## Contents



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# ENVIS RP Centre

**NORTH EASTERN HILL UNIVERSITY (NEHU)**
**SHILLONG, MEGHALAYA**

*Newsletter*

# SOLID Waste Management Practices in Meghalaya



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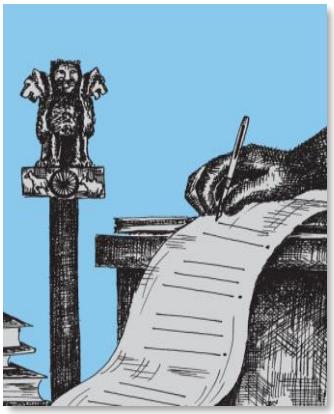
## Editorial

Solid Waste Management (SWM) is the process of collection, treatment and disposing of discarded solid material. Improper handling and disposal of solid waste creates unsanitary conditions that lead to pollution of the environment and outbreak of diseases. The essential objective of SWM is to reduce and eliminate adverse impacts of squander materials on human well-being and to the environment. The Government of India plays a vital role to define approach rules and gives specialized help to different States of the country whenever is needed.

One of the most obvious impacts of rapidly increasing urbanization and economic development can be witnessed in the form of heaps of Municipal Solid Waste (MSW) lying in dumping sites near several cities and towns. SWM is everybody's responsibility. Solid Waste Minimization can be achieved by focusing primarily on 4R's i.e. Reduce, Reuse, Recycle and Recover. These four words can make changes in the country; it will not only reduce the amount of solid waste going to landfill sites but turn waste into a resource and also save our fast depleting natural resources.

*-Dr. Dinesh Bhatia*

## Introduction



Solid waste is any unwanted or discarded solid materials produced by human and animal activities. Solid Wastes include Municipal, Industrial, Hazardous and Agricultural Wastes.

In India, due to uncontrolled growth rate of population, Solid Waste has grown rapidly in the last few decades and has put huge pressure on the maintenance of hygienic conditions in the country. India generates more than 42 million tons of MSW annually. The waste collection in the country is quite low.

In order to improve the collection, segregation, recycling, treatment and disposal of solid waste in an environmentally sound manner, the Union Ministry of Environment, Forests and Climate Change (MoEF&CC) notified the new SWM Rules, 2016 on 8$^{th}$April, 2016 and replaced the earlier Municipal Solid Waste (MSW) (Management and Handling) Rules, 2000.

## Current Waste Management Practices in Meghalaya

In Meghalaya, the State Government under the Ministry of Urban Development (MoUD), Government of India (GoI) and the Asian Development Bank (ADB) in partnership with North Eastern Region Capital Cities Development Investment Programme (NERCCDIP) is implementing a Project with an aim to improve and upgrade the existing services of SWM System viz. collection, transportation, processing and disposal of solid waste through a scientific and more efficient engineered sanitary landfill in Greater Shillong Planning Area (GSPA) i.e. both inside the Shillong Municipal Board (SMB) and outside the SMB. This initiative was launched to promote segregation of waste at the doorstep of residents of the municipal area, to provide long-term solutions to the problems of SWM, to protect the public health including the Staff and Rag Pickers involved in the collection of SWM and to generate revenue.

There are 7 Urban Local Bodies (ULBs) responsible for implementing MSW Rules in the State. These are Shillong Municipal Board (SMB), Shillong Cantonment Board (SCB), Jowai, Tura, Williamnagar, Baghmara and Resubelpara. Out of these, 05 have reported for implementation of MSW Rules (Shillong, Jowai, Tura, Resubelpara and William Nagar) and Authorization was granted to 4 ULBs (Shillong, Jowai, Tura and Williamnagar).

There are 6 dumpsites identified for disposal of MSW namely Shillong, Shillong Cantonment, Jowai, Tura, Williamnagar and Resubelpara. The dumpsite of Shillong has been converted to landfill site commonly known as MARTEN. Monitoring is done at Shillong dumpsite for ambient air, groundwater and leachate quality.

To implement MSW rules in the state, action plan was prepared and reported by 4 municipalities i.e. Shillong, Shillong Cantonment., Williamnagar and Tura.

**Resubelpara:** The MSW generated 7.5 tonnes per day (TPD) is collected in RCC bins. House to house collection is also practiced. No segregation is done at municipal level. No waste processing facility and waste disposed in open dump.

**Shillong:** Municipal Board collected 45 TPD of MSW. House to house collection and segregation of waste with color coded bins and storage facilities were introduced and provided in different localities. Covered transportation is being practiced. Aerobic compost plant installed at Mawiong.

**Tura:** MSW at an average daily quantity of 45 MT are collected. House to house collection is being practiced. Segregation of MSW is being introduced for the purpose of vermin culture processing of biodegradable waste at the facility being installed at the existing disposal site.

**Williamnagar:** There is no proposal for waste processing/disposal facility as quantity is less (10.5 MT). Effort is being made for House-to-house collection. No segregation at municipal level. No covered transportation of wastes. Solid waste collected is dumped in landfill site.

**Jowai:** MSW at an average daily of 48 MT are collected from different localities/wards on the daily basis. House to house collection is being practiced. No segregation of MSW is adopted. Uses of public dustbins are discouraged by Local Durbar of different localities in the town. At present the solid waste collected is dumped in the existing dumping, yard at Myngkjai of Jaintia Hills Autonomous District Council.

***Source:*** *CPCB Report 2015-2016*

## *Authorities & Responsibilities*

**State Pollution Control Board (SPCB)** — Monitors the compliance of the standards regarding ground water, ambient air leachate quality and the compost quality including incineration standards as per Schedule II, III & IV appended to SWM Rules 2016, Issuance of authorization to the municipal authority or an operator of a facility stipulating compliance criteria and standards to prepare and submit to the CPCB an annual report with regard to the implementation of the rules.

**Municipal Authorities** — To ensure that MSW are handled as per SWM Rules, 2016, SPCB for setting up waste processing and disposal facility includes landfills, furnishing annual report and complying with Schedule I, II, III and IV appended to the rules.

**State Government** — The Secretary In-Charge of Department of Urban Development is responsible for the overall enforcement of the provisions of the rules in the metropolitan cities and the District Magistrates/ Deputy Commissioner is responsible for enforcement of the provisions of the rules within the territorial limits of their jurisdiction.

**Central Pollution Control Board (CPCB)** — Co-ordinate with State Boards and Committees with reference to implementation and review of standards and guidelines and compilation of monitoring data and laying down standards on waste processing/ disposal technologies including approval of technology.

**Statistics of MSW generated in the State as per CPCB Report**

| Year | Total no. of towns/cities | Total no. of ULBs | Number of Authorization granted | Total MSW Generated (TPD) | MSW collected (TPD) | MSW treated (TPD) | Land filled (TPD) |
|---|---|---|---|---|---|---|---|
| **2015-2016** | 22 | 7 | 4 | 187 | 156 | 36 | 120 |
| **2014-2015** | 16 | 7 | 3 | 208 | 175 | 55 | 122 |
| **2013-2014** | 16 | 7 | - | 268 | 199 | 98 | N.A. |

## Projections of Solid Waste Generation

If a constant of 400gms per capita per day of MSW is generated with the increased growth of population projected for the SMB areas of the State based on the Arithmetic and Geometric Progression methods and taking out the average of the two, then the MSW generation for the coming years can be projected as under.

| Year | Population Projection | Waste Generation gms /day | MSW generated Metric /Tonnes (MT) |
|---|---|---|---|
| 2011 | 145532 | 145532x400 = 58212800 | 58.22 |
| 2026 | 165278 | 165278x400 = 66111200 | 66.11 |
| 2041 | 186015 | 186015x400 = 74406000 | 74.40 |

*Source: State Investment Planning Management and Implementation Unit (SIPMIU), Report 2011*

## Field Visit/ Campaign: Shillong City

ENVIS RP Centre, NEHU, Shillong held an awareness campaign in few places of Shillong, Meghalaya i.e. **Residential Areas, Commercial Areas, Health Care Centre and the Disposal site at Marten.** The aim of this awareness campaign was to bring awareness to the community by informing them about the importance of waste segregation and its safe disposal. The awareness programme also addressed the long-term effects on the human health and surrounding, and ensures the right to public health, efficient and quality basic services to all citizens, to provide a congenial environment.

*ENVIS Team*

## *SMB: A Brief Review*

**Introduction**

MSW in general is a mixture of residential, commercial, construction, bio-medical and hotel wastes.

In Shillong, solid waste is managed by various authorities namely SMB within the municipal area, Shillong Cantonment Board (SCB) in cantonment, the Dorbars outside the municipal area.

The Shillong Municipal area is divided into 5 zones comprising of 27 wards. The responsibility of SMB is to manage the solid wastes within the municipal boundaries of Shillong (10.36 sq. km). Population as per 2011 census is 1,42,530 in SMB. In the agglomeration it is about 4.5 lacs for the town.

As per the Solid Waste Management Rule, 2016, waste should be segregated into two categories biodegradable and non-biodegradable waste. In order to channelize the waste to wealth, segregation of waste is mandatory for the purpose of reduce, reuse and recycle.

Vehicles with various capacities have been provided for collection and transportation of waste within the municipal area.

600 colour coded bins have been placed on the roadside at convenient locations of Shillong.

During the awareness drive, the following things were observed by the ENVIS team.

### *Waste Collected and Transported from the Residential Areas*

In Shillong, under the municipal area, two 25 litres color-coded household waste bins are distributed to each households of each community for segregation and storage of waste. The distribution of green (for storage of Bio-degradable waste) and blue (for storage non-biodegradable wastes) dustbins meant for segregating biodegradable and non-biodegradable waste under the ADB and MoUD funded by NERCCDIP.

Segregation at source was started on the 5th June, 2015 in the entire municipality of Shillong.

The SMB ensures waste is loaded into two different vehicles in the respective localities where the dustbins have been distributed. The household bins have been distributed to 31,674 households for segregation and storage at source. The collection system is divided in 18 routes and two vehicles ply through each route for collection of the segregated waste. About 72% residential households in the city are segregating at source. Efforts are on to bring about full compliance before 2018.

## *Commercial Waste of the City under Municipal area*

For the commercial areas, wastes from different shops are dumped in the locality waste bins without any segregation. All the wastes generated by individual shops/outlets during the day, were stored in common dumpsters/bins created for the purpose and then the wastes were collected by municipality trucks early next day and transported directly to the landfill site for disposal.


*Transfer of Solid Wastes from Primary Garbage Collection Vehicle to the Garbage Compactor vehicle*

## *Solid Bio-Medical Waste (SBMW)*

The solid bio-medical waste which is generated at hospitals and other health facilities, blood banks, laboratories and research centres, Nursing homes, Mortuary and autopsy centres is being collected by a van designed for this purpose and this waste was used to be disposed-off at incinerator, installed at Marten. It was observed that the incinerator installed at the Marten was lying idle for the past few months. The SBMW are being disposed and burnt in the open at the dumping site (Marten) which may pose environmental challenge in near future.


*SBMW are being disposed and burnt in the open at Marten*

## *Marten, Disposal Site*

The disposal site is located within the existing landfill site at Municipal Trenching Ground at Marten, Mawiong, Shillong 8km away from the city adjacent toNH-40 (the Shillong Guwahati Road). This dumping site has been operational and used for disposal purposes since 1938. The site already includes an operating compost facility and was being well maintained.

**Management and Disposal Method:** Swachh Bharat Mission has funded for setting up a composting unit to process segregated bio-degradable waste into compost during the interim period until the completion of the 170TPD Compost Plant in 2019 which is under construction. Two phases were developed for a Sanitary landfill wherein one phase was completed and ready to be used. Leachate treatment tank has been designed at the same location where the existing

discharge point of the landfill is situated. Retaining walls are also constructed to support the cells, laying of geo-membrane over geo-synthetic clay liners to avoid contamination of ground water.

*Mini Composting Unit of SMB which is operated and Maintain by a Self-Help Group (SHG) of Former Rag-pickers at the Disposal Site.*

*Completed Phase I Sanitary Landfill at Marten, Shillong.*

*Phase II Sanitary Landfill under Construction at Marten, Shillong.*




*Garbage Compactor Vehicle*

*Primary Garbage Collection Vehicle*

Problems observed during the visit:

- Due to un-hygienic practices during waste handling, the health of the workers and rag pickers involved was getting affected
- Due to the condition at the current disposal site at Marten, the area nearby was deteriorating day by the day as foul smell and smoke are emitted which affects the overall public health at large including workers and rag pickers. Open dumping still being practice at Marten which contributes to several health problems
- Incinerator installed at Marten is non-functional. Incineration can greatly reduce the amount of MSW. However, incinerator ash may contain hazardous materials

Despite several problems, SMB has taken number of action plans and tasks in regards to the decisions of the supervisory committee of the State on waste management and maintenance of cleanliness and the directions therein such as Grading of Localities, Declaration of Localities as ODF, Loudspeakers on vehicles, No littering in public places, Cleaning Drive, Waste Management Patrol Awareness Programmes, etc.

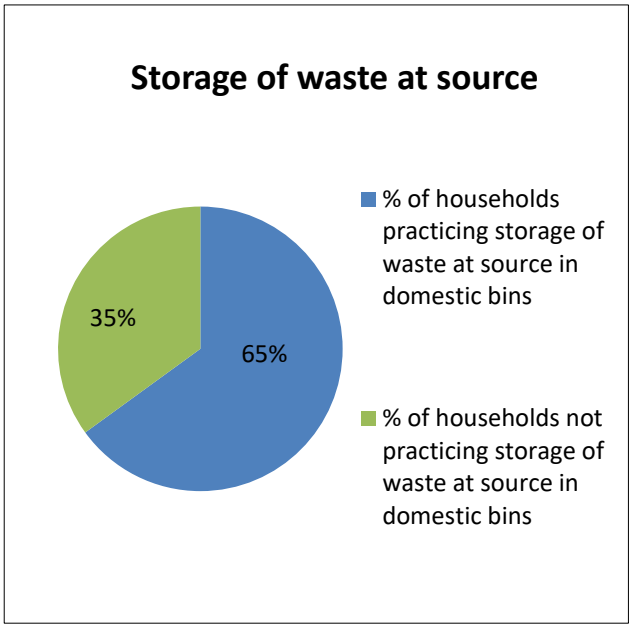
*Foul smell and smoke emitted affected the workers and rag pickers*

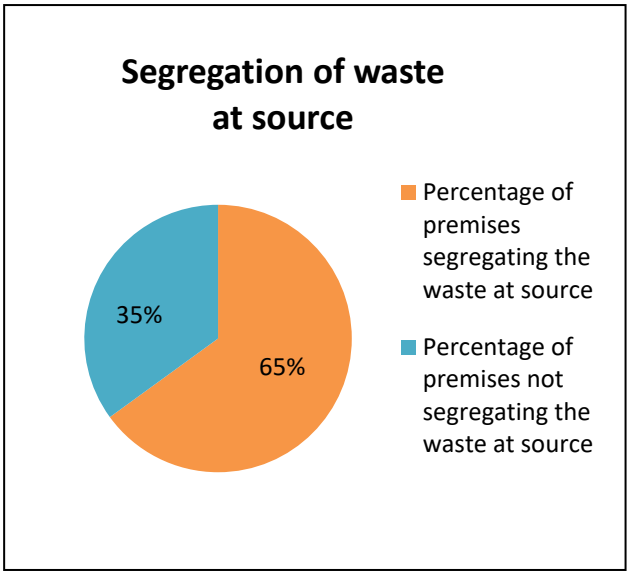
*Open burning at Marten, Mawiong.*

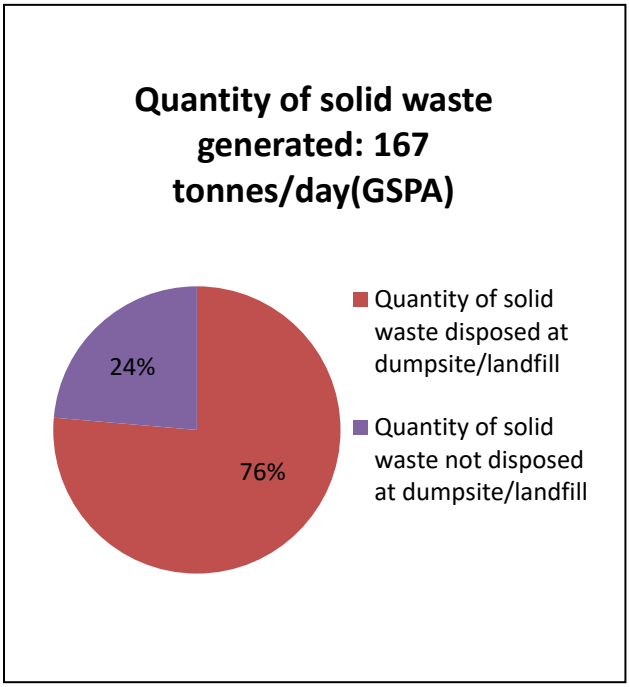
**SMB Report, 2017**

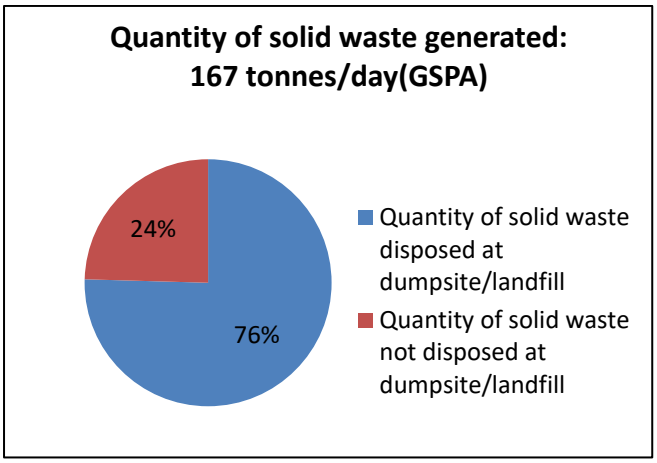
| Name of the City/Town and State | Shillong, Meghalaya |
|---|---|
| Population | 1,43,229 (SMB, 2011 Census)<br>4,11,995(GSPA,2011 Census) |
| Area in sq. kilometers | 10.36 sq. kms |
| Number of households in the city/town | 31,674 |
| Number of election/administrative wards in the city//town | 27 |
| Per capita waste collected per year | 373/gm/day |
| **Door to Door collection of solid waste**<br>Whether door to door(D2D) collection is being done in the city/town | Yes |
| If Yes, Number of wards covered in D2D collection of waste | 27 |
| No. of households covered | 36,000 (approx) |
| **Sweeping of streets**<br>Length of roads, streets, lanes, bye-lens in the city that need to be cleaned | 185.61 Kms |
| **Sweeping of streets**<br>Frequency of street sweepings and percentage of population covered | Daily<br>100% |
| **Tools used:**<br>a) Manual sweeping<br>b) Mechanical sweeping<br>c) Whether long handle broom used by sanitation workers | a) 100%<br>b) 0%<br>c) Yes |

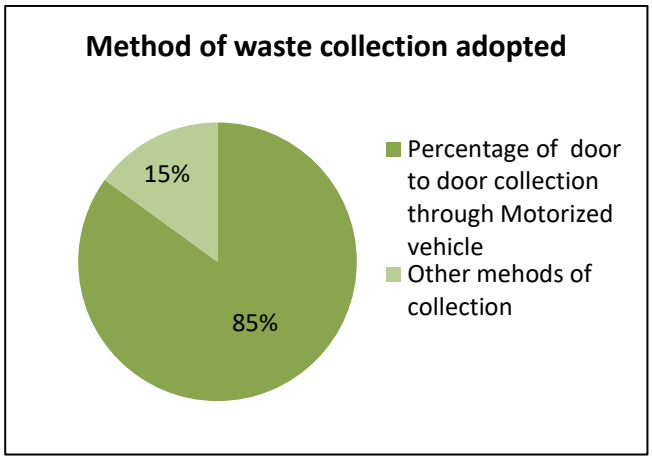
| | |
|---|---|
| **Waste transportation per day**<br>a) Quantity of waste transported each day<br>b) Percentage of total waste transported daily | a) 126 tpd<br>b) 76 % |
| No. of dumpsites available with the local body | 1 |
| No. of sanitary landfill sites available with the local body | 1 which is still under construction phase |
| Area of each such site available for waste disposal sites | 4.706 hectares |
| Distance from the nearest habitation | 1 |
| Distance from state/national highway | 0.02 kms |
| Distance from airport | 27 kms |
| Whether it falls in flood prone area | No |
| Whether landfill site is fenced | Yes |
| Whether landfill facility is available onsite | Yes |
| Whether Weigh bridge facility available | No |
| Vehicles and equipment used at landfill(specify) | Bull dozers, compacters available |
| **Give details of:**<br>Local body's own man power deployed for collection including street sweeping, secondary storage, transportation, processing & disposal waste | The SMB employs 235 sweepers, 33 mazdoors, 27 drivers and 67 lorry attendants for the purpose of collection, transportation and disposal of solid wastes including street sweeping and cleaning of roadsides and drains. |



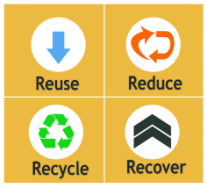



## *Conclusion*

The Management of Solid Waste is controlled by collection means of transport. About 72% of household are attaining benefit through collection means of transport and around 12% waste generated are simply burnt by them. Over 2% of wastes are thrown in the open space continuously. Only 5% is being practiced through door to door collection of waste. The NERCCDIP project has been taken in the state for the overall improvement of Solid Waste Management to meet the existing gaps.

The existing landfill sites may get exhausted in the coming years in handling the increasing amount of garbage being generated by the growing population. It can be recommended that since Marten has been serving the state for many years, there is an urgent need for an alternative landfill site which should be setup far away from the water bodies, public places etc. in order to protect the Environment as well as the public health. Public participation is important to effectively curb littering. The Municipal authorities should maintain the storage facilities to avoid unhygienic and unsanitary conditions. The Government has to formulate more stringent rules and regulations in different places to discourage people from throwing garbage or any other waste. The individual level capacity and awareness towards cleanliness should be developed well. Working together on this effort can significantly minimize the waste that goes into landfills. Changing our habits and managing our waste properly to keep a healthy, safe and livable environment for our next generation can be the greatest service the present population can do.




To conclude the **4R's** about waste management are much important for the public. It is necessary to notify the city-dwellers that each must examine their own wastes as well as the potential on how to Reduce, Reuse, Recycle and Recover the waste in order to protect and bring about a healthy and clean environment.

**News**

### *For the first time, roads were built with shredded waste plastic technology in Nongstoin Village, Meghalaya*

Plastics are utilized on every day premises all through the world. The word plastic could be a common
term that's utilized for numerous materials of synthetic or semi-synthetic materials. Plastic can cause great harm to our environment and for many years the brains of our planet earth have tried to come up with a solution to save the environment.
However, recently some intelligent minds have come up with amazing ideas to recycle and reuse plastic waste materials.
In Meghalaya, Nongkynjang village in Nongstoin, West Khasi Hills have taken the initiative to recycle waste plastics and use these waste materials for the construction of roads. They built with shredded squander plastic technology in convergence with MGNREGA and Megha-LAMP.

*Source: thenortheasttoday.com*

## *Waste- Pickers to become compost suppliers: Known as "Merry Maidens of Marten", Shillong*

***Shillong women group makes money out of dump yard waste***

On November 2014, the NERCCDIP, SIPMIU, urban affairs department and SMB developed a plan to rehabilitate the women and facilitated the formation of the lainehskhem Self-Help Group (SHG). This women group collected all discarded waste items which are of economic value from the landfill, Marten, and sold them to scrap dealers for a price.

The work is done regularly with their uncovered hands with small or nothing to secure them from inescapable health hazards. Some ladies have come up the difficult way who worked energetically for hours in a day to support themselves and their families.

They are content and grateful inspite of the small amount they earned through this tedious and unsafe task.

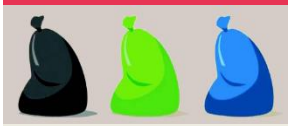
The group has put up its own rules and regulations to gather useful material from waste and is built upon a strong team spirit.

They are now known as **"Merry Maidens of Marten"** for their sense of joy, harmony and team work.

They also started a project to compost biodegradable wastes. The compost manure was found suitable for plants after testing confirmed by the Department of Agriculture Laboratory and reconfirmed by the ICAR laboratory. People are beginning to recognize the work of this group and they are getting in touch with them for compost requirements.

*Source: wastenarratives.com*

### DID YOU KNOW???



**More than 95% of Food Waste**

**ends up in LANDFILLS.**

**Much of this and other waste materials in the LANDFILL can actually be COMPOSTED or RECYCLED.**

## *Meghalaya: From 'Trash To Cash'- Community Building Through Recycling*

On April 19, 2018: The importance of a sustainable living is slowly but steadily gaining momentum in the present decade and many states in India are increasingly adopting means of a sustainable lifestyle. In view of this, the Meghalaya Research and Development Society (MegRDS) conducted a seminar and training on "Trash-to-cash: Building Community through Recycling" at Shella, East Khasi Hills. The programme was sponsored by the Government of Meghalaya under the Voluntary Action Fund (VAF), 2016-17, East Khasi through the District Planning Office, East Khasi Hills District. Akmenroy Nongrum and Elkin Ryniaw from Bethany Society, Shillong collaborated with MegRDS for the programme. The programme attended by youths and womenfolk was aimed at introducing the possibility of generating employment through recycling and to encourage the practice of the 3 Rs .Reduce, Reuse, Recycle at the household level. The importance of a comprehensive and inclusive waste management concept was emphasized. The methods of composting were demonstrated by Akmenroy and Elkin, who also detailed out the marketability of the organic compost. MegRDS demonstrated recycling of plastic bottles into usable ottoman; table and displayed products made from plastic bags and discarded glass bottles. This is an ongoing effort of MegRDS to direct focus on a planned solid waste management in the fast urbanizing Meghalaya, one that benefits environment as well as provides means of livelihood to the ever growing number of unemployed youths in the state. If one knows how to use things, they must also know how to dispose them or recycle them in the right manner is their motto.

*Source: The Northeast Today*

### MAKE A DIFFERENCE!

REDUCE the amount of waste you create

REUSE materials when possible

RECYCLE whenever possible

**RETHINK** the materials you use and those you throw away

If we all take small steps every day to reduce the amount of waste we produce, we can help protect our environment for the generations to come.

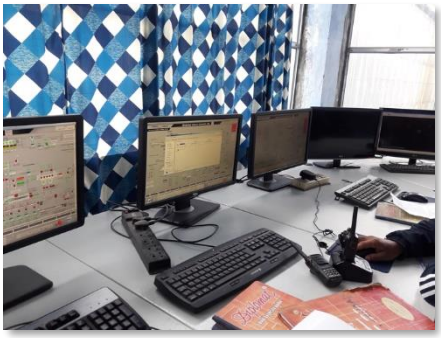
# Activities undertaken by ENVIS RP Centre, NEHU, Shillong during the months of March 2018 – May 2018

## Seminar on Contemporary Environment Issues and Concerns in collaboration with NSS NEHU, Shillong


## Awareness programme on Solid BMW at Community Health Centre (CHC), Mawiong, Meghalaya

## Awareness Programme in Mawmluh Cherra-Cement Limited, Cherrapunjee, Meghalaya









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