


IMPLEMENTING RA 9003: The City of Naga Experience




THE CITY PROFILE

- ▶ lies along the south coast of the island of Cebu and is approximately 21 km away from Cebu City
- ▶ has a land area of 10,208.4524 hectares
- ▶ a third class city in the Province of Cebu with 28 barangays/villages
- ▶ it is home to 101,571 individuals




OUR VISION

To become a livable and economically - developed city committed to the upliftment of the standard of living of the populace through industrialization, enhanced commercial activity and a well-balanced environment.



OUR MISSION

Commit to provide effective and efficient delivery of basic government services for the welfare, well-being and contentment of its constituency through:

- a) the implementation of infrastructure and socio-economic projects that are most beneficial to the needs of the people





OUR MISSION (CONTINUED)

- b) the proper management of its resources
- c) the maintenance of peace and order
- d) the provision of extension and support services through partnership and linkages with the public and private sectors; and
- e) the preservation and protection of the environment



THE CITY OF NAGA FRAMEWORK FOR ENVIRONMENT PRESERVATION AND PROTECTION

THE CITY OF NAGA SWM FRAMEWORK AND PLAN: ITS SALIENT FEATURES



- goal and objectives
- the current solid waste condition
- the legal and institutional framework
- the social, environmental and financial aspects
- strategies and approaches
- implementing systems and mechanisms

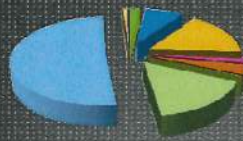


WASTE CHARACTERIZATION STUDY

- conducted in November 2010
- to determine the types of waste disposed and the actual volume of wastes generated by households, commercial establishments and industries
- covered 6 urban barangays in the city



BREAKDOWN OF WASTES



- Special Waste
- Paper
- Metal
- Plastics
- Construction Materials
- Mixed Residue
- Glass
- Electronics
- Organic
- Hazardous Waste

Component	Percentage (%)
Special Waste	2.00%
Mixed Residue	7.84%
Paper	6.18%
Glass	1.63%
Metal	3.51%
Electronics	0.10%
Plastics	6.00%
Organic	50.56%
Construction Materials	1.00%
Hazardous Waste	0.12%



OUR LITTLE PUSHES



OUR LITTLE PUSHES

- designation of an environment officer lodged at the City Mayor's Office



OUR LITTLE PUSHES (CONTINUED)

- closure and rehabilitation of the Bairan dumpsite in July 2011
- making the City of Naga one of the few LGUs compliant with RA 9003



OUR LITTLE PUSHES (CONTINUED)

- ▶ fostered partnership with a private company to help manage its solid waste management program
- privatized collection
- establishment of central processing and treatment facilities



OUR LITTLE PUSHES (CONTINUED)

- ▶ adoption of the industrial ecology principle



Organic waste to compost fertilizer



Alternative Fuel Resource (AFR)



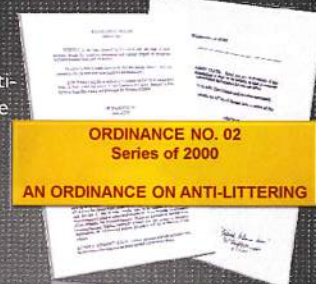
OUR LITTLE PUSHES (CONTINUED)

- ▶ creation of a multi-partite waste monitoring committee



OUR LITTLE PUSHES (CONTINUED)

- ▶ passage of the anti-littering ordinance



CHALLENGES, AREAS FOR IMPROVEMENT AND SIGNIFICANT LEARNING

- the need for an effective and efficient waste disposal and collection system
- cooperation of and commitment from the households, commercial establishments, industries and the public in general



CHALLENGES, AREAS FOR IMPROVEMENT AND SIGNIFICANT LEARNING (CONTINUED)

- an integrated and comprehensive solid waste management program, i.e. systems and procedures, strategies and approaches, adoption by/participation of all sectors in the city, and
- installation of sustainability mechanisms



OUR NEXT STEPS

- ▶ strengthen and capacitate the City of Naga Solid Waste Management Board (CoN-SWMB)



OUR NEXT STEPS (CONTINUED)

- ▶ fine tune the City's 10-year SWM Framework and Plan



OUR NEXT STEPS (CONTINUED)

- ▶ develop/strengthen/nurture partnerships and/or linkages and networks with local and international organizations



OUR NEXT STEPS (CONTINUED)

- ▶ organize and strengthen the various sectors in the city as active partners in the City LGU's solid waste management program



OUR NEXT STEPS (CONTINUED)

- ▶ employ an effective social preparation strategy to encourage participation and commitment of the various sectors

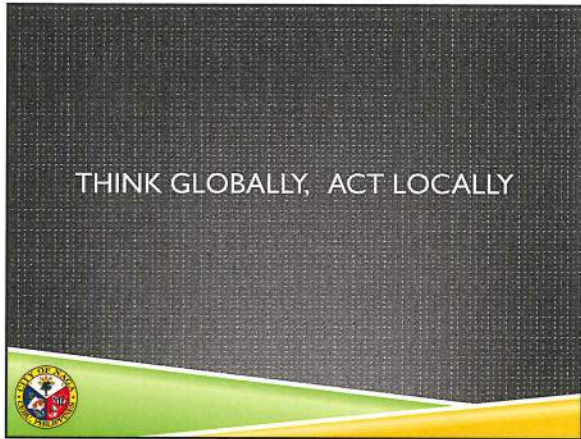
- ▣ information, education and communication (IEC)
- ▣ segregation at source



OUR NEXT STEPS (CONTINUED)

- ▶ adoption and implementation of the CoN-SEPTAGE MANAGEMENT PROGRAM







Public-Private Partnership on RA 9003: The Cebu City Experience

Hon. Nida C. Cabrera
City Councilor
Chairperson, Committee on Environment
Cebu City Council

Regional Workshop on Municipal Solid Waste Management
and Plastic Waste Recycling
January 28, 2013

INTRODUCTION

“**Republic Act (RA) 9003** otherwise known as the Ecological Solid Waste Management Act of 2000 emphasizes the importance of treating waste as a resource and promoting its recovery through avoidance, reduction or minimization, recycling and reuse.”

INTRODUCTION

“Local government units (LGUs) are mandated by the Act to divert solid waste from final disposal at a minimum of twenty-five percent during the first five years of implementation of the Act and to increase the rate every three years thereafter. Barangays are mandated to set up materials recovery facilities in order to help meet the waste diversion targets of their municipalities and cities. However, majority of LGUs are still unable to implement the minimum waste diversion requirement. Instead, it is mainly the informal waste sector consisting of waste reclaimers in the dumpsites, jumpers and paleros, itinerant waste buyers and junkshops that recover materials and divert solid waste materials from final disposal.”

Source: National Framework Plan for the Informal Sector in Solid Waste Management, National Solid Waste Management Commission Philippines, May 2010

INTRODUCTION

PRIVATE SECTOR PARTICIPATION

**RA 9003. Section 2.
Declaration of Policies.**

(f) “Encourage **greater private sector participation** in solid waste management”

RA 9003 Section 17 – The Components of the Local Government Solid Waste Management Plan

(L) “The plan shall likewise indicate **specific measures to promote the participation of the private sector in the management of solid wastes**, particularly in the generation and development of the essential technologies for solid waste management.”

BARANGAY LEVEL INITIATIVES

Ayala Center Cebu/Barangay Luz

Waste Collection System • Composting Project • Recycling



RESULT

2009 Galing Pook Award for Barangay Luz for
Participatory Environment Management



BARANGAY LEVEL INITIATIVES

Talamban and Kalunasan

Supporting the distribution of Takakura compost baskets to business and the community



TAKAKURA COMPOST PAY FORWARD SCHEME

Partnership with Kitakyushu City thru the Environmental Cooperation Network of Asian Cities

Community-based Solid Waste Management Program



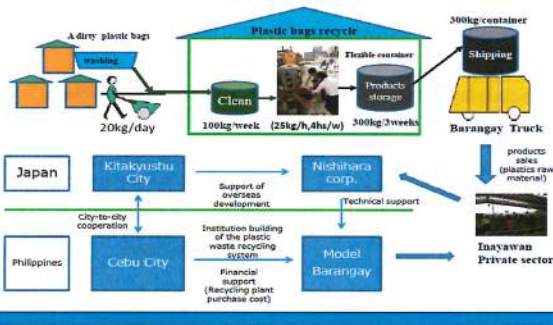
Decentralised, community-based composting is considered as one of the effective approaches for organic waste management, achieving sustainable development and mitigating Green House Gases (GHG) emissions.



Environmental & health benefits to residents thru appropriate waste collection & treatment at barangay level.

- Treats solid wastes at source, minimizes transportation costs, prolongs the life of landfills, saves costs for landfill management.
- Creates livelihood opportunities.

Partnership with Kitakyushu City for the operation of Plastic Waste Recycling Model Project in Barangay Talamban



Partnership with Kitakyushu City for the establishment of an E-Waste Research Project in cooperation with Nippon Magnetic Dressing Co., Ltd., CCCI & CCTFI

Recovering used Mobile Phones. Any Brand or Maker is acceptable.

Please note the following points

- Please do not provide Personal Information in Mobile Phone
- Please note that return of recovered mobile phones and accessories is NOT possible
- Please note that return of recovered mobile phones and accessories is NOT possible
- If you wish the destruction of the mobile phone, please bring to the local dealer
- Please put accessories (such as AC battery) in "Used Small Home Appliances Recovery Box"
- Recovered Mobile Phone will be materially recycled.

Kitakyushu City, Japan
City of Marikina, Philippines
090-5007308

Mobile Phones Recovery Box
MATERIAL RECYCLE

Thank you for your cooperation to Recycle Mobile Phones

Image of recovery Box (Kitakyushu City, Japan)

Partnership on Resource Recycling with Mansei Recycle Systems Co. Ltd. under the JICA scheme "Pilot Survey for Disseminating SME's Technologies"

Proposed "Pilot Survey" Overview



OTHER PARTNERSHIPS

International Environmental Technology Center (IETC) and United Nations Environment Program (UNEP)

WASTE PLASTIC 2 FUEL

United Nations Environment Programme
Division of Technology, Industry and Economics
International Environmental Technology Centre

Development Academy of the Philippines
Center for Sustainable Human Development
Environmental Management Office

A. WASTE PLASTIC TO FUEL TECHNOLOGY

B. PELLETIZER

EDF

San Pedro Makabayan Integrated Solid Waste Management (SPM)

OTHER PARTNERSHIPS-PROPOSAL STAGE

Byfusion Marketing New Zealand: Recycling All Waste Plastics into Building Blocks



Strengthening Partnerships thru Participation in International Conferences and Networks

International Conference on Future of Cities
14-21 October 2013 @ Tokyo, Yokohama, Saitama



Strengthening Partnerships thru Participation in International Conferences and Networks

Eco Cities Network in South East Asia: Peer Review @Map Tah Phut, Thailand in partnership with UNIDO



Ongoing PARTNERSHIP ON WASTE DISPOSAL:

Asian Energy Systems Corporation

Ongoing PARTNERSHIP ON WASTE PROCESSING:

Cebu Solid Waste Management, Inc.

PARTNERSHIP ON WASTE PROCESSING (proposal stage):

Bio Nutrient Waste Management, Inc.
[to collect and process market waste]

End of Presentation.
Thank You.

**Public and Private Partnership
for Implementing R.A. 9003**

**KEY LESSONS
LEARNED**

**CSWMI has been collecting garbage
since 1999**



**Cebu Port Authority
since 1999**



**Inayawan Landfill
closure
has been an
opportunity for us**

**Thus, the search for better
alternatives to manage waste**

**We became a member of International Solid Waste
Association (ISWA), an organization of waste
experts & practitioners from different countries**



**We attended Waste Conventions
to learn from experts**



**ISWA World Congress 2011
Daegu City, South Korea**



**WasteMet Asia 2012
Singapore**

Visits of Waste Management Facilities



Sudokwon Landfill Site (Incheon, South Korea)



**Metropolitan Recycling Center (South Korea)
recycles over 100 refrigerators/washing machines daily**

Visits of Waste Management Facilities



Construction Demolition Facility (Taiwan)



Woodchips Facility (Taiwan)

Visits of Waste Management Facilities



Berjaya Waste to Energy Landfill in Kuala Lumpur



Remediated Landfill in Selangor, Kuala Lumpur, Malaysia

OUR COMPANY'S BELIEF

EVERY WASTE IS A POTENTIAL RESOURCE

- valuable resources are recovered from the waste like cartons, aluminum, glass, hard plastics, steel plates, etc are processed for recycling
- waste plastics, which takes decades to decompose, are recovered and turned into alternative fuel and other usable materials
- biodegradable wastes are turned into compost

...which is in line with the direction of the Philippines

R.A. 9003 (signed January 26, 2001) states:
Section 20. Establishing Mandatory Solid Waste Diversion - Each LGU plan shall include an implementation schedule which shows that within five (5) years after the effectivity of this Act, the LGU shall divert at least 25% of all solid waste from waste disposal facilities (landfills) through re-use, recycling and composting activities and other resource recovery activities; Provided, That the waste diversion goals shall be increased every three (3) years thereafter; Provided, further, That nothing in this Section prohibits a local government unit from implementing re-use, recycling, and composting activities designed to exceed the goal.

...and the rest of the world



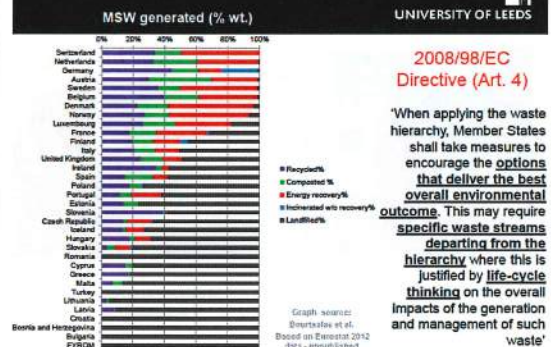
Main target is to achieve 40% diversion of MSW from landfill disposals in 2020.



EU Resolution to Boost Recycling and Cut Landfill & Incineration

9 May 2012

Application of waste hierarchy in Europe



2008/98/EC Directive (Art. 4)

"When applying the waste hierarchy, Member States shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste"

INTEGRATED MATERIAL RECOVERY FACILITY



Conforms to Republic Act 9003.

OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

FLOW OF PROCESSING MSW

1st
- Garbage truck dumps waste on the tipping floor of the segregation area.



OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

FLOW OF PROCESSING MSW

2nd
- Group of segregators and scrap pickers separate the waste plastics and recyclables from the mixed waste.



OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

FLOW OF PROCESSING MSW

3rd
- Non-bio waste like plastic bags are shredded or pelletized and turned into fuel or other useful materials.



OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

FLOW OF PROCESSING MSW

4th
- Biodegradable wastes are brought to the compost area for processing.



OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

CHALLENGES ENCOUNTERED

HOW WE SOLVED IT

Garbage trucks cannot wait so waste is dumped on top of one another.

We asked the help of DPS to talk to the drivers.

Human fecal waste is mixed-in with the waste of a lot of barangays, which not only slows down work but is also a health hazard to our workers.

We asked permission from DPS that we will not accept waste from Pasil, Sawang Calero, Duljo Fatima, and even, Inayawan,

Segregators' attitude – a) no sense of urgency since paid based on daily wage, and b) more focused on looking for "Jackpot".

Basis of compensation scheme was changed to productivity or per kilo.

OUR ACTUAL EXPERIENCE IN PROCESSING MSW OF CEBU CITY

CHALLENGES ENCOUNTERED

Carbon market waste, which is ideal for composting, was mixed with plastics.

Our compost facility was slow in processing bio-waste inspite of already having 2 shredders and a chipper.

HOW WE SOLVED IT

To minimize plastics, we incentivized some people in Carbon to segregate by giving them rice weekly.

We bought a 4-ton per hour bio-waste shredder.



OUR BIO-WASTE SHREDDER AT WORK



Our Actual Experience in Processing MSW of Cebu City

CHALLENGES ENCOUNTERED

Mixed biodegradable & non-biodegradable waste is wet & sticky making segregation very difficult & time-taking.



HOW WE TRIED TO SOLVE IT

We had to make Compost B for biodegradables wastes from barangay which contained small plastic wastes, and cannot be directly loaded in our compost pile. The process was costly and not effective.



STILL A CHALLENGE!!!

1st Solution: Invest in advanced sorting & shredding machine



- can process up to 20 tons/hr.
- expensive thus assurance is needed thru a long-term contract

2nd SOLUTION

RE-IMPLEMENTATION OF SEGREGATION OF WASTE AT SOURCE

(easier to implement w/ the new fleet of trucks)

THE RIGHT WASTE

GOES TO

THE RIGHT FACILITY

WHERE MUCH OF THE WASTE WILL BE UTILIZED AS A RESOURCE.

KEY LESSONS LEARNED

Waste is a Resource

- Waste plastics are used as alternative fuel, building materials, etc.
- Vegetable & fruit peels, scrap bones, intestines, etc. are excellent raw material for compost.
- Recyclables from waste provide income to unskilled workers.

KEY LESSONS LEARNED

Segregation at Source is a necessary step to the efficient recovery of resources from waste

- Minimizes contamination of useful materials in the waste thus a big percentage is recovered
- Minimizes waste thrown in a landfill, thus prolonging the life of a landfill.

KEY LESSONS LEARNED

Proper waste processing facility should be available

- Composting facility for food waste, market waste and other biodegradable waste
- Material Recovery Facility for further sorting of waste into carton, paper, aluminum, glass, plastics, etc., and shredding of waste plastics
- Landfill for residuals

will.i.am Hits Two Events in One Night Without Changing



will.i.am rocks his EKOCYCLE suit. (Splash News/Startrakphoto.com)

"This entire suit was made out of 17 plastic bottles, the pants are 12 plastic bottles, this hat is one plastic bottle, and this shirt is 5 plastic bottles," he told Yahoo's omg! in an interview backstage at the music festival. "If we all participate in this movement, we could all reach a global, sustainable society by 2020. **Waste isn't waste unless we waste the opportunity to make something out of it.**" Naturally, he recycled his recycled ensemble at the next event too. Nice work, Will.

Every Waste is a Potential Resource...

DON'T LET WASTE GO TO WASTE!

THANK YOU!!!

**Public Private Partnership for
Implementing RA 9003: Key Lessons Learned**



FDR Integrated Resource Recovery Management Inc. (FDR-IRRMI)
Pangdan, City of Naga, Cebu

Presented By:

Margot J. Omega
Project Development Manager

"Regional Workshop on Municipal Solid Waste Management and Plastic Waste Recycling"
January 28, 2014, Diamond Suites & Residences, Cebu City



- **2009:** FDRCon Company Inc. diversified into solid waste management.
- **2010:** Signed its first contract with the City of Naga.
- **2012:** Officially established as a spin-off company.

✓ **Operates Cebu's first Integrated Resource Recovery Facility**

✓ **Processed more than 60,000 tons of garbage since 2010**

✓ **Industrial producer of compost / soil conditioner**

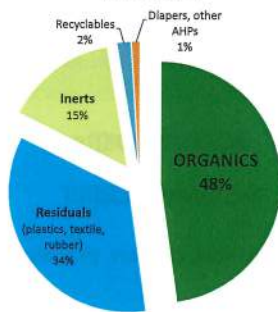
Core SWM Services and Clients



Average 100 tons per day

Local Government Clients	Contract	Tons Per Day	Scope of Service
1. City of Naga	25 years (June 2010 – 2035)	25	a) Daily Collection, Transfer & Processing b) Dumpsite Closure
2. Municipality of Minglanilla	20 years (Feb. 2011 - 2031)	35-40	Daily Collection, Transfer & Processing
3. City of Carcar	20 years (March 2013 – 2033)	15-20	Daily Collection, Transfer & Processing
4. City of Lapu-Lapu	To date: 8 th Purchase Order since July 2012 (Proposed Long-term contract)	15-20	Hauling of Residual Waste from Dumpsite
	TOTAL	100 TPD	

**Solid Waste Profile at FDR-IRRMI Facility
*(by weight)**



Research and Development

Technology Visits to Europe & Middle East on solid waste processing and recycling



MBT Plant of GRE in Frankfurt



HerHoff Stabilat Plant in Germany



KAP Plant of IuT Group in Austria



MSW Processing Facility of EET in Al Ain, UAE

Diaper Recycling Study

Chemical Engineering Department
University of San Carlos
(Office of Dr. Evelyn Taboada)



USC, company pursue diaper recycling project
Planned facility to deal with 40 tons of waste in Cebu City daily

From garbage to compost!

Aerobic decomposition turns waste or "basurang malata" to **compost**, rich in organic matter.

FOR BioGreen Compost

- ✓ rich in organic matter
- ✓ for soil amendment
- ✓ for topdressing
- ✓ for landscape and surface design

From Kitchen & Garden Waste

Naturally-Produced

All natural & healthy produce!
No commercial fertilizers & no pesticides!

Sergio's Farm in Maluray, Dalaguete, Cebu uses FDR Bio-Green Compost made from kitchen and garden waste.

For more details and farm visit, call:
Mr. Boyet Revalde - 0916-4361641 / 273-7434

ONE Earth. ONE Home.

Let us work together to protect the environment...

City of Naga Organikong Gulayan Program

Using FDR BioGreen Compost : July to October 2013

Welcome Friends!

Organikong Gulayan sa Barangay Tinaan, City of Naga

G* Organic!
G* Natural!
G* Healthy!

How did it all start?

In 2009,
with the City of Naga's industrialization and growing economy,
there was a strong political decision to look for sustainable and long-term solutions to its growing solid waste problem.

Key Questions:




- *What are the best practices in SWM?*
- *What are the available technologies that are cost-effective, sustainable, environmentally sound and socially acceptable?*

~~New dumpsite~~

~~Sanitary Landfill~~

Central facility to sort, recover, process & treat waste.

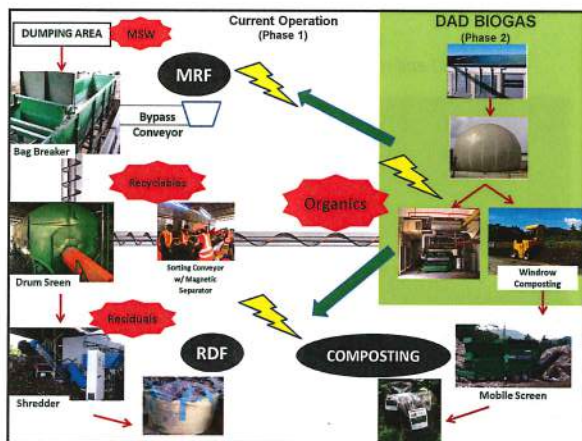
Cebu's First Integrated Resource Recovery Facility in the City of Naga, Cebu

Location:
Barangay Pangdan, City of Naga (25 kms from Cebu City)

Sub-Facilities:

1. Material Recovery (MRF) Facility
2. Refuse Derived Fuel (RDF) Facility
3. Composting Facility
4. AHP Recovery Facility (R&D stage)




Material Recovery Facility (MRF)

- Recyclables are recovered
- Large organics are separated

Recyclables stored & Ready for delivery

- Assorted plastics, PET, PP, PE etc.
- glass bottles cartons
- Metals: Tin, aluminum, mixed metals



Refuse Derived Fuel Production (RDF) Facility

Residual Plastics are separated





Alternative Fuel Source





Compost Production Facility

Collected and Separated




Composting

Turning & Screening



FDR BioGreen Compost



Green Waste to Compost
(backyard waste + agricultural waste + other organics)

Collection and Transfer

A. Collection Fleet:
 10 Compactor trucks (2-8 m³)
 2 Hook Lift / Arm Roll
 2 Mini dumptrucks
 5 Dumptruck (15 ton cap)
 10 Bins (10ton cap.)

B. 27 Total Manpower:
 Supervisors, drivers, sanitation crew

C. Professionalized approach to garbage collection:
 - Schedule-driven & field monitoring
 - Complete PPE (personal protective equipment)
 - Strict policy on crew behavior (i.e against asking for tips)
 - Available customer service hotline for feedback



Closure and Rehabilitation of Bairan Dumpsite, City of Naga

In accordance with guidelines set by
DENR Administrative Order No. 09:
The General Guidelines in the closure and rehabilitation of open dumpsites and controlled dumpsites.

On-going works of remediation and closure

Bairan Open Dumpsite in City of Naga

Before as open dump	During remediation works
	

BAIRAN TODAY

Fully closed and rehabilitated with regenerated greeneries!



Tree Planting for Phil. Environment Month
FDR-IRRM staff joined the
City of Naga last June 24, 2012

Key Benefits

Economic & Social Benefits

- 1) Tipping Fee Share** – The City of Naga gets a 10% of the tipping fee share for all waste coming from outside the city which are processed inside FDR-IRRM's facility. 
- 2) Local Employment & Skills Development** – 90% of the facility's manpower is composed of local residents of the City of Naga. Skills needed to develop our own environmental management industry. 
- 3) Compliance to RA 9003**– Naga's serious efforts to protect its environment thru the establishment of a recovery facility & closure of its dumpsite. 

Most Outstanding LGU in the Management of Waste by the Federation of Philippine Industries, Inc. (FPI)

Economic & Social Benefits

Improved efficiency of solid waste management services:

- **Application of commercial principles** with clear objectives, targets and schedules
- **Managerial & Financial Autonomy**
 - Faster equipment & spare part purchases critical to operations
- **Clear accountability** to clients and customers

Reference:
Private Sector Involvement, World Bank website



Environmental Benefits

Reduction of Greenhouse Gas Emissions thru:

Recycling & Alternative Material Use– displacing virgin raw materials thus avoiding environmental releases associated with raw materials extraction and production.

Composting – diversion of materials from landfills/dumpsite that will produce methane & other GHG's

How we contribute to economic and environmental sustainability...



Key Lessons Learned

Lessons Learned

In developing SWM projects with local governments:

- a) Solid waste > long term problem > long-term commitment. LGU's limited resources > private partnership is inevitable.
- b) SWM infrastructures requires huge capital investment > long term partnership is needed.

Next Challenges & Opportunities

In the further improvement of privatized SWM services:

- 1) Wider and long-term public awareness & education program on solid waste management among constituents.
 - *Throwing garbage: Out of sight, out of mind mentality*
 - *Waste as shared responsibility: Waste segregation at the generator's level*
- 2.) Stronger coordination and communication with city officials and pertinent departments heads to address SWM issues within the scope of the contractor (i.e. in high volume critical areas – public market, highways etc.)
- 3.) Strengthen implementation and compliance of local anti-littering ordinances

The significance of what we do...

Landslide in Baguio dumpsite in August 2011.



Why we need to solve our garbage disposal problem..

Flood victims of Typhoon Ondoy and Sendong.



*The trash of one affects everyone.
Let's start with sustainable solutions to
garbage.*

Daghang Salamat...



We find ways for your waste.

FDR Integrated Resource Recovery Management Inc. (FDR-IRRM)
Pangdan, City of Naga: Tel No. (032) 316-1066
Talisay City Office: Tel. No. (032) 2737834; Fax No. (032) 4918976
feedback@fdrcon.com