

SCIP Plastics Constellation Analysis Workshop:

The first SCIP Plastics Constellation Analysis workshop on “Future Visions for Desirable and Sustainable Plastic Waste Management in Khulna” was conducted on 01 October 2023. The ISOE team and the AWC team jointly conducted the workshop. From the ISOE, Dr.-Ing. Martin Zimmermann, Senior Expert; Jonathan Pillen, Research Scientist actively, and from the AWC Sheikh Enjamamul Haque, Head of Awareness Centre; Ankon Singh, Secretary (Awareness Centre); Fahima Akter, Environmental Education Assistant/ Trainer, and S. M. Nahin Rahaman, Communication Designer conducted the workshop. The day long workshop commenced at 09:00 am and ended at 05:00 pm.

The SCIP team members, including the Professors and the KCC Officials, were the participants of the workshop. The participants are listed below:

SI No.	Name	Designation
01.	Prof. Dr. Quazi Hamidul Bari	Head of Waste Lab
02.	Md. Anisur Rahman	Chief Waste Management Officer, KCC
03.	Nurunnahar Anne	Assistant Conservancy Officer, KCC
04.	Subrata Paul	Assistant Director (Board of Directors)
05.	Noor Alam	Expert of Waste Lab
06.	S. M. Rafew	Project Supervisor
07.	Pangkaj Kumar Mahanta	Research Associate
08.	Jobaer Ahmed Saju	Research Associate
09.	Niloy Das	Research Associate
10.	Salahuddin Setu	Project Engineer
11.	Ankon Baral	Research Assistant
12.	Tasnim Tarannum Jarin	Research Assistant
13.	Nishat Tasnim Nisha	Research Assistant
14.	Saptarshi Mondal	Research Assistant
15.	Syeda Tasnova Imam	Research Assistant
16.	Meherab Hossain	Research Assistant
17.	Mir Mohammad Noman Farsi	Research Assistant
18.	A S M Rokibuzzaman	Research Assistant

Dr. Martin opened the workshop with a warm welcome and an introduction to its objectives. He then invited Jonathan to present an overview of the Constellation Analysis method.

Following the presentation, participants were divided into four groups, each led by a moderator. The moderators included Dr. Martin, Jonathan, Enjamamul, and Nahin. Fahima and Ankon



Dr. Martin delivering the welcoming speech

assisted Dr. Martin and Jonathan in their respective sessions. The participants actively shared their ideas and experiences in the workshop.

The workshop comprised two main sessions:

1. World café morning session “Status Quo” on status quo sub-constellations (focus: hindering factors)
2. World café afternoon session “Sustainable Future” on sustainable sub-constellations (focus: facilitating factors)



Jonathan Presenting an overview of the workshop method

The workshop mainly focused on the following topics central to plastic waste management in Khulna:

- Public Awareness
- Informal Sector
- Operational Efficiency & Infrastructure
- Governance & Coordination

The primary goal of the workshop was to gather insights through actor mapping and material flow analysis to understand the existing challenges and envision a sustainable and desirable future for plastic waste management in Khulna. A brief summary of the workshop findings on two of the key topics are given below:

Public Awareness- Problem Constellation

Actors:

1. Inactive communo religious Leaders
2. Inactive social Media/ Content creator
3. Unaware Local Authority
4. Unaware household
5. Knowledge gap of dwelllers
6. Unaware of the consequences
7. Unaware People
8. KCC
9. Unaware Local Authority
10. Inactive Local govt
11. Inactive National Media
12. Inactive Youth Group

13. Inactive Community
14. Inactive NCTB
15. Unaware School Kids
16. Alienated Recycling Industry
17. Inactive Youth Group
18. No authority to determine AW policy
19. Knowledge Gap in NGO
20. Lack of AWC
21. Less committed campaign personnel
22. Unaware media figure/ influencer

Environmental/Natural Elements:

1. Fresh Air
2. Fresh water Environment
3. Fresh Soil Environment

Symbolic Elements:

1. Social Mimicry
2. Absence of Knowledge in personal hygiene
3. Design Lacking in waste equipments
4. Reward based campaigns
5. Failed Campaigns
6. Absence of Cohesive Law
7. Wrong sampling of TG
8. Out of date method of info disclosure and media
9. Absence of ward based aw. policy
10. Lack of Women engagement and activation
11. Misuse of Political Power to divert focus
12. Lack of financial transparency
13. Lack of functionality in Post-Awareness treatment of Waste
14. Absence of Databased Representation in Com Design

15. Lack of Waste Conversion technology
16. Lack of implementable product/ less Waste footprint
17. Lack of AWC professionals
18. Lack of central waste collection System
19. Absence of family Practice in WM
20. Lack of Law enforcement
21. No national Curriculam inclusion
22. Lack of Rewarding System
23. Lack of WM knowledge
24. Lack of community Survellience
25. Knowledge gap in Accessibility
26. Policy Gap to establsih Circular economy
27. Lack of Knowledge Circular economy
28. Lack of Social Norms

Technical/Material Element:

1. Lack of Post-Awareness Readiness in KCC
2. Non-source separated Dumping station
3. Lack of public Signage
4. Lack of availability of Household equipment
5. Fund for public AW
6. Camp. Material, Appearance, Access
7. Lack of fund for Awareness campaign NGO
8. Good budget commercial
9. Lack of technical Compatibility
10. Lack of infrastructural visibility
11. Design Lacking in waste equipment.

Problems/Other Comments:

1. Waste Separation
2. Less efficient/ frequent campaigns

Public Awareness- Future Visions

Actors:

23. Waste monitoring tech startups
24. LGED
25. Tech Giants (Data Mining)
26. Collaborative & Transparent Authority
27. Super Functional Conservancy Department of KCC
28. Waste Collectors (Campaigning)
29. Shops (Alternative Material Showcasing)*****
30. Super Active Social Influencers
31. Activated Youth
32. Community Volunteers
33. Aware Individual
34. Activated Community Leaders (Religious)
35. Department of Environment (DoE)
36. Collaborative NGOs
37. Independent Research Groups
38. Activated National Media
39. Permanent Waste Awareness Officers (Ward wise)
40. Law Enforcement Agency
41. Empowered Community
42. Well Connected Recycling Shops

Environmental/Natural Elements:

1. Low Carbon-Footprint Print Material Campaign*
2. Sustainable Material (Jute Fiber)*

Symbolic Elements:

1. Local Governance Monitoring by KCC
2. Bigger Budget Allocation on Awareness Campaign
3. Development of Business Model for Waste Plants*
4. “Go Green” Award Initiative by KCC
5. Inclusive Education System
6. Social Justice Implementation (Breaking the Barriers)
7. Waste Management Technological Knowledge
8. Design + Material Innovation
9. Social Media Strategy Development
10. Multitier Focused Awareness Campaign
11. Youth Targeted Concert/Attractive Campaign Design

12. Establishment of Research Groups
13. Super User Friendly Design of Equipment
14. Increased Knowledge about End Point of Waste*
15. Developing Waste Tracking based IoT wear-fits
16. Establishment of Waste Management Chair in Universities
17. Expanded Social Dept. Development (National)
18. Government Departmental Awareness Campaigns
19. Commercializing Value Chain of Waste

Technical/Material Element:

1. Sustainable & Long Life Cycle Daily Usage Commodities
2. Establishment of Public Friendly Graphic Signage in Public Space
3. Completely Capable Waste Processing Plants
4. Waste Management Manual in Product Package
5. Advancement in Plant Technology
6. Interactive Textbook Design
7. Digital Innovative Awareness Campaign
8. Interactive Game Design and Development
9. Graffiti + Cartoon + TV Show
10. Public Awareness Material Development

Problems/Other Comments:

3. NCTB has to include Waste Management Curriculum
4. Arrangement of Street Theatre or Flash mobs
5. Inclusion of Women in Every Layer of Waste Management Value Chain
6. Modification of Rewards Aligned to Waste Management Policy**
7. Collaboration with Research Group and Media**
8. Research and Publication
9. Establishment of Dedicated Behavioral Research Institutes
10. Arrangement of Training for Low-End Waste Collectors
11. Spreading Awareness about Punishments & Fines of Law Violation*
12. Increasing Monitoring and Surveillance
13. Bins, Vans (According to Need Assessment)

Operational Efficiency and Infrastructure (Problem Constellation)

Actor

1. Khulna City Corporation (KCC), NGO and CBO's, Informal Sector (lack of coordination among them) ****
2. Households do not separate waste at source *****
3. Port authorities don't implement rules for local ship

Environmental/ Natural Elements

1. Air Pollution
2. Uncontrolled dumping of hazardous and plastic waste at drain outlets and river
3. Overflow of waste due to surface runoff

Symbolic Elements

1. Lack of knowledge among the workers about waste treatment
2. Lack of social acceptance of waste collectors
3. Waste collectors are underpaid
4. Lack of monitoring in waste collection process
5. Improper business model for recycling
6. Lack of willingness to pay for waste management by the households
7. Lack of rules and regulations in waste management
8. Improper implementation of existing rules and regulation
9. Lack of social norms*
10. Lack of awareness among stakeholders
11. High paying system for household/ community
12. No recognition for the recycling sector from Govt./KCC

Technical / Material Elements

1. Lack of manpower for waste collection**
2. Lack of manpower at the landfill
3. Lack of garbage chute for high-rise building
4. Space shortage at household to set up separate bins
5. Lack of optimized waste collection routes
6. Insufficient waste collection frequency*
7. Uncovered/open drain/ canal
8. Lack of screening of the drainage outlet
9. Lack of safety equipment for worker
10. Lack of waste bins at marketplaces/ business center/ commercial space
11. Illegal dumping of waste (drain, canal etc.) *
12. Unavailable/ absence of smart dustbin
13. Inappropriate design of container
14. Shortage of vehicles for waste collection
15. Lack of separate and covered waste compartment in the collection vehicle

16. Lack of public space for STS setup
17. Improper waste transportation system
18. Lack of engineered/ sanitary landfill
19. Lack of proper equipment (e.g. Truck scale at landfill)
20. Lack of fencing at landfill or disposal site
21. Lack of recycling facility (40%) **
22. Lack of treatment system for non-recyclables materials
23. Non-value for non-recyclable waste
24. Production facility shortage of alternative products of plastic
25. Lack of supply chain efficiency for plastic substitution (eg. Jute products) (jute)
26. Lack of adequate waste bin near marine environment
27. No waste notification system at port
28. Absence of compulsory waste reception facility at port
29. Lack of waste collection facility from local vessel

Problems / Other Comments

1. Lack of baseline and operational database
2. No treatment facility for workers
3. Absence of odor and nuisance free SDP/STS
4. Open burning at SDP, recycling shop and landfill
5. Lack of funding/ budget in waste management from government **

Operational Efficiency & Infrastructure (Future Vision)

Actors

1. KCC, Councilors, Supervisors, NGO, CBO, Informal Sectors, Recycling Shop Owners working collaboratively*
2. Proper bridge connected all the stakeholders*
3. Online complaint/suggestion platform available for the stakeholders*
4. Stakeholders are now separating waste at source**
5. Introduced the Department of Environment at KCC**
6. Environment officer is already appointed in every Ward
7. Expert trainer for the Occupational Health and Safety of waste collectors has already been appointed
8. Research facility increased for sustainable waste management

Environmental / Natural Elements

1. High efficiency air pollution control mechanism is available for municipal incineration
2. Environmental emissions reduced

Symbolic Elements

1. Stakeholders are now aware of waste management
2. All informal waste workers are now working in a formal way
3. Proper monitoring in the waste management system is ongoing
4. A proper business model for recyclable and non-recyclable plastic waste is developed
5. Incentives are given when the users want to exchange plastic waste
6. Economic feasibility analysis is done before the implementation of any waste management related plan
7. Developing baseline and operational database

Technical / Material Elements

1. Landfill is now far away from the locality and surface waterbody**
2. Separate container is available for collecting biodegradable and non-biodegradable waste*
3. Separated storage system is available in both primary and secondary waste collection vehicles
4. Proper separated waste collection system is available
5. Bins are available at convenient places
6. Available Secondary Transfer Station (STS) for low-income community
7. PPE is being provided by the authority to all the waste workers
8. Waste compactor vehicle has been introduced
9. Covered and advanced drainage system introduced
10. Community based waste management system running properly
11. Authority optimizes the waste collection routes
12. Open Secondary Disposal Points (SDP) turned into in-house Secondary Transfer Stations (STS)
13. Sufficient equipment available for waste handling
14. Sufficient and trained manpower in waste management is available*
15. Robot is being used in Hazardous waste handling
16. Artificial Intelligence (AI) based waste sorting system introduced at STS and Landfill
17. Allocation of sufficient funding for waste management
18. Proper end-of-life treatment for plastic waste has been developed
19. Sanitary / Engineering landfill concept introduced while developing a new landfill
20. Open dump site turned into Sanitary / Engineering landfill
21. Waste compressing bin at the household level is implemented
22. Drone has been introduced in waste transportation and monitoring system
23. Waste chute system in high-rise buildings is working
24. Economic conversion of waste facility has been developed
25. Kids zone is developed with waste management concept
26. Automatic bar screen system at every outfall of KCC is introduced
27. Wall / Screening system in the embankment area is developed
28. New garage has been established in the northern part of KCC

29. Sufficient separated and covered vehicles are available for waste collection and transportation
30. Alternatives to plastic products have been developed
31. Ecofriendly alternatives for single use plastic bags are available at low price
32. Sea ports have their own waste management system
33. Adequate laws being enforced by port authorities on foreign and local ships
34. Compulsory waste reception facilities for foreign and local ships are available
35. Waste collection Boat has been provided at the local port (ghat)
36. Containers has been provided near the ghat area*

Problems / Other Comments

1. Free & available medical facility for all waste workers

After the World café sessions, moderators of each group presented the findings before the participants. Then a feedback session was arranged at the end of the workshop. Finally Dr. Martin and Jonathan, and the AWC team thanked everyone for their patience and cooperation which marked the conclusion of the workshop.



Concluding speech by Dr. Martin