



SEMINAR ON
PLASTIC WASTE FOR ROADS,
BUILDINGS AND CONSTRUCTION

13th December 2019

PROGRAMME FOR THE DAY

- **Welcome and purpose of seminar**
Mr. S. B. Dangayach,
Founder Trustee, Innovative Thought Forum and
Chairman, Plastindia Environment Committee (Coordinator)
- **Importance of plastic waste management for success of Swachh Bharat Abhiyaan**
Mr. D. P. Joshi, IAS (Retd); Ex Spl Commr, SBM
- **Plastic waste for infrastructure**
Mr. Dhimant Vyas, Chief Engineer and Addl Secy, WRD, GoG
- **Commercial viability of plastic waste in bituminous polymer roads**
Dr. Rasik Kadam, Hindura Infracon
- **Plastic waste for roads and energy**
Dr. Medha Tadpatrikar, Rudra Environmental Solutions
- **Plastic waste for roads and other applications**
Mr. K K Ahmed Khan, K K Plastic waste management (video conferencing)
- **Plastic waste management – Kerala scenario**
Dr. Reena Anil Kumar, Ram Biologicals
- **Exciting opportunities for plastic waste based WPC in buildings and architecture**
Mr. Hardik Panchal, WPC Centre
- **Mixed plastic waste -building products and technology**
Mr. Anup Patel, Doll Plast
- **Plastic waste based tiles, blocks and boards**
Mr. Aditya Shukla, Saltech
- **Dhoraji Model -Best way for plastic waste business**
Mr. Dalsukhbhai Vagadia, Dhoraji cluster
- **Efficient logistics for success of waste management -WOW model**
Mr. Vijay Kothari, WOW (wealth out of waste)
- **Testing, evaluation and standardisation of building products**
Dr. B Singh, Chief Scientist (Retd) CBRI
- **Way forward**
Mr. S B Dangayach
Founder Trustee, Innovative Thought Forum and Chairman, Plastindia Environment Committee

Summary of presentations and discussions

Mr. S.B.Dangayach:

Founder Trustee of Innovative Thought Forum

Welcome and purpose of seminar

- Swachh Bharat Mission (SBM) succeeded in making India Open Defecation Free (ODF) in first phase
- Aims to work on waste management, sanitation and clean air in new SBM+ phase
- Ahmedabad Management Association (AMA) has created a special vertical for thinking and action on waste and water in collaboration with Innovative Thought Forum (ITF)
- Under this programme, ITF-an India centric think + act tank - to conduct seminars cum workshops in the next year
- ITF to also coordinate all follow up actions related to these programmes
- 4 such programmes on waste and 2 on water to be arranged in next one year to bring together solution providers, solution seekers, government officials, specifiers, entrepreneurs, financiers and consultants
- Focus on immediate action on piloting or spreading the solutions
- Plastics waste a prominent problem all over the country needing urgent attention from all stakeholders
- Following dictum of “waste being resource at wrong place” exploration of successful examples of use of plastic waste in roads, buildings and construction to be discussed
- With many successes in India and abroad, entrepreneurial opportunities to be highlighted
- With huge untapped opportunities in waste business management, several more workshops to follow in Ahmedabad and later in other parts to boost economy as well as achieve goals of Swachh Bharat Mission

Mr. D. P. Joshi;

IAS (Retd); Ex Spl Commr,

SBM: Importance of plastic waste management success of Swachh Bharat Abhiyaan

- Swachh Bharat Mission (SBM) a nationwide campaign started in 2014 to clean up streets, roads, infrastructure etc. of all the areas of the country and to provide sanitation facilities all over the country
- Aimed at making India Open Defecation Free (ODF) by 2nd Oct 2019 as the first part of the mission
- In SBM+ (second part of SBM) focus on the waste management
- Plastic waste a major problem. Many countries have banned plastic bags
- Encouragement to conversion of urban waste into energy or waste into compost

- Instructions from Gujarat government collect plastic waste at designated places for transportation to cement plants, recyclers and road authorities
- Need to look at proper management of all types of solid and liquid waste management
- SBM a government programme but as a mission by the people, of the people and for the people

Mr. Dhimat. B. Vyas;

Chief Engineer and Addl Secy, WRD, GOG: Plastic waste for infrastructure

- Plastic is important group of materials used in the modern world. As being non-biodegradable use to be reduced or recycling to be promoted
- Worldwide only 10% quantity recycled. 90% unused or untreated that pollutes the environment
- Significant use of waste plastic like waste water pipes, storage tanks of waste water or septic tanks, construction of filling materials, canal lining, pond lining and geosynthetics or reinforcement in structures
- Government incentives for replacement or procurement of plastic like
 - Kerala govt. pays Rs. 20 per kg for plastic waste of designated quality
 - Sugar against plastics waste in defined proportion in Anand municipal area

Dr. Rasik Kadam;

Hindura Infracon: Commercial viability of plastic waste in bituminous polymer roads

- Hindura group proudly associated with Dr. R. Vasudevan (plastic man of India).
- Use of plastic waste in bitumen roads practically feasible
- Expertise of Hindura in 'dry technology'
- Have constructed 25000 kms of actual roads in different parts of India
- Saving in road costs with use of plastic waste
- Saving achieved while maintaining parameters like Marshal stability, flow, VMA, Los Angles abrasion etc.
- Willing to take up trials on mutually agreed terms anywhere in Gujarat or India

Dr. Medha Tadpatrikar;

Rudra Environmental Solution: Plastic waste for roads and energy

- Tie up of Rudra Environmental Solutions with Keshav Sita memorial foundation trust for creating awareness of segregation at source as well as collection of plastic waste from different area of Pune
- At present collection from 12000 households, hotels or businesses

- Integrated programme conducted including meetings, presentations, discussions etc. in target groups
- Also able to give the “Thermo Catalytic Depolymerisation” process solution to convert mixed plastic waste into plastic oil. Several successful plants working in India
- Cost effective process and technology with low payback period for helping entrepreneurs.

K. K. Ahemad Khan;

Plastic waste management: Plastic waste for roads and other application

- Started operations to mix plastic waste with bitumen in 1996
- Technology approved by Central Road Research Institutes(CRRI) to place the company as the pioneer in the line of plastic waste based roads
- Have constructed 3500 kms of roads in several parts of India with consumptions of 15000 tonnes
- End to end solution from collection, sorting, cleaning, shredding and blending. The final product in the form of flakes marketed under the brand name of K.K. Polyblend
- The above blend mixed in ratio of 8:100 of blend and bitumen in hotmix plant. Material pumped by special machinery for spraying on aggregate at 160 °C
- Plastic gets coated to aggregate and then over coated with bitumen for improving strength
- Mix needs to be laid at minimum 100 °C, while asphaltting roads for better results
- Benefits
 - Garbage free from plastic waste can be processed and managed easily
 - Better quality roads
 - Durability of such roads found to be at least twice more than only bitumen roads

Dr.Reena Anil Kumar;

Ram Biologicals: Plastic waste management- Kerala scenario

- Ram biologicals is focused on food waste management with food crushers, organic waste converters, biogas plants, community compost units, vermi composting aerobic bins etc.
- In non-biological waste management programme, Ram Biologicals has supplied and commissioned more than 50 plastic shredding, baling and reprocessing machines for various local bodies of Kerala
- Engaged in R & D of solid and liquid waste management technologies
- Kerala pioneer in waste management in India
- Kerala started initiative like Suchitwa Mission, Clean Kerala Mission and Haritha Karmasena with the support of self-help groups and local bodies

- Kerala government, first to put recyclable plastic waste to good use
- Kudumbashree a self-help initiative for door-to-door collection of plastic waste
- Haritha KarmaSena deployed to collect non-biodegradable waste from houses and establishments for shredding units
- Shredded plastic sold by Panchayat to the PWD at rate of Rs 20 per kg or as decided by government
- Many roads now made in villages with plastic waste

Mr. Hardik Panchal;

WPC Centre: existing opportunities for plastic waste based WPC in building and architecture

- Hardy Smith Private Limited is the leading Maker of extensive range of WPC Doors, windows, Boards, PVC Marble Laminates, WPC Pergolas, Modular Furniture, Cladding Panel etc.
- WPC recyclable with potential to save precious natural resources
- Overall technical advantages
 - 100% environment friendly
 - Technically clean and green product for new generation
 - Excellent water and moisture resistance
 - Termite and Borer resistance
 - High screw holding strength
 - Good machinability and workability
 - Saving of time
 - Excellent mechanical properties
- Product range
 - Doors
 - Windows
 - Panels
 - Decking
 - Partitions
 - Wall tiles
 - Kitchen cabinets
 - Boards
 - Laminates

- Many products made with plastic waste based WPC for use as pallets, pergolas, road, furniture, decking, balconies etc.
- Now gaining acceptance of architects and designers all over the country.

Anup Patel;

Doll Plast: mixed plastic waste-building products and technology

- Initially started as a plastic machinery manufacturer
- Now offering products made with plastic waste
- Have supplied machines in 25 countries and have won many awards
- Able to offer machines for all types of single or mixed plastic wastes
- Able to even convert mixed waste into products like pallets, door frames, window frames on job work basis
- Have helped many local bodies to make benches or road, furniture from mixed plastic waste available with them
- Now also helping in fabrication of several furniture items

Aditya Shukla;

Saltech Design Labs Private Limited: Plastic waste based tiles, blocks and boards

- First generation entrepreneur. Started operation under name “Recycler India”
- Focused on transforming plastic waste into valuable products
- Recently developed a process for mixing variety of plastic waste with industrial waste like fly ash, quarry dust, ceramic waste, glass waste, construction & demolition waste.
- Above composite material moulded or cast into products to replace cement concrete based products like paver blocks, tiles, hollow bricks and curb stones
- Composite material of the company found superior to cement concrete based product in laboratories and actual use
- Have also developed special machines for such conversion
- Product approved recently by NABL accredited laboratories and CIPET, Ahmedabad
- Working on roof shingles, floor and wall tiles and slabs
- Already installed products in several prestigious places

Dalsukhbhai Vagadiya;

Dhoraji cluster: Dhoraji model- best way for plastic waste business.

- Dhoraji and Upleta active in plastic waste processing for around 40 years
- Plastic waste collected by rag pickers and other agencies all over the country brought to Dhoraji

in baled form

- Plastic waste from other sources also procured in organised manner and brought for processing at Dhoraji
- End products sold all over the country as well as exported in many parts of the world
- Range of cost effective technologies and machinery to make big array of products including agricultural pipes, bio medical waste bags, garbage bags, packaging strips, etc.
- Willing to offer know how for Dhoraji model all over the country for increasing processing of plastic waste and employment creation

Vijay Kothari,

WOW (Wealth out of Waste): Efficient logistics for success of waste management- WOW model

- Working in area of collection of dry waste for several decades
- Introduction of a transparent system by the company using technology for door to door collection of all wastes of dry waste incl. paper, plastics, metal, glass, wood, e-waste, rusty vehicles etc.
- Handsome payment in transparent way against collected wastes
- Proper pricing, billing and payment mechanism
- Open to offer franchise in different parts of India

Dr. B. Singh;

Chief Scientist (Retd) CBRI: Testing, Evaluation and standardisation of building products

- Lot of importance of polymer based materials in building and contraction industry
- Several viable substitutes now widespread in the country while replacing metal, wood, concrete etc.
- Improvement in formulation and technologies to make polymers/ plastic based materials more reliable and durable
- Plenty of support from Central Building Research Institute (CBRI) and others for evaluating quality standards and installation/ usage instruction to specifiers designers and users
- Partial list of polymer based products as developed in CBRI and other institute of India
 - Composite door shutters
 - WPC based profiles and frames
 - Bituminous based waterproofing & sealing compounds
 - Natural fibre based laminates/ panels/ sheets
 - Pine needle composites boards
 - Geo-polymer based bricks
 - Processed fly ash

- Hydrated flexible waterproofing membrane/ coating
- Bitumen foam
- Hybrid polymer network core for sandwich composites
- Plastic tanks and pipes
- Doors and windows
- Prefabricated panels and shuttering plates
- Natural fibre composite products
- Waterproofing and sealing compounds
- Polymer latexes/fibres
- Polymer modified bitumen
- Timber and timber substitutes
- Guidance and help available from designated institute for blending of plastic waste while maintaining desired quality parameters and performance standards

Parag Solanki;

Eco Pole Innovation: founder of Eco Pole Innovation

- Based in Ahmedabad with ability to offer composite products through “compatibilization” of plastic wastes of different type of building wastes
- Also able to offer technological solution to the hazardous wastes after suitable treatment in outdoor building products like paver blocks, tiles etc.

Action to be taken by ITF

- Identify 10 kms of roads in urban and rural local areas
- Identify 2 kms of roads in private domain
- Coordinate plastic roads by bringing together solution providers with the proposal users
- Work with waste suppliers to ensure availability of right materials
- Work with mixer makers for right equipments
- Connect plastic waste building and road furniture product makers with CBRI and BMTPC for relevant tests relevant tests
- Help promotions of the above products in private and government sectors
- Help spread of technology in other states
- Helping to build plastic waste check dam in a few villages 3
- Locating a source for waste plastic fibre for cement mixing



Part 1 : <https://youtu.be/M8IZIIIYOIs>

Part 2 : https://youtu.be/84srUWn-m_E