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Ministry of Housing and Urban Affairs
Government of India



Smart City
MISSION TRANSFORM-NATION



Training on Sustainable Construction and Demolition Waste Management

Manual for Trainers

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List of Abbreviations

CDW	Construction and Demolition Waste
CDWM	Construction and Demolition Waste Management
CE	Circular Economy
CPCB	Central Pollution Control Board
CSC	Climate Smart Cities
CSCAF	ClimateSmart Cities Assessment Framework
DIFU	German Institute of Urban Affairs
GHG	Green House Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IKI	International Climate Initiative
MC	Material Circularity
MoUD	Ministry of Urban Development
MoHUA	Ministry of Housing and Urban Affairs
NDC	Nationally Determined Contributions
NIUA	National Institute of Urban Affairs
RE	Resource Efficiency
SDG	Sustainable Development Goals
SWM	Solid Waste Management
TU Berlin	Technical University of Berlin
ULB	Urban Local Bodies

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Figure 1: Example of the Brainstorming on CDWM steps; source: NIUA, First training on CDWM, held in December 2019

Figure 2: The Five Finger Method; source: Difu

Preface

The Climate Smart Cities (CSC) project is funded under the German International Climate Initiative (IKI), by the German Ministry of Environment, Nature Conservation and Nuclear Safety (BMU) in cooperation with German Ministry of Interiors Building and Community (BMI) and is in partnership with the Indian Ministry of Housing and Urban Affairs (MoHUA). The project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The German Institute of Urban Affairs (Difu), the National Institute of Urban Affairs (NIUA) and the Technical University of Berlin (TU Berlin) are implementing partners on the project for GIZ.

The project aims at anchoring climate-friendly solutions for urban infrastructure projects and area-based development in the planning and implementation of Smart Cities. It thus contributes to the achievement of the Nationally Determined Contributions (NDCs) to the Climate Goals as well as the Sustainable Development Goals (SDG), namely to the SDG 11 "Make cities and human settlements inclusive, safe, resilient and sustainable". It further acts as a facilitator for promoting cooperation between national & sub-national actors, by technically supporting international advisory and exchange formats and by supporting the implementation of measures and aims at the capacity development of Urban Local Bodies (ULB) on climate-relevant solutions.

The topic of "Sustainable Construction and Demolition Waste Management" is specifically targeted to enable resource efficiency in the utilization of waste and debris derived from construction, renovation and demolition work. Waste management and therefore, the aspect of Construction and Demolition Waste Management (CDWM) is a core infrastructure element in a city. Enabling a sustainable approach to the matter meets the overall objectives of the smart cities initiative India.

The training also contributes to the Climate Smart Cities Assessment Framework launched by the Ministry of Housing & Urban Affairs and its indicator on Construction and Demolition waste under the integrated waste management sector.

This manual is the result of the training test run on "Sustainable Construction and Demolition Waste Management" held in December 2019, which aimed at imagining climate-sensitive urban design from a user perspective. The training included over 50 participants from 6 Municipal Corporations of – Kochi, Coimbatore, Bhubaneswar, Madurai, Salem and Nashik. Indian training institutes of Kerala Institute of Local Administration (KILA), Tamil Nadu Institute of Urban Studies (TNIUS), Engineering Staff College of India (ESCI) and Maharashtra Environment and Engineering Training and Research Agency (MEETRA). KILA, TNIUS, ESCI, and MEETRA participated in the training as observers and as essential facilities for the intended institutes for dissemination and utilization of practice in cities across the country.

The training manual is designed for the training of operative staff in the field of local waste management as well as decision-makers at ULB level.

We would like to thank all the contributors who helped develop the training as well as to the cities and training institutes which provided their valuable input during the test run.

We hope that this training manual will be used far and wide, as envisaged by the developers.

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I Introduction to the Training Course

The Issue

Due to rapid urbanisation, India's construction sector is projected to grow at a rate of 7-8% over the next 10 years and is likely to become the world's third largest by the middle of the next decade¹. It is estimated that almost 70% of buildings that are to exist by 2030 are yet to be built¹. The total quantum of waste from the construction industry in India is estimated to be 100 million tons per annum in 2018². Such massive construction will rely heavily on raw materials such as sand (for concrete and mortar), soil (for clay bricks), stone (for aggregates) and limestone (for cement); the extraction and production of which have significant ecological impacts. Some of these materials, especially sand, are already facing supply constraints (often due to environmental bans and restrictions), and are thus affecting the sector.³

Rapid urbanisation leads to enormous growth in India's construction sector. This relies heavily on raw materials such as sand, soil, stone or limestone.

Only 5% of Construction and Demolition waste (CDW) is recovered in India. The existing practice is to dispose the waste in landfills or illegally dump it in rivers and water bodies affecting the land and water resources. While disposal of CDW is a challenge, there is an acute shortage of naturally available aggregates, limestone and other construction materials like sand and soil. At the current growth rate, the limestone reserves may run out by 2060. The extraction of soil, especially for brick making decreases agricultural productivity, which in turn increases food security concerns. Reduction of this demand is possible only with the utilisation of waste generated from the construction activities by producing bricks, paver blocks and construction aggregates. There is an opportunity to develop and establish standards and guidelines that create transparency and legitimacy in the reuse of CDW.⁴

There is great potential to re-use resources from CDW in India – currently only 5% of CDW is properly recovered.

The government has taken steps to address Construction and Demolition Waste Management (CDWM). In 2000, the Ministry of Urban Development (MoUD) provided basic guidelines on CDW handling. Later in 2012, MoUD mandated that cities exceeding a population of 1 million should establish CDW recycling facilities. The Ministry of Environment, Forest, and Climate Change established the CDW Management Rules (2016), a comprehensive set of directives to address this growing problem with a uniform approach. Later in 2016, the Ministry of Housing and Urban Affairs (MoHUA) mandated the use of recycled CDW in new construction projects.

The Indian Government has provided guidelines and rules on how to handle Construction & Demolition Waste.

Unfortunately, India is not progressing in waste recovery due to low implementation rate.⁵ Local municipalities are key actors in reducing CDW. The Climate Smart Cities Assessment Framework (CSCAF) notes cities should handle CDW through proper processing for recycling, reuse, and disposals in designated places. The CSCAF indicator assesses the extent of decentralised and centralised management of CDW and the extent to which recycled CDW is (re)utilised in the city.

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- 1 Strategy on resource efficiency in construction and demolition sector, MoHUA; 2019, p9
 - 2 Resource Efficiency & Circular Economy – Current status and way forward, NITI Aayog; 2019, p19
 - 3 Strategy on resource efficiency in construction and demolition sector, MoHUA; 2019, p9
 - 4 Resource Efficiency & Circular Economy – Current status and way forward, NITI Aayog; 2019, p16
 - 5 Resource Efficiency & Circular Economy – Current status and way forward, NITI Aayog; 2019, p7

The objective of the training is to educate and train experts from local governments to successfully plan, structure and organize CDWM in their own jurisdiction.

This trainer's manual supports the trainers to be effective in their roles.

The Climate Smart Cities project seeks to anchor climate-friendly solutions within the Smart Cities Mission.

Helpful resources on the ClimateSmart Cities Assessment Framework are provided here: smartnet.niua.org/csc/

Our Approach

The intention of the Sustainable Construction and Demolition Waste Management training is to inform participants about the relevance of the environmental impacts, the current national policies and guidelines and the implementation of measures and actions on the local level to handle CDW. Based on this basic information, the trainings **objective is to educate and train experts from local governments** in a stepwise approach to plan, structure and organise Construction and Demolition Waste Management (CDWM) in their own jurisdiction, city or town. Furthermore, the manual outlines the damages on the environment of improper treatment of CDW, as it is still the case in India. However, if CDWM is implemented in a thorough way, including options for the use of recycled materials, Urban Local Bodies (ULB) and the environment will equally benefit from taking proper action.

This **trainer's manual**, Training on Sustainable Construction and Demolition Waste Management, seeks to prepare the trainers with the necessary information to be effective in their roles. As such, the manual aligns with objectives of the training to:

- Create awareness,
- Improve knowledge,
- Demonstrate the potential and possibilities,
- Engage the topic through interactive exercise, and
- Motivate and empower to act.

To achieve this, the training utilizes **practice-oriented and interactive learning**. Through the training, participants will be introduced to the theoretical background, participate in a structured activity for exercise, and then reflect on what has been learned and its applicability to their own cities. At the conclusion of the training, participants should have the knowledge and motivation to implement local actions.

About the Project – Climate Smart Cities

The training on CDWM is facilitated within the framework of the Climate Smart Cities (CSC) project (2018-2022). CSC is part of the German International Climate Initiative (IKI), funded by the German Ministry of Environment and coordinated by Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) India. Implementing project partners are the German Institute of Urban Affairs (Difu), the National Institute of Urban Affairs (NIUA) and the Technical University of Berlin (TU Berlin). The CSC project attempts to anchor climate-friendly solutions within the Smart Cities Mission.

The project contributes to the achievement of the Nationally Determined Contributions (NDCs) to the Climate Goals as well as the Sustainable Development Goals (SDG). It acts as a facilitator in promoting cooperation between national and subnational actors by technically supporting international advisory and exchange formats and by supporting the implementation of measures.

The project works with the three Indian Smart Cities of Bhubaneswar, Coimbatore, Kochi and their respective state governments of Odisha, Tamil Nadu and Kerala, in the planning and implementation of smart and climate-friendly measures for infrastructure and area-based development, as well as the measuring and monitoring of their Greenhouse Gas (GHG) emissions.

ClimateSmart Cities Assessment Framework

This training manual links directly with the indicator "Recycled Aggregates (RA) and Recycled Concrete Aggregates (RCA) derived from City Construction and Demolition (C&D) waste" under the Waste Management sector of the CSCAF. It provides assistance to cities on how to perform on it and progressively move forward—in turn helping the city move up in its ClimateSmart City performance. Similar trainings will be provided subsequently which will link to other indicators on the CSCAF.

II General Training Introduction

Training series are vital to replicating the successful development and implementation of climate mitigation and adaptation strategies. The packaged information and materials make it easy to transfer and customize the training multiple times over.

However, it is the role of the trainers that ensure the effectiveness of the training. The trainers also contribute to an important aspect of convening a class of participants thereby creating a cohort among the participants who become partners in the journey to sustainable practices.

The way trainers conduct the training influence the effectiveness of the training.

The manual is designed for the training of operative staff in the field of local waste management as well as decision makers at Urban Local Bodies (ULB). However, this training could also be beneficial to a wide range of stakeholders including consultants, practitioners and students. Anyone with general interest to slow climate change or improve the environment could use this training to promote and implement sustainable strategies.

Content and Structure of Training Modules

The training is divided into thematic modules that use a combination of short introductory lectures, case work and exercises in groups, wrap-up sessions and discussions, as well as individual work and readings. The structure allows for maximum flexibility to tailor trainings for shorter events with extended, in-depth discussions and activities. The recommended duration of total training time is two to three days to adequately cover all modules. The training would work best with 15-25 participants facilitated by two trainers. The modules are designed in a way that allows the trainer to customize the training course as needed.

It is advisable to conduct the training over two to three days with about 15 to 25 participants.

Methodology of the training course

The training methodology is based on interactive, practice-oriented exercises that link to the real work experiences and challenges of the participants. Each module is composed of the following basic elements.

Input: The necessary theoretical background is provided to frame the topic and identify the need for action. This background comprises general to specific information from legal framework, environmental consequences to best practices.

The training combines interactive, practice-oriented exercises that link to the real work experiences and challenges of the participants

Exercise: The interactive portion of the training provides a real-life situation where participants develop their individual capacity. Site visits are recommended to provide on-site exposure to tangible conditions.

Reflection rounds: The reflection elements can be part of each module or cover multiple modules. In discussion rounds participants are invited to reflect upon and share their experiences from their respective perspectives and explore the challenges and opportunities for improvement.

Agenda

The following agenda and training exercises are based on a two-days training. These can be adapted for longer trainings. In general, we suggest two 90 minutes sessions in the morning and in the afternoon.

Day 1	Day 2
Morning	Morning
<ul style="list-style-type: none"> • Welcome, introduction and expectation assessment 	<ul style="list-style-type: none"> • Reflection of the first day and site visit
<ul style="list-style-type: none"> • Introduction into the topic incl. exercises 	<ul style="list-style-type: none"> • CDWM Steps • Exercises: Project Management
Afternoon	Afternoon
<ul style="list-style-type: none"> • Site Visit 	
<ul style="list-style-type: none"> • Reflection of site visit 	<ul style="list-style-type: none"> • Exercises: Roadmap
	<ul style="list-style-type: none"> • Conclusion and Feedback

How to prepare and conduct successful trainings?

The following information is given to assist in the preparation and delivery of training modules. While not extensive, this list provides general guidance for preparing and conducting an effective training. Hints and tips may be adjusted depending on the composition of participants and other adjustable parameters of the training.

Preparation Phase

- Participants should be invited as early as possible. The invitation should be attractively designed to motivate participation. Participants should be decision makers, whether high level official or operational manager. This helps to ensure implementation. It is also helpful to have participants with prior interest in the subject matter.
- The venue should be devoid of disturbances which could affect communication and learning. The facilities should be accessed for support systems including audio/visual capabilities and food/beverage services.
 - » The training room should have sufficient space to accommodate the participants comfortably with access to daylight. The room should also separate from the area reserved for coffee and lunch breaks, if possible.
- Workshop facilitation kit of basic materials should be prepared in advance. The kit includes flipcharts, pin boards, cover paper, cards, dots, glue, pins, scissors, writing pens and markers.
- Power Point slides introducing and supporting each module should be prepared and printed-out in advance. Participants will receive them as documentation of substantial information.
- A workbook containing instructions and necessary background information for casework and exercises should be compiled in advance.

An exemplary checklist can be found in the Annex –0: Preparatory Checklist.

Start of the Workshop

- First impressions are important! Greet participants during registration with Identity-card, notebook, pen, and a folder. The folder should contain the workshop agenda, background information and important notes regarding timings, logistics and facility safety.
- In introductory remarks, be clear about the challenges and opportunities. Seek to inspire participants with a compelling presentation supported data. Lastly, the remarks should make participants feel welcomed and ready to engage in the training.





- Introduce into agenda structure briefly, point out the active role of participants and present the training manual as back-up.

During the Workshop

- To keep concentration high, use warm-up games or icebreakers in the mornings or after lunch. These simple activities could be physical exercise, games, or quizzes related or not related to the topic. For examples, see <https://paradigmshiftleadership.com/tag/icebreakers/>.
- Change seating order after the first day or session, especially if participants already know each other.
- It is beneficial to reflect on what has happened and what will happen next when finishing and starting new sessions or modules.
- Reserve time for questions, feedback, and reflections.
- Balance group work with individual work.
- For group work, provide clear tasks supported by leading questions.
- Follow the scheduled agenda as much as possible. Yet, be flexible to accommodate the participants with any necessary changes.
 - » Shorten or lengthen session when interest is low or high, respectively.
 - » Always announce the exact time for continuance, for example state "at 12:45" instead of "in 15 mins".
- Offer coffee and other breaks to keep the concentration level high.
- Provide participants with hand-outs of any additional information as well a summary of key messages. Work continuously with the training manual.
- Disturbances should be addressed immediately. Use them as a chance to transform negative inputs into constructive steps. Involve the disturber positively by taking his/her remarks seriously.
- End the day with a short outlook and the starting time for the following day to ensure participants arrive on time!
- Start the day with reflections of activities of the previous day. Ask for impressions or still pending questions.
- For site visits:
 - » Registration data of participants should be updated. If required, attendance should be taken before leaving for the visit.
 - » Encourage participants to be on time and gather at the designated point from where the journey will begin.

Structure of Module – Explanatory Table

The table explains the structure and meaning of the following chapters.

Title	Explanation
 Input and instructions from the trainer	In addition to the key content and learning goals box at the beginning of each module, it summarizes main input topics and how to conduct them.
 Optional aspects	Further options and variants especially for exercises.
 Tips	Practical information and additional hints for conducting the topic.
 Material	Lists a) input for the respective part/module (presentations, matrixes etc. and b) necessary workshop material (flipchart, pin-board etc.).

Module 1:

Inaugural – Introduction

Key content:

- Need and purpose of the training
- Introduction of participants and expectation management
- Workshop Rules

Learning goals:

- Participants gain a general understanding of the topic and the aim of the workshop and relate their expectations to them

1.1 Purpose of the training on CDWM for Indian Urban Local Governments (ULB)

Tip: To provide an interesting point of entry it is helpful to provide the latest figures and facts about CDW in general and in your city/ region.

Input and instructions from the trainer:

In the beginning of the workshop it is important to give a short but interesting introduction into the field of CDWM. The topic should be put in the wider context of Climate Change and environmental issues, Solid Waste Management (SWM) as well as the ClimateSmart Cities Assessment Framework. The purpose of the training needs to be clarified, and the relevance of the issue for Indian Urban Local Bodies (ULB) emphasized.

Optional aspects:

It could be necessary to invite important ULB members or the head of your department to introduce the workshop and put it in a wider context of your work. Alternatively, if the technical equipment allows for it, you may include a short video with introductory remarks.

 **Material:** See Presentation/ Module 1

1.2 Introduction of participants and expectation assessment

1.2.1 Introduction of participants

Input and instructions from the trainer:

The total number of participants will determine the method of introduction. With a smaller group, each person can introduce her/himself individually. Encourage interaction during the introductions by delegating questions from the audience to the participants.

- What's your name?
- Where do you come from?
- How large is your city?
- What's your profession?
- Describe your experience in CDWM?

Optional aspects:

A larger group could be divided into smaller groups by tables or other seating arrangements where individual introduction may be better facilitated. Here, two people each speak individually and ask each other the above mentioned questions for 5 minutes. The following 15 minutes everybody introduces his/her partner to the whole group (e.g. one minute each).

For groups with more than 25 participants, the introduction could be organized by questions from the trainer, asking for hand signals. The trainer could mark the place of origin on a map/ flipchart to get an overview where the participants come from.

 **Material:** See Presentation/ Module 1

Tip: Questions should be entertaining and informative at the same time. Every participant should contribute to the introduction, but give short and focused answers.

1.2.2 Expectation Assessment

Input and instructions from the trainer:

Collecting and assessing the expectations from each participant helps the trainer to facilitate the training effectively. Ideally, participants arrive at the training with a general idea about the contents of the training and the level of detail. While beginning the training, the expectation assessment helps the trainer to understand specific interests and the level of knowledge among the participants. The trainer can then react to certain expectations and may respond to when and how specific questions may be addressed. Even if participants raise expectations which are not part of the planned training program, it helps the trainer to refer to other sources of learning or slightly adapt elements of the training modules if possible.

At the end of the training, the trainer may refer to the initially collected expectations and check how they have been met or which other areas might be covered in a follow-up training.


To collect different expectations, participants can share their expectations during the introduction round and record them on a flip chart. Every participant should name up to three points. Guiding questions for the expectations assessments could be:


- What are the topics you are most interested to learn about?
- Why is that important for you and your ULB?

Optional aspects:

Each participant writes down one expectation per moderation card that can be collected on pin boards. Read them out loudly, pin them and if possible, already cluster them.

For groups with more than 25 participants expectations can be collected by a 5-10 min. open question round, collection of answers on moderation cards, or in combination with prepared list of questions asked by the trainer (gaining an overview on CDW, specific questions on processing, collection, implementation support etc.)

 **Material:** See Presentation/ Module 1, Annex -1: Expectation Assessment Questions prepared, moderation cards, marker and pin board, flipchart

 **Tip:** All participants should contribute either verbally or in writing.

 **Tip:** Mention the collected expectations during the workshop discussions when relevant and leave moderation cards of expectations visible throughout the workshop.

1.3 Workshop Rules

Input and instructions from the trainer:


Workshop rules help to establish a common understanding about the basics for a successful and timely conduction of a workshop. This is especially significant in having a dialogue of joint cooperation among all participants and moderators and experts. Here it is important to highlight and motivate the participants to engage actively with open mind and fairness.

Some of the main "rules" focus on open mind and curiosity to learn and the equal valuation of everybody's input. However, participants are requested to ask for clarification whenever needed. Nobody should be left behind. Discussions and criticisms should focus on interests, not people. Punctuality helps the moderator and his team to present all topics of the workshop timely and as thorough as possible for the benefit of the participants themselves. Phones and pagers should be put on silent or vibrate mode during the sessions to avoid unnecessary disturbance.

Optional aspects:

If time is limited for a presentation of the rules, printed copies could be placed on each table and briefly acknowledged.

 **Material:** See Presentation/ Module 1

 **Tip:** Keep the workshop rules visible throughout the entire workshop.


Module 2: Overview – Thematic Background

Key content:

- Introduction of concepts to waste management
- Construction and Demolition Waste – an overview

Learning goals:

- Gain theoretic background knowledge on the scope of the topic, the aims and benefits of sustainable CDWM, and the climate relevance of the constructions sector
- Understand the benefits and challenges of CDWM
- Awareness of the state of local CDWM, the relevant stakeholders, and understand possible need for action in their city in general

 **Tip:** Research current developments in India, up-to-date numbers etc. before the workshop.

2.1 Introduction of concepts to waste management

Input and instructions from the trainer:

This module first introduces the general concepts to waste management and then leads to a detailed introduction of CDWM. It consists mostly of a general overview of Circular Economy (CE), Resource Efficiency (RE) and Material Circularity (MC) and the complex system of Integrated Solid Waste Management. The task is to explain in more detail, why the topic is important and how CDW is interrelated with these concepts.

The trainer may include short reflection rounds on the introduced concepts and how these relate to the day-to-day practice in the participants' ULBs (see exercise in sub-chapter 2.1.4 in training manual).

The trainer may include short reflection rounds on the introduced concepts and how these relate to the day-to-day practice in the participants' ULBs (see exercise in sub-chapter 2.1.4 in training manual).

 **Material:** See Presentation/ Module 2, Annex –2.1: Exercise on existing module

2.2 Construction and Demolitions Waste Management

Based on the more general concepts, the trainer then develops together with the participants an understanding of CDWM. This includes a common definition, sources and composition of CDW, processing and products, the economic, environmental and social impacts of CDW and CDWM and the Informal sector and traditional Recycling systems in India. Keep the theoretical introduction as relevant as possible and provide the links on how these concepts can help training participants in their daily routines.


 **Material:** See Presentation/ Module 2

2.3 Exercise Module 2 : Further Impacts of CDW in your City

Input and instructions from the trainer:

Based on the economic, environmental and social impacts that were presented before, the participants should be motivated to reflect on their own impacts of CDW in their cities. In the training manual, they find a matrix where they can note down economic, social and environmental impacts and reflect the role the informal sector plays in their waste management system. In the end they should discuss these findings with fellow participants.

 **Material:** See Presentation/ Module 2, Annex –2.2: Exercise Module 2

 **Tip:** After each sub-chapter, allow and ask actively for questions and comments; "investigate" the general understanding of the presented material.

 **Tip:** Use as many graphics and photos as available, check newspapers for current or recent developments, illegal dumping or positive aspects.

Module 3: Legal Background

Key content:

- Administrative System of India
- Rules and Regulations of CDWM in India
- Responsibilities of different stakeholders

Learning goals:

- Improve knowledge of national law on CDWM
- Identify the necessary legal tasks for CDWM in your jurisdiction
- Regulatory and capacity challenges

3.1 Administrative Structure of India and rules and regulations of CDWM in India

Input and instructions from the trainer:

This Module comprises a presentation on the legal background including the regulatory framework at the national, state and city level. The details of the CDWM Rules 2016 give an overview on the duties of different stakeholder, timeline for implementing rules, as well as other related mechanisms for ease in implementation of the rules such as guidelines and advisories. The input may also include the possible challenges that may be faced at various levels in implementing the rules, such as the ULB, state agencies and in the private sector. Related codes and standards, such as the revision in the Bureau of Indian Standards and the National Building Code, provide the supporting structure for the implementation of the rules through examples and encourage the use of recycled CDW material. There are also related guidelines issued by various agencies such as the Central Pollution Control Board (CPCB) which address issues of environmental impacts of CDW.

Optional aspects:

This can be done either by the trainer or external experts such as someone who has been involved in the drafting of the rules or city policy.

 **Material:** See Presentation/ Module 3

3.2 Exercise Module 3: Compliance with CDW 2016 Rules


Input and instructions from the trainer:

The exercise on the CDW 2016 Rules is divided into two steps. In the beginning the participants are asked to answer the questions in the matrix regarding the legal action in their city on their own and discuss the results in small groups. As a second step compliance gaps considering different requirements can be identified. This can be done city-wise or in table groups. This exercise will be an important step towards the more detailed discussion on CDWM steps and project management in the latter modules.

Optional aspects:

Some of the legal requirements in the second part of the exercise module are quite extensive. Depending on group size it might be useful to let participants fill this in for themselves and only collect main aspects in the group – ideally by using a flip chart. Module 6-8 will handle strategic questions. Here it is advisable to not spend too much time on group discussions at this point.

 **Material:** See Presentation/ Module 3, Annex -3: Exercise Module 3

 **Tip:** Research current guidelines, additions or further developments in India. There may be new cities/states which have formulated their own policies to tackle CDW or there may be some revisions in codes which provide an enabling environment for promotion of recycled material etc.

Module 4: Site Visit – Preparation & Lessons Learned

Key content: (for visit of processing site)

- Overall management of a processing site: Segregation of CDW and usage of products
- Processing site initiation and management and maintenance
- Processing site technical requirements (responsibilities, data, recycling products, etc.)

Learning goals:

- Understand components of an overall CDWM strategy on local level
- Gain motivation and knowledge about different ways to implement a sustainable CDWM system
- Understand challenges and pros and cons of the components, overall system

4.1 Preparation of the site visit an site visit

Input and instructions from the trainer:

The site visit plays an important part of the training. Therefore, the trainer should deliver a short explanation of its importance and how it fits to the overall workshop program and the CDWM main steps.

The topics and program of the site visit should be briefly explained in advance. If possible, a short fact sheet about the site should be provided or a representative from the site could give a short overview. Brief questions from the participants should be allowed.

To increase the attention and learning on site, divide the group into small sub-groups with specific tasks of observation during the visit. Depending on the number of participants this could be:


- technical equipment,
- efficiency of the plant/site
- environmental protection measures,
- quality and marketing of processed products;
- overall maintenance
- health and safety issues
- economic aspects etc.


Throughout the visit, participants may be equipped with a questionnaire where they can note down their observations for later presentation and reflection.

On the site, the visit should start with a general introduction (Initiation of facility, responsibilities, contracts, site processes and visit, use of recycled material) and followed by a guided tour of the facility, from input to output.


Optional aspects:

In case no proper site is at hand, options for an alternate site visit should be assessed in advance: e.g. a landfill where CDW is used for covering purpose, the usage of CDW to refill or level lower areas e.g. for construction; a CDW dumping site (legal and illegal), an illegal dumping that clogs rain water channels etc.

 **Tip:** For a successful visit, it is important to have a clear agreement on what will be presented on-site in advance.

 **Tip:** If places other than a treatment facility are visited, prepare a list of common-sense questions to investigate challenges of the visited area (for citizens, nature, infrastructure etc.) and address what could be done to improve the situation (and by whom?).

If there is no possibility to visit a site, videos or presentations may be used. For example, videos of the Burari Construction and Demolition Waste Facility and the Indore facility are available on the website of the ministry at <http://swachhbharaturban.gov.in/>

 **Material:** See Presentation/ Module 4, Annex-4.1: Site visit preparation and questions, printed questionnaire for the site visit

4.2 Site Visit observation and reflection

Input and instructions from the trainer:

As follow up to the site visit, the "lessons learned" from site visit should be assessed by the participants. This will enable them to identify opportunities, synergies and challenges for CDWM in their participating cities.

The small observation groups should have the opportunity to collect their impressions (10 min.). Each group can then present their findings briefly and discuss them together with all participants (20 min.). The following questions can help to facilitate the discussion:

1. What was interesting and helpful? What inspired you?
2. What surprised you?
3. What was different than expected?
4. Where do you need further information?
5. What is (not) transferable and why?
6. Where any challenges recognized? How could they be handled?


As a conclusion the participants could be asked to assess the site on a scale from 1-10 (one = very low; ten: very high) considering the following questions. Answers can be collected non-verbally by inviting the participants to put small sticky dots on a flipchart for each questions.


- a. Quality of site visit in general (topic, conduct)?
- b. Personal benefit and knowledge improvement?
- c. Helpfulness for your city's approach towards CDW?
- d. Relation to workshop and training program?


Optional aspects:

The presentation of findings could be introduced as a role play. Suppose the superior of a participant wants a short briefing of the site-visit but is very busy. Hence, he can only spare 5 minutes of his time. The participant learns to deliver, under time and psychologic pressure, the main findings and conclusion. Requirement: Pair one participant from a group with a participant from another group as "superior".

 **Material:** See Presentation/ Module 4, Annex -4.2: Exercise Module 4 Questions and Scale on flipchart, moderation cards, pins and pin board

 **Tip:** Depending on the site (especially treatment facility or landfill), it might be quite noisy. Hence, a room for introduction and questions should be provided for questions and answers.

 **Tip:** Provide flipchart to note important findings and feedback.

 **Tip:** If time is short the trainer may integrate this conclusion in the final feedback session.

Module 5:

Best Practice Examples

Key content:

- Indian Best Practice for CDWM
- International best practice for CDWM (Germany)

Learning goals:

- Learn about Indian and German approaches to implement CDWM or treatment facilities
- Increase motivation to implement a sustainable CDWM system in their own city
- Gain better understanding of the complexity of CDWM

5.1 Indian Best Practices

Input and instructions from the trainer:

This session gives an overview of (adaptable) Indian examples. The input by the trainers should address the following questions:

- What is transferable, what was the point of origin, where are they now?
- What was the motivation behind setting up of the best practice?
- Which regulations are the bases here?
- What was the implementation model?
- What were the challenges faced in the process?
- What are the key takeaways from the best practice?
- What are the successes that can be replicated in other cities?


Make sure, that the following points are covered:

- What challenges are they facing and how is the situation today?
- Is it a functional facility?

Optional aspects:

Invite Indian experts to introduce best practice examples. The Module could also be connected with the site visit, a short interview or video could be shown additionally. Someone who has worked on setting up of a facility would be best to speak in this session as they can go deeper into the real issues, challenges and learnings.

 **Material:** See Presentation/ Module 5

 **Tip:** Avoid examples that are too sophisticated or not at all comparable.

5.2 International Best Practices

Input and instructions from the trainer:

International examples provide different inspirations and possibilities to think outside the box. However, transferability of examples is usually limited. Hence, it is important that the trainer adequately presents examples and discusses these using the questions provided in the exercise module.

Optional aspects:

Participants can be shown a short video that summarizes the key points listed above e.g. an interview with an expert, an explanatory video etc.

 **Material:** See Presentation/ Module 5

5.3 Exercise 5: Best Practice examples reflection


Input and instructions from the trainer:

Based on the examples presented, participants are asked to note down their observations into the matrix. Afterwards, the group can gather for a question and answer session to clarify questions of comprehension. The module concludes with a joint discussion on the following questions: Which example(s) would best suit your city and why? What is helpful for your city's approach to CDW? What do you think would not work in your city? What kind of support do you need?

Optional aspects:

This exercise can also be a panel discussion if there are multiple experts available for this session. Questions from the participants can be tackled by the experts and moderated by one of the faculty members to maintain time and relevance.

If all participants' questions have been answered, the trainer can also take recommendations for other case studies/examples which may not have been covered during the presentation.

 **Material:** See Presentation/ Module 5, Annex -5: Exercise Module 5, microphone

 **Tip:** This session should emphasize the practical applicability of the best practice example: Experts may be invited to talk from their own experience.

Module 6: Main Steps of Construction and Demolition Waste Management

Key content:

- Overall approach of CDWM in the Indian framework
- Integrated steps of a CDWM plan/strategy

Learning goals:

- Elaborate on CDWM steps based on the previous modules
- Gain clear understanding about CDWM steps

6.1 Main steps of Construction and Demolition Waste Management

Input and instructions from the trainer:

The module starts with the exercise of working out the main steps, topics and findings by the participants. Participants are invited to write each idea on a moderation card. By acclamation, the participants brainstorm the main aspects of the CDWM from their previous understanding. Together with the participants, the trainer immediately arranges the cards on the prepared pin board. At the end the trainer can introduce additional ideas and missing points and discuss them with the participants.

Duration: 15-20 min, depending on the input from the participants.

Tip: Prepare 2-3 pin boards with the main headlines from the flow chart "Main Steps towards CDWM strategy" in advance.



Figure 1: Example of the Brainstorming on CDWM steps (Source: NIUA, First training on CDWM, held in December 2019)

Using a printed flow chart "Main steps of CDWM", the trainer presents the ideal step-by-step approach of a CDWM strategy.


After answering comprehension questions, all participants should be invited to compare the self-elaborated steps with the ideal approach. Questions to facilitate this part:


- a. Where are similarities, where differences?
- b. Where is an adaption of the self-elaborated approach necessary or reasonable, depending on a city's framework and status quo (see Module 2)?
- c. Is anything else missing?

A critical discussion and consideration should be supported. In this way, a common basic version can be created which, where appropriate, also contains city specifics.

Optional aspects:

Carry out this exercise as group work, especially if you have a large number of participants. One group starts by presenting their results, each additional group adds new and additional aspects.

 **Material:** Annex -6.1: Steps toward CDWM
Pin boards, markers, pins, moderation cards

 **Tip:** Start with the exercise before providing the overall process flow-chart; motivate participants to contribute and reflect what they have learned and observed so far.

6.2 Basic Assessments for the CDWM strategy/plan

Key content:

- Strategic Assessment of CDWM
- Technical assessment: waste estimation, collection and transportation evaluation
- Plant level Calculations

Learning goals:

- Understand needs at governance level to ensure implementation (responsibility)
- How to calculate CDW amounts?
- Aspects of locating collection points and processing unit


6.2 General Situation in your Municipality


Input and instructions from the trainer:

The trainer's task is to get a general overview on the status quo of CDWM in the participating cities. Main information needs to be collected related to existing strategies, responsibilities, treatment of CDW, existing data, current restraints and challenges. The assessment is ideally prepared before the training by sending a questionnaire to the training participants. If this is not possible or questionnaires are not returned in advance, a reflection round can be included during this module. It could be helpful to encourage the participants to call a responsible colleague and ask for relevant data.

Optional aspects:

If providing a questionnaire in advance is not possible, the question might be asked into the audience only during the workshop. Take short notes (use flipchart) of main feedback and summarize the feedback after the questions round to the audience.

 **Material:** Questionnaire or prepared questions
Annex -6.2: General situation in your Municipality
Flip chart, moderation cards, markers, pins and pin board

 **Tip:** If a flipchart is used during the exercise, the trainer should note the main aspects of the questionnaire in advance. Write down the main challenges of the cities.

Module 7:

Involving Stakeholders

Key content:

- Role and functions of stakeholders in the CDWM process
- Challenges and agendas of potential stakeholders

Learning goals:

- Identify and cluster of relevant stakeholders for CDWM
- Understand stakeholders' interaction and collaboration with each other

7.1 Stakeholders in CDWM

Input and instructions from the trainer:

This module invites the participants to consider the actors or stakeholders involved in CDWM. The trainer should briefly present the importance of stakeholders on all different levels, as the involvement of all actors in the field of CDW is crucial to the success of CDWM on a local level. This is already outlined in the CDWM rules (see Module 3).

The main task in this reflection is to engage participants to identify stakeholders in CDWM process on their own and in three steps:

1. General brainstorming or involving all participants
2. Related to their importance (Cluster I) and
3. In the ways of involving or approaching them (Cluster II)


7.2 Exercise Module 7: Stakeholder Identification and Assessment

Input and instructions from the trainer:

As a first step, invite the participants to a brain writing session. Each participant writes down stakeholders on moderation cards, one card per stakeholder. Collect the cards and group them together with the participants under the categories: governance, technical, and others.

To assess the stakeholders' importance, the moderation cards can be pinned to a pin board in a prepared stakeholder circle matrix (see training manual module 7.3). The participants can create a common "stakeholder map" to define, group and evaluate the stakeholders according to their role and importance for CDWM at local level. The closer to the centre of the circle, the more important a stakeholder is, e.g. because of his or her decision-making tasks. You can also use bold letters or underline the most important in each sector. Finally, use the exclamation mark (!) for those who can "veto" the development and implementation of the CDWM.

The relationship between the different stakeholders can be discussed and visualized in the circle matrix by using different arrows and lines. The clarification of strong, weak and conflicting relationships can allow a better understanding of opportunities and obstacles to involving different stakeholders.

 **Tip:** Provide necessary material for the exercise. If brainstorming with all participants, at least a second trainer needs to collect the ideas on moderation cards as the process of clustering requires shifting cards on the pin board.

The method should be adapted to the timeframe for the exercise. This elaboration will be needed again in the project management and road map modules (Module 8).

 **Optional aspects:**

Use group work in the three mentioned steps; the first group presents its results on a pin board, the following groups add additional aspects (more time intensive).

As an alternate interactive step: One can circulate a broad list of potential stakeholders in terms of governance, technical and others, and ask the participants to actually fill in the names and numbers of individuals in their city (see Annex -7). Some designations are entered as a clue for the participants, while others are left empty to encourage thinking.

 **Material:** See Presentation/ Module 2, Annex -7: Exercise Module 7
Pin boards, moderation cards, markers, pins or flipchart

Module 8: Project Management and Roadmap

Key content:

- Task Identification from status quo to CDWM implementation
- Stakeholder Identification responsible for each of the next steps
- Timeframe for actions to ensure CDWM implementation success

Learning goals:

- Develop a CDW flowchart for the city (material and responsibility flow)
- Develop a roadmap (next steps and responsibilities) jointly, using the learnings of the training workshop so far
- Present CDWM elaborated solution to superior/senior

8.1 Project Management Set-up for CDWM

Input and instructions from the trainer:

This module is conducted as a group-exercise with final presentation by different groups. The CDWM strategy chart and Project Management and Roadmap sheet (see Annex-8.1) are distributed in the class, and participants from the cities start filling the sheets with specific details for their own city.

Ideally, each city should act independently with a trainer on the table, but it is possible for a group of similar cities to sit together for brainstorming while sheets are filled individually.

8.2 Exercise Module 8: Project Management and Roadmap Development

1. Project Management

In this section, for each task the city has to identify:

- » What needs to be done to achieve the topic?
- » What are the principal challenges in doing so?

2. Roadmap

In this section, for each task the city has to identify:

- A. Who is the person in the city responsible for addressing the task?
- B. What is the timeline for the person for completing the actions (start date and end date)?

In the end, each city (if it is a small group and time permits) or a selection of cities, depending on the variation in size and approach, will be asked to present their project management and roadmap to the others. Trainers and other cities can raise questions and doubts and act as a guide for the presenting city to refine its CDWM strategy.

Optional aspects:

Create "role play" situation e.g.: The Commissioner of example city asks the responsible staff to present the CDWM strategy: important requirements, steps, responsibilities; As he is a very busy man, he has only five minutes to spare before an important meeting; So he is already under time pressure.



Material: Printed CDWM Strategy Chart and Project Management and Roadmap sheets for each city, Annex -8.1: Exercise Module 8 and Annex -8.2: Exercise Matrix Project Management and Roadmap Development

Module 9: Reflection and Feedback

Key content:

- Expectation reflection
- Feedback and outlook

Learning goals:

- Learn to assess expectations and identify different needs to implement CD waste management in their communities.


9.1 Reflection

Input and instructions from the trainer:

To round off the training, there should be a joint reflection round to reflect on what has been learned and give an outlook on further possible step. This module is most critical to transforming the knowledge and information gained into actionable steps toward implementation. The entire module should be framed as a movement towards the future.

Invite the participants to note their thoughts on the provided questions in the matrix in Module 9 individually. Afterwards moderate a group discussion on selected points.

Additionally, refer to the recorded expectations of the first day (present on flipchart or pin board) and discuss them one by one regarding the fulfilment. If time is limited, only elaborate on the most important expectations.


 **Material:** Flipchart, Matrix, Annex –9.1: Exercise Module 9

9.2 Feedback:

Input and instructions from the trainer:

Feedback, positive and negative, is guidance to track towards successful outcome. Create a safe space for open communication.

Within the training, one suggested feedback exercise is the Five Finger Method:

 **Tip:** Ensure the conversation is not dominated by the opinion of a few. Instead invite contributions by all participants.

Tip: In case of negative feedback, avoid defending it, but request ideas for improvements by participants.



Figure 2: The Five Finger Method (Source: Difu)

Additionally, one can use the feedback form to receive a detailed and anonymous feedback (see Annex -9.2).

Optional aspects:

If time is limited, the Five Finger method can be shortened to Three Finger Method and everyone just answers the three most important aspects.

Another option is to prepare a flipchart paper with a list of most important aspects of training (content, design, performance, site visit, exercises, time budget etc.) and offer them three options (columns) for feedback. Positive (😊) – Neutral (😐) – Negative (☹️). For each aspect, every participant marks one choice.

Material: Flipchart with explanation of method

Annex – Training Manual for Training Institutes

Annex –0: Preparatory Checklist

Preparatory Checklist		
Category	Components/Key Elements	Notes
VENUE	Location	
	Accessibility	
	Capacity of training room	
	Additional space for breaks and lunch	
	Seating and Tables	
	Table for reception	
	Table for publications/give-aways	
	Facility support system (A/V, food)	
	Speakers desk	
	...	
PARTICIPANTS	Selection of participants	
	Invitation sent	
	Confirmation of participants	
	Final notification of dates, instructions and agenda	
	Questionnaire sent to participants	
	...	
MATERIALS	Workshop facilitation kit (moderation cards, pens, flipchart, pin board, pins, marker, ...)	
	Laptop, charger, pointer, microphone, beamer, speaker, roll-up (visuals)	
	Participants' bags, bottles, identity-card, notebook, pen, workbook and documents	
	Presentation, Hand-outs, Training Material etc.	
	...	
PRINTED MATERIALS	Name plates (participants and experts)	
	List of participants	
	List of participants' signature	
	Handout's and agenda	
	Feedback questionnaires	
	...	
CATERING	Tendering of Catering	
	Report final number of participants to caterer (and special needs)	
	Arrangements (times, location, schedule)	
	...	

Annex –1: Expectation Assessment

To start the training, it is helpful to assess the expectations of the participants with the content and intentions of the program. This helps to identify specific questions of the participants that can be considered during the workshop. At the end of the workshop, we will assess if and how expectations have been met.

Please note down your expectations for the training and share them with fellow participants. The expectations are not limited to technical aspects of CDWM but could also include management or environmental issues, to mention a few.

What are the topics you are most interested to learn about? Why is this important for you or your ULB?

Annex –2.1: Exercise on existing module

What are the topics you are most interested to learn about?
Why is this important for you or your ULB?

Guiding questions:	Notes:
Are there specific concepts such as Integrated Municipal Waste Management used in your ULB?	
What are the responsible departments?	
What are lessons learnt of existing strategies which could be relevant for CDW?	

Annex –2.2: Exercise Module 2

Exercise Module 2: Further Impacts of CDW in your City	
Based on the list of economic, environmental and social impacts	
<ol style="list-style-type: none"> 1. Please note down important impacts of CDW in your city. 2. Think about the role that the informal sector plays and might play in the future related to CDWM; What are challenges and benefits when involving this sector in a structured way? 3. Explain and discuss impacts of CDWM and your additional findings with your fellow participants. 	
Economic Impact	
Environmental Impact	
Social Impact	
Informal Sector Involvement	

Annex –3: Exercise Module 3

Exercise Module 3: Compliance with Construction and Demolition Waste 2016 Rules

This exercise intends to verify legal action already taken in your city including challenges that relate to the legal requirements of the CDWM rules.

Please answer the following and discuss with your fellow participants.

- Identify possible solutions to overcome existing restraints – on a national, state and local level.
- What are the first steps to get started, if no or few steps have been taken?
- Who should take the lead in your ULB?

Question	Answer
Is any legal action already taken in your city?	
Are (further) steps towards legal implementation planned in the near future? Which ones?	
What are general challenges for legal action related to CDWM and rules in your administration?	
What are the capacity challenges related to CDWM in your city?	

Secondly, this part of the exercise relates explicitly to the ULB duties as outlined above in Section 3.2.3. You are invited to reflect for each requirement how far the existing system in your city is already in line with the Rules by indicating 'compliance gaps'. You can work city-wise or in sub-groups and document your findings in the Matrix.

Requirement	Compliance gaps	How to overcome gaps?
The town and country planning department shall incorporate the site in the approved land use plan so that there is no disturbance to the processing facility on a long-term basis.		
The town and country planning department shall procure and utilize 10-20% materials made from construction and demolition waste in municipal and government contracts.		
Local Authority (LA) shall place appropriate containers for collection of waste, removal at regular intervals, transportation to appropriate sites for processing and disposal.		
LA shall seek a detailed plan or undertaking from large generators of construction and demolition waste and sanction the waste management plan.		
LA shall seek assistance from concerned authorities for safe disposal of construction and demolition waste contaminated with industrial hazardous or toxic material or nuclear waste if any.		
LA shall give appropriate incentives to generators for salvaging, processing and or recycling preferably in-situ.		
LA shall establish a data base and update once in a year.		
<ul style="list-style-type: none"> - Million plus cities (based on the 2011 census of India), shall commission the processing and disposal facility within 1 ½ years - 0.5 to 1 million cities within 2 years - Cities with less than 0.5 million inhabitants within three years. (date of final rules notification)		
LA shall review and issue instructions to the in- charge of the facility if any accidents reported by in charge of the processing facility (Rule – 14).		

Annex –4.1: Site Visit Preparation

The following questions should be sent to responsible persons of the site in advance to assure good preparation of site-visit.

A. Preparation of the site visit	
Question	Observation
<p>Initiation of the project: Who initiated the process? Why? How? How where the preconditions?</p>	
<p>Planning Process: Who was responsible on government side? How is the process of tendering? Who was responsible on the company side? How do they communicate and cooperate?</p>	
<p>Financing: Overall costs? Economical and financial structure?</p>	
<p>Lessons Learned: What works well? What would they do different? What would they suggest to interested municipalities (main considerations before getting started?) Future plans</p>	

B. Questions to Participants	
Question	Observation
<p>General impression: What was striking the most? Unexpected impressions? Positive impressions? Challenges recognized? Transferability to own local situation?</p>	
<p>Learning check: Amount of CDW treated? Recycling products as of their selling opportunities? Products that could be utilised for conserving rain water (allowing water to percolate and reach ground water? Maximum recovered product at the plant (soil, sand, brick, stone, concrete?) The plant is working on which model (BOOT, PPP, BOT)?</p>	

4.2 –Exercise Module 4

Exercise Module 4: Site visit observation and reflection	
<p>1. The site visits will be split into small groups with specific tasks of observation during the site visit. For the visit of a processing facility, this could include:</p> <ul style="list-style-type: none"> • technical equipment, • efficiency of the plant/site, • environmental protection measures, • quality and marketing of processed products, • overall maintenance, • health and safety issues, or • economic aspects etc. <p>Each small group shall briefly present their findings and discuss together with all other participants.</p>	
<p>2. Please reflect on the below questions for each participant/group. Identify the strengths and weaknesses of your observations.</p>	
Question	Observation
What was interesting and helpful? What inspired you?	
What surprised you?	
What was different than expected?	
Where do you need further information?	
What is/is not transferable and why?	
Challenges recognised?	
<p>Thirdly, assess the following statements on a scale from 1 to 10 (one = very low; ten: very high):</p> <ol style="list-style-type: none"> Helpfulness for your city's approach towards CDW Relation to workshop and training program Helpfulness for your city's approach towards CDW Relation to workshop and training program 	

Annex –5: Exercise Module 5

Exercise Module 5: Best practice examples reflection	
1. Based on the experience of the site visit and information presented in the best practice examples, please reflect the information and answer the following questions on your own:	
Question	Observation
What was interesting and helpful in general?	
What are the similarities of the two Indian examples?	
What is different between the two Indian examples?	
What is different or similar between Indian and German examples?	
What is/ is not transferable and why for your city? Techniques, management.	
What further information would be helpful?	
2. Please answer the questions below and discuss your findings with your fellow participants.	
<ul style="list-style-type: none"> • Which example(s) would fit the best for your city and why? • What is helpful for your city's approach towards CDW? • What do you think would not work in your city? • What kind of support do you need? 	
...	

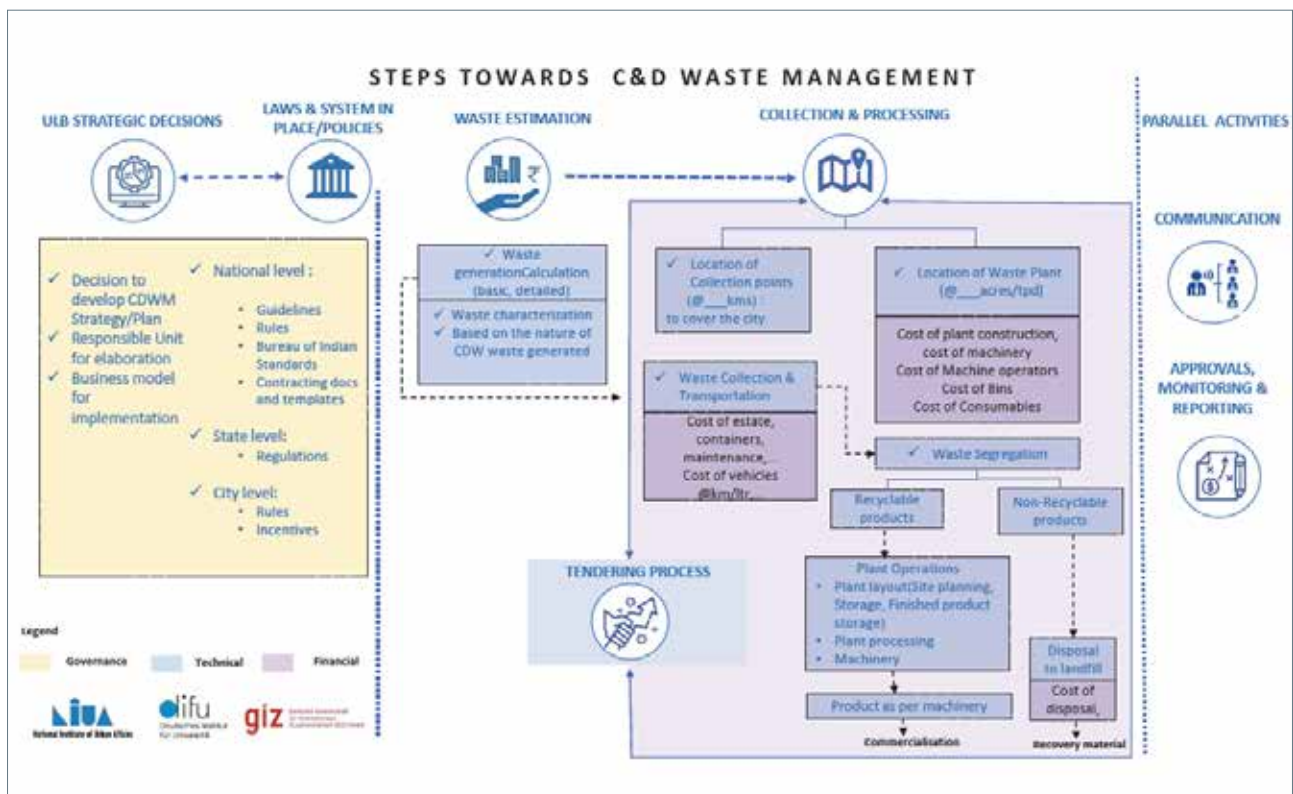
Annex –6.1: Steps towards C&D Waste Management

Exercise Module 6: Main Steps of CDWM

The task and intention of this exercise is to develop main steps of CDWM based on the information of the previous modules and learnings so far.

1. Using one coloured moderation cards, identify important aspects from your point of view that need to be part of a CDWM strategy (Brainstorming) and put them on a pinboard.
2. Merge mentions with same content and then cluster related aspects. Find a meaningful headline for each cluster. Sometimes aspects fit into different clusters. Then you should agree on where it fits best for the time being or copy it, if the aspect is important.
3. Agree on which tasks are preparatory or basics tasks. Define an overall order of steps.
4. The trainer will explain the "Steps towards CDWM" graphic, shown in figure 21.
5. Compare your elaborated result with the trainer's presentation:
 - Look for similarities and differences!
 - Have a dialogue on differences: how could your outcome or the trainer's version be adapted or improved?
 - Check if anything is missing?

Agree on a joint basic version, including city specifics if reasonable.



Annex –6.2: General Situation in your Municipality

Exercise Module 6: General Situation in your Municipality	
<p>1. Please describe the general situation of CDWM in your City using the matrix below. In case, you cannot answer questions on your own, try to contact a responsible colleague via phone. If data or information is not available at all, please note accordingly.</p> <p>2. After you finished the questionnaire, on a scale from 1 to 10, if ten CDWM is working properly and one nothing implemented, please rate CDWM in your own city.</p>	
Topic	Explanation
Quantity of Waste	
Solid Waste generated (t/a)	
CDW generated (t/a)	
CDW collected (t/a)	
CDW recycled (t/a)	
Transport and Treatment	
Organisation of Collection	
Segregation of CDW; Collection points?	
Processing Facility in operation? – TPD?	
Facility Output (recycled material?)	
Disposal site(s)	

Annex –7: Exercise Module 7

Exercise Module 7: Stakeholder Identification and Assessment

The involvement of stakeholders in the CDWM process is important and requires a thorough approach. You are invited follow this process stepwise.

In a first step, please brainstorm and identify all stakeholders in your city that are relevant from your point of view. List them below.

List of Stakeholders

In a second step, please group them in the suggested three fields below. Feel free to further subdivide the grouping if necessary.

Relevant Stakeholder Collection Matrix

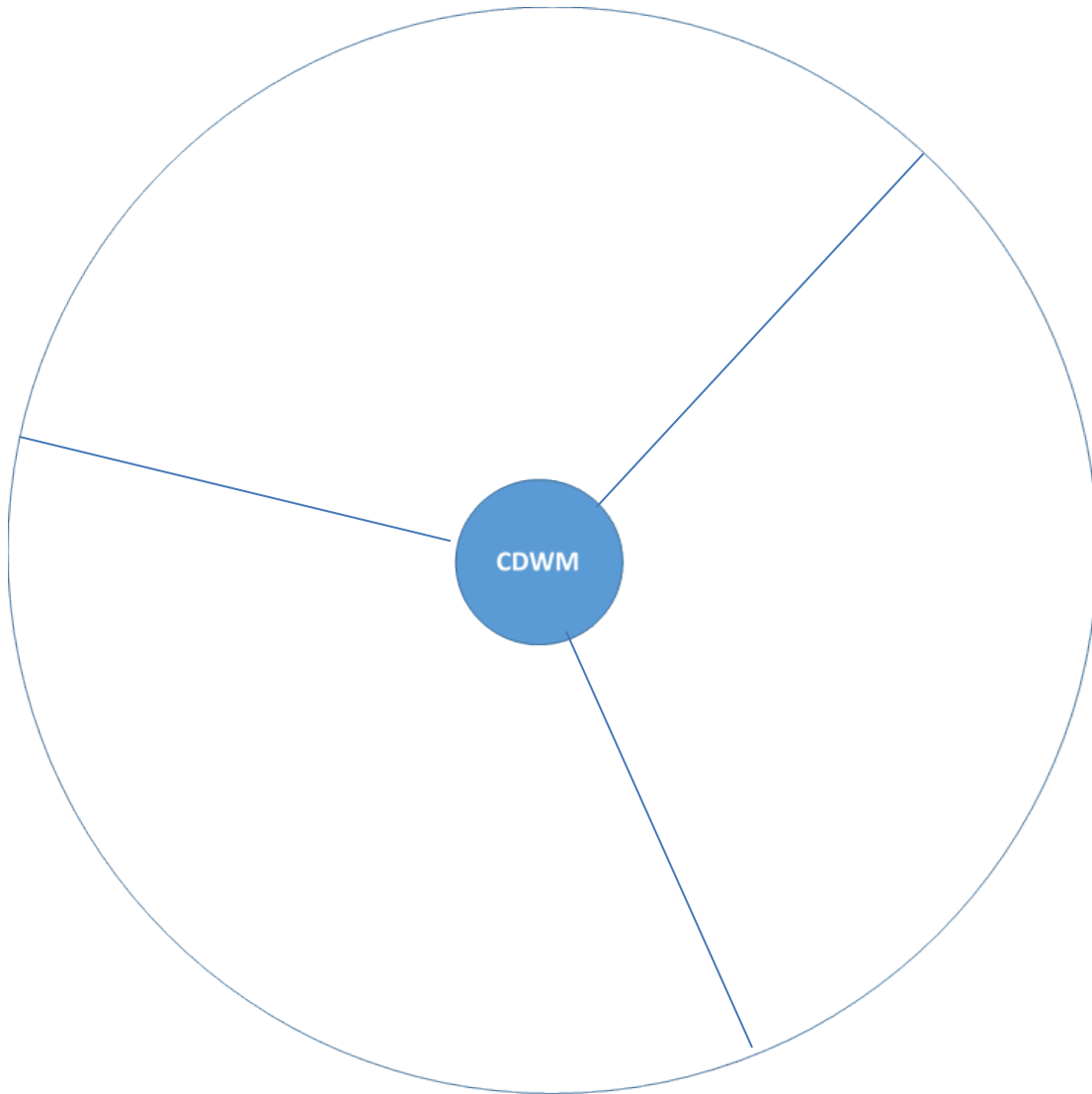
Governance Local, regional, state etc.	Waste Generators Builders, constructors, transporters, processors	Others Supporters, multipliers e.g. residential groups etc.

In a third step, please integrate the stakeholders in the circle provided below. Divide the circle according to the groups you created in the second step.

Next, rate the stakeholders according to their importance. The more important stakeholders should be placed nearer to the centre e.g. because of his decision taking tasks.

Use bold letters or underline the most important stakeholders in each sector.

Finally, use the exclamation mark (!) for stakeholders with the ability to "veto" CDWM elaboration and implementation.



In a fourth step, please use the following arrows to highlight the relationship between different stakeholders:

Strong relation 

Weak relation 

Conflicting relation 

In a fifth step, please present your results to the other participants and discuss differences and similarities, opportunities and threats of involving different kind of stakeholders.

Annex –8.1: Exercise Module 8

Exercise Module 8: Project Management and Roadmap Development

The following matrix combines the project management and roadmap development in one document. The document will guide you through the different aspects and steps of CDWM. The exercise is divided by the main steps and phases of the CDWM process (see flow chart in Module 6) including sub-sections:

1. Preparation phase
2. Regulation and Rules
3. Contracting/Tendering process
4. Technical aspects
5. Supporting Mechanisms

1. Project Management (Task identification and Challenges)

In a first step*, please discuss and fill in the "project management columns":

- A. What needs to be done to achieve the topics intention or goal?
- B. What are the principal challenges in doing so?

Roadmap (Responsibilities and Time schedule)

In a second step*, please discuss and fill in the "roadmap columns":

- C. Who is the person in the city responsible for addressing the task? (see Module 7)
- D. What is the timeline for the person/team to start and for completing the actions (start date and end date, e.g. if you imagine to begin as of now)?

3. –Designing CDW Strategy

Design a "CDW strategy core team" for your city. Use the learnings and results of the stakeholder assessment of Module 7.

The following questions are intended to support you:

- Who takes/has the lead? (Chair)
- Who is supporting him (Team, Department)
- Whom does he report to?
- Which departments are involved?
- Who advices the core team?
- Which external stakeholders need to be involved, how and when?

CDWM Management Core Team

Presentation and Discussion

Finally, we ask you to present and share you results of your group work.

1. Each group presents their Project Management and Roadmap
2. Furthermore, each group should mention the three most important steps to be taken immediately for their city, responsibility and challenges.
3. Each group should briefly report striking and controversial aspects during group work

Annex–8.2: Exercise Matrix Project Management and Roadmap Development

	CDWM Process: Two steps elaboration	Option B: Step one - Module 8a – Project Management		Option B: Step 2 - Module 8b – Roadmap	
	CDWM process: One step elaboration	Option A: Module 8 – Project Management & Roadmap (Joint Elaboration)			
No	Topic	What needs to be done to achieve the topic?	Challenges?	Who? (Responsible/Involved)?	Starts When? Completed by when?
1	Preparation				Concrete dates (month/year)
	Is there a formal decision to develop CDWM strategy or plan?				
	Is a responsible unit assigned for elaboration and project responsibility?				
	Has a preliminary assessment of CDW / Inventory/ Characterisation been carried out?				
	Has there been a preliminary assessment of circularity (on-site reuse, reuse for local purposes)?				
	Have preliminary locations of Collection points been identified? (with land requirement – availability)				
	Has a preliminary location of processing plant been identified? (Land requirement – availability)				
	Has there been a full stakeholder identification and Assessment?				
2	Regulation/Rules				
	Have the national rules including templates been studied?				
	Are necessary state regulations or General Development Control Regulations in place for CDWM as per SWM Rules 2016?				
	Are there clear specifications & rules for the handling of CDW in construction permits?				
	Are debris collection charges specified and is there corresponding usage of the same?				

	CDWM Process: Two steps elaboration	Option B: Step one - Module 8a – Project Management	Option B: Step 2 - Module 8b – Roadmap		
	CDWM process: One step elaboration	Option A: Module 8 – Project Management & Roadmap (Joint Elaboration)			
No	Topic	What needs to be done to achieve the topic?	Challenges?	Who? (Responsible/Involved)?	Starts When? Completed by when?
3	Is the responsibility for debris collection and segregation specified?				
	Is there a separate cost estimation for CDWM currently? (Not only as part of overall SWM costs)				
	Has a business model for implementation of CDWM been arrived at? What is the model (Cost-plus, Profit-share, etc.)?				
	Has the tendering process for CDWM or processing plant been carried out?				
4	Technical Aspects				
	What are existing circularity measures in place (to reduce CDW in general and high value resources)?				
	Is segregation on-site stipulated and being checked?				
	What is the plan for collection and transport of CDW?				
	What is the plan for segregation of CDW at collection points or processing plant?				
	Has the procurement of treatment machinery (up to full plant operations) been done?				
	What are the categories for waste for processing into recycling or re-purposing?				
	Is there a list of recycling products decided as per the waste characterisation of the city?				
	Are there measures in places for disposal of the unusable waste (hazardous and otherwise?)				
	Is there an adequate monitoring and reporting system in place for CDWM?				

	CDWM Process: Two steps elaboration	Option B: Step one - Module 8a – Project Management	Option B: Step 2 - Module 8b – Roadmap		
	CDWM process: One step elaboration	Option A: Module 8 – Project Management & Roadmap (Joint Elaboration)			
No	Topic	What needs to be done to achieve the topic?	Challenges?	Who? (Responsible/Involved)?	Starts When? Completed by when?
5	Supporting Mechanisms				
	Is there an IEC plan for CDWM?				
	Is there an established network of stakeholders for updates and addressing CDWM issues?				
	Are there any special Incentives for CDWM at owner or other levels?				
	Is there a role model approach (e.g. use of recycled material in authority's own projects)				

Annex –9.1: Exercise Module 9

Exercise Module 9:	
Participants are invited to reflect on the past training modules. Feel free to note your thoughts first and then share it with your fellow participants.	
What are the lessons-learned from this training and the site visit?	
Which new insights could be implemented in your daily work routines?	
What and who could help you to monitor future process in setting up a CDWM system?	
Which actors and stakeholders and/ or other ULBs can assist in keeping "on track" for a sustainable CDWM system?	
Which kind of support will be needed in the future?	

Training on Sustainable Construction and Demolition Waste Management

To help us improve the quality of our workshop, we would appreciate your feedback!

Please provide your candid assessment of the course by completing this evaluation form. Please read the following statements and indicate your level of agreement by marking the appropriate box.

1. Institution:					
<input type="checkbox"/> City Council <input type="checkbox"/> Training Institute					
2. Content relevance and transfer possibilities	Totally disagree	Partially disagree	Neutral	Partially agree	Totally agree
The content of the workshop is important for my work.I have got concrete ideas of how to apply what I have learnt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The content of the workshop is intelligible and applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples and problem solutions are in meeting with the course objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Working and learning methods					
The course materials and the learning methods were well prepared and applied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The time available for content of the course was adequate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Achievement of objectives					
Participants developed a shared understanding about Sustainable Construction and Demolition Waste Management and possible applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participants draw lessons from training and can translate experience to their work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Trainers					
The trainers had considerable expertise on the subject and excellent teaching skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Participants					
The atmosphere among the participants themselves was constructive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was enough time and space for exchange of experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please list the topics/ content you learned and did during the course which you think are important for your work.

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Please list the things which prevented the course from being more effective for you.

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Do you have any suggestions for improving the Trainings concept and organisation?

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Other comments or suggestions with regard to the course, the venue or facilities. Continue over the page if you want

--

Your overall assessment of the Training	1	2	3	4	5	6	7	8	9	10
	very dissatisfied					very satisfied				

Thank you for your time and cooperation!

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