Concept of Sustainable Communities

- A sustainable community is one that uses its resources to maintain current needs without compromising the ability of future generations to meet their own needs.
Annual Greenhouse Gas Emissions by Sector

- Industrial processes: 16.8%
- Power stations: 21.3%
- Waste disposal and treatment: 3.4%
- Land use and biomass burning: 10.0%
- Residential, commercial, and other sources: 10.3%
- Fossil fuel retrieval, processing, and distribution: 11.3%
- Agricultural byproducts: 12.5%
- Transportation fuels: 14.0%

Carbon Dioxide (72% of total)
- 20.6%
- 29.5%
- 19.2%
- 12.9%
- 8.4%
- 9.1%

Methane (18% of total)
- 40.0%
- 29.6%
- 18.1%
- 4.8%
- 6.6%

Nitrous Oxide (9% of total)
- 62.0%
- 1.1%
- 1.5%
- 2.3%
- 5.9%
Increase in the global average surface temperature will increase by 1.4 to 5.8°C.

Decrease in snow cover and ice extent

Global mean sea level will rise by 0.09 to 0.88 m.

Climate Change

Flood

Drought
Reduce Carbon footprint

Actions to be taken
Green Buildings
## MSW composition

### Composition - 1999

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Municipal Waste</td>
<td>70%</td>
</tr>
<tr>
<td>Industrial Non-Hazardous Waste</td>
<td>15%</td>
</tr>
<tr>
<td>Construction &amp; Demolition Waste</td>
<td>11%</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>5%</td>
</tr>
<tr>
<td>Health Care Waste</td>
<td>0.2%</td>
</tr>
<tr>
<td>Sludge</td>
<td>0.08%</td>
</tr>
</tbody>
</table>

### Composition - 2002 (on a weight basis)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Municipal Waste</td>
<td>70%</td>
</tr>
<tr>
<td>Food Waste</td>
<td>25%</td>
</tr>
<tr>
<td>Yard Waste</td>
<td>43%</td>
</tr>
<tr>
<td>Plastics</td>
<td>13%</td>
</tr>
<tr>
<td>Paper</td>
<td>12%</td>
</tr>
<tr>
<td>Textiles</td>
<td>3%</td>
</tr>
<tr>
<td>Metals</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Diagram

- **Paper**: 5%
- **Plastics**: 3%
- **Metal**: 2%
- **Textiles**: 2%
- **Gravels**: 3%
- **Kitchen**: 10%
- **Glass**: 2%
- **Yard waste**: 45%
Composting is a controlled aerobic decomposition of organic wastes in the presence of microorganisms.
Composting Projects

- Large-scale projects
- Community-based projects
- Research projects
- University projects
Union Park Women Association (2004-2005)

- Composting of domestic wastes

Funded by National Women Council
Solid Waste Recycling Ltd

- Composting of 100,000 t/y of wastes
- Enrichment of compost
- Commercialise enriched compost
- Use of compost in agricultural applications
Mission Verte Project
2011-2012

- A National Project funded by MCB Forward Foundation
- 300 planters
- North South East West
- Onsite training of planters in composting projects
Sept Cascade AMCS, Onion Producers Association, Midland AMCS, Green Technology Mix Farming Coop Society
Nouvelle Découverte AMCS & Trou D’eau Douce AMCS
Roche Bois Community Centre
Train the Trainers (2006-2010)

Island wide composting
Rodrigues

Funded by
UNDP GEF/SGP
Rodrigues - Demonstration

Funded by
UNDP GEF/SGP
Compost Use - Training
Practical Assessment
Rodrigues- Award ceremony

Exam + setup of composter + final compost assessment

Funded by UNDP GEF/SGP
Trainers in Action
Sustainable animal waste management in Rodrigues 2006-2010

Association des Fermiers de Maréchal, Citron et Château des Fleurs
Activities

- Identification of the characteristics of wastes
- Construction of 200 composters per village
- Setting up of rotary composters
- Training on composting
- Assessing quality of compost from composters
- Production of booklet
- Distribution of 200 composters
Making of compost in rotary drum
Domestic solid waste recycling at community level in Rodrigues 2006-2011

Association des Planteurs de Petit Gabriel & Association des Planteurs de Mourouk
Activities

- Identification of the characteristics of wastes
- Construction of 200 composters per village
- Setting up of rotary composters
- Hands on training on composting
- Assessing quality of compost from three composters
- Production and explanation of information in pamphlets
- Distribution of 200 composters
Demonstration Session
Pilot demonstration facility for windrow composting of agricultural wastes and production of bio-vegetables
2006-2010

President of Association des Agriculteurs de Nouvelle Découverte & Association des Planteurs de St François
Activities

- Design of windrow facility
- Construction of facility for composting (the concrete base was constructed on a plot of land belonging to farmers at Nouvelle Découverte)
- One training session
- Collection of different types of wastes
- Setting up of windrow composting
- Turning of windrows
- Establishing parameters
- Assessing compost quality
- Utilisation of compost & Production of bio-vegetables
Discussion on windrow design
Construction of Windrow Facility
Research Projects

Year 2009-2010

• Impacts of composts application on properties of a dry soil - a lab-scale study
• Assessing the environmental impacts associated with MSW incineration from a life cycle perspective
• Biodegradability testing of pre-aged plastics using D5338 or D5988
• Algae biomass as a renewable source of energy
• Effect of pesticides on compost maturity

Year 2010-2011

• Waste Management in a hotel
• Assessing environmental impacts associated with poultry waste management
• Composting of mixed and sorted MSW
• Impact of climate change on human settlement
• Investigating the potential of composting poultry wastes
• Vermicomposting of shredded confidential paper using Pheretimoid Spp.
• Eco-building assessment: efficient energy utilization and sustainable waste management
• Pinch analysis in industries
• Potential of producing biodegradable plastics in Mauritius
• Energy potential of poultry waste
Research Projects

Year 2011-2012

• Assessing the potential of optimizing energy use in a textile industry
• Potential of producing biogas from vinasse
• Energy saving opportunities at La Pirogue hotel
• Assessing the effect of grey-water on the anaerobic digestion of organic waste at household level
• Assessing the potential of treating greywater on a household level
To analyse the characteristics of domestic organic waste
To analyse the characteristics of domestic greywater
To determine the potential of methane from organic fraction of municipal solid waste.
To assess the effects of using greywater in the production of biogas through the anaerobic digestion of municipal solid waste.
To analyse the characteristics of the final sludge and determine their disposal or treatment solutions.
To conduct a preliminary design of a digester for the production of biogas at domestic level.
OUTCOMES

MAJOR OBSERVATIONS

Run 1
- COD Reduction = 83.78%
- VS Reduction = 82.39%
- 3805 ml methane per kg VS destroyed per day
- 6963 ml methane per kg VS destroyed

Run 2
- COD Reduction = 84.80%
- VS Reduction = 84.96%
- 3882 ml methane per kg VS destroyed per day
- 8851 ml methane per kg VS destroyed

• AD is an effective tool for both waste reduction and energy production.
• Digestion of organic waste can be promoted at household level to mitigate use of fossil fuels, alleviate domestic MSW per capita sent to landfills and to cater for greywater disposal.

Run 1
Run 2
- Mass Reduction
- Methane Production
ASSESSING THE POTENTIAL OF TREATING GREYWATER ON A HOUSEHOLD LEVEL by ARSHAD RAMEN GOUANA

- Estimating amount of greywater production produced at a household level (bathroom and kitchen)
- Characterizing greywater in terms of BOD, COD, nitrate, phosphate, SS and E coli
- Design of unit operations to be used to treat the household greywater
- Construction of treatment system
- Testing whether treatment system is performing under expected conditions (effluent produced suitable for garden irrigation or toilet flushing)
- Cost analysis of final treatment processes
Wood chips for odor removal
Overall greywater treatment Systems
MRC Funded Research Project

- Use of Compost by farmers as an adaptation strategy for climate change: Land application and simulation studies (Dr G.Somaroo, Prof R. Mohee & Mr A. Mudhoo)

- Assessing the potential of using coal ash and bagasse ash as an inorganic amendment in the composting of municipal solid wastes: Improvements in compost quality for agronomic application (Prof R. Mohee, Mr Selven Rungasamy (SWRL), Dr G. Somaroo & Mr A. Mudhoo)
Thank You