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Partners

- Prodipan, Bangladesh
- Tribhuvan University, Nepal
- Asian Institute of Technology, Thailand
- Karlsruhe University, Germany
- University of Leeds, UK

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Asia Pro Eco II

Promoting sustainable solutions for the environment between Europe and Asia

Safe disposal of wastes to improve urban environment in Least Developed Asian Countries

"There is no single system – i.e. 'The Solution' – to offer to manage MSW in LDACs. Since the problem is complex in nature, and sustainability of the solution needs the acceptance and cooperation of all concerned stakeholders, the integrated and sustainable management of MSW for LDACs should be site-specific (on local, regional, national levels) and adapted to the socio-economic and infrastructure settings and existing management practices"
Muhammed Alamgir, Project Coordinator, WasteSafe (2005)

In recent years problems related to improper Municipal Solid Waste (MSW) management have been intensified in the Least Developed Asian Countries (LDACs) due to absence of appropriate and sustainable systems to handle wastes, inadequate or no infrastructures, severe financial constraints, lack of motivation, awareness and participation and due to the absence of effective legislation to protect the environment. As a result, MSW presents a widespread and continuing threat for city dwellers, city authorities and other concerned stakeholders. Inadequate or unavailable solid waste collection and disposal services result in indiscriminate dumping and spreading of wastes in public areas, clogging of urban drainage systems, contamination of water resources, and proliferation of insects and rodents. Clinical and industrial waste streams are also in part allied with the general flow of MSW and increase health risks due to direct human contact with their hazardous elements. Co-funded by the European Commission, this project – *"Integrated Management & Safe Disposal of Municipal Wastes in Least Developed Asian Countries – WasteSafe"* – was designed to address the need of LDACs of an appropriate integrated MSW management based on their socio-economic settings and technological capabilities. The project builds on a previous project funded by the EC under the Asia Link Programme (*"Geoenvironmental Engineering Curriculum Development for the South and Southeast Asian Region"*), in which both the applicant and two of the partners (AIT and Karlsruhe University) were involved, and prepared a feasibility study on the characterization of solid waste properties and compositions, separation, on-site storage, collection, recycle, reuse and ultimate disposal sites in six major cities (Dhaka, Chittagong, Khulna, Rajshahi, Barisal and Sylhet) of Bangladesh and Kathmandu, the capital of Nepal, and by mutual transfer of knowledge and experiences among the experts from European and Asian partners.

Creating a multiplier effect

The prime beneficiaries of this project are the citizens living in the targeted cities of Bangladesh and Nepal and ultimately to whole country and other LDACs. However, given the widespread of the issues addressed (social and environmental aspects) there was a varied spectrum of stakeholders involved, from city dwellers to local authorities, from private sector to civil society and academics.

The multiplier effect potentialities are considerable, as the project created a reliable database on the present status of MSW in the 7 cities of the two target countries, which can be used as an information pool for supporting decision-making processes relating to this issue. The broad-based information and data provided by this project on MSW is presently very limited in LDACs and will be of highest interest not only for authorities and NGOs, but also for researchers and academics.

The main results of this project were:

- Physical and chemical characterisation of MSW evaluated through in depth studies in six major cities of Bangladesh and the capital of Nepal;
- Evaluation of existing MSW management systems and their constraints, present scenarios of ultimate disposal sites in the seven case study cities and the adverse social and environmental problems;
- Identification of successful models of MSW management in other Asian countries;
- Production of a unique database as an outcome of the feasibility study, which allowed also to propose a method for the selection and evaluation of an integrated management and safe disposal system for MSW in LDACs;
- In the target cities, both in Bangladesh and Nepal, the project activities succeeded in drawing the attention of city dwellers, city authorities, government officials, NGOs, community-based organisations (CBOs), the private sector, academics and other concerned stakeholders, to work together to find a sustainable solution on the basis of the recommendations made by the study;
- Agreement by the concerned stakeholders that such an unmanageable situation of MSW in the cities of the LDACs is no longer sustainable has led to the submission of a proposal for an approach for the selection and evaluation of an integrated MSW management.

At the partnership level the project was also able to generate some positive results:

- Initiate and facilitate close research contacts among the European (Germany and UK) and South and Southeast Asian (Bangladesh, Nepal and Thailand) experts to achieve an improved cooperation in the field of waste management, which can contribute to the development of this field especially in the LDACs;
- Initiate and facilitate contacts among European companies, consultants, NGOs working in the field of waste management and

the relevant stakeholders in Asian countries;

- Continue close cooperation and plan of future collaboration among the Asian and European partners for a possible follow-up project to demonstrate the applicability of the approach to select and evaluate an integrated and sustainable waste management system and the safe disposal of MSW developed by this project.

Lessons Learnt

For a project as ambitious as WasteSafe, the number and expertise of partners involved proved to be adequate and the partnership consortium generated the support required for the successful implementation of the project activities. The partnership also proved to be extremely cordial and fruitful and there is a strong possibility for future cooperation among the various partners.

The geographic areas covered by the project also strengthened the findings of the project, which based on MSW management in urban areas in LDACs. In this context, the major six cities of Bangladesh and the capital city of Nepal, rapidly growing and densely populated truly represented the urban reality of LDACs, where the proposed WasteSafe approach can be easily applied.

For the success of the project also contributed the wide range of local organisations cooperating for its implementation, from city authorities to local community organisations, which ultimately originated local appropriation of the project. As a consequence of their involvement, both the City Mayors and Officials working in MSW management have shown keen interest to be involved in a future demonstration project.

Although the activities have been fully completed and the results achieved, one lesson learnt from the project was that the 12-month duration of the project was under-estimated for conducting a feasibility study and compiling the final output by both the Asian and European experts on such a complex topic and in such a broad geographical area. Some activities, such as the estimation of total MSW generation in a big city were more complex and required greater efforts, human resources and time than had been assumed. The project would have, therefore, gained from a more extended timeframe.

Outreach and Dissemination

There is a close relation of this project with three ongoing post-graduate research projects at the Department of Civil Engineering of KUET, ensuring the dissemination of the project findings:

- An Approach for the Selection and Evaluation of Integrated Municipal Solid Waste Management in Bangladesh;
- Geoenvironmental Assessment of Ultimate Disposal Sites of Municipal Solid Wastes in Major Cities of Bangladesh;
- Generation, Composition and Characteristics of Municipal Solid Wastes in Major Cities of Bangladesh.

These research activities were partially supported by this project's fund, along with KUET's support for post-graduate research. Some post-



graduate students have also undertaken similar research activities at AIT, in Thailand, and Tribhuvan University, in Nepal.

Due to the implementation of a previous Asia Link project in the partner Universities of WasteSafe on MSW management topics, the partnership was strengthened and the team used this experience for the formulation of the outcomes of the project.

The project also found synergies with several other activities carried out in the field of MSW management in the target countries by several NGOs, using some of their experiences for the implementation of the project. The experience of the other projects provided a vivid guidance to formulate the approach proposed for the selection and evaluation of an integrated MSW management and its safe disposal. The partners still keep the contact created during the project, which can lead in the future to collaborations for follow-up actions.

The dissemination of the project's results among the relevant stakeholders was furthermore guaranteed through the following activities:

- Seminars held in both the Asian and European partner countries;
- Series of discussions, meetings and exchange of views held with the concerned stakeholders in the case study countries;
- A survey, conducted in the seven case study sites, targeting different sectors of the population in terms of age, education, profession and income level;
- Data collection activities during the field study in 25 households in each of the case-study cities, which served as a way of directly approaching the local populations and authorities about the project's results and importance;
- Publication of the feasibility study produced during the project: *"Integrated Management and Safe Disposal of Municipal Solid Waste in Least Developed Asian Countries – A Feasibility Study"* (Ed. M. Alamgir et al., 2005: ISBN: 984-32-3003-5).

Sustainability

As a result of this project, the research reputation of KUET has been accepted by a wide range of stakeholders and several research activities on MSW have been started both in the undergraduate and postgraduate levels. Also through this research project, a new "Geoenvironmental Engineering Laboratory" has been established. This project helped to establish the research relationship between the city authorities of Bangladesh and KUET.

Some project infrastructures also remained to the beneficiary after its completion, which can be used for academic and research purposes. Through this project KUET has established very good relation with the leading Asian and European Universities, which will help for possible collaboration in the future.

As a direct result from the network created by this project, NGOs, CBOs, city authorities and academic institutions are also working to prepare some demonstration projects based on the feasibility study produced.

Although the action plan did not include workshops or other training or knowledge-transfer activities, several discussion meetings, seminars and stakeholders dialogue meetings were held for the transfer of views and ideas that should be considered in the proposal, creating also, among these stakeholders, a common understanding of the approach to be taken in further demonstration projects.

Due to the similar characteristics of the major cities in South and Southeast Asia, the project has potentially enormous multiplier effects either in the targeted countries or in the whole region. However, until now, no concrete initiatives to implement a follow-up project have been taken. It is expected, nevertheless, that the relevant parties will take the proper steps to adopt this methodology. The WasteSafe team realized that a successful demonstration project in a particular area would attract the relevant authorities. The outcomes of this feasibility study and its implementation in the future will provide the relevant information and act as a tool for improving legislation, codes and methods.

A relevant aspect of this project, however, was the enduring relationships that it has promoted between the partners and a determination for further collaboration in future actions. Some bilateral agreements between the partner institutes have developed during the project that resulted in a new partnership for the proposal of another project submitted under the Asia Pro Eco II Programme.

Recommendations

As waste management is a relatively young discipline, even in Europe, it is inevitable that the few real experts in the field are currently in great demand. This has reflected in the availability difficulties by the team members of the consortium for conducting common activities of the project, to which they were required to attend. Projects addressing similarly new areas should have this fact under consideration.

It is also advisable for projects that include data collection from local sources to previously establish contacts with the local authorities to ensure the data availability and adequately prepare the action plan and the timeframe of the activities. In this case, it was necessary to address and use different sources to obtain actual, reliable data regarding existing waste management facilities, originating, thus, extra unplanned difficulties in the implementation of this activity.

Regarding the Asia Pro Eco Programme itself, from the results obtained and the EU-Asia partnerships created through the different projects, it becomes most evident that its importance for the tackling of some striking environmental issues is very much relevant to improve the urban environment in Asian countries. Another main advantage brought by this programme is that it opens the scope for Asian and European Universities to establish partnerships with financial liabilities without interference of the respective governments.

However, the establishment of a monitoring committee would be useful to evaluate the successful implementation of projects, maintaining at the same time very close relation with the implementing authority.

In the same way, it would be also relevant to create, at programme level, a mechanism for the implementation of subsequent actions or demonstration/field solution projects that would build up on previous feasibility study actions.

Due to recent economical developments in some Asian countries, more emphasis should be given to projects addressing specific environmental problems to LDACs.

The EU-Asia partnership introduced by the Asia Pro Eco Programme certainly plays a very vital role for cultural exchange and dissemination of modern technologies from Europe for addressing environmental problems of the Asian countries. During this project, the EU-Asia partnership has proved to be very beneficial for the successful completion of the project. Exchange of expertise knowledge and new ideas among the experts of both sides and the laboratory facilities available at European universities contributed greatly to the proper implementation of the project.

Due to the entrepreneurial nature of some projects, the involvement of partners other than non-profit organizations would be beneficial. A practical example can be drawn from the WasteSafe project, as well as from project relating with water supply or sanitation. For the practical implementation of environmental solutions to these problems, the building of infrastructures is ultimately necessary, which would be more effectively achieved with involvement of private sector organisations as partners.

An important recommendation of WasteSafe is that its integrated management approach should be refined and implemented through a demonstration project in one or more LDAC case-study cities. Such a demonstration would be structured, conducted and disseminated in such a manner that it would eventually enable to address MSW problems in any of the LDACs, further supporting the long-term sustainability of the project.

Sustainable MSW management is not a function of a single group of society. Rather it needs the consistent involvement of local communities (direct beneficiaries), city councils (the responsible authorities), Governments (having up-most authority and financial responsibilities), National Assemblies (responsible to introduce new laws and provisions for their enforcement), the Ministry of Environment & Ministry of Local Government (related enforcement agencies), NGOs, CBOs, private sector (already working in these areas) and donor agencies (sharing the financial liabilities in LDACs). Therefore, the implementation and sustainability of WasteSafe, in both the mid-term and long-term, to a large extent depend on the desire, commitment and cooperation of all the above-mentioned parties.

It is expected that some interested stakeholders will take initiatives with private resources to solve this striking problems. However, it is crucial that such interest is harnessed to realistic and responsible solutions, and avoids the repetition of mistakes already made elsewhere. Sound solutions will attract more people, public & private organizations and donor agencies to contribute in this sector.