Loja is considered pioneer of urban environmental protection. It has been successful in implementation of the integrated solid waste management programme. This programme involves pure technical applications, including public education on poverty eradication, integration of socially marginalised groups and creating incentives for the consumer. Solid waste management is linked to soil protection and urban landscape architecture activities. It is accompanied by continuous information and monitoring campaigns. During the five years since its initiation, many Ecuadorian and foreign municipalities have visited the area. The initiative intends to establish a special municipal unit for technical consultancy to other municipalities (horizontal technology transfer). Recently a cooperation with AME was initiated in order to ensure sustainability and continuity of the technical assistance.

First, a sanitary landfill was constructed and then the separate collection of biodegradable and non biodegradable waste commenced. The separate collection has been extended to more than 80% of Loja. Repeated waste analysis has shown that approximately 90% of the participating households separate their waste accordingly.

Two productive projects have been developed regarding the waste; 
- Biodegradable waste is used to produce compost as an alternative fertiliser 
- Non-biodegradable waste passes through a recycling plant where paper, cardboard, plastic, glass and metal are recovered, processed and sold to the industries which use them as raw materials.

The programme has resulted in; considerable reduction of environmental pollution in
Loja, improvement in sanitary conditions and increase in environmental awareness among the citizens. Both projects are economically sustainable and are beneficial to the whole community.

**Narrative**

**Situation Before the Start of the Activity**

The problems listed below indicate the status quo-
- Dispersed dumping yards in inhabited areas, which led to increased environmental pollution and poor sanitary conditions
- Elevated number of infections and contagious diseases
- Inhuman working conditions for recyclers
- Decrease of the aesthetic attraction of the city

**Establishment of Priorities**

Municipal actions are based on the "Action Plan for Loja - 21st Century", where attention and support to poor and marginalised citizens, environmental protection and conservancy, and the realisation of activities for the improvement of the living conditions of the citizens have been outlined as priorities. This includes the introduction of new technologies in order to create economically and ecologically sustainable development incentives, to generate work and increase the living standard.

The integrated solid waste management programme has been elaborated in agreement with these principles and demands from the public.

**Formulation of Objectives and Strategies**

The principal objective is the promotion of environmental awareness among the citizens, the creation of work and better working conditions for the poor people.

The main strategy has been the continuous information and monitoring campaigns held among all participating parties (households, hospitals, recyclers etc.). These campaigns succeeded in ensuring the commitment of most participants and thus, the sustainable success of the programme.

The strategy selected to improve the income and the working conditions of the urban recyclers was the construction of a central recycling facility where people can work under hygienic conditions and obtain better pay by direct sales of pre-processed material to the industry. This was organised by the Loja Municipality.

**Mobilisation of Resources**

The motto of Loja Municipality is, "Poverty is no excuse to neglect environmental protection".

Accordingly the integrated solid waste management programme preserves its priority in municipal budget planning for environmental protection. Financial and technical support has been solicited and obtained from other organisations. Investments for constructing and extending of the compost plant, for the infrastructure and the larger parts of the recycling plant and all operating costs of the project have been assumed by the municipality. In the course of the programme, 102 permanent employment places have been created.

The Technical University of Loja, the Metropolitan Municipality of Quito, AME and various NGOs have contributed conducting studies and giving technical assistance. The German Development Service granted the permanent presence of a solid waste expert.

The main financial support has been:
- Credits from the State Bank

http://www.bestpractices.org/cgi-bin/bp98.cgi?cmd=detail&id=20340&key=Eppyfjbjkdfdag 06/03/2003
- Donation from the Embassy of the Netherlands

Great moral support was obtained from the grant of the "Nations in Bloom" award for public participation and environmental protection in December 2001. All these contributions have been obtained due to the national and international success of the programme, which has been achieved by the unyielding perseverance of the municipal authorities and the enthusiastic participation of the citizens.

Process
The first phase of the programme was the establishment of a sanitary landfill. The first problem in this phase was seeking consensus for the construction site. Referring to previous experiences with wild dumping yards, the public vehemently opposed the construction in the foreseen site. The municipality overcame this opposition with a massive information campaign on technology and working conditions of a sanitary landfill. After this the active contribution of the local habitants was ensured.

After a pilot phase with approximately 3000 participants, the 'separate' collection programme has been extended successively to actually 80% of the city. This could was due to; a continuous door-to-door campaign, municipal personal deliveries of personally green and black waste bins and information booklets and collection schedules to each household. In households and municipal markets, biodegradable waste is collected in green recipients while non biodegradable waste in black ones which are carried away daily carried.

Initial problems with bad or incomplete separation were overcome by permanent monitoring, where municipal inspectors pursued the route of the collection vehicle, control the separation and explain it repeatedly to the habitants. After the introduction, a fine system is applied for non-compliance which increases with the number of repetitions.

After putting the biodegradable waste in the composting plant it produces organic fertiliser which is sold to local and regional farmers, to the Loja population or used in municipal parks and gardens.

Non biodegradable waste is carried to the recycling plant where all recoverable material is removed, processed and sold to industries the rest is disposed of in the landfill area.

A special collection route and a security landfill have been designed for toxic and infectious hospital waste.

The project includes:
- Waste collection
- Classification of domestic waste
- Separation of hazardous waste of medical care centres
- Planning of collection routes
- Recovery and recycling
- Composting of biodegradable waste
- Organised and professional recycling
- Emission control in the treatment plants
- Final disposal of non recoverable waste
- Operation of the sanitary landfill
- Operation of the security landfill
- Emission control (gas and leachate)
- Awareness and capacity building
- Door-to-door campaigns
- Information campaigns on compost
- Seminars for hospital, laboratory and other medical personnel
- Technical, social and administrative support to the recyclers
- Technical assistance to other municipalities (in Loja and on site)
- Technical and educational publications
Achieved results
The results can be summarised under three fundamental headlines:

1. Improvement of quality of life;
   Quality of life improved considerably for the entire Loja population this was due to ensuring a hygienic environment by the elimination of litter and wild dumping yards and the introduction of a reliable waste collection. This can be seen by observing the citizens before and after the introduction of the programme. Concerning the urban recyclers their working conditions (security, hygiene, elementary machines, wholesale commerce) improved.

2. Institutional capacity building on national, sub-national and local level;
   The Loja municipality gives technical assistance concerning solid waste management to all interested municipalities. Seminars are conducted in co-operation with AME and technical guidelines are published by the municipality. The progress is visible especially in the southern Ecuador region, where several municipalities have already started implementing their own integrated solid waste management.

3. Changes in behaviour and attitudes of the population;
   A considerable change in the level of environmental awareness of the Loja population can be seen since the introduction of the programme. Domestic separtion has been widely accepted (proved by repeated waste analysis), and Loja citizens are proud of the neatness of their home town. This is also reflected in issues not related to waste such as use of organic fertilisers, purchase of vegetables from organic cultivation etc.

Sustainability
The integrated solid waste management programme aims at economic, ecological and social sustainability. To ensure its continuity independently from political changes, economic crisis or other external influences, it was integrated in the municipal legislation.

Parts of the project have already proved their economic sustainability. The sales income in the worm composting plant covers the expenses and even ensures a small benefit. In the recycling plant, the actual production ensures the coverage of personal costs and is expected to recover all operative costs at the end of the current year.

The special treatment of hospital waste is entirely paid by the producers.

Waste management fees paid by the population are insufficient to cover the cost of waste collection and disposal, education campaigns and capacity building. The municipality subsidises these.

It is a national problem in Ecuador that the citizens don't pay the real cost of waste management. The Loja municipality has thought about gradually increasing these fees up to their real value (quintuple), but considering the financial charge already imposed on the population by the sales of waste bins, this plan has not been pursued.

Until now, technical consultancy to other municipalities is free. Considering the important environmental benefit on national basis, we think that this activity should in the long term be integrated into a governmental assistance programme. First steps have been taken consulting the State Bank.

Opinions of all involved parties are permanently sought in order to ensure the largest possible consensus concerning the 'modus operandi' of the programme. Citizens are invited to criticise, propose or discuss items during the door-to-door campaign or directly in the municipality. The programme has been extended to the entire population, considering differences in social status and income (purchase on credit of waste bins, free containers in marginal urbanisations) and culture - urban/rural).
Learned Lessons
The most important lesson we learnt during the implementation of the project was that with adequate planning and administration, including the input of all parts of the public at all times, large scale objectives may be achieved successfully and with sustainability, even if the financial resources are less or scarce.

It is possible to use the economic resources generated by waste recovery in order to give support to socially marginalised people and to protect the environment.

Additionally, the citizens have seen that common aims can be achieved successfully and for the benefit of the whole community by their individual contribution. The experience of commitment and cooperation has multiplication effect which can be seen by large projects been successful due to large public contribution.

The success of the waste programme has encouraged the Loja municipality to venture into new areas of environmental protection. This new areas include; the introduction of eco-tourism, the environmentally sound renovation of the public transport system and the introduction of alternative energy production in Loja.

Transferability
As mentioned before, the integrated solid waste management programme has been considered exemplary on national and international level.

Approximately once a week the Municipality of Loja receives visits from representatives from other municipalities who wish to benefit from the experience and receive technical assistance. In various cases, the visits are returned in order to give more detailed consultancy. Until today, more than 100 visits from Ecuadorian municipalities have been registered.

Further, a contract on technical assessment has been signed with the Peruvian municipalities of Piura, Paita and Catacaos, in the framework of the Peace Covenant of 1999.

The technical assistance is not only theoretical but aims at practical outcome. On request, municipal technicians can stay in Loja and receive training on whatever subject they need. They all receive a set of manuals on recycling and composting (another manual concerning landfills is in preparation), there also educational brochures which are used in the information campaigns. Consultancy on site is given according to the specific needs and conditions of the municipality in question.

The assistance has already shown its fruits. Until now, the municipalities of Zamora, Gualaquiza, Cuenca and Riobamba have initiated similar programmes and continue to receive regular assistance from the Loja municipality. Rural communities in the Loja province have received assistance to produce compost as an alternative fertiliser on individual basis, which is applied in several villages and by some large scale farmers.

In co-operation with AME, the Municipality of Loja wishes to increase the sustainability of the technical assistance granted to other municipalities by the establishment of a special Technical Assistance Centre, where two professionals should be occupied exclusively with technical consultancy. If this project can be realised, more emphasis shall be given to continuous assistance and visits to the soliciting municipalities.

Further, the Municipality of Loja has submitted its offer of technical assistance to the Costa Rican Direction of International Co-operation, which co-ordinates and organises horizontal transfer of technology throughout the American Continent.

Key Dates
http://www.bestpractices.org/cgi-bin/bp98.cgi?cmd=detail&id=20340&key=Eppyfgjkbkdfig
Date Activity

February 1996 Construction of the sanitary landfill
January 1998 Start of worm composting with market waste
December 1998 Start of separate collection from households
August 2001 Start of separate collection and disposal of hospital waste
February 2002 Start of the recycling plant

Contact

Ing. Fernando Montesinos
Municipio de Loja
Calle Bolr y Josentonio Eguiguren esquina.
Casilla "M"
Loja - Ecuador

Tel: 00593-7-570 492
00593-7-561 634 (Mayor's office)
00593-7-570 409 (telephone central)
Fax: 00593-7-571 716
Email: zjaramillo@municipioloja.com OR ilaroche@municipioloja.com

Type of Organization: Local Authority

Nominating Organization

Same as above

Partners

Contribution of the Embassy of the Netherlands
Carlos Falcon
Edificio El Libertador Piso 5
Carrion E9-41 y Tamayo,
Quito

Tel: 0059322229230
Fax: 0059322550359
E-mail: dedecu@porta.net

Type of Organization: Non-governmental organisation (NGO)

Type of Partner Support: Financial Support

DED - German Development Service
Daniel Kempken
Edificio El Libertador Piso 5
Carrion E9-41 y Tamayo,
Quito

Tel: 0059322550359
dedecu@porta.net
Type of Organization: Central Government
Type of Partner Support: Technical Support

AME - Association of Ecuadorian Municipalities
Carlos Falcon?

Type of Organization: Local Authority
Type of Partner Support: Administrative Support

Financial Profile

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