting held in Ho-Chi-Minh City and chaired by Dr. Pham Khoi Nguyen, the Chairperson of the Steering Committee, members heard and discussed presentations on various issues including:

- (i) A review of project performance and outcomes achieved in the past; and
- (ii) Completion of on-going activities as well as proposed activities to be implemented at the end of February 2003 including:
 - Delivery of Waste-Economy training courses with women as the target audience;
 - Laying out of the framework and for the second seminar on the Waste-Economy curriculum;
 - Organization of the Fourth National Planning Conference for the Waste-Econ Project in Hanoi.

(Tang The Cuong)

3. Workshop on Pilot Research Projects

Pilot research is one of the focal activities of the Waste-Econ project. A two-day workshop on pilot research projects was successfully organized in Ho-Chi-Minh City on December 7-8, 2002. Specific outcomes of the individual pilot research projects were presented on the first day, and on the second day, a field visit was organized for the participants to the AMATA industrial estate in Bien Hoa city, Dong Nai Province.

The workshop was attended by representatives from the Vietnam branch of CIDA, the Vietnam-Canada Environment Project (VCEP), Canadian and Cambodian partner agencies and local management agencies of provinces where pilot research projects have been implemented.

This workshop offered an opportunity to exchange research experiences through discussions between partner agencies, the research community and the various management agencies. It was agreed that the input from these discussions will benefit future pilot projects. Issues relating to the publication of research results were also discussed by the participants to facilitate their dissemination.

(Tang The Cuong)

4. Pilot Research Projects

4.1 Organic Waste Pilot Project at Bai Chay Beach, Ha Long City

Following a workshop entitled “Strengthening participatory management of solid wastes at Bai Chay Beach - Ha Long Bay Tourist Destination,” held June 3, 2002, the following activities have been implemented.

+ The translation of *CIDA Technical Guidance for Producing Microbial Fertilizer from Organic Wastes Generated from Hotels* has been completed for demonstration activities and the transfer of this technical knowledge to local officials at Bay Chay beach.

+ The delivery of a training course on solid waste management at source for local managers and residents focusing on basic knowledge and technical skills. The course was attended by 30 participants, drawn from local households, hotels, markets, floating communities and leaders of local mass organizations and authorities. The organization of this training course was designed to encourage local people to contribute to the project. There was a special emphasis on solid waste separation at source as well as a small scale composting process to be demonstrated in 2003.

+ The organization of a study tour for five officials to learn from the experiences in community-based solid waste management in Singapore and Indonesia, July 21-27, 2002. The knowledge and experience gained from the study tour has proved useful as some of the ideas learned from abroad have been adapted and applied as solutions to solid waste management in Bai Chay beach and Ha Long city.

+ Amendments and additions to the existing regulations and rules on local solid waste management in Bai Chay beach and Ha Long city were made. At present, these drafts are under the review and consultation of the Quang Ninh provincial Department of Science, Technology and the Environment, and other provincial agencies before being forwarded to the Provincial People's Committee for approval.

In summary, the pilot project's activities have been actively implemented with the participation of various local stakeholders including local authorities in a proactive manner.

In the next period, the pilot project will further focus on activities such as (1) demonstration of solid waste separation at source; (2) small scale organic waste processing; (3) delivery of several short-term training courses on public awareness of the waste-economy; (4) continuing extension of its research cooperation and information exchange with other research projects; (5) consultations provided for local stakeholders in developing their regulations on, and commitments to solid waste management in Bai Chay beach, Ha Long city; and (6) preparation of a final report on the pilot research project performance.

(Tran Hieu Nhue & Nguyen Quoc Cong)

4.2 Project on "Waste-Economy - A Case study on Industrial Wastes in Ho-Chi- Minh City"

In 2002, the fishery product processing industry was selected as a waste economy case study on applications of end-of-pipe treatment and cleaner production. The case study focused on potential applications of cleaner production and end-of-pipe waste treatment at the Vinh Loi fishery product import and export company in Bac Lieu province.

Cleaner production options proposed to be adopted by the fishery product processing industry include (1) housekeeping; (2) better monitoring of production line; (3) improvement of existing equipment/machinery; (4) substitution of raw materials; (5) reuse and recovery of valued materials.

Audits and cost-benefit analysis were applied as cleaner production options to the fishery product (refrigeration) processing at the company.

Initial outcomes from the application of cleaner production revealed many economic and environmental benefits. This has consolidated an argument that cleaner production applied prior to end-of-pipe treatment can be seen as an important and appropriate strategy to ensure environmentally friendly and sustainable development of the fishery product processing industry.

(Lam Minh Triet)

4.3 Municipal Solid Waste Landfill Pilot Project in Da Nang

The following activities have been recently implemented within the framework of the pilot research project:

(1) Good results have been produced from study tours on solid waste management and treatment in Singapore and Thailand. Participants were able to learn about various innovative waste management strategies. In the case of Singapore, while a landfill constructed in the sea may save land, it requires a large capital investment and has a high cost of operations. On the other hand, Thailand's model on solid waste separation and treatment at landfills seems to be more consistent with Vietnam's socio-economic conditions. A combined landfilling-incineration approach has been applied by the two countries.

(2) Relevant information on solid waste continues to be collected in Da Nang city, and socio-economic and technical aspects of potential sites for landfill construction are being further analyzed. In this area, the Center for Environmental Protection & Research (EPRC) has effectively collaborated and shared relevant information with the city's Department of Science, Technology and Environment and the Urban Environmental Company.

(3) Geographical information systems (GIS) are being applied to solid waste landfill planning. The GIS technology allows the selection of optimal sites for landfill construction by plotting and overlaying maps for conducting analysis of landfill criteria.

(4) Study of the deployment and application of research outcomes to other provinces. The study will be carried out in Quy Nhon city, which faces many difficulties in landfill siting, and requires counsel on solid waste treatment and landfill planning.

The pilot project has much benefited from the Canadian experience in the application of a waste economy approach to resolve several specific solid waste treatment issues, and it has contributed to training Vietnamese experts of landfill planning.

As planned, a workshop on "Solid waste planning and treatment" will be organized in Da Nang city in February 2003. The workshop aims at discussing relevant solid waste treatment issues in the Central Coastal and Highlands regions. These issues shall be clarified with the technical assistance of Canadian experts.

(Bui Van Ga)

4.4 Gender outreach pilot project for women involved in waste collection and recycling in Trang Minh ward, Hai Phong city

As of November 2002, the pilot project has organized four training courses on credit-savings management for 65 managers at all levels including those in the women's centers/groups as well as 14 training courses for 280 local woman borrowers.

The project has thus far disbursed an amount of VND 413 million to 259 women borrowers, thanks to funding from the Canadian non-governmental organization (NGO), GEMS of Hope. Among the borrowers, 49 women have had access to secondary credit based on their capacity to buy additional recoverable materials as well as their compliance to the project's loan regulations. In addition to loans, local women are also encouraged to save money on a monthly basis, and as a result, an amount of VND 35 million has been accumulated so far. The project has achieved a pay-back rate of 100%. This is a particularly encouraging result as the pay-back period is on a monthly basis, which requires the borrowers to comply stringently to their commitments, and actively work and daily save up money. Such a high pay-back rate indicates that the loans have been effectively used by local woman borrowers.

Most of the borrowers have been enthusiastic to be involved in the project, and highly appreciate the availability of funds, which enabled them to raise their incomes from improved trade in, and collection of, recoverable materials. Repayment of capital and other financial transactions take place at monthly meetings at the various group's centers. These meetings also provide the opportunity for local women to exchange information and experiences and to benefit from useful training in environmental sanitation and health care.

The pilot project has completed the compilation of the project's management/operational manual, which has been translated into English. The project has also completed a sociological survey of the local woman waste collector's socio-economic conditions, and a report on the survey results is now being prepared.

The project has hosted and worked with Canadian experts and students from the University of Toronto, Canadian GEMS of Hope, and Christian Children's Fund of Canada.

At present, the project continues loan disbursement and implementation of its routine activities as well as completion of the first year revolving fund management plan. The project administration is compiling relevant training materials and organizing environmental, health and gender training courses for the year 2003.

(Cao Hong Van)

4.5 Awareness Pilot Project for Child Waste Pickers at Nam Son Landfill, Hanoi

The pilot project started from the third quarter of 2001, and has achieved the designated objectives to date. The project has achieved significant outcomes on communication activities including the launch of contests on painting, environmental protection and children's rights. The project has also contributed to the improvement of the health and education of local children in Nam Son and Bac Son communities, located around the Nam Son Landfill.

A seminar on "Children and the Environment" was organized within the framework of the project at Bac Son, Soc Son District on the first of November 2002. The seminar was attended by representatives from the Waste-Econ Project Coordinating Committee (both Canadian and Vietnamese), the Ministry of Science, Technology and the Environment, and district Educational and Health Divisions, the Youth Union, the Party and the People's

Committees, the administrative boards of lower secondary schools in Nam Son and Bac Son communes and school children, amongst others.

At the seminar, the project's report and various papers were presented and discussed focusing on the progress of the project activities and their effectiveness. Comments and contributions given by school children revealed that their environmental and health awareness has been much improved through their active participation in the implementation of the project's activities.

Local authorities at all levels and other counterparts expressed their desire for continuing assistance to be provided by the Waste-Econ Project to the pilot project so that its outcomes could be replicated to other localities. This would strengthen the long-term sustainability of the pilot project.

At the seminar, the representatives of the Waste-Econ project stated that both the selection of the pilot project site and the implementation approach are appropriate. This assessment has renewed enthusiasm in all the partners to participate in this project.

During meetings with both the Canadian and Vietnamese members of the Coordinating Committee, the pilot project team proposed a follow-up work-plan on pilot research activities. These activities will focus on communication, traditional vocational training, and the continuation of the provision of health and educational assistance.

(Pham Bang)

5. A two week training course on the waste economy held in Son La province from 9-20 September 2002

A two-week waste-econ training course was delivered for selected northern provinces from 9 to 20 September 2002. This was the fifth training course organized by the Waste-Econ project in conjunction with the Son La provincial Department of Science, Technology and the Environment. The training course was attended by 31 participants from Son La, Lai Chau, Ha Giang, Hoa Binh and Hanoi. Among them there were eleven woman and six representatives of ethnic minority groups. The conference was attended by managers, teachers, researchers and practitioners in environment related sectors.

The course was presided over by Prof. Dr. Nguyen Hieu Nhue, Dr. Nguyen Thi Anh Thu, and Dr. Hoang Xuan Long. Six topics were covered: (1) waste management planning and technologies; (2) industrial waste management; (3) community health, education and waste economy; (4) waste-econ principles and theories; (5) waste management economy; and (6) waste-econ research methodologies. Field trips were organized to visit Chieng Sinh cement plant, three landfills in Son La (of these landfills, one was already closed, another under construction and the third was operational), The Northwestern Forestry Science and Production Center, and the Song Da Brewery.

Overall logistics went smoothly, and at the end of the course participants made reports covering the six topics and were granted course certificates.

(Le Trong Cuc)

6. Evaluations given by participants to the two week training course held in Son La

Like other activities within the framework of the waste-Econ Project, an evaluation of the two-week training course was carried out by participants. Their feedback will be taken into account when planning further activities.

Sixteen per cent of the participants evaluated the usefulness of the training topics to be excellent, while 58% and 26% answered very good and good levels respectively. Most of the concepts presented during the course were new to the participants. All six topics were deemed useful, although waste management planning and technologies, and waste management economy were singled out as being of the greatest interest.

The two-week duration of the course was assessed as a reasonable amount of time. The combination of face-to-face theoretical lecturing with field-visits, and in-group discussions with instructor-participant interactions proved helpful. It was noted that the teamwork aspect of the activities could be improved upon.

The participants proposed many strategies to involve target audience groups, namely management agencies, professional associations, and enterprises.

Some of these proposals included the organization of additional in-depth training courses specializing in urban solid waste management and waste economy. Also receiving backing were the Waste-Econ project's activities in the fields of training and pilot research, along with efforts to update information on waste management and waste economy from foreign and domestic sources.

(Nguyen Thi Anh Thu)

B. INVESTIGATIONS - RESEARCH

1. Research reports by participants to the two week training course held in Son La

Participants looked at six research themes taken from emerging issues relating to provincial waste management. Key themes included waste-water treatment, industrial emissions, and pollution reduction in cement production, forestry product and dairy processing industries.

(1) "Environmental risks of hazardous waste produced by the Son La Fibrocement Plant and proposed treatment options" researched by Ha Thi Hang Nga, Nguyen Thi Bich Hang, Nguyen Van Tinh, Le Thanh Tam and Luong Van Yeu. The research looked at the impact of hazardous waste on local air, soil and water. The researchers proposed waste treatment in the raw material processing stage; construction of wastewater tanks to ensure that treated waste

water volumes meet the Vietnamese environmental standards (TCVNs); and planning and design of specialized landfills for hazardous wastes according to TCVNs.

(2) A research report entitled “ Proposed Measures for Solid Waste Separation at Source in Son La Provincial Township” was presented by Nguyen Duc Sinh, Phi Van Tuc, Vu Thi Lien, Nguyen Thi Hanh, Ca Van Chung. The report looked at the socio-economic and environmental benefits of local solid waste separation at source, with emphasis on the situation in Son La province. Incentives for local solid waste separation at source were proposed in the report including the establishment of an organic waste-to-microbial-fertilizer production plant, investment in the development of facilities to support local solid waste separation at source, and increased public awareness.

(3) “Proposed Options for environmental pollution mitigation in limestone mining and processing, Chieng Sinh-Son La cement factory” was prepared by Luong Phu, Le Thi Oanh, Bac Cam Khuyen, Hoang Thi Thuan, and Pham Viet Binh. The report indicated pollution sources, environmental risks imposed by the pollution; analysis of the existing waste management methods applied by the factory, and several socio-economic and technical solutions to noise, dust and waste water issues.

(4) “Some Options for Reducing Environmental Pollution at Son La Forest Product Processing Company” was made by Chu Hong Vinh, Nguyen Van Minh, Tran Manh Hung, Vu Thai Thuy, and Khuc Ngoc Hoan. The report looked at current pollution problems at the company, analyzed of pollution sources, and proposed measures for reducing dust, noise, heat and waste water pollution, as well as the strengthening of environmental control and monitoring capacity.

(5) “Some Options for Dust Pollution Reduction at a fluidized bed dryer of the Chieng Sinh - Son La Cement Factory” was prepared by Ngo Anh Hoang, Nguyen Quang Thien, Nguyen Kim Xuyen, Ho Si Ngoc, Nguyen Thu Hien, and Nguyen Khac Long. The report focused on the current status of pollution and pollution sources at a fluidized bed dryer stage where most of the dust is generated, and contained an analysis of the existing dust treatment technology (China made electrostatic and bag filters). Proposed solutions included a gravity dust collection method combined with watering.

(6) “Some Wastewater Pollution Mitigation Options for The Thao Nguyen Dairy Company,” was prepared by Dang Hong Loan, Nguyen Van Bac, Nguyen Thanh Son, Nguyen Tien Thang, and Cam Thi Lien. The report highlighted links between the company’s production line and waste-water generation sources, and presented analysis of the current status of environmental pollution caused by waste water streams. The report proposed various waste-water treatment methods, namely septic tank construction and bio-chemical treatment methods.

(Nguyen Thi Anh Thu)

2. Research by Canadian and Vietnamese Students

To date, five Canadian students have completed their studies in Vietnam. They include: Nupur Malaviya, Yogendra Shakya, Carrie Mitchel, Laura McNally, and David Richardson. Others are expected to complete their studies by March 2003.

The Vietnamese students completing their studies at the University of Toronto include Nguyen Van Ha, Nguyen Quang Tuan, and Luu Duc Cuong. Having successfully conducted data collection in Vietnam, they are currently completing their graduate degrees in Canada. A copy of the Master thesis prepared by Nguyen Quang Tuan is available and may serve as a reference for relevant pilot research projects.

(Tang The Cuong)

3. Waste-Econ activities implemented by the Center for Urban and Rural Environment Research and Planning

The Center for Urban and Rural Environment Research and Planning (CRURE) is one of many of the Vietnamese partners to the Waste-Econ Project. In 2002, the center implemented many waste economy related scientific research activities, including:

(1) A feasibility study of the industrial waste treatment area at Tram Than commune, Phu Ninh district, Phu Tho province. This study was approved by the provincial People's Committee.

(2) The Inter-urban MSW management planning project in Bac Ninh province organized a seminar in Bac Ninh province on 21 November, 2002. Studies implemented within the framework of the project were presented at a seminar on pilot research projects held in Ho-Chi-Minh City from 7-8 December, 2002. The strategies that emerged from this seminar are anticipated to be applied to the development of ten urban centers in this province in 2002. This is the first time that MSW planning has been developed for inter-urban centers, and Bac Ninh province was selected as a pilot research area.

(3) A project on sanitary landfill and solid waste treatment development planning for 17 urban centers in Vietnam (including Hanoi, Hai Phong, Ha Long, Cam Pha, Uong Bi, Hai Duong, Hung Yen, Nam Dinh, Phu Ly, Ha Dong, Son Tay, Mong Cai, Hoa Binh, Bac Ninh, Viet Tri, Phu Tho and Thai Binh) will be undertaken by the center from 2002 to 2003.

These research activities implemented by CRURE are considered spin-offs from the Waste-Econ Project.

(Luu Duc Hai)

4. Waste economy related activities implemented by the Faculty of Environmental Economics and Urban Management, National Economics University of Hanoi

The Faculty of Environmental Economics and Urban Management, National Economics University of Hanoi, has implemented a small project on “Community-based solid waste management systems in Hanoi” with assistance and cooperation provided by the University of Toronto. The project aims to enhance research and teaching capacity of the local partners.

The project has been implemented for the last three months (from May to August 2002) with the active participation of the Faculty’s staff and significant contributions made by Prof. Shasi Kant and David Richardson, a Master’s student from the Forestry Faculty of the University of Toronto.

The project focused on two major research activities: (1) Survey and/or investigation of local socio-economic conditions and current status of local communities’ solid waste management; and (2) Comparative analysis of community-based solid waste management practiced in different locations (Minh Khai, Nhan Chinh, Thanh Cong) in Hanoi.

The research project has strengthened the project participants’ research and teaching capacity, and at the same time, produced relevant documents that will prove useful for follow-up research activities relating to community-based solid waste management in Hanoi, Vietnam.

(Nguyen The Chinh)

C. EXCHANGE OF VIEWS & EXPERIENCES

Canadian University Level Curriculum on Waste Economy (continued)

The course: *Solid Waste Management* (Course Description of Prof. Philip Byer, Department of Civil Engineering, University of Toronto, Canada)

The course introduces the engineering and management principles, practices and techniques for the management of municipal solid waste. Topics include waste generation; recycling, collection, transfer and transport; processing; material and energy recovery; landfilling; and facility choice and siting.

The contents of the course is based on the textbook: "Techobanoglous et. al., Integrated Solid Waste Management: Engineering Principles and Management Issues, McGraw-Hill, 1993".

The below is the contents of the above Textbook:

Part I: Perspectives

1. Evolution of solid waste management
2. Legislative trends and impacts

Part II: Sources, types and composition and properties of solid waste

3. Source, types and composition of municipal solid wastes
4. Physical, chemical and biological properties of municipal solid waste.
5. Source, types and properties of hazardous waste found in municipal solid waste.

Part III: *Engineering principles*

6. Solid waste generation and collection rates
7. Waste handling and separation, storage and processing at the source
8. Collection of solid waste
9. Separation, processing and transformation of solid waste
10. Transfer and transport
11. Disposal of solid wastes and residual matter.

Part IV: *Separation, transformation and recycling of waste materials*

12. Materials separation and processing technologies
13. Thermal conversion technologies
14. Biological and chemical conversion technologies
15. Recycling of material found in municipal solid waste.

Part V: *Closure, restoration and rehabilitation of landfills*

16. Closure of landfills
17. Remedial actions at inactive waste disposal sites

Part VI: *Solid waste management and planning issues*

18. Meeting federal - and state - mandated diversion goals
19. Implementation of solid waste management options
20. Planning, siting and permitting of waste management facilities.

(Philip Byer)

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