



SOLID WASTE MANAGEMENT RECOMMENDATIONS OF TOURISM AREAS IN THE ISLANDS OF BATANES

Environmental Engineering Program
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Workshop on Solid Waste Management



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OUTLINE



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Overview

SOLID WASTE MANAGEMENT RECOMMENDATIONS OF TOURISM AREAS IN THE ISLAND OF BATANES

Objectives

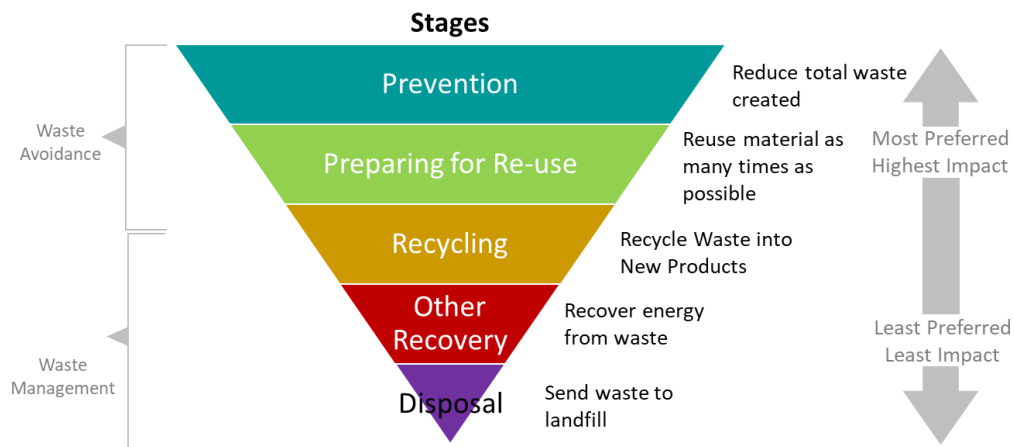
- Assess the current solid waste management system of Batanes.
- Propose recommendations on SWM for sustainability considering carrying capacity limits

Must haves

- Current Waste **Generation**
- Present Waste **Composition**
- Existing Waste **Flow/Stream**

Output

- Alignment of Programs in 10 Yr SWMPs
- Projection of waste volumes with triggers for potential technological intervention/recommendations



Vermicomposting Facility Viability



Refuse derived Fuel Pre-processing



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Focused Group Discussions

- Residents
 - Sabtang
 - Itbayat
 - Batan Island Municipalities
- Tourism Workers / Operators

Household Survey Enumerators
Orientation/Meeting

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- Seminar/Discussion on Solid Waste Management
- Waste Analysis and Characterization Study (Basco)
 - 1-day Demonstration
 - 3-day End of Pipe and At Source
- Field Observation
 - Select Waste Management Facilities (Basco and Sabtang)
 - Tourist Spots



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FIG 1. WASTE VALUE CHAIN (MRF)

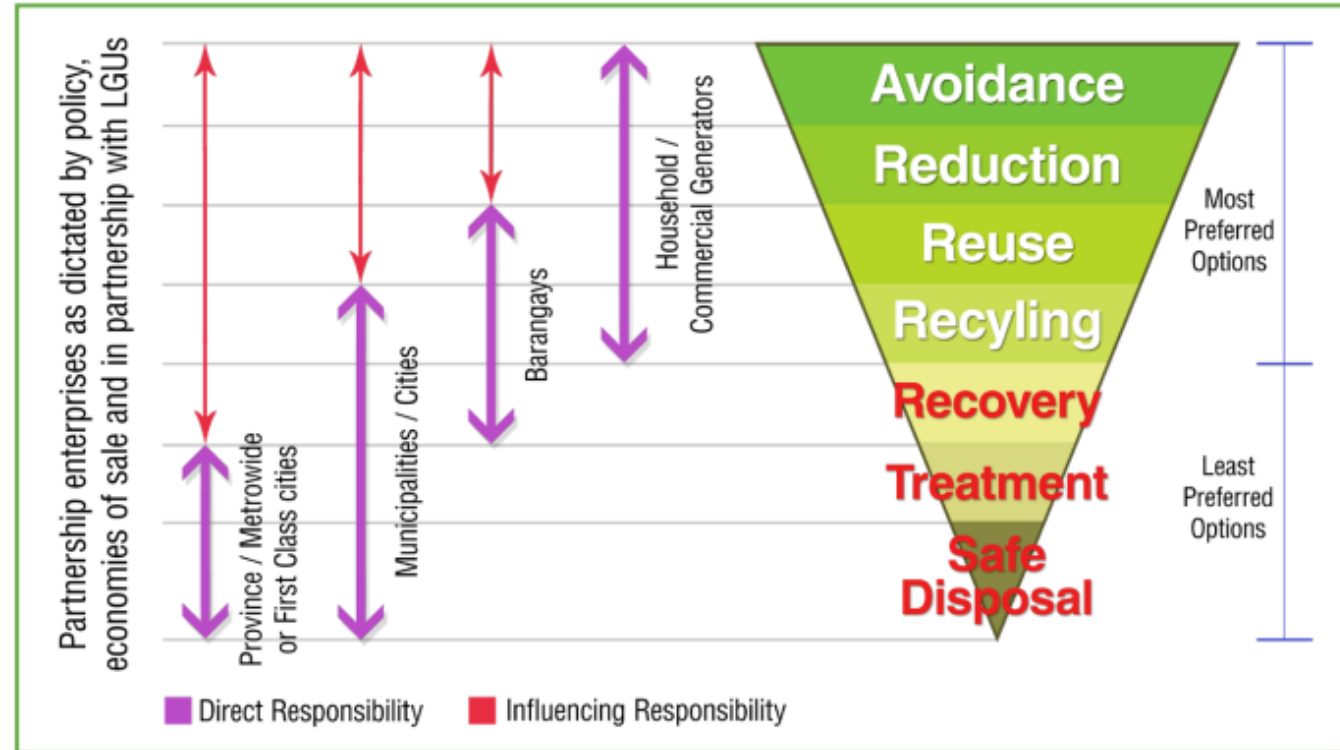
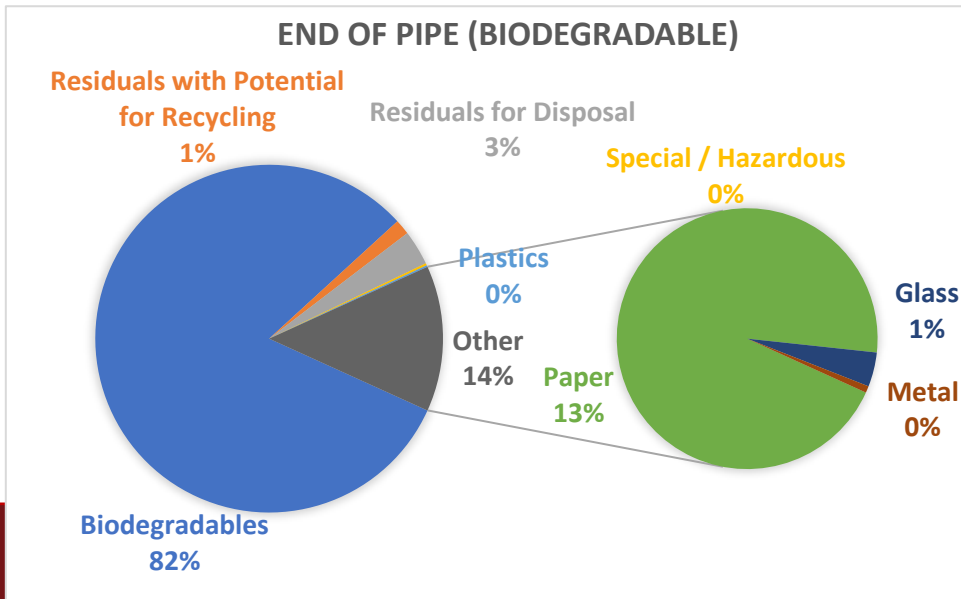
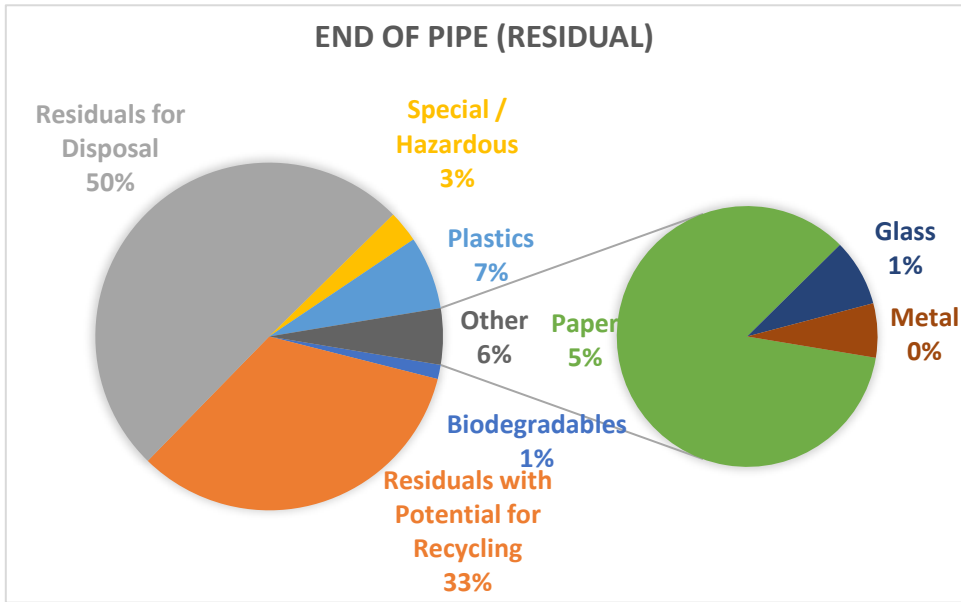


FIG 2. WASTE MANAGEMENT HEIRARCHY NATIONAL FRAMEWORK



Results

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The Awareness and Participation of Batanes Residents is commendable.

- At Source Segregation
 - Residuals Collection **~88% Residuals**
 - Biodegradables Collection **~82% Biodegradable**
- **100%** of the surveyed households segregates.
- **Almost half** of interviewed households have composting areas; **86%** practices reuse.

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Awareness and Participation in Current Solid Waste Management Practices and Programs

Question	Response	Remarks
Do you practice waste segregation?	Pre-Pandemic: 99.71% Yes, 0.29% No Pandemic: 99.62 % Yes, 0.38% No	Confirmed with relatively high compliance on the End of Pipe WACS. Residuals Collection ~88% Residuals Biodegradables Collection ~82% Biodegradable
Do you have your own backyard pit/composting area?	Pre-Pandemic: 47.89 % Yes, 52.11% No Pandemic: 49.00 % Yes, 51.00% No	Consistent with End of Pipe Composition. Sampled wastes during biodegradable collection are primarily composed of yard wastes; There is observed door-to-door collection of food and kitchen wastes as an alternative feed for hog raising.
Do you re-use other materials?	Pre-Pandemic: 86.94% Yes, 13.06% No Pandemic: 86.11% Yes, 13.89% No	Much of the residual wastes disposed of are film plastics. While there is a relatively low percentage of recyclable plastics reaching the disposal site, recyclable plastics remain the top recyclable mixed in residuals.

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Awareness and Participation in Current Solid Waste Management Practices and Programs

Question	Response	Remarks
Awareness of what happens to recyclables	Pre-Pandemic: 44.03% do not know Pandemic: 44.09% do not know	A high percentage of residents are unaware; no known sustainable local market for recyclable wastes.
Are you aware of the ordinances and policies related to waste in your municipality?	94.09% are aware	Notable high awareness percentage.
Implementation of the ordinances and policies are effective?	59.26% Agree	A poorer perception of implementation indicates the need to improve/update waste management strategies.

- During FGDs, the public is also perceived to have concerns about the current SWM system.
- While the overall awareness of the need to construct a new disposal facility may be seen as a positive point, it may also show the urgency to solve the final disposal problem.

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Location: Basco



Three (3) Key Issues on Solid Waste Management in Batanes

- Further improvement on **Appropriate** Solid Waste Management **Facilities**
- The need for **Sustainable Market** for Recyclables
- Need to improve **Institutional Operation**



- Further improvement on **Appropriate** Solid Waste Management **Facilities**
 - **ALL** Municipalities (6 out of 6) in Batanes do not have a Sanitary Landfill.
 - May impact other resources such as groundwater.
 - Material **Recovery** Facilities (MRFs) are mostly utilized as **temporary storage** area.





- The need for **Sustainable Market** for Recyclables
 - Continuous Generation ➤ No Recovery ➤ Accumulation ➤ Improper Storage ➤ Degradation of Quality ➤ Disposal
 - LGUs are **discouraged** to store paper, and corrugated cartons as recyclables; paper products accumulate dust and attract termites when proper storage is unavailable.
 - Given the isolation of Batanes and low volume of recyclables per municipality, market for recyclables is almost non-existent, hence, **clustering and partnership with private companies** is necessary and practical.



The Lack of Sustainable Market for Recyclable





- Need to improve **Institutional Operation**
 - **ALL** Municipalities (6 out of 6) do not have MENRO plantilla positions, rather they have designates on additional assignments coming from personnel with other official appointments (MPOs, MEs, MAs).
 - Batanes is a Protected Area; MENRO's mandate goes beyond Solid Waste Management, let alone Collection.
- The **Provincial Solid Waste Management Board (PSWMB)** needs to have regular meetings.
 - Provincial Solid Waste Management Board meetings are avenues to discuss common issues, best practices, and reach collective agreements/consensus.



Recommendations



General Recommendations

- Convene and maximize the institutionalization of Provincial Solid Waste Management Board (PSWMB).
 - Regular board meetings should be an avenue for different stakeholders not only to raise issues, but also share collaborative programs and best practices.
 - It is important to point out that clusterization of cities/municipalities are among the listed mandate of PSWMB according to RA 9003 and its IRR.
- Financial allocation for staffing of MENRO of all six (6) municipalities.
 - The entirety of Batanes is a proclaimed Protected Area by the virtue of Proclamation No. 335 Series of 1994; the mandate of MENRO goes beyond Solid Waste Management, let alone Collection.





General Recommendations

- Allocation of budget for the improvement of MRF operations and maintenance.
 - Assignment of (additional) staff to sort and pre-process collected recyclables prior to centralized processing.
 - Operational expenses for a Centralized/Clustered MRF for processing and selling of recyclables.
 - Partnership with industries (recyclers, corporations, companies, etc.)
 - Investment in processing machines for reuse and recycling (plastic extruder, plastic molders, biodigesters, etc.)
- Trainings and Retraining of Waste Workers (Managers, Sorters, etc.) if deemed necessary
 - Partnership with Universities and relevant Government Agencies such as DENR-EMB etc.
- Strengthen waste reduction and diversion schemes (composting, MRF recovery etc.) through conduct of Information, Education, and Communication (IEC) Campaign for waste diversion such as:
 - Backyard composting
 - Material Reuse/Recovery





General Recommendations

- Immediate Construction and Operation of Sanitary Landfills.
 - Province may consider putting up a shared disposal facility, provided that concurrence among municipalities is attained. The **PSWMB must play an important role** in achieving consensus among municipalities with regard to shared infrastructure. The board must define the **benefits** of host municipalities and **responsibilities** of all involved parties.
 - Construction and Operation of Sanitary Landfill requires significant **CaPex and OpEx**; the Province and Municipalities must also factor in that the entirety of Batanes is a protected area, hence regulating agencies might require more environmental protection measures that comes with additional costs.
- Consider investing to volume reducing waste treatment technologies(gasification, pyrolysis etc.).
 - Some technologies could significantly reduce volume for up to 80%, hence prolonging disposal site lifespan. By-products are usually inert, easier to manage.
 - Just like Sanitary Landfills, treatment facilities require highly technical personnel for operation and maintenance; Should factor in OpEx not only CaPex.





Tourism Focused Recommendations

- Standardization of briefing material for tourist to contain ethics on cleanliness.
 - Ideally, details regarding penalty/reward system in relation to compliance must be included.
- Consider promoting reusable utensils and packaging for packed meals included in tour packages. Use of 100% biodegradables/compostable packaging is also a good alternative.
 - Preference to reusable utensils could drastically reduce single use plastics. Use of reusable or biodegradable/compostable packaging could reduce residuals.
 - Reusable utensils and/or containers could also serve as souvenir.
- Introduction of custodianship agreements to community, especially, to establishments directly benefiting from tourism.
 - The government must consider that majority of the tourism areas are privately owned/titled lands so arrangements with owners must be clear to avoid conflicts.
 - Prioritization of tourism areas for clean-ups/animal waste collection.



Summary/Key Takeaways



Summary / Key Takeaways

- Batanes community's awareness and willingness to participate is an **asset** that needs to be maximized in solving the solid waste management problems of the province.
- **Systematic solutions** not only addresses systematic problems but also eases the impacts of infrastructure issues.
- **New** ideas are **not** necessarily **better**; Reinforcement of existing solutions has similar potential.





Thank you! 😊

