
Mid-term Evaluation and Learning Exercise of the Waste Solutions for a Circular Economy in India Project

Project Evaluation and Learning Exercises for the
Mitigation Action Facility

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Final Report

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Disclaimer

The results and analysis included in the report are based on an external and independent evaluation conducted by the consortium AMBERO-OPM. The conclusions drawn in the report do not necessarily reflect the official views of the Mitigation Action Facility and/or of the project under evaluation.

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Preface

The Mitigation Action Facility is a joint initiative of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), UK's Department for Energy Security and Net Zero (DESNZ), the Danish Ministry of Climate, Energy and Utilities (KEFM), the Danish Ministry of Foreign Affairs (MFA), the European Union and the Children's Investment Fund Foundation (CIFF). The Mitigation Action Facility evolved from the NAMA Facility, which was established in 2012. The Mitigation Action Facility's vision is to accelerate decarbonisation to keep temperature rises below 1.5 degrees Celsius by financing measures that shift priority sectors in a country towards a sustainable, carbon-neutral pathway. All projects with an overall duration of more than three years are subject to a mid-term and a final evaluation and learning exercise.

The Technical Support Unit (TSU) functions as the secretariat of the Mitigation Action Facility. The TSU commissioned AMBERO and Oxford Policy Management to conduct mid-term and final Evaluation and Learning Exercises (ELEs). Each ELE is conducted using the same Theoretical Framework (FW), which involves the application of a document review, participatory workshops, and stakeholder interviews to collect evidence about projects' results and lessons analysed using a Theory-based approach centred on the use of contribution analysis reinforced by elements of process tracing.

This document presents the findings of the **mid-term ELE of the Waste Solutions for a Circular Economy in India project**. The report has been reviewed by Luca Petrarulo (Technical Lead, ELE project). For further information, please contact davita.steinemann@ambero.de.

Executive Summary

This document presents the findings of the **Mid-term Evaluation and Learning Exercise (ELE) of the Waste Solutions for a Circular Economy in India project**. The ELE was undertaken during the period December 2023 to April 2024. In accordance with its Terms of Reference, this ELE sought to address the following questions:

- Is the project achieving its planned results?
- Is the project starting to trigger transformational change?
- What can be learnt from the project so far?

Please refer to Section 1.2 and Section 2 for the project context and the ELE methodology, Section 3 and 4 for the detailed findings and conclusions, and Section 5 for the full lessons and recommendations. The rest of the executive summary provides the highlights of the ELE's findings and key lessons.

The main goal of the project is to initiate the low-carbon transformation of the Indian Municipal Solid Waste Management (MSWM) sector by substantially reducing Green House Gas (GHG) emissions and providing other co-benefits. The project runs from September 2020 to August 2025¹ and its budget is EUR 17.3 million. The project is designed to develop replicable, state-of-the-art, low-carbon, and circular economy approaches for the waste management sector in India. It is being implemented in five cities: Bengaluru (Karnataka), Panjim (Goa), Patna (Bihar), Tiruchirapalli, also known as Trichy (Tamil Nadu), and Varanasi (Uttar Pradesh), covering a combined population of 23 million. The project is implemented by GIZ and supported by a range of project delivery partners, including NGOs and research institutes.

The project aims to transform the waste management sector by scaling up investment in low-carbon projects, strengthening regulatory frameworks, and implementing the 3R (Reduce, Reuse, Recycle) concept. It focuses on integrating informal recycling sectors and promoting extended producer responsibility (EPR). Market transformation efforts target five key cities with existing expertise in waste management practices. Measures include establishing source segregation systems, material recovery facilities, recycling facilities, and compost facilities. Innovative technologies like biomethanation will be supported and piloted, and support will be provided for refuse derived fuel (RDF) co-processing in cement plants.

This mid-term ELE highlighted the following key findings²:

- **Project support to the national government has been effective in putting the existing policy framework for low-carbon MSWM into practice.** GIZ has provided valuable support to the Ministry of Housing and Urban Affairs (MoHUA) at the national level via its embedded technical experts. This has comprised demand-led support, such as specific guidelines on implementing EPR and studies on options for addressing certain types of plastic waste.

¹ An extension to August 2026 is currently pending approval.

² Please see the report's Section 3 for the full findings.

- **The project is enabling significant improvements and behavioural change in source segregation.** A range of approaches to promoting source segregation and achieving behavioural change at the household level that are designed to respond to nuances of local context has been implemented by GIZ and their project delivery partners, which are often NGOs. For example, in Bengaluru, significant improvements in segregation have been achieved in 12 wards.³
- **The project has developed the awareness and capacity of Municipal Corporation (MC) staff in the five selected cities in terms of the importance and methods for low-carbon MSWM.** The project has enabled greater public sector understanding and replication of low-carbon SWM processes and investments. This has been particularly strong in Bengaluru, Patna, Panjim (Goa), Varanasi and Trichy.
- **The project's Grant Funding Mechanism is supporting MCs to access necessary equipment for improved low-carbon MSWM.** The project support is helping city governments to implement necessary sorting and processing infrastructure and procure equipment, to enable recycling and circular economy business opportunities to be unleashed. An example is the support to the Varanasi MC to purchase equipment to excavate legacy waste as an input to a large-scale RDF-to-green charcoal process, which will displace coal in a thermal power plant.
- **The Risk Sharing Facility (RSF) implemented by the project is showing promising signs of impact, and its replication in a scaled-up version by the Housing and Urban Development Corporation or MoHUA is a major achievement for the project.** At the time of the mid-term ELE, the RSF has recently started to make good progress in unlocking more finance for private sector investors in biomethanation and other processes, which have less proven commercial models and are seen as risky investments by commercial banks.
- **A cumulative amount of 138,544 metric tonnes of CO₂e of avoided emissions can be attributed to the project as of the end of 2023.** This leaves 1,061,456 metric tonnes of CO₂e reduction to be achieved between early 2024 and the end of 2025, which is challenging. While currently well below target, the emission reduction figure is likely to increase rapidly as the RSF becomes more active and the project builds on the foundations of improvements to source segregation and municipal capacity and resources for low-carbon MSWM processes.
- **Gender considerations have been a significant part of the project:** This includes women's livelihoods being improved through employment in a women-only Material Recovery Facility (MRF) and through the tailoring of cloth bags as an alternative to plastics in the Cheela Mela initiative and in the approach to household and community engagement on segregation.

The **learning and recommendations** derived by the evaluators of the ELE for future projects in the low-carbon MSWM sector, included the following⁴:

³ 'Wards' refer to specific administrative subdivisions within a city or town. These subdivisions are part of the local government structure and are used for municipal governance and planning purposes. Each ward represents a segment of the population within the urban area and is overseen by an elected representative known as a ward councillor.

⁴ See Section 5 for a full list of lessons and recommendations.

- **Source segregation at scale is crucial for a wider sector transition to low-carbon MSWM.** A comprehensive behavioural change approach has been proven to work well, but it cannot be implemented in all wards of a city due to the limited budget and scale of the project. Scaling is likely to rely on building the capacity of MCs and waste collection contractors to drive forward the process, following awareness-raising engagement by NGOs.
- **Integration of informal sector workers into more formal roles in the MSWM value chain is challenging.** This is partly due to the reluctance of workers to lose the flexibility that informal work brings. The project has instead aimed to improve the interface between workers and MRFs and to improve their social security and health and safety outcomes.
- **Replication of project approaches to other cities is more likely to work within States.** Supporting the replication of MSWM approaches in surrounding cities with similar environmental and cultural contexts is likely to be more effective than aiming to replicate a singular approach across the country. The geographic distribution of the selected cities is an advantage for understanding which approach is likely to work well in which State.

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List of abbreviations

BMWK	German Federal Ministry for Economic Affairs and Climate Action
BBMP	Bruhat Bengaluru Mahanagra Palike
BSWML	Bengaluru Solid Waste Management Ltd
CCP	Corporation of the City of Panaji
CPCB	Central Pollution Control Board
COVID-19	Corona Virus Disease 2019
CNG	Compressed Natural Gas
CSR	Corporate Social Responsibility
ELE	Evaluation and Learning Exercise
ELEQ	Evaluation and Learning Exercise Question
EQ	Evaluation Question
EUR	Euro
EPR	Extended Producer Responsibility
FC	Financial Cooperation
FW	Framework
GDP	Gross Domestic Product
GFM	Grant Funding Mechanism
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GWMC	Goa Waste Management Corporation
HUDCO	Housing and Urban Development Corporation
IO	Intermediate Outcome
JCM	Joint Credit Mechanism
KfW	KfW Development Bank (KfW – Kreditanstalt für Wiederaufbau)
KII	Key Informant Interview

Logframe	Logical Framework
MAF	Mitigation Action Facility
MLP	Multilayer Packaging
MoEFCC	Ministry of Environment, Forest and Climate Change
MoHUA	Ministry of Housing and Urban Affairs
MC	Municipal Corporation
M&E	Monitoring and Evaluation
MRF	Material Recovery Facility
MSWM	Municipal Solid Waste Management
MCD	Municipal Corporation of Delhi
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contributions
NGO	Non-governmental Organisation
NMCG	National Mission for Clean Ganga
NTPC	National Thermal Power Corporation
OECD DAC	Organisation for Economic Co-operation and Development's Development Assistance Committee
OPM	Oxford Policy Management
QA	Quality Assurance
QC	Quality Control
RAG	Red Amber Green
RDF	Refuse Derived Fuel
RRR	Reduce, Reuse, Recycle
RSF	Risk Sharing Facility
SBM-U	Swachh Bharat Mission-Urban
SWYWC	Shop with Your Waste Campaign
SHGs	Self-help Groups
SIDBI	Small Industries Development Bank of India

SMART	Specific, Measurable, Achievable, Relevant and Timebound
SUP	Single Use Plastic
TC	Technical Cooperation
ToC	Theory of Change
TPD	Tonnes per Day
TS	Types of Sources
TSU	Technical Support Unit, Mitigation Action Facility
TCMF	Transformational Change Measurement Framework
ULB	Urban Local Body
UNFCCC	UN Framework Convention on Climate Change

1 Introduction

This document presents the findings of the **mid-term Evaluation and Learning Exercise (ELE) of the Waste Solutions for a Circular Economy in India project**. The ELE was undertaken during the period December 2023 to April 2024.

1.1 Overview of the project

India generates approximately 55 million tonnes of Municipal Solid Waste (MSW) annually from its urban population of 377 million due to rapid urbanisation, industrialisation and population growth. Projections indicate that the urban population will rise to 600 million by 2030 and 814 million by 2050, leading to an expected increase in waste generation to 165 million tonnes by 2030 and 436 million tonnes by 2050⁵. This surge will also elevate annual greenhouse gas emissions from MSW to an estimated 41.09 million tonnes by 2030⁶. The Ministry of Housing and Urban Affairs (MoHUA) highlights significant opportunities in adopting circular economy principles, with potential revenues of INR 118.36 billion (approx. EUR 1.31 billion) annually from recycling dry waste, and INR 3.65 billion (approx. EUR 40.4 million) and INR 16.79 billion (approx. EUR 186 million) per annum from composting and Bio-Compressed Natural Gas (Bio-CNG) production from wet waste, respectively⁷. The government of India has launched initiatives such as the Swachh Bharat Mission-Urban (SBM-U)⁸, SBM 2.0, AMRUT, GOBARdhan, and Extended Producer Responsibility (EPR) policies to promote a transition towards a circular economy in MSW management at various levels - national, state, and city.

India has pledged to reduce the emissions intensity of its GDP by 45% by the year 2030, as outlined in its Nationally Determined Contribution (NDC). This commitment signifies a significant stride toward India's overarching objective of attaining net-zero emissions by 2070. Although India's NDC does not specify quantitative GHG emission targets for the waste sector, it prioritises reducing waste-related emissions through "promoting waste to wealth conversion" and "abatement of pollution". Developing more sustainable practices in the Indian Municipal Solid Waste Management (MSWM) sector thus directly contributes to the NDC⁹.

The key barriers in India's MSWM system include **financial barriers**, notably the inadequacy of funds for operating low-carbon MSWM facilities due to the absence of user fees or tipping fees paid by urban local bodies (ULBs) to plant operators. Delays in accessing compost subsidies and Swachh Bharat Mission (SBM) capital expenditure grants from the Government of India exacerbate financial

⁵ MoHUA, 2022, Circular Economy in Municipal Solid and Liquid Waste. <https://mohua.gov.in/pdf/627b8318adf18Circular-Economy-in-waste-management-FINAL.pdf>

⁶ *Ibid.*

⁷ *Ibid.*

⁸ Swachh Bharat Mission-Urban (SBM-U) is a national Government of India initiative aiming to enhance cleanliness, sanitation, and hygiene in urban areas of India through the construction of toilets, solid waste management, and behaviour change campaigns, fostering a healthier and more sustainable urban environment.

⁹ UNFCCC, 2022, India's Updated First Nationally Determined Contribution Under Paris Agreement. <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>

challenges, with stakeholders facing technical hurdles in navigating the application process. **Regulatory barriers** add to the complexity, with MSWM rules not rigorously enforced, allowing landfilling of organic waste and biomethanation plants lacking access to Preferential Power Tariffs. Cement plants' limited compliance with refuse-derived fuel (RDF) mandates and reluctance to cover transport costs for RDF further impede progress. **Market-related challenges** include low demand for compost and recycled products, driven by farmers' mistrust in compost quality and limited awareness among consumers. On the **technical front**, a lack of technical know-how among private operators hampers the smooth operation of MSWM facilities. Addressing these barriers is crucial for the successful implementation of MSWM practices.

The main goal of the Waste Solutions for a Circular Economy in India project (referred to as 'the project') is to initiate the low-carbon transformation of the Indian MSWM sector by substantially reducing Greenhouse Gas (GHG) emissions and providing other co-benefits. The project runs from September 2020 to August 2025¹⁰ and its budget is EUR 17.3 million. It is implemented by GIZ and supported by a range of project delivery partners, including NGOs and research institutes.

The project is designed to develop replicable, state-of-the-art, low-carbon, and circular economy approaches for the MSWM sector in India. It is being piloted in five cities: Bengaluru, Panjim (Goa), Patna, Trichy (Tiruchirapalli), and Varanasi, covering a combined population of 23 million. The target of benefiting 11 million people from the project considers that approximately 50% of the population in 2018 will benefit from activities such as source segregation, home composting, and other low-carbon waste management awareness initiatives.

The project aims to transform the MSWM sector by scaling up investment in low-carbon projects, strengthening regulatory frameworks, and implementing the 3R (Reduce, Reuse, Recycle) concept. It focuses on integrating informal recycling sectors and promoting extended producer responsibility. Market transformation efforts target the five key cities with existing expertise in waste management practices. Measures include establishing source segregation systems, material recovery facilities, recycling facilities, and compost facilities. Innovative technologies like biomethanation will be piloted, and support will be provided for RDF co-processing in cement plants.

The selection of cities for the project was based on proposals submitted by various cities. Initially, the process involved inviting cities to participate, and the first five cities to submit letters of support were included: Varanasi, Goa, Trichy, Bengaluru, and Coimbatore. Despite subsequent requests, the participation was limited to five cities to ensure regional diversity. During the Detailed Preparation Phase (DPP), Coimbatore was replaced by the North Delhi Municipal Corporation due to a lack of response from Coimbatore during the DPP. However, the North Delhi Municipal Corporation was merged with the Municipal Corporation of Delhi in 2022 and secured additional funding from Corporate Social Responsibility (CSR), obviating the need for grant funding. In consultation with the Ministry of Housing and Urban Affairs (MoHUA) for a replacement, Patna was added as the fifth city in December 2022.

¹⁰ An extension to August 2026 is currently pending approval.

The project's primary components involve a Financial Cooperation (FC) Component and a Technical Cooperation (TC) Component. The TC Component primarily focuses on enhancing the source segregation of waste, which is a crucial prerequisite for the sustained operation of low-carbon MSWM solutions. Additional measures being implemented include setting up semi-mechanised Material Recovery Facilities (MRFs), upscaling existing and establishing new recycling facilities, ensuring viable operation of existing compost facilities, and piloting innovative organic waste treatment technology in new plants. Additionally, the project will enable the formal engagement of the informal sector through technical cooperation, as they are key stakeholders in waste management in India. The overall goal is to enable municipalities to sustain these initiatives beyond the project duration.

Under the FC Component, a Risk Sharing Facility (RSF) will provide loan guarantees in two tranches for small and larger MSWM operators, with a focus on establishing composting, biomethanation, and RDF plants. In addition, a Grant Funding Mechanism will provide targeted financial and procurement support to Municipal Corporations (MCs) to facilitate the restart of stalled MSWM plants, implement new sorting and processing plants and enable more effective low-carbon MSWM operations.

The main project counterparts include the MoHUA and the Ministry of Environment, Forest and Climate Change (MoEFCC) at the national level. At the ULB level, partners consist of the Municipal Corporations of Varanasi, Goa (Panjim and Goa Waste Management Corporation), Trichy, Bengaluru, and Patna. Other partners encompass the project delivery partners, such as TERI, Saahas, the Small Industries Development Bank of India (SIDBI) and third parties, including the Housing and Urban Development Corporation (HUDCO), industries, start-ups, and RSF beneficiaries. The project was developed in consultation with national government policymakers and planners, aiming to foster a close coordination mechanism for information exchange and tangible results on the ground. This collaborative approach serves as both an implicit and explicit strategy for disseminating project outcomes upwards, providing evidence-based national policy advice and enhancing project impact.

The targeted waste treatment capacity is set at 4,500 tonnes per day (TPD), which is expected to directly mitigate 1.2 million tCO₂e within the project's 5-year duration, 4.1 million tCO₂e in 10 years, and 7.4 million tCO₂e over the lifetime of the waste treatment facilities. The low-carbon MSWM solutions supported by the project will serve as blueprints for similar interventions in other cities, catalysing a transformation of the national MSWM sector. Indirect emission reductions are also anticipated, reaching around 2.8 million tCO₂e in 10 years and 7.4 million tCO₂e over the lifetime of the waste treatment facilities, assuming additional treatment capacity of at least 4,500 TPD will be indirectly triggered.

1.1.1 The impact and outcomes of the project

The overall impact of the project, as set out in the Theory of Change, is to transform the waste management sector by scaling up investment in low-carbon projects, strengthening regulatory frameworks, implementing the 3R concept, and initiating a shift towards low-carbon technologies in alignment with the circular economy principles.

Below this impact statement, there is one outcome: "A sector-wide transition towards low-carbon waste management technologies in line with circular economy principles has been initiated". This overarching goal is expected to materialise through several key outputs. Firstly, national and sub-national decision-makers will be equipped with the necessary instruments to guide the secondary

resources market towards low-carbon waste management strategies within the existing legal framework (**Output 1**). Secondly, operational financial mechanisms will be established and made available for replication, facilitating the adoption of sustainable practices (**Output 2**). Thirdly, models for source segregation and the integration of the informal sector will be implemented in five designated lighthouse cities, serving as replicable examples for other urban areas (**Output 3**). Additionally, the capacities and performance of solid waste management facilities in these cities will be enhanced, fostering the replication of best practices for low-carbon municipal solid waste management (**Output 4**). Finally, key stakeholders' capacities and awareness regarding integrated low-carbon waste management approaches will be bolstered, ensuring a holistic and sustainable transition (**Output 5**). Through these outputs, the project aims to catalyse a significant and enduring transformation towards a more environmentally sound waste management paradigm.

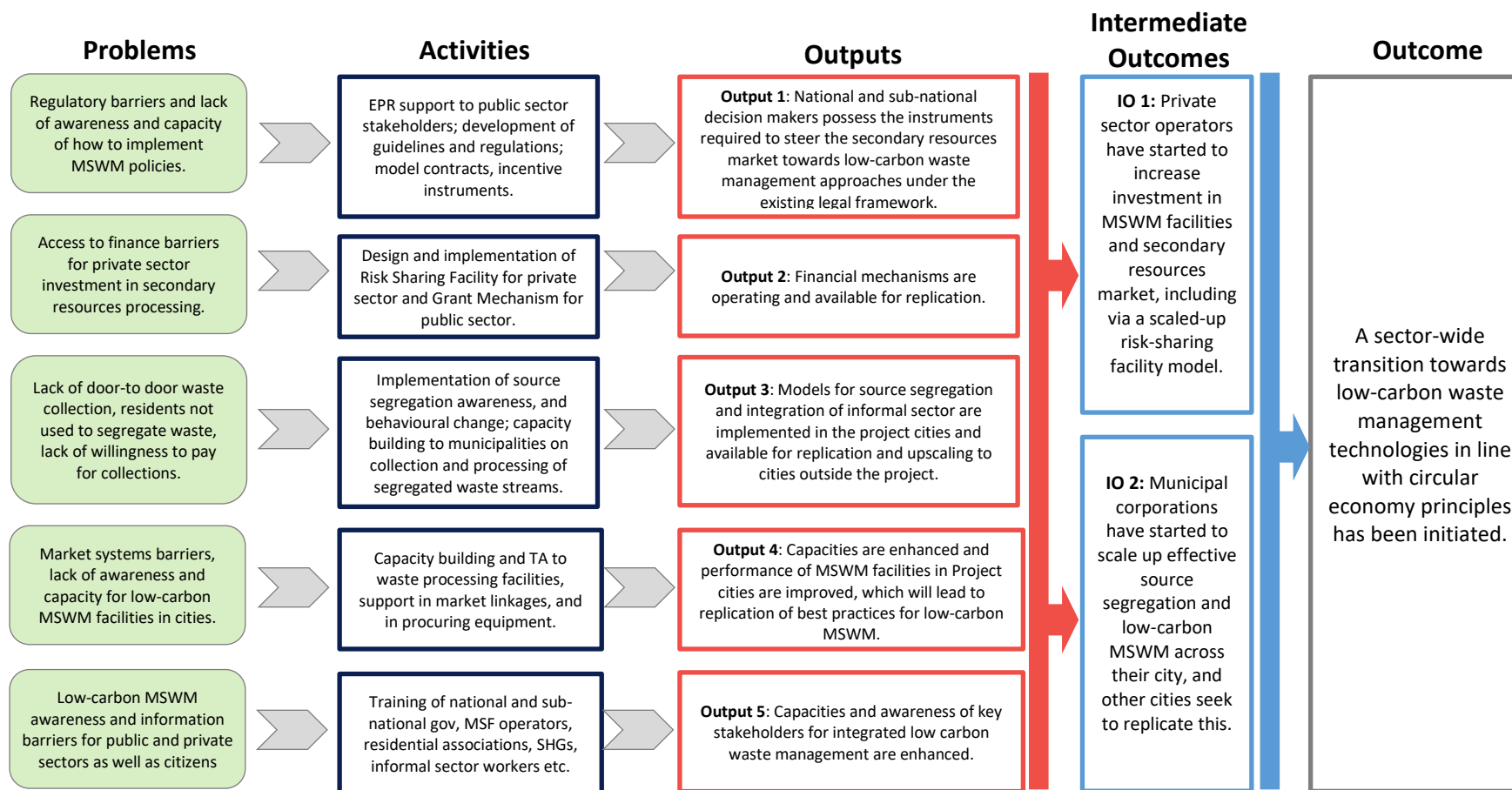
The ELE has suggested that it would be useful to include **two intermediate outcomes (IOs)** to demonstrate the project's early signs of sector-wide transition. Intermediate outcomes serve as measurable milestones, facilitating the assessment of progress. By prioritising the achievement of specific outputs that contribute to intermediate outcomes, progress can be effectively tracked, enabling informed decisions regarding adjustments or modifications to the implementation strategy. These are:

- **Intermediate Outcome 1:** Private sector operators have started to increase investment in MSWM facilities and secondary resources market, including via a scaled-up risk-sharing facility model.
- **Intermediate Outcome 2:** Municipal corporations have started to scale up effective source segregation and low-carbon MSWM across their city, and other cities seek to replicate this.

1.1.2 The original causal pathways

In order to progress from the initial problem and barriers identified to the achievement of the outcome presented, the project Theory of Change (ToC) foresees causal pathways that converge from the five output areas to the two intermediate outcomes and then to the main project outcome. These are illustrated below in Figure 1.

Figure 1. Overview of the Original Causal Pathways of the project



Source: ELE team

It is important to note that there is some overlap in how outputs contribute to the two intermediate outcomes. Intermediate Outcome 1 is achieved through outputs 1, 2, and 3, while Intermediate Outcome 2 is attained through outputs 3, 4, and 5. Both Intermediate Outcomes 1 and 2 serve as crucial steps leading to the accomplishment of the final project outcome.

The ELE has identified the following causal pathways sustaining each of the two intermediate outcomes and the final outcome of the project:

- **Causal Pathway for Intermediate Outcome 1:** Effective operation of financial mechanisms (**Output 2**), such as the Risk-Sharing Facility (RSF), enables private sector operators to invest in MSWM facilities and secondary resources markets. Additionally, providing decision-makers with the necessary instruments to steer the secondary resources market towards low-carbon waste management (**Output 1**) creates a favourable environment for private sector investment. Moreover, offering models for effective source segregation and integrating the informal sector, which is pivotal for municipal corporations to upscale low-carbon MSWM practices (**Output 3**), further bolsters the motivation for private sector investment. Consequently, private sector operators are empowered to boost their investments in MSWM facilities and secondary resources markets, potentially through the implementation of a scaled-up RSF model. This progression culminates in **Intermediate Outcome 1:** Private sector operators have started to increase investment in MSWM facilities and the secondary resources market, including via a scaled-up RSF model.
- **Causal Pathway for Intermediate Outcome 2:** Providing models for effective source segregation and integrating the informal sector is critical for municipal corporations to upscale low-carbon MSWM practices (**Output 3**). Augmenting capacities and enhancing the performance of MSWM facilities (**Output 4**) furnishes municipal corporations with the necessary infrastructure, equipment (including via the Grant Funding Mechanism) and expertise to implement and scale up waste management endeavours. Simultaneously, bolstering the capacities and awareness of key stakeholders secures greater support and participation in low-carbon waste management initiatives at the municipal level and should also encourage replication in other cities (**Output 5**). These efforts coalesce into **Intermediate Outcome 2:** Municipal corporations have started to scale up effective source segregation and low-carbon MSWM across their city, and other cities seek to replicate this.

1.2 Focus of the Evaluation and Learning Exercise

In accordance with its Terms of Reference (ToR), this ELE seeks to address the following General ELE Questions (ELEQs):

- Has the project been achieving its results?
- Has the project started to trigger transformational change?
- What was learnt from the project so far?

A number of additional questions have been considered in this Mid-term ELE, as stated in the ToR:

1. Which additional partnerships and alliances should the project explore that will go beyond the project activities?
2. How well has the project supported the promotion of source segregation in India through the project activities, and what are other promising approaches that the project could consider?
3. How well is the project team considering alternative approaches for increasing the quantity of waste processed through project support? Can the ELE team suggest any alternative approaches based on the evaluation findings?
4. What is the project relevance / performance in relation to the promotion of the use of RDF in cement production? What lessons can be learnt from this specific focus area (if any)?
5. What is the project's relevance/performance in relation to i) the avoidance of and ii) the recycling of single-use plastic (SUP)? What lessons can be learned from this specific focus area, if any?
6. What are the lessons from the performance of the RSF? Are any changes to the current modality of guarantee provision required, why?
7. The project has recently amended its Grant Funding Mechanism and substituted the provision of grants to ULBs with a direct procurement of waste treatment equipment for them. The assumption has been that the change of modality will not affect the transformational potential of the project – could ELE look at this issue and evaluate the impact of the amendment?
8. To what extent has the project contributed to the advancement of the secondary resources market for low-carbon waste management approaches within the existing legal framework?
9. In what ways has the project successfully enhanced the capacities and awareness of key stakeholders for integrated low-carbon waste management?
10. How effectively has the project contributed to job creation and the improvement of livelihoods, particularly for underprivileged individuals and women?
11. What risks could impact the delivery of the project, and how well have these been managed by the project team?

The three general ELEQs presented above were broken down and operationalised into Specific ELEQs that are answered in this report. In Table 1, the General and Specific ELEQs are mapped against the Organisation for Economic Co-operation and Development's Development Assistance Committee's (OECD DAC) evaluation criteria¹¹, which are widely used as international standards for evaluations of development interventions. Reference to the relevant report section where each ELEQ / evaluation criterion is treated is also given. Finally, the specific ELEQs were broken down further into sub-questions, which are included in the official ELE Matrix in Annex B. These are designed to address the 11 additional questions in the ToR, and they were approved by the Mitigation Action Facility Technical Support Unit (TSU) at the start of the ELE exercise.

¹¹ Relevance, Effectiveness, Efficiency, Impact, Sustainability. The ELE team added a 6th criteria, namely Learning.

Table 1. General and specific ELE questions and their link to the ELE Report sections

General ELE Question	Specific ELE Question	Evaluation criteria (relevant ELE Report section)
Is the project achieving its planned results?	To what extent does the project address an identified need (by national policy institutions, city governments, citizens, and the private sector)?	Relevance (Section 3.1)
	To what extent has the project been achieving its intended outcomes?	Effectiveness (Section 3.2)
	To what extent has the delivery of the outputs been timely and to expected quality standards?	Efficiency (Section 3.3)
Is the project starting to trigger transformational change?	What evidence is there that the project is likely to contribute to the intended impact in the ToC (incl. transformational change)?	Impact (Section 3.4)
	What is the likelihood that the outcomes will be sustained after the end of the project funding period?	Sustainability (Section 3.5)
What has been learnt from the project so far?	What key lessons can be learnt to the benefit of this or other projects funded by the Mitigation Action Facility in achieving their results?	Learning (Section 5.1)

1.2.1 The Mitigation Action Facility Transformational Change Measurement Framework

Some words need to be spent on the concept of transformational change, which is included in the General and Specific ELEQs. The enabling of transformational change is one of the key aims of the Mitigation Action Facility and, therefore, of projects. The Mitigation Action Facility defines Transformational Change as *“Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways”*¹². The Mitigation Action Facility Theory of Change explains how transformational change is expected to be achieved through its outputs and outcome. The Theory of Change is broad, and there are different ways in which transformational change can be achieved through the projects. Figure 2 illustrates three dimensions that interact and reinforce each other to produce project-induced transformational change. Each project will work on different elements of the three dimensions to define its own pathway to or “recipe” for transformational change. A more detailed explanation of the ELEs’ Transformational Change Measurement Framework (TCMF) summarised in Figure 2 is presented in Annex A.

The ELE used the TCMF to assess the project’s progress towards its impact in Section 3.4. In particular, in the evidence gathered through the ELE, the evaluators have looked for “signals” of the materialisation of the three dimensions and classified them as early, interim, and advanced signals according to the definitions in Table 2. Table 3 shows the minimum level of signals of each of the three transformational change dimensions that projects are expected to have achieved by respectively their mid-line and end-line.

¹² https://mitigation-action.org/wp-content/uploads/Mitigation-Action-Facility_TC-factsheet.pdf

Figure 2. Transformational Change Measurement Framework

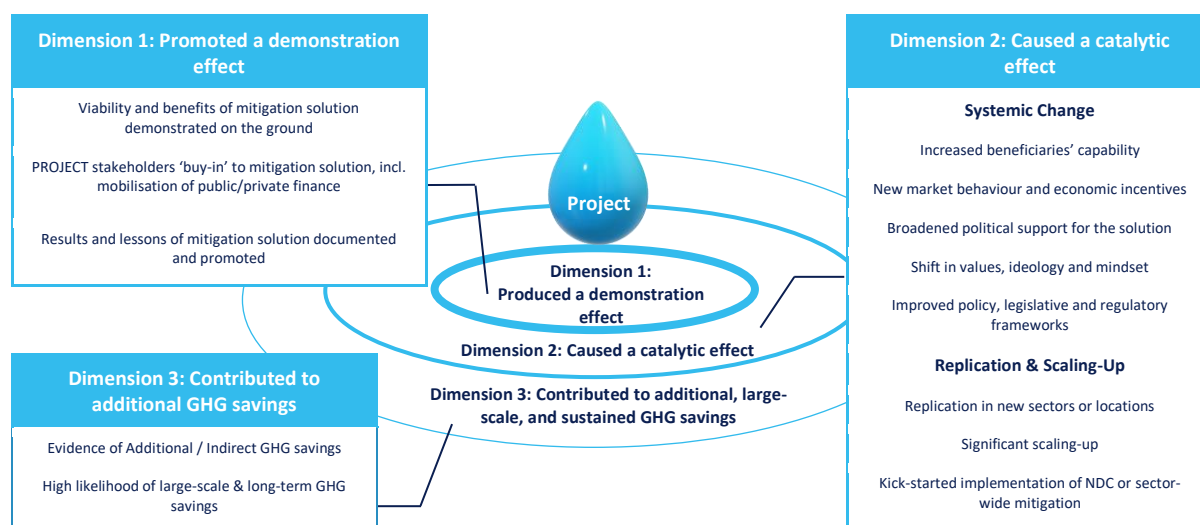


Table 2. Transformational Change “Signals” assessment by ELEs

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the project, but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway, and there is little doubt that it will continue.

Table 3. Minimum expected signals of project-induced transformational change

Dimension	Mid-point	End-point
1: Promoted a demonstration effect	Interim signals	Advanced signals
2: Caused catalytic effect	Early signals (of one or more of the types of possible changes)	Interim signals
3: Contributed to additional GHG savings	None	Early signals

2 Methodological approach

2.1 Criteria and scoring system

The ELE used the standardised ELE methodology and tools to carry out this Mid Term Evaluation. These include the ELEQs, sub-questions, evaluation criteria, and TCMF. The evaluation criteria are presented in the ELE Matrix (Annex B). This matrix formed the empirical basis for formulating the evaluation findings, from which the conclusions were drawn, which served as evidence and a logical basis for formulating the recommendations. Based on the ToR's questions, tailored questions were developed to collect the answers directly from the stakeholders via key informant interviews.

2.2 Evaluation Approach

2.2.1 Data identification and collection

The data collection tools comprised desk review and key informant interviews as summarised below:

- The ELE team collected and reviewed the preliminary data from the project documentation in the ELE desk review phase (see list of consulted documents in Annex C).
- To ensure the data's accuracy, completeness, and quality and to obtain additional information, the ELE team conducted a field mission to the cities of Delhi, Bengaluru, Panjim and Varanasi to facilitate interviews with stakeholders, using prepared questions in line with the ELEQs. Along with Delhi, where the Core Project Team is based, the three cities were selected from five cities in which the project is operating, as they represent a good sample of geographical and social contexts. The interview list is included in Annex C.

Table 4. Overview of number of interviews and interviewees by sampling category

	Project Team	Project Stakeholders	Project Delivery Partners	Third Parties	TOTAL
No. interviews	06	08	07	14	35
No. interviewees	11	09	12	18	50

2.2.2 Data Analysis

Following the data collection fieldwork, the ELE team then analysed the quantitative data collected in the desk review and interview phases. For sound interpretation of qualitative data, the evaluators cross-checked, analysed and compared (triangulation of data or sources of information) the documentation prepared by the project and the interview findings. The data was analysed in a disaggregated manner to the greatest extent possible, considering the opinions of the different groups. See Table 5 for a summary of the procedure followed.

Table 5. Summary of the ELE Analysis Methodology

Integrating Primary & Secondary Data	Evaluating Strength of Evidence	Draft Contribution Story
Tailor analytical tools	Assess strength of evidence of common themes	Draft contribution stories in the ELE report for each ELEQ and causal pathway
Tidy up notes	Identify concurrent / alternative explanations in ToC causal pathways	Final QC / QA
Data mining and evidence mapping from interviews and docs along ELEQs	Agreement on contribution of PROJECT vs Context	
Extract positive and negative common themes for each ELEQ	Perform process tracing formal tests of causal pathways	
Consolidate and cross-check common themes	Develop figure with RAG rating of causal pathways	
1st Quality Control (QC) / Quality Assurance (QA)		

2.3 Quality control

The ELE report followed the required structure and editorial format, responded to the ToR and answered all ELEQs. A quality control process was conducted throughout the ELE process. It was verified that the data were collected from sufficient and appropriate sources, that findings were validated through cross-checking information and that the findings, lessons learned, and conclusions were coherent. The strength of evidence was assessed using the score card in Table 6. The ELE team cross-checked all project information to ensure consistency between the sections of this report and the original data. All comments from the Mitigation Action Facility and the project team were addressed.

Table 6. Score card for assessing the strength of evidence

		Variety (number of types of sources (TS) reporting the evidence)		
		1 TS only	2 TSs	3 TSs
Quantity (number of sources reporting the evidence)	1 interview only	Single source		
	2 interviews	Weak evidence	Medium evidence	
	3+ interviews	Medium evidence	Strong evidence	Very strong evidence

2.4 Limitations

This mid-term ELE has been conducted per the typical ELE methodology and scope. However, as always, there are aspects that can be improved. As such, the following limitations should be recognised:

1. **Only a sample of the five selected cities could inform more in-depth data collection:** Due to budget and time limitations, a sample of three of the five cities (Bengaluru, Panjim (Goa) and Varanasi) were selected for in-person visits and interviews with key project delivery partners and city government counterparts and other stakeholders. Interaction with similar stakeholders in the other cities of Patna and Trichy was limited to five online meetings with GIZ representatives, project delivery partners and city officials. Despite this limitation, the ELE team was able to gather significant data from across the five cities of project implementation, as well as for national-level stakeholders.
2. **Limited availability of interviewees:** Several scheduled interviews were conducted with secondary information providers, such as newly positioned or supporting staff. Five interviews were conducted via a written response, which meant that the ELE team could not follow up on specific points in the same way as during semi-structured interviews. This limited the completeness and depth of findings from these interviews, but this limitation was mitigated by the significant number of interviews that were conducted in person and with knowledgeable stakeholders.

3 Key Findings

In this section, the ELE team presents the main findings of the ELE. These are structured according to the ELE Questions in Table 1. At the beginning of each section, a Red-Amber-Green (RAG) rating of the strength of the project's contribution story to the ToC and the OECD DAC criteria is included, following the scale: Good / Very good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey.

3.1 Relevance of the project

Relevance

1. To what extent does the project address the needs of identified stakeholders?

The mid-term ELE underscores the meticulous development of the project, achieved through extensive consultations with relevant national and state governments, municipal corporations of selected cities, and implementation partners. The project is strongly aligned with pertinent national policies concerning MSWM, circular economy, NDC, NetZero, and the Clean India Mission. Notable policy synergies include initiatives such as Swachh Bharat Mission 1.0 and 2.0, MISSION LIFE - Lifestyle for the Environment, GOBARdhan, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), various EPR policies, the Smart Cities Mission, the National Policy on Biofuels (2018), the National Mission for Clean Ganga (NMCG), and the ban on single-use plastic items (effective July 1, 2022), among others. At the national level, the technical cooperation provided to MoHUA addresses capacity-building and knowledge-sharing needs in a demand-led approach.

The alignment with policies has significantly motivated engagement from pilot cities and attracted interest from other cities seeking to learn from the project's outputs and communication channels. There is strong evidence indicating a positive reception of the technical cooperation provided by the project, from stakeholders such as MoHUA, municipal corporations, third-party entities like SIDBI and HUDCO, and project delivery partners. Noteworthy areas of support include guidance on the Risk Sharing Facility (RSF), establishment of Material Recovery Facilities (MRFs), composting plants, source segregation, and development of EPR guidelines. For instance, the support extended to SIDBI and entrepreneurs regarding the RSF model has inspired MoHUA to initiate a larger-scale replication for the waste management and other sectors.

The project aligns well with national and sub-national policies aimed at reducing GHG emissions from the waste sector in India. By promoting source segregation, encouraging public and private sector investment, and enhancing the capacity of public sector entities, the project aims to achieve a reduction of 1.2 million tCO_{2e} by the project's conclusion, with further indirect emission reduction targets set for 10 and 15 years. The project's alignment with national policies on improving source segregation and fostering thriving secondary resources markets in India, such as Swachh Bharat Mission 1.0 and 2.0, MISSION LIFE, EPR policies, Smart Cities Mission, and the National Policy on Biofuels (2018), among others, is noteworthy. The selection of cities representing diverse climatic,

environmental, and social contexts across India enhances the project's relevance in exploring effective solid waste management approaches.

The project is designed to address evolving national and city-level needs and priorities in the waste sector. Collaborative efforts with Municipal Corporation (MC) representatives and local stakeholders have ensured that project approaches in the five cities are tailored to specific requirements. Additionally, the project is instrumental in supporting selected cities to improve their rankings in national assessments for smart cities and clean cities, exemplified by the progress observed in cities like Panjim and Trichy.

The project is designed to mobilise investment in secondary resources markets in the waste sector (biogas, composting, etc.). The RSF is designed to overcome barriers to accessing finance for private sector stakeholders in sectors that can process segregated waste streams, such as organic waste and plastic waste. Investment and access to finance in this sector are challenging due to commercial banks being wary of new and uncertain commercial models. Once the financing constraints are overcome, the social and environmental benefits of circular economy processing methods such as biomethanation are generally very positive. The Grant Funding Mechanism (GFM) meets the needs of MCs in supporting them or State companies with waste processing facilities, MRFs, and biomethanation and to procure expensive equipment, such as excavators, screw presses, or biogas tanks and other equipment, to support circular economy processes. Often, this type of equipment is lower on the priority list of MCs due to other competing demands, so the project's contribution helps to justify expenditure in this area.

These initiatives have facilitated buy-in from national stakeholders, including MoHUA, and generated demand at various government levels for practical implementation strategies, such as the ban on single-use plastics, EPR enforcement, and low-carbon solid waste management practices. Strong motivation for engagement has been observed among the MCs of the selected cities, as well as other interested cities keen on leveraging the project's outputs and communication channels for their initiatives.

Given the project's relevance to national policies and local needs and its comprehensive support to city governments in understanding and implementing relevant national policies, a green RAG rating has been given to the relevance criterion.

3.2 Effectiveness of the project

Effectiveness	2. To what extent has the project been achieving intended intermediate outcomes (and unintended ones)?
	Intermediate Outcome 1: Private sector operators have started to increase investment in MSWM facilities and secondary resources market, including via a scaled-up risk-sharing facility model
	Intermediate Outcome 2: Municipal corporations have started to scale up effective source segregation and low-carbon MSWM across their city, and other cities seek to replicate this

As explained in Section 1, above, two intermediate outcomes (IOs) have been suggested by the ELE team, as shown in Figure 1. These help to group together the relevant aspects of the five output statements and their related activities in an intermediate step to the overall project outcome statement. The effectiveness of the project is therefore described against these two IOs.

3.2.1 Intermediate Outcome 1: Private sector operators have started to increase investment in MSWM facilities and secondary resources market, including via a scaled-up RSF model

A number of the five output areas contribute to IO1, most notably Outputs 1, 2 and 3. The effectiveness of the relevant project activities that contribute to this IO is discussed below. Note that activities related to Output 3, focused on source segregation, are discussed in Section 3.2.2.

Project support at the national government level, to MoHUA, is enabling instruments and guidelines to support the implementation of the secondary resources market. Project support to MoHUA is resulting in high-impact studies and guidelines that are requested on a demand basis by the ministry. These are facilitated by three technical experts embedded by the project in the ministry. An example of a technical study is the ongoing multilayer packaging (MLP) techno-market analysis study. Only a limited number of model contracts and incentive instruments along the collection and recycling chain have been developed so far, but these are expected to be deployed during the remaining time of the project. GIZ has also provided inputs related to the climate change mitigation impact of the Municipal Solid Waste Management (MSWM) sector in 2023¹³. A basic design feature of the project is that the experience, evidence and learning points from the project interventions in the 5 cities are fed by GIZ into MoHUA, which can be used to inform guidelines and policy, supported by the embedded team members in the Ministry. There is less evidence that this is working in practice, although it is expected that the majority of learning from the project cities to MoHUA will take place as more evidence on source segregation and low-carbon MSWM is gathered as the project progresses.

Project support to the national government has been effective and the sub-national EPR support is scheduled to start soon. GIZ has provided direct support to MoHUA at the national level via its embedded technical experts. This has comprised demand-led support, as well as more sustained inputs such as helping to link cities with the [national EPR web portal](#) set up centrally by the Central Pollution Control Board (CPCB) and the Ministry of Environment for tracking producers, importers, brand owners, and plastic waste processors. This portal, on which any recycler, whether a business or

¹³ GIZ (2024) Mitigation Action Facility, India Project. Annual Progress Report, 2023.

a municipal corporation, can register, caters for dry waste and single-use plastics. Approximately 2000-3000 institutions have registered to date. It is expected that private sector recyclers share revenues from EPR credits with ULBs, and the project is supporting in capacity building of ULBs to benefit from EPR. The data collection process of the ELE identified a number of challenges to the successful implementation of EPR across India. Firstly, much of the recycling ecosystem is informal by nature, so many entities are not registered on the portal. Secondly, unattractive per one-ton price of recycled plastic. Thirdly, many states are developing their own roadmap / planning document on the integrated implementation of EPR. For example, on the third point, the project will soon start to support the creation of an EPR roadmap in Goa linked to an EPR portal.

The Risk Sharing Facility is enabling private sector operators to access greater amounts of capital for low-carbon waste processing, such as biomethanation. At the time of the mid-term ELE, the RSF has recently started to make good progress in unlocking more finance for private sector investors in biomethanation and other processes. Three companies to date have successfully used the RSF from SIDBI to secure either working capital or capital expenditure (capex) loans from banks for plastic waste recycling and biomethanation. For example, facilitating RSF has enabled GPS Renewables, a private company focused on biogas, to set up a compressed biogas (CBG) plant and has enabled NEPRA, a private company focused on the waste sector, including MRFs, to secure a working capital loan from a bank to extend its operations. The RSF contributed to a reduction of 5,463 mtCO_{2e} emissions from October to December 2023 solely through NEPRA's processing of 39,172 tonnes of dry waste. While this seems like a fairly slow start, many initial obstacles to the RSF have been overcome, and a greater number of private sector entities are likely to secure funds via the RSF in the coming year of the project. However, due to limited funds, SIDBI can currently support only 10-12 entities. Therefore, considering the demand from the market, scaling up the RSF is a high priority for the project.

The planned scaling of the RSF by MoHUA via the Housing and Urban Development Corporation (HUDCO) is, therefore, a significant achievement for GIZ. The project is providing technical cooperation to HUDCO in creating a specialised fund called the SBM Infra Fund to provide partial credit guarantees to waste management companies and entrepreneurs. The new facility, based on the RSF, will be funded by MoHUA. The SBM Infra Fund, once established, will continue to support companies across India to access debt by providing guarantees at a much larger scale than the project RSF, as the initial corpus of the fund is tentatively planned to be around EUR 75 million¹⁴.

The project has had success in promoting and catalysing private sector-led models for composting, plastic waste recycling and biomethanation. The project has played an important role in disseminating private sector opportunities and convening different stakeholders and partners. For example, awareness of commercial opportunities for businesses has been increased by the project's social media posts, including via the BioGas Association and attendance of national level events, such as Swatchhotsav 2023, Waste Tech Expo 2023 and "SBM GoBARDHAN Biogas" conference, which has been the biggest event attended by the project so far, with 500 participants. The project has had success in mobilising public finance for improved MSWM models that can be led by the private sector. For example, in the State of Goa or Panjim Municipality, this is in the form of allocation of free land for sorting plants, MRFs and recycling plants such as Saliagao and Cacora or contribution via the State

¹⁴ GIZ (2024) Mitigation Action Facility, India Project. Annual Progress Report, 2023.

budget to financing the buildings or equipment needed for these projects. In Varanasi, a private sector model is being supported, with the MC allocating suitable land and power connections for entrepreneur-led MRFs, although operators must still pay for rent and electricity costs as well as other operational costs, including staff costs.

Based on the factors explained above, including the national policy and guideline-related influence of the project, the considerable achievement of establishing the RSF and supporting MoHUA and HUDCO to scale this up, as well as the promotion of private sector opportunities in low-carbon MSWM and the resulting ability of the private sector to reduce GHG emissions in the sector, the ELE team assigns a green rating to the effectiveness in achieving Intermediate Outcome 1.

3.2.2 Intermediate Outcome 2: Municipal corporations have started to scale up effective source segregation and low-carbon MSWM across their city, and other cities seek to replicate this

For IO2, the most notable output areas that are contributing to this objective are Outputs 3, 4 and 5. The effectiveness of the relevant project activities associated with these output areas and IO2 are discussed below.

The project is enabling significant improvements and behavioural change in source segregation. A context specific range of approaches to promoting source segregation and affecting behavioural change at the household level has been implemented by GIZ and their project delivery partners, which are often NGOs. The range of approaches is known as Modes 1, 2 & 3, as described here:

- **Mode 1:** The comprehensive engagement of citizens in a selected ward by the project team, as implemented so far. This is very effective but not scalable without significant resources.
- **Mode 2:** Train the local waste collection teams in selected wards team, as well as limited citizen awareness-raising sessions with residents and community representatives.
- **Mode 3:** Train the trainers, engaging only with MCs, who would then train local partners such as NGOs and waste collection teams or directly train waste workers in groups with the objective of achieving scale. No citizen awareness-raising sessions with residents and community representatives are organised in the case of mode 3.

For example, in Bengaluru, significant improvements in segregation have been achieved in 12 wards where the awareness campaign was implemented by Saahas, a local NGO, especially in the wards where the comprehensive engagement approach (Mode 1) was conducted. For example, in Yelachenahalli ward, segregation increased to 87% from 6%, and in Ejipura ward, it rose from 34% to 86%¹⁵. Saahas is also piloting a digital solution for registering which household is segregating their waste, which is an effective way to monitor and enforce segregation. This should be replicated if possible.

Generally, households and communities have responded very well to the project's efforts to increase source segregation. Comprehensive citizen engagement (Mode 1) has achieved real change in source segregation, and this change has generally been maintained for the past year or months following the end of the engagement. In cases where households continue not to segregate waste, there is a strong

¹⁵ Presentation by Saahas to the ELE team on 29/01/2024

connection between the project delivery partners and MCs in terms of referring non-segregating households for enforcement via financial penalties. **It is notable that gender considerations have been a part of the source segregation approach.** For example, lessons from Goa showed that engaging self-help groups of women in this State was more effective for promoting home composting compared to community-wide composting programmes, since women are often in charge of waste management for the household.

However, enabling Municipal Corporations and local entities to scale up source segregation work is crucial to wider impact. The door-to-door approach of the project's comprehensive engagement (Mode 1) is very impactful but not cost-effective for the project. Resources from the GIZ project are insufficient to do this at scale. Therefore, led by the work of Saahas in Bengaluru and Trichy, the project has implemented a good approach to trying different alternative methods to overcome the requirement for comprehensive citizen engagement by the project. While Mode 1 was found to be more effective than Modes 2 and 3, GIZ views Modes 2 and 3 as the only viable long-term solution for scaling up effective and sustained source segregation. This has been tried in Panjim, where waste workers in selected housing complexes are trained to promote segregation among the residents, complemented by some awareness-raising events. At the time of the ELE visit in January 2024, Modes 2 and 3 were starting to be implemented in all project cities, with the process not sufficiently advanced to provide evidence. There are currently considerable uncertainties around the effectiveness of Mode 2 and 3 approaches to scaling up source segregation, which remain to be proven by the project.

The project has made strong progress in delivering a wide range of awareness-raising events for citizens on source segregation and composting. In 2022 and 2023, 534 and 485 awareness-raising events on integrated low-carbon waste management were implemented, respectively. These were delivered in a range of ways, including community events, school presentations to pupils, who were then expected to tell their families, the Flower Show (Cheela Mela) and, in Varanasi, public awareness was encouraged by a spectacle of creating three large-scale models of single-use plastic items, such as bottles, and sailing these on small boats on the River Ganges accompanied by a social media campaign. For the awareness programmes in schools, there have been successes and some setbacks. For example, in Goa, the Corporation of the City of Panaji (CCP) had planned the programme for a school calendar year in 2022/2023, but with the slow approval, the momentum was lost, and interest/motivation dropped. It should be noted that the actual increase in the capacity of stakeholders is not measured by the project and is indeed very hard to assess. However, taken with the household source segregation results, the programme of raising awareness appears to be working well.

The project has developed the awareness and capacity of MC staff in the five selected cities in terms of the importance and methods for low-carbon MSWM. The project has enabled greater public sector understanding and replication of low-carbon MSWM processes and investments. This has been particularly strong in Bengaluru, Patna, Panjim and Trichy, whereas the project seems to have gained less traction with the MC in Varanasi due to frequent transfers of officials and other urgent tasks that need their attention in the city, although this has changed with the appointment of a new Commissioner in late 2023. In tandem with the Grant Funding Mechanism (see below), the project has provided significant support to MCs' adoption of standards and/or procedures to improve their output quality and/or quantity of MSWM facilities. The project has demonstrated effective implementation of source segregation awareness raising and training for the public and private sectors, as well as the public. For example, in Bengaluru, Bengaluru SWM Ltd (BSWML) received training on overall waste

management, including the importance of waste segregation, collection, and appropriate waste processing. However, the critical test for how effective this is will be in the MC buy-in and enthusiasm to take over and replicate project processes, such as facilitating household behaviour changes in source segregation, as per Modes 2 and 3 above.

The Grant Funding Mechanism component is working well in supporting MCs to fund and procure necessary equipment for low-carbon MSWM. A significant output of the Financial Cooperation Component of the project is the provision of grant funding to MCs, in order to purchase equipment and machinery that can enable low-carbon MSWM at a greater scale in the five selected cities. As of now, the total amount allocated in terms of grant funding from the project across the five cities is EUR 3,796,671. This included, for example, supporting the Varanasi Municipal Corporation with CAPEX for refurbishment and upgrading the Karsara Composting Facility and supporting Bruhat Bengaluru Mahanagra Palike (BBMP) with CAPEX for refurbishment and upgrading 6 composting facilities. In 2023, notable improvements were achieved due to the implementation of the Cacora integrated waste management facility in Goa with an investment of EUR 19.2 million by the Government of Goa, leveraged partly by a project grant of EUR 126,084¹⁶. This support is responding to strong demand from ULBs. For example, in Patna and Trichy, project stakeholders stated that more effort is needed in decentralised facilities to process waste beyond segregation only. Without pre-processing capacity, such as shredding and compacting, there is a risk of unprocessed waste being diverted to landfills. In Varanasi, in 2024, the project is indirectly technically supporting the set-up of a large-scale RDF to Charcoal plant (600 tons per day), which will displace a small proportion of coal in a thermal power station. GIZ is supporting the MC to procure machinery to excavate legacy waste previously dumped in landfills for the plant, with a target of 200 tons of legacy waste per day. Out of the 750 tons per day of waste generated in Varanasi at present, 600 tons per day will be utilised by the National Thermal Power Corporation (NTPC), which should have a significant impact on waste management in the city.

The project is enabling improvements and demonstration projects in local composting of organic waste. There has been notable project support in catalysing home composting and micro-composting in communities (such as in local parks in Bengaluru or the Railway Colony in Varanasi) in a decentralised SWM approach. One of the lessons from the project is that engaging self-help groups of women is more effective for promoting home composting compared to community-wide composting programmes. Taken together, source segregation and home composting awareness programmes should greatly reduce the share of waste going to landfills while also reducing the need to transport and process organic waste in a city. However, much of the decentralised composting catalysed by the project has been very small-scale to date, with hopes for increased scale during the rest of the project.

The project is performing well in promoting the avoidance of and the recycling of single-use plastic (SUP). In terms of plastic recycling, the project is enabling many more opportunities for private sector-driven processing of higher-value plastics such as PET and HDPE. Source segregation is enabling greater volumes of plastics to be directed towards recycling via collection centres and MRFs. The project has also supported the setting up of 3R (Reduce, Reuse, Recycle) centres in Patna, Tiruchirappalli, and Varanasi. These hubs are run by a mix of public and private sector operations (for example, the public sector in Panjim and the private sector in Varanasi). Sorted and baled plastics are

¹⁶ GIZ (2024) Mitigation Action Facility, India Project. Annual Progress Report, 2023.

sold to aggregators or provided/sold to plastic processors (like Recyclo Plastics in Varanasi). There has been a successful implementation and replication of the Cheela Mela (Bag Fair) initiative, which aims to replace SUP shopping bags with multiple-use cloth bag alternatives. The project has scaled up Cheela Mela from Bengaluru to Patna, Goa, and Trichy, and it has now expanded beyond the project activities. There are also successful results from the project's **sustainable menstruation initiative**, by Saahas in Bengaluru. This involves the promotion of and distribution of sanitary pads and menstrual cups that mitigate the use of non-biodegradable sanitary pads. Six hundred sixty-two women had benefited from this activity by the end of 2023.

There has been less success in the Shop With Your Waste Campaign (SWYWC) and the Plastic Free Markets initiative. The “purchase model” of SWYWC (i.e. individuals receiving cash, vouchers or in-kind value against the waste they deposit at dedicated shops/ sorting stations) is working better with Ayya, a private waste collector running 2 MRFs in Panjim, than with the shops. The ELE found that the uptake is slow and the incentives too small for the majority of households to make the effort to deposit waste in designated shops, and it seems to have only taken off with people who are already waste-aware. E-coupons (part of a proposal submitted by Panjim Smart City for the CITIIES 2.0 programme) could help scale this up. In its current form, the SWYWC is not working, as confirmed by Ayya and the shop keepers visited. Beyond the Cheela Mela initiative, the Plastic Free Markets initiative has not gained traction. SUP ban implementation in the selected markets has shown different results in different cities. While in Bengaluru it started positively but did not sustain, four markets of Trichy have been successful in SUP ban due to support from ULB, Agriculture Department and shopkeepers. To scale it up, further political support and an overall enabling ecosystem are required. It may be noted that the lack of commercially viable and available alternatives to SUPs is still a critical barrier.

The project is achieving limited but valuable job creation and improvement of livelihoods, including for women and informal sector workers. The project is affecting small scale initial impacts on job creation and improvements of livelihoods, mainly via MRFs and their interaction with informal sector workers. Examples, such as the Pink MRF in Patna, have shown how the workforce can be entirely women, with significant benefits in terms of job security and reduced workplace harassment. Integration models for informal sector workers into low-carbon MSWM have been challenging for the project. While the project has had a positive impact of involving ragpickers by actively connecting them to MRFs and ensuring transparent market rates are paid to them for collected materials via clear rate cards at the MRF entrances, there has been less emphasis on formalising the roles of informal workers via employment. An exception to this has been the support to GWMC to successfully integrate informal workers involved in waste picking at the Saligao plant in Panjim. The lack of larger-scale integration is due in part to a lack of enthusiasm by informal workers to lose their very flexible livelihoods. Instead, the project has focused on improving access of informal workers to social security systems, although only four individuals had been integrated into government schemes by the end of 2023, two of which were women.¹⁷

Through the combined efforts described above, a cumulative amount of 138,544 metric tonnes of CO₂e of avoided emissions can be attributed to the project as of the end of 2023. The project has greatly increased its emission reduction capability from 141 metric tonnes of CO₂e in 2021, 24,096 in

¹⁷ GIZ (2024) Mitigation Action Facility, India Project. Annual Progress Report, 2023.

2022 and 114,307 metric tons of CO₂e in 2023. However, this leaves 1,061,456 metric tonnes of CO₂e reduction to be achieved between early 2024 and August 2025, which is challenging. While currently well below target, the emission reduction figure is likely to increase rapidly as the RSF becomes more active and the project builds on the foundations of improvements to source segregation and municipal processes that lead to solid waste being diverted from landfills. The ELE team believes that the project avoided emissions target can be delivered using the existing budget but extending the timeframe will probably be necessary. The project has also set a 2030 emission reduction target of 4.1 million tonnes of CO₂e by all supported waste processing facilities in the five selected cities, which relies on sustained impact beyond the end of the project support.

There are many positive aspects of effectiveness demonstrated by the project, including the considerable capacity development of MCs in low-carbon MSWM, support via the grant funding mechanism, and the improvement of source segregation rates in selected wards. However, due to the significant uncertainty around the ability of MCs and local waste collection entities to scale up the source segregation performance across the wider city, which underpins the outcome statement of the project, the ELE team assigns an amber rating to the effectiveness in achieving Intermediate Outcome 2.

3.2.3 How external factors have impacted the project's effectiveness

A notable negative external factor was the impact of the COVID-19 pandemic, which caused delays to the implementation at the start of the project between 2020 and late 2022. 2023 has, therefore, been the first full year of implementation, and the project is behind schedule against many of the indicators in the results framework. However, the positive alignment of the project with national policy has been a strong external factor that has improved the ability of the project to gain traction with a wide range of stakeholders, including MCs. As mentioned in Section 3.1, there are synergies with many policies on decarbonisation and sustainable MSWM. This has enabled buy-in from national GoI stakeholders such as MoHUA, who wish to see how evidence from selected cities can inform further national policy and strategy, Demand from GoI at national, state and city level on how best to implement existing policies and initiatives, such as the ban on SUPs, EPR and achieving low-carbon MSWM in practice. There is also a strong motivation for engagement by the MCs of the five selected cities and a strong motivation for other interested cities to learn from the project's outputs and communications channels.

3.2.4 Unintended outcomes

The ELE identified three positive unintended outcomes. Firstly, the RSF is being replicated at a greater scale by MoHUA / HUDCO, as described above. This is a significant achievement for the project as it is likely to unlock much greater volumes of private sector finance in the low-carbon SWM space, with a high impact in terms of avoided GHG emissions. Secondly, the Cheela Mela initiative has been replicated beyond the project activities. This represents a positive expansion of an initiative that provides alternatives to SUP grocery bags, as well as livelihoods for women. The third unintended impact is the indirect impact of the project activities in Goa on stakeholder collaboration. For instance, the GIZ team in Goa supported Panjim Smart City in submitting a strong proposal to the national CITIIES 2.0 programme to get funding for circular economy and urban improvements.

3.2.5 Assessment of overall Effectiveness

To sum up, based on the above-mentioned evidence and analysis of intermediate outcomes, the project is showing strong signs of positive progress in line with the ToC causal pathways, and the underlying assumptions have held as valid and accurate. The source segregation initiative underpins much of the project's success, and there remain some uncertainties in terms of the ability to scale up Modes 2 and 3. **However, due to positive progress in this area, as well as impressive results in establishing and scaling the RSF and building capacity, buy-in and technical ability of MCs in low-carbon MSWM, the ELE team gives a green rate to overall project effectiveness.**

3.3 Efficiency of the project

Efficiency

3. To what extent is the relationship between inputs and outputs timely and to expected quality standards?

The mid-term ELE finds that the chosen implementation mechanism appears to be conducive to achieving the expected outcomes. The Technical Cooperation Component of the project is making good use of both in-house GIZ expertise and NGO delivery partners. Locally based NGOs, such as the WADS Foundation in Patna and Saahas in Bengaluru, are particularly well-placed to understand and engage with local communities in the best way, as well as establish lasting relationships and behavioural change. At the national level, the model of embedding experts in MoHUA working in a demand-led way appears to be working as intended. The FC Component of the project is tailored to address the financial constraints of both public (Grant Funding Mechanism) and private sector (Risk Sharing Facility) stakeholders. Both of these aspects are set up and are now able to help overcome barriers to investment in the necessary equipment to help scale MSWM / recycling processing and secondary market processes, such as biomethanation.

The project is performing well in terms of project management and timeliness of delivery outputs. GIZ is widely seen as a very strong delivery partner by the Government and NGO stakeholders. Robust project management processes are clearly in place with project responsibilities designated across the portfolio of activities. The distribution of local GIZ project team members in the five cities plays an important role in frequent engagement with project delivery partners and with local stakeholders, including the MCs. Frequent team meetings ensure coordination and the rapid exchange of knowledge, progress, and challenges. Project targets and spending are slightly behind schedule in some areas, mainly due to COVID-19 impacts at the start. As such, while the project is likely to deliver its logframe results within budget, an additional year or more is required to achieve this due to the initial delays. Finally, there are some minor project management challenges identified by the ELE to be mitigated where possible. Firstly, for example, the sub-national government and other project stakeholders in Goa are unclear about the EPR Roadmap process and timings, which GIZ intends to implement later in 2024. Clearer communication on this by the GIZ team is advisable. Secondly, while the project team took on the procurement of equipment for the MCs to speed up the process, there was some feedback that they would like GIZ to move faster on this. Again, frequent communication on the process and expected timings is advised.

Project communications and visibility are implemented according to an integrated approach and to a high standard. The project has a well-defined and implemented Communications Strategy as well as a designated core team member who is responsible for this part of the project. The project is active

on a range of social media channels, including YouTube, Facebook, Twitter (X) and Instagram, reaching 700,000 people up until the end of 2023¹⁸. The project is also participating in a number of events and conferences that help to disseminate its experience and learning. Examples include support to MoHUA to organise the Swachh Bharat Mission Gobardhan Conference in December 2023 with 150 city officials participating; and COP 27's 'India's Climate Friendly Sustainable Lifestyles – Transformational Solutions towards Sustainable Consumption Pathways, Circular Economy and a Low-Carbon Society' side event (November 2022) with the participation of 30 government stakeholders and experts.

Stakeholders are participating and collaborating actively in the intervention. There appears to be strong participation and buy-in from national and city-level government counterparts. In the five selected cities, the MCs are generally committed to their inputs to the project. A wide range of partners are actively involved and appear to value the project support, such as private and public financed MRFs and composting facilities and resident's associations and self-help groups (SHGs) in wards targeted for improved source segregation. A range of private sector and third-party stakeholders, such as the Indian Institute of Management in Indore (IIM-Indore) and NIT Patna, are also actively engaged in the project in order to design and implement relevant skills development programs. These initiatives will commence with the Goa Waste Management Corporation, focusing on MRFs, biogas, and other related areas. The National Skill Development Council is also involved in these endeavours. This is likely to further disseminate knowledge and learning related to low-carbon MSWM. An area of challenge and potential risk to successful outcomes related to partnerships is in convening stakeholders so that they are more actively coordinating with each other in order to improve MSWM systems such as segregation and MRF processing. For example, in Goa, it was acknowledged that the project team is enabling strong bilateral coordination between the project and specific stakeholders, but not doing so well in getting the stakeholders to talk to each other. The project could do more to leverage convening events for this purpose, such as a recent conference organised by the GWMC in Panjim.

Risks are appropriately identified and managed by the project team. Risks are considered in a robust way based on frequent discussions within the project team and with delivery partners. Anticipated risks, such as elections in Goa and expected staff turnover in MCs, have generally been well mitigated. It is hard to avoid unanticipated risks, such as government officials becoming unavailable for events at the last minute, but these are generally handled well through well-coordinated team responses. As an example of mitigating risk, the initial project plan in Varanasi was to support the MC in procuring equipment for legacy waste extraction based on the Grant Funding Mechanism. Due to risks identified around delays and possibly transparency issues, GIZ took on a direct procurement role. Another example is the lack of clarity to stakeholders on which GIZ projects are focused on which outcomes. Coordination between the project and other GIZ and donor-funded programmes can sometimes be challenging, although many synergies are also created. To mitigate this in Goa, as part of its India Country Plan, GIZ wants to appoint a State-Level Coordinator to avoid confusion between GIZ initiatives in Goa and among stakeholders. This should help streamline communication and avoid silos between projects in Goa State.

¹⁸ GIZ (2024) Mitigation Action Facility, India Project. Annual Progress Report, 2023.

The project M&E framework has generally been able to adequately function although several indicators could be considered further. The five output areas are well defined with specific, measurable, achievable, relevant and timebound (SMART) indicators used in most cases. There are two areas recommended for further consideration by the project team. Firstly, the logframe outcome indicators are rather specific and more suited to output-level indicators. For example, Outcome Indicator 2 is: *“No. of implementation support documents for waste processing products (e.g., composting process, MRF, recycling material, RDF and biogas) that are submitted for approval to MoHUA)”*. This could be further considered by the project team. Secondly, the way in which the project records impact against Core Indicator M2 on project beneficiaries seems problematic. The indicator is *“No. of people directly benefiting from PROJECT: inhabitants in selected cities benefit from modernised waste management systems.”* At the end of 2023, the cumulative figure was 8.7 million people. However, impacted beneficiaries are included even with a very thin amount of contact with the project. What counts as ‘directly benefiting’ is not very clear. This could be considered further, along with consultation with the Mitigation Action Facility TSU and other similar projects in the Mitigation Action Facility’s portfolio, to avoid any reporting issues at the project conclusion.

Learning and adaptation processes are well-integrated into the project. There are frequent opportunities for the team to discuss the project, including risks, challenges, successes, and related learning points. There are coordination meetings every 2 weeks with the GIZ team members in the five cities. An example of adaptation is the Mode 1, 2 and 3 approaches for scaling source segregation, being tested by Saahas in Bengaluru. There is also some limited evidence of other GIZ project lessons contributing to the successful implementation of the project. GIZ enables communication and knowledge sharing between its projects in India and between other GIZ and Mitigation Action Facility projects around the world. For example, the GIZ project team overlaps with delivery teams for the GIZ Marine Litter Reduction project in India. The project team is exploring collaboration with a GIZ circular economy project in Rwanda, which is also addressing source segregation and secondary processes such as biomethanation.

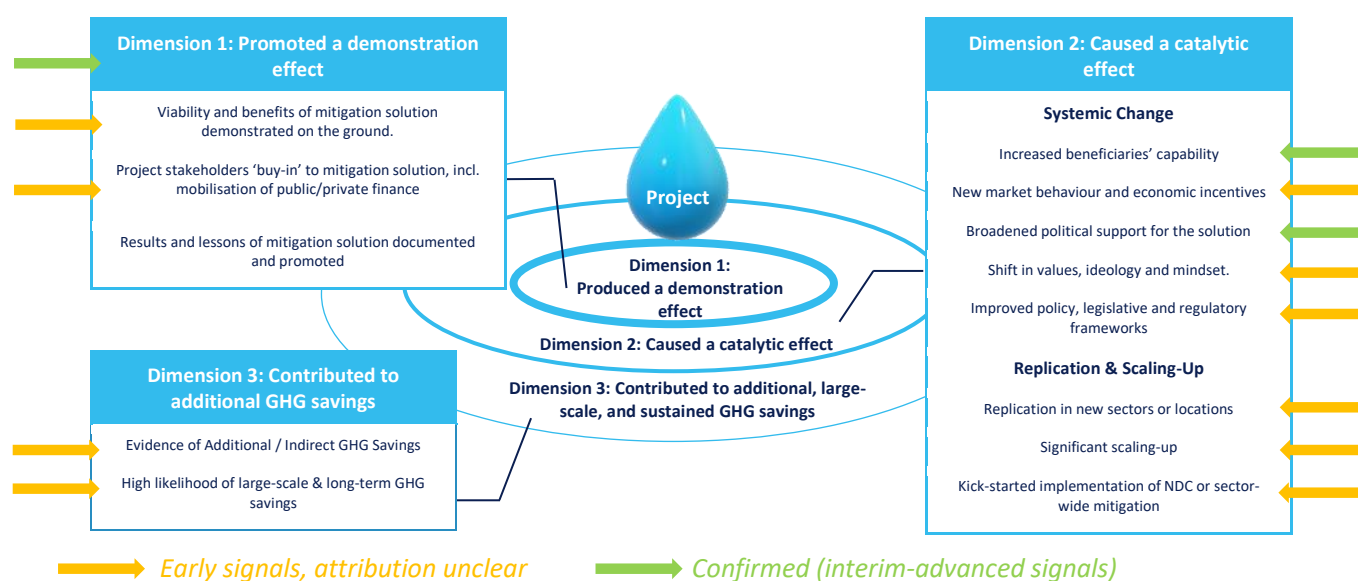
Based on the factors explained above, such as the high standard of project management skills, communication with government counterparts and key stakeholders, and delivery of high-quality deliverables, the ELE team assigns a green rating to the Efficiency criterion.

3.4 Impact of the project

Impact 4. What evidence is there that the project is likely to contribute to the intended impact in the ToC (incl. transformational change)?

The current trajectory towards project impact is discussed below within the framework of the three dimensions of transformational change, as explained in Section 1.2.1 and more in detail in Annex A of this report. **The mid-term ELE has found that the project has advanced well under Dimension 1 (Promoted a demonstration effect) and Dimension 2 (Caused a catalytic effect) with greater uncertainty with regard to Dimension 3 (Contributed to additional GHG savings),** as summarised in Figure 3 and discussed in more detail below.

Figure 3. Assessment of the project's ability to trigger transformational change



Source: ELE team analysis, based on ELE Framework

3.4.1 Dimension 1: Promoted a demonstration effect

Viability and benefits of mitigation solution demonstrated on the ground: The project is demonstrating effective methods of improving source segregation of waste, enabling stronger sorting and processing of recyclable materials, including plastics and enabling decentralised organic waste management. Robust source segregation, if scaled and sustained, enables the expansion of markets for secondary resources, such as biogas produced from organic waste. Overall, the project is providing a strong demonstration effect with its focus on MSWM systems in the five cities and the RSF.

Results of mitigation solution documented and promoted project stakeholders 'buy-in' to mitigation solution: The demonstration of the RSF is already fruitful in terms of causing MoHUA and HUDCO to scale this up via the SBM Infra Fund. The capacity building of MCs is supporting the buy-in to low-carbon SWM, although the degree to which they take on and scale up aspects such as source segregation campaigns is uncertain at this point in the project.

3.4.2 Dimension 2: Caused a catalytic effect

3.4.2.1 Systemic change

Systemic change underway to enable widespread adoption of mitigation solution: The project is attempting to achieve systemic change for the low-carbon MSWM sector in the five selected cities, as well as by de-risking private sector investment into waste management processing, such as biomethanation. By addressing the whole system, from segregation of waste through to collection, processing and various value chain avenues, the project has a strong likelihood of understanding effective behavioural change and governance approaches in different city contexts. This should be able to inform national or state-level policy and wider replication across other cities.

New market behaviour and incentives: The RSF is helping to de-risk private sector investments in low-carbon MSWM and secondary materials markets, such as biomethanation. At the same time, the project support for the implementation of EPR, via guidelines the support to MoHUA on managing the EPR portal for MSWM producers, importers, brand owners, and recyclers and preparation of a state-level roadmap for Goa, is helping to incentivise private sector entities to participate in the effective implementation of the EPR system.

Broadened political support for the solution: The project is building awareness, understanding and appreciation of low-carbon MSWM at the MC and ULB levels. This is a key ingredient in the city-level implementation of the mitigation solution, as it becomes a higher political priority as well as practical and possible to implement. There is, therefore, early evidence of a shift in political support, particularly at the local level, whereas it is already a priority for the national government.

Increased institutional capacity and management practices: Significant efforts have been applied by the project to develop the institutional capacity of MoHUA at the national level as well as the Municipal Corporation level. The project is aiming to enable MCs to take ownership and apply the source segregation transition across the remaining wards in the selected cities. Ultimately, this is designed to enable many more cities to replicate and adopt this process. This replication will need to be appropriately driven and supported by MoHUA and state-level governments.

Shifts in values, ideology, and mindset: The project has implemented a significant amount of community and public engagement via a range of channels. Supported by the practical implementation of source segregation, the project is showing early signs of achieving a shift in public behaviour in valuing and supporting low-carbon MSWM.

Improved policy, legislative and regulatory frameworks: There is early evidence of the project's impact in this area, particularly in supporting MoHUA and sub-national government bodies to implement relevant policy, such as EPR, in an effective way via studies and guidelines.

3.4.2.2 Replication and scaling-up of mitigation solution and/or project

Replication in new sectors of the mitigation solution and/or project itself: There is no project focus on aiming to replicate the mitigation solution in new sectors beyond low-carbon MSWM. However, SIDBI is interested in continuing to work with GIZ on setting up an RSF in other sectors, inc. to help decarbonise steel production.

Significant scaling-up of the mitigation solution and/or project itself: There is, however, significant potential for scaling up the mitigation solution demonstrated by the project. The RSF concept being

scaled up by the HUDCO RSF is a prime example of this, along with the project efforts to scale up its less resource-intensive source segregation model via Modes 2 and 3. The project is receiving queries from state governments and ULBs to support replication cities.

Kick-starting and influencing sector-wide mitigation: The project has significant potential in terms of enabling low-carbon MSWM at scale, based on both the role of the project RSF and the HUDCO RSF, as well as the demonstration effect of how to improve source segregation and waste processing at the city and ward level. However, the project's ability to enable source segregation at scale remains uncertain due to the need to catalyse significant public sector action and coordination in this area.

3.4.3 Dimension 3: Contributed to additional GHG savings

Evidence of Additional / Indirect GHG savings: There is no evidence of additional GHG savings being realised at this stage of the project that can be directly attributed to the project. However, indirect GHG savings can be partly attributed to the project as a result of the TC Component and the Grant Funding Mechanism support to MCs to improve MSWM processing such as compost plant and MRFs.

High likelihood of large-scale & long-term GHG savings: The scaled-up RSF, along with the improved buy-in and capacity of MCs to implement low-carbon MSWM, is likely to lead to large-scale and sustained GHG savings. However, much of the project's long-term success in terms of GHG savings achieved via low-carbon MSWM depends on its ability to identify viable and replicable approaches to incentivise and enable MCs and waste collection partners to facilitate greater source segregation by households, which is currently being explored by the project team.

Core Mandatory Indicator M3 Score: Following the instructions from the TCMF in Annex A, the ELE team has assessed the evidence to assign a value to the Core Mandatory Indicator M3¹⁹ and compare it with the indicator's self-assessment given by the project team (i.e. score 2 at the end of 2022). Having assessed the progress made by the project and based on the evidence described above, the ELE team assigns a **score of 2 - Some early evidence suggests transformation likely** - to the Impact criteria. Positive aspects include: i) clearly demonstrating the effectiveness of low-carbon MSWM as a mitigation solution with strong buy-in from national and city-level government stakeholders; ii) starting to cause a catalytic effect in terms of raising the awareness of citizens and the interest of the private sector in low-carbon MSWM investments; iii) supporting the implementation of enabling regulations and policies, such as the EPR model; iv) and recognising early signs of knowledge exchange and replication between cities. The score is constrained by the uncertainty that source segregation can be scaled up across cities and replicated in other cities in greatly varying contexts.

In conclusion, the evidence confirms that the early evidence from the project on transformational change measurement framework is of the levels expected in the middle of the project (see Table 3). Therefore, based on the matrix in Table 10 of Annex A, the ELE team is comfortable with marking the Impact criterion for the project as green.

¹⁹ The Core Mandatory Indicator M3 reads: "Degree to which the supported activities are likely to catalyse impacts beyond the projects (potential for scaling-up, replication and transformation)". The project team is asked to self-assess it using the following 0 to 4 scale: 0 = Transformation judged unlikely; 1 = No evidence yet available; 2 = Some early evidence suggests transformation likely; 3 = Tentative evidence of change – transformation judged likely; 4 = Clear evidence of change – transformation judged very likely.

3.5 Sustainability of the project

Sustainability

5. What is the likelihood that the outcomes will be sustained after the end of the project funding period?

The mid-term ELE finds that the main conditions for the project outputs to be sustained are in place.

There is a good level of evidence of self-sustaining institutional structures, official standards, and political and financial commitment of key stakeholders. Political support from national and ULB-level stakeholders to implement sector reform continues to be high. There is also good evidence of progress on source segregation at the individual citizen level, enabled by active segregation awareness campaigns and participation of private waste collectors to promote source segregation (as they have an incentive to get higher quality, well-segregated and non-contaminated waste to sell it forward to aggregators). The assumption that the project would improve MSWM practices is proven correct in all visited cities. In Patna, awareness of segregation had just started at the time of the ELE, and project partners expect it may take additional engagement with grassroots groups like Self-help Groups and another three to four years to achieve widespread awareness and improved waste processing and see long-term results.

However, as stated in Section 2.2.2 (Intermediate Outcome 2) the sustainability of segregation awareness levels and the ability to scale this across more wards is fragile. Across the five cities, door-to-door awareness was rolled out successfully (starting with Mode 1), reaching 78,704 households in Varanasi, 36,805 in Bengaluru, 23,691 in Goa, and 7,300 in Trichy.²⁰ Trichy and Bengaluru reported being more confident in terms of segregation behaviour sustainability, after a campaign of comprehensive engagement run by Saahas. In Panjim, as described in Box 1, the project has contributed to improved segregation, but there is a concern that the level of improvement may not be sustained at the same level beyond the project support. However, in most of the cities, it is assumed that behavioural change on segregation will be sustained within communities if it takes place alongside the necessary facilities being established or improved by the project, such as MRFs, Learning Centres and 3R centres. The project is addressing this challenge of scaling up source segregation awareness and behavioural change by building the capacity of MCs and local entities, such as waste collection contractors, to take on this role via Modes 2 and 3 discussed in Section 2.2. However, there is great uncertainty about how realistic and sustainable this method will be.

Box 1: Project support on source segregation in Panjim, Goa State

In Panjim, source segregation greatly improved, with the project supporting greater uptake of the 16-way segregation that is targeted in 45% of the housing societies across the city (established in 2010), where staff are employed to segregate waste on behalf of residents. The project also supported selected wards in other parts of the city to achieve 2 to 5-way segregation, where waste is collected by the City Corporation. Overall, in Panjim, source segregation rose to cover 80% of the city population during TERI's door-to-door campaign by volunteers. However, a drop was recorded

²⁰ These can be considered direct beneficiaries. It should be noted that along with successful implementation of mode 2 and 3, the total outreach, including to indirect beneficiaries, has been around 8 million people across five cities (project team's estimation).

after the end of TERI's contract, and in July 2022, 50% segregation was recorded across sampled households. In Panjim, door-to-door awareness on source segregation and public awareness events are currently solely continued through Information Education and Communications (IEC) units. Source segregation could be lost if IECs at the city level cannot access more support or sponsorship. In the rest of the Goa State, MRFs at the Panchayat²¹ level are working towards an easier-to-achieve 2-way segregation (dry-wet).

Access to sufficient land in crowded cities is a barrier to the sustained growth of low-carbon MSWM.

Whilst the source segregation levels achieved with support of the project and with ongoing awareness work invested by City Corporations (e.g. Panjim City Corporation has achieved 80% segregation) are encouraging, the challenge across cities is a continuously increasing volume of waste, combined with limited availability of land to process and recycle it. Land issues, combined with capacity and budgetary limitations, are the reasons why Panchayats cannot afford to comply with building or refurbishing MRFs. Stakeholders across the five cities shared that the most viable solution is to promote more segregation at source and decentralised waste processing, such as material recovery and sorting and micro composting within colonies.

Working with the State level seems to have enabled greater sustainability and engagement of the local governments, and the project has been able to engage with policy and legal improvements on MSWM at the State level, such as starting an EPR study in Goa, providing repair and maintenance support for equipment in Bengaluru, and assisting the municipal corporation of Varanasi in extracting RDF from legacy waste. The RDF will be supplied to NTPC's waste-to-charcoal plant. A project development partner involved across cities saw an advantage of working with the State level, where the project can better connect interventions with their policies and programmes, such as the EPR process or the Pollution Board rules. The municipal administration and staff turnover is a risk for the implementation on the ground level. This was, however, not reported in Panjim, where MSWM processes have been set up since 2003 with the same lead, which ensures continuity and sustainability of the capacity building provided by the project.

National initiatives established through the Swachh Bharat Mission (SBM) are an important vehicle for the sustainability of improved MSWM practices. For instance, SBM funds are allocated for setting up one MRF and one compost plant in each city. 23 Swachhata Knowledge Partner institutions have been designated by MoHUA to take up capacity building on improved SWM over time (e.g. GWMC in Goa) at the State / Union Territory and ULB levels in the key focus areas of SBM-U 2.0.

The mid-term ELE broadly validates the original assumption that the project continuously explores the most effective partnerships for sustained impact beyond the lifetime of the project, particularly for the RSF and the Grant Funding Mechanism. There is strong evidence that NGOs have been effectively used as project delivery partners as they can provide much more detailed insights into and engagement with local communities, as well as maintain a presence beyond the end of the project. However, these partnerships are generally reliant on a contract for operating effectively, so there is

²¹ Panchayats are units of local government at the village, block or district level, which support close political representation of communities.

uncertainty about the effectiveness and sustainability of NGOs continuing with aspects such as source segregation after the project has ended.

There is strong evidence that the RSF is designed to ensure sustainable impact. The RSF mechanism managed by SIDBI will scale up through the current pipeline and is likely to become sustainable over time as an established SIDBI instrument. Guarantees have been provided for loans beyond the current lifetime of the project via the RSF manager SIDBI. The impact will also be extended beyond the project by the scaling of the RSF by HUDCO. The RSF offers some evidence of how learning from current partnerships (with SIDBI, commercial banks and companies) is already being used to inform improved approaches to MSWM carried out by some of the first RSF recipients (such as CAM clearing legacy waste or GPS Recyclables getting the plant constructed in Delhi). SIDBI is confident in its capacity to expand and sustain the RSF beyond the project with additional internal and external investments into its green portfolio, including from the World Bank for another decarbonisation RSF initiative.

Sustainability challenges stem from the Grant Funding Mechanism's co-financing approach, as the capacity of MSWM actors to cover the operational costs of SWM facilities is broadly limited. In most cities, the State or City Governments cover the capital expenditure (such as land and some procurement of machinery, complemented by GIZ), but the operational expenditure (rent, staff/labour, energy, and transportation costs) are not covered by the project, since the project wanted to avoid subsidising this and skewing the secondary resources market. In some cases, this represents a significant barrier to sustainable MSWM improvements. This was highlighted in Goa for the Saliago recycling facility sustainability, and a waste collection company in Varanasi, which can see source segregation and improved collection sustain, providing there are sufficient resources for manpower. There is also some evidence that transport costs can be prohibitive for secondary resources markets to work, such as for plastic recycling, RDF and biomethanation. In Goa, the transportation costs for RDF to be taken to neighbouring Karnataka State's cement factories using RDF-derived fuel are borne by the Goa Waste Management Company, but this is affecting their operations.

New partnerships have also emerged indirectly from the project: State-level, ULBs, and private-sector players already coordinate their actions beyond the project boundaries. For instance, an MoU between NTPC and Varanasi Municipal Corporation to provide dry waste for waste to charcoal plant. MoHUA has also partnered with institutions such as IIM Indore and GWMC for skilling programmes, with a target to develop five programmes. These initiatives will commence with the Goa Waste Management Corporation, focusing on MRF, biogas, and other related areas. The National Skill Development Council is also involved in these endeavours. In Goa, the State and City level institutions coordinate their action beyond the project already. For example, the Goa Chief Minister and the Corporation of the City of Panaji (CCP) are on the GWMC board, showing strong relationships between different institutional levels. GWMC has plans to set up a SWM Institute with Goa Institute of Management to teach the next generation in India and other Asian countries. ULB stakeholders are confident that MSWM resilience and sustainability can largely be ensured by internal staff continuity, but external support is crucial to take risks and pilot new initiatives such as the Shop with your Waste campaign.

There is good evidence that lessons from the project are being disseminated, which in turn supports the sustainability of outcomes and replication in the future. The project team is proficiently using

social media channels for sharing content about the project by tailoring communication materials for LinkedIn (effective for promoting the RSF) vs Instagram (more effective for source segregation and home composting awareness activities, e.g. Saahas Instagram channel). Specific activities like home composting and sustainable menstruation are shared through active WhatsApp groups (e.g. Saahas in Bengaluru, Ayya in Panjim, and “ComePostVille” group in Panjim) where households can ask questions about sustainable practices. BBMP, contractors, and community leaders also have similar WhatsApp groups in Bengaluru.

Project initiatives to enable replication of project approaches in other cities have not yet started in earnest, although there are some encouraging signs that replication will occur. The focus so far has been on implementation in the five selected pilot cities. As yet, there has been limited focus on facilitating greater replication of successful approaches to other cities. MoHUA sees these five cities as “lighthouse areas” with a strong demonstration effect for future improvements elsewhere in India at the district and city levels. In addition, Swachhata Knowledge Partners will play a key role in disseminating lessons from project cities to others (e.g. GWMC from Goa). However, replication was reported as likely to be very challenging without tailoring the successful pilots and approaches (for example, source segregation at ward level heavily promoted by Saahas in Bengaluru) to a specific context elsewhere in India (e.g. Varanasi, where narrow streets and influx of tourist and pilgrim populations add additional challenges both on the waste generation and collection capacity). To enable replication an effective approach is likely to be to work with State governments instead and support them to disseminate this downward to their cities.

Exchange within and between the five cities has been encouraging so far. Peer-learning trips organised by the project have also played a role in raising awareness and inspiring MC representatives. For example, GIZ organised a trip for Patna representatives to visit Bengaluru and for Trichy representatives to visit Sidipet. The latter resulted in the Commissioner of Trichy initiating the process for setting up a biogas plant in Trichy, similar to the model in Sidipet and Bengaluru. An encouraging sign that the project will enable greater replication is the ongoing knowledge sharing between Bengaluru and 10 surrounding towns and cities in the state of Karnataka. Another example of possible replication is the National Green Court inviting Kerala to adopt the Goa MSWM system as a model. These are driven by government stakeholders rather than the project team and show that there is a strong likelihood of successful approaches being shared and replicated, particularly where they rely on knowledge and capacity rather than a lack of financial resources. In addition, TERI is using the project learning for their own training programmes in other cities of Uttara Pradesh and Madhya Pradesh.

Based on the positive evidence explained above, including the proactive approach to find a viable solution to enable municipal corporations to scale up source segregation, the increasing low-carbon MSWM capacity of municipal staff, the scaling up of the RSF by HUDCO and the initial signs of replication to other cities, the ELE team assigns a green rating to the Sustainability criterion.

4 Conclusions

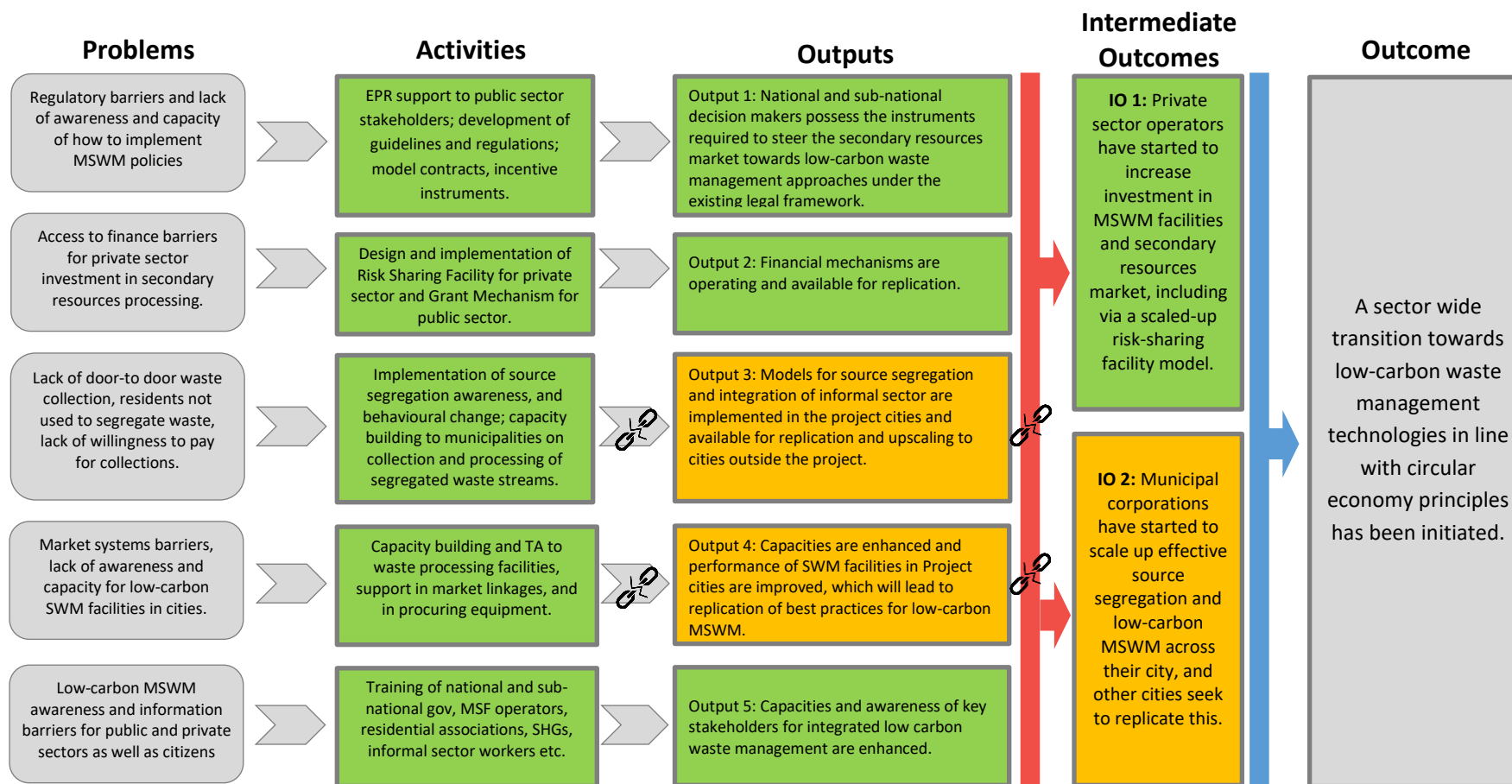
Now that the evidence collected and analysed by the ELE has been explored, this section goes back to the project's Theory of Change to test to what extent the original causal pathways and assumptions behind them (see Section 1.1) have held.

Figure 4 presents an overview of the progress of the project along its ToC causal pathways towards its intended outcomes. The RAG rating uses the same scale as the previous section (i.e. Good / Very Good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey), and the colours of the Intermediate Outcomes' shapes are the same colours used in Section 3.2 to rate the project's achievements for each Intermediate Outcome. This is to be read as an assessment of the project's situation at this point in time, i.e. at mid-term.

The ELE has identified the following causal pathways sustaining the two Intermediate Outcomes and final Outcome of the project (see also Figure 1):

- **Causal Pathway for Intermediate Outcome 1:** Effective operation of financial mechanisms (**Output 2**), such as the Risk-Sharing Facility (RSF), enables private sector operators to invest in MSWM facilities and secondary resources markets. Additionally, providing decision-makers with the necessary instruments to steer the secondary resources market towards low-carbon waste management (**Output 1**) creates a favourable environment for private sector investment. Moreover, offering models for effective source segregation and integrating the informal sector, which are pivotal for municipal corporations to upscale low-carbon MSWM practices (**Output 3**), further bolsters the motivation for private sector investment. Consequently, private sector operators are empowered to boost their investments in MSWM facilities and secondary resources markets, potentially through the implementation of a scaled-up risk-sharing facility model. This progression culminates in **Intermediate Outcome 1: Increased private sector investment in SWM facilities and secondary resources markets.**
- **Causal Pathway for Intermediate Outcome 2:** Providing models for effective source segregation and integrating the informal sector, critical for municipal corporations to upscale low-carbon solid waste management practices (**Output 3**). Augmenting capacities and enhancing the performance of MSWM facilities (**Output 4**) furnishes municipal corporations with the necessary infrastructure and expertise to implement and scale up waste management endeavours. Simultaneously, bolstering the capacities and awareness of key stakeholders secures greater support and participation in low-carbon waste management initiatives at the municipal level, facilitating replication in other cities (**Output 5**). These efforts coalesce into **Intermediate Outcome 2: Municipal corporations successfully upscaling effective source segregation and low-carbon SWM citywide, prompting other cities to replicate these practices.**

Figure 4. Overview of Project Causal Pathways Assessment at Mid-Term



Source: ELE team

What transpires from Figure 4 is that the ability of the project to achieve two causal pathway links in particular is uncertain. Firstly, there is a significant amount of uncertainty in the sustained impact and the ability to scale source segregation of household waste, which is part of Output 3. While implemented in a very robust way in selected city wards during the project to date, the mode of comprehensive household engagement cannot be scaled up to many more wards due to limited project resources. Enabling the MCs and related stakeholders, such as waste collection contractors, to take on this role is vital for scaled-up source segregation, which in turn is an important aspect of replication to other cities and states and to achieving the outcome of a sector-wide transition to low-carbon MSWM. This is an important area of experimentation that the project is conducting, and the extent to which scaled-up source segregation can be achieved via a lighter-touch project approach (Modes 2 and 3) will be of great interest to the Government of India and other similar MSWM projects in low- and middle-income countries. For now, the causal pathway link is currently shown as potentially broken.

Secondly, related to Output 4, while the project shows initial evidence of MC capacities being enhanced and the performance of MSWM facilities in project cities being improved, including via the Grant Funding Mechanism, the replication of best practices for low-carbon MSWM in other cities is uncertain. There is some initial interest shown by additional cities in learning from and replicating the project approach. However, this cannot be fully initiated by the project until further evidence that source segregation can be achieved at scale. However, beyond achieving source segregation at scale, there are many other aspects that the project can promote for replication, including decentralised organic waste management via home and community composting and the establishment of MRFs that integrate informal sector workers as part of the collection and aggregation network.

The other aspects of the causal pathways from output through to outcome appear to be viable. In some cases, they are already well on the way to being proven, such as Output 2 on “Financial mechanisms are operating and available for replication”, which is true for the project RSF and the scaled-up version that is currently being designed by HUDCO, with project support.

Finally, process tracing was applied as an additional test to check the validity of the project ToC and assess the strength of the evidence collected by the ELE. The results of the process tracing test did not contradict the findings presented in the body of the report. In summary, process tracing confirmed that, at mid-term, causal pathways for Intermediate Outcomes 1 and 2 are likely to be correct. In most cases, there is strong evidence that the project activities are leading towards successful outcomes, which will, in turn, achieve the intermediate outcomes. However, evidence is still thin that the source segregation work of the project can be sustained at scale and that the replication of the approach in the five selected cities can be adopted in other cities with other political, social and environmental contexts.

5 Lessons and recommendations

5.1 Key lessons

The evidence gathered during the ELE, along with the key findings presented in Section 3 and the conclusions in Section 4, have been used by the ELE team to draw the lessons below.

5.1.1 Lessons for the project team to achieve the goal of the project

- Lesson 1: Municipal Corporations’ buy-in to take on a long-term role in segregation awareness is limited.** The “Mode 2 and Mode 3” approaches have not been comprehensively tried by the project but offer a route to greater scale. This requires a more integrated approach, working with the private sector contractors responsible for waste collection as segregation promoters in communities. While Mode 1 was found to be more effective, GIZ views Modes 2 and 3 as the only viable long-term solution for scaling up effective and sustained source segregation. This has been tried in Panjim, where waste workers in selected housing complexes are trained to promote segregation among the residents, complemented by some awareness-raising events. At the time of the ELE visit in January 2024, Modes 2 and 3 were starting to be implemented in all project cities. The process does not provide strong evidence yet, and much depends on the ability of the project to develop the capacity and enthusiasm of MCs to drive this forward.
- Lesson 2: There appear to be advantages of working more closely with the State level governments, where the project can better connect city-level interventions with state-level policies and programmes.** There is already progress towards this in the State of Goa, but this is harder in large States like Uttar Pradesh and Karnataka because of the size and complexity of governance in those much more widely spread States. Working with the State level seems to have enabled greater sustainability and engagement of the local governments, and the project has been able to engage with policy and legal improvements on MSWM at the State level, such as starting an EPR study in Goa; providing repair and maintenance support for equipment in Bengaluru; and assisting the municipal corporation of Varanasi in extracting RDF from legacy waste to supply NTPC's waste-to-charcoal plant. A project development partner involved across cities saw an advantage of working with the State level, where the project can better connect interventions with their policies and programmes.
- Lesson 3: Some wards are not responding as well to segregation support as others, with a possible factor due to cultural differences.** In Varanasi, in particular, a uniform approach for household engagement in the four wards selected so far has resulted in poor performance from one ward with a different cultural context. Although the sample is too small to extrapolate strong evidence, the project could further investigate it.
- Lesson 4: Source segregation alone is not enough to ensure the waste recycling value chain is sustainable and reduces the burden on MRFs.** The project team is confident segregation results are sustainable, but the ELE team is concerned about sustainability beyond the project, once NGO contracts run out. The project is supporting MCs to optimise existing MRFs and

composting plants and to extract legacy waste for the RDF-to-Charcoal plant in Varanasi, for example. In Patna, project stakeholders recommended more investment is required in building up the processing capacity at the city level, i.e. by developing decentralised facilities to process waste beyond working on the segregation only. In Trichy, pre-processing capacity is still limited, and transformation such as shredding and compacting are a bottleneck presenting a risk of unprocessed waste being diverted to landfills.

- **Lesson 5: An integrated approach to modernising the MSWM practices is needed.** The ELE team found that the project has not covered some important aspects of the MSWM system, such as tools to monitor source segregation or an integrated approach to providing both infrastructure (e.g. capital funding into a recycling facility) and operational costs (e.g. expenses to ensure the plant runs at full capacity and can ensure maintenance), which limits the results that can be achieved in a city. In addition, land availability issues to set up processing facilities are also key to address alongside segregation initiatives.
- **Lesson 6: Formalising informal waste workers has posed a significant challenge. Integration can be achieved without formalising the employment of workers.** Integration is challenging because there is often a backlash from the groups informal workers work with or for, if they formalise their employment status outside of these groups. Instead of formalisation, the project team has begun to integrate waste workers into value chains, particularly by providing access to selling recyclable items at MRFs and by improving their health and safety and social security provisions.
- **Lesson 7: Monitoring and categorising direct vs indirect beneficiaries of the project across cities has been a challenge of this project, and tracking the actual number of beneficiaries is lacking.** The annual reporting process currently focuses on aggregated figures, and it is challenging to make the distinction between direct/indirect and primary/secondary/tertiary beneficiaries. Under Mandatory Core Indicator M2, the claim that the project has reached out to and, therefore, impacted around 8.7 million people through awareness programmes seems artificially high. Impacted beneficiaries are included even with a very thin amount of contact with the project. A clearer method of categorising beneficiaries could be considered, with clear classifications of direct/indirect and primary/secondary/tertiary beneficiaries, in line with MAF guidance.

5.1.2 Lessons for the project partners for supporting the success of the project

- **Lesson 8: Recruitment of students / volunteers for awareness-raising engagement work has presented challenges.** Longer-term planning for their engagement was challenging due to uncertainties around resourcing. At the same time, they often have limited grounding or passion in SWM.

5.1.3 Lessons for improving other or future projects' design and implementation

- **Lesson 9: The role of big corporate companies or Public Sector Undertakings can be crucial in scaling up the Mitigation Action Facility projects' efforts.** Project support to the MC in Varanasi to extract and input legacy waste to NTPC's RDF-to-Charcoal plant is a strong example. GIZ can play a critical role in identifying similar partners and encouraging their involvement by facilitating stakeholder engagement and providing additional support.

5.2 Recommendations

5.2.1 Recommendations to the project team to achieve the goal of the project

- **Recommendation 1: Foster MCs' buy-in and long-term commitment to segregation awareness (see Lesson 1).** The project team should explore collaboration and capacity building with waste collection contractors as an effective way to improve segregation awareness and enforcement beyond the end of the project. This seems particularly relevant in Varanasi, for example, where MC buy-in has been more limited and resources and capacity are lacking.
- **Recommendation 2: Foster collaboration with the State level institutions (see Lesson 2).** The project team could consider greater engagement and collaboration with State-level government for the other four pilot cities.
- **Recommendation 3: Mainstream segregation across wards in a city (see Lesson 3).** The project delivery teams at the city level should more proactively consider different engagement approaches that take cultural and social differences into account.
- **Recommendation 4: Go beyond a focus on segregation (see Lesson 4).** The ELE team suggests the creation of Standard Operating Procedures at the municipal level to move to Mode 3. The project could also play a greater role in supporting / investing in pre-processing and processing to limit the risk of valuable waste being directed to landfills, especially in Patna and Trichy.
- **Recommendation 5: In addition, to ensure the sustainability of source segregation (see Lesson 5), the ELE team recommends that partner NGOs, such as Saahas, develop Standard Operating Procedures on source segregation, following a Training-of-Trainer Model.** Partner NGOs could, therefore, train MCs to train their own staff on how to sustain residents' awareness and commitment to segregation. This aligns with GIZ's intention to shift to Modes 2 and 3, seen as the only viable solution beyond the direct involvement of the project and partner NGOs.
- **Recommendation 6: Successfully adopt an approach that modernises MSWM practices (see Lesson 5).** The project team could consider investing in: (i) A digital platform recording waste segregated and diverted from landfill as part of a separate and longer funding component (e.g. CITIIES 2.0), as it takes time to establish; (ii) Delivering infrastructure at the same time as software interventions (e.g. biogas plants) and the infrastructure should be separate as it takes at least five years to transfer ownership; (iii) Operation and maintenance (OpEx), whereby support on preparing relevant business model could be provided by the project team to cities to ensure that the waste management system remains sustainable even after the project duration ends.
- **Recommendation 7: Ensure further integration of informal waste workers without formalisation of roles (see Lesson 7).** The project team can further explore how to integrate waste workers in ways that safeguard their working flexibility while ensuring they receive enhanced benefits from waste management initiatives. These benefits may include skills training, improved wages, health benefits, education for their children, and social security, among others. The objective would be to link them to the social security programme of the Government of India at a greater scale than has been achieved by the project so far.

- **Recommendation 8: Improve sustainability and replication. The project team should assess the technical, institutional and financial capacity of MCs to roll out the project activities beyond the project closure** and look at other cities' examples like Indore and Surat, which have invested significant funds in their waste management activities. However, other MCs either lack sufficient tax collection or are not sufficiently motivated to allocate enough funds.
- **Recommendation 9: Continue to disseminate project learning via events, conferences and papers.** Project stakeholders called for support on wider dissemination of positive outcomes of the project (through conferences and papers), seen as central to improve the visibility of the project, of the progress made by the current partner cities, and for stimulating demand for the RSF.
- **Recommendation 10: Improve the monitoring of beneficiaries (see Lesson 9).** A more robust method of categorising beneficiaries should be adopted in the project, in alignment with MAF guidance, which provides clear classifications of direct / indirect and primary / secondary / tertiary beneficiaries.

5.2.2 Recommendations to the project partners for supporting the success of the project

We provide these recommendations to the national project partners because their contribution is critical in sustaining the project's outcomes in the long term and fostering the envisaged transformational change. However, we do not expect them to provide a written response to these recommendations in the "management response" to the ELE.

- **Recommendation 11: Address the challenge of keeping volunteers working on ongoing segregation awareness (see Lesson 8).** The project partners could develop a well-phased plan for each city to give longer-term stability to volunteering resources that are well-trained and driven to affect change. For example, there could be an overlap of one month so that the same volunteers / manpower can be continued from one ward to the next. The ELE team also suggests the creation of Standard Operating Procedures at the municipal level to move to Mode 3, seen as the only viable option for segregation awareness raising to be conducted through a "Training of Trainers" led by the local governments, with the objective of achieving scale.

5.2.3 Recommendations to the Mitigation Action Facility for the review, approval, and management of future interventions

- **Recommendation 12: Make sure this project is communicating with other circular economy projects under the Mitigation Action Facility.** There is likely to be much value in exchanging learning related to aspects such as source segregation, capacity building of city government, and accelerating private sector investment.

Annex A Capturing Project-induced Transformational Change

Introduction

This is a brief guidance developed by AMBERO/OPM outlining a framework to consistently evaluate Mitigation Action Facility-funded projects' progress towards bringing about transformational change.

Transformational change is embedded in the Mitigation Action Facility's goals and Theory of Change (ToC), and projects are the main way through which the Mitigation Action Facility will achieve this transformational change. Therefore, the projects need to be aiming to achieve this level of change, and the Evaluation and Learning Exercises (ELEs) of such projects should evaluate their progress.

In a way, key elements of transformational change are already monitored through the project's Mandatory Core Indicators M1-M5, part of the Mitigation Action Facility M&E Framework²². However, they only cover partial elements of transformational change. Therefore, clearer guidance in identifying the signals or evidence of project-induced transformational change is needed.

This brief document clarifies how transformational change is expected in projects and provides guidance to both project and ELE teams on how to characterise the elements and evidence of project-induced transformational change.

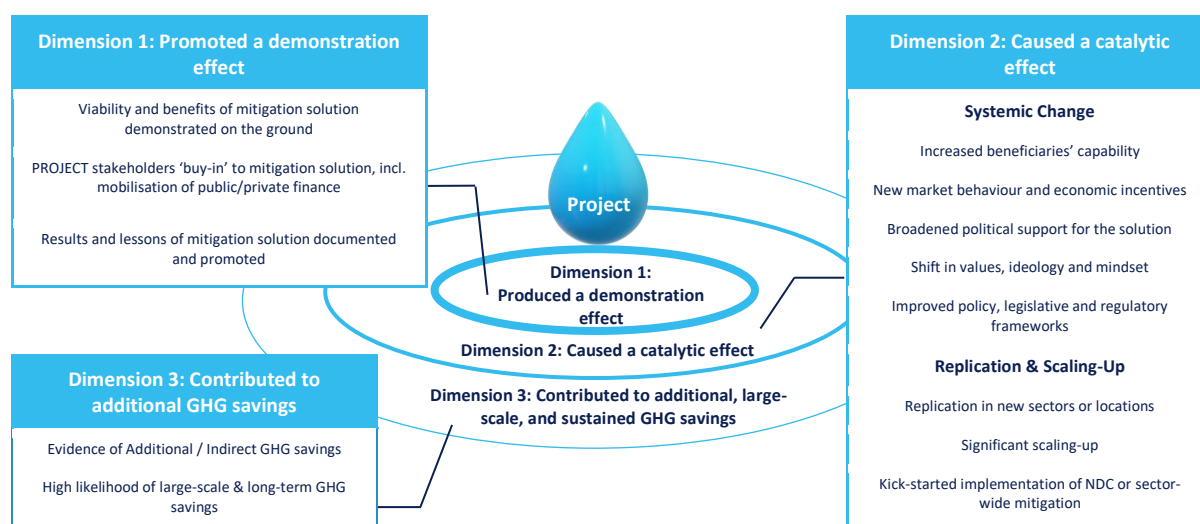
Breaking down project-induced transformational change

The Mitigation Action Facility defines transformational change as "*Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways*"²³.

The Mitigation Action Facility's ToC explains how transformational change is expected to be achieved through its outputs and outcome. The ToC is broad, and there are different ways transformational change can be achieved through the projects, which are simplified into the three *dimensions* summarised in the figure below.

²² <https://mitigation-action.org/our-approach/monitoring-evaluation-learning/>

²³ https://mitigation-action.org/wp-content/uploads/Mitigation-Action-Facility_transformational_change-factsheet.pdf.

Figure 5. Dimensions of project-induced transformational change

Three dimensions interact and reinforce each other to produce project-induced transformational change (Figure 5). These are described below with an indication of what is expected to be achieved at the project's mid- and end-point (see Table 8 and Table 9 for more details on scoring criteria).

- **Dimension 1: Promoted a demonstration effect.** The most direct way in which a project can contribute to transformational change is to produce a demonstration effect which will imply that:
 - The project has **demonstrated** or proven the viability and benefits of a particular **mitigation 'solution' (e.g. models, practices or technologies)** through implementation on the ground (e.g. using pilot projects), thereby directly contributing to GHG emissions savings;
 - There is **evidence of buy-in by key project stakeholders**, e.g. by mobilising additional public/private finance along with the project Financial Cooperation Component;
 - The demonstrated **results and lessons of the mitigation solution have been documented** (e.g. in knowledge or communication products) **and promoted externally to a wider audience.**

By mid-line, projects are expected to show interim signals of achieving this demonstration effect, which should have become clear evidence (i.e. advanced signals) by the end-line.

- **Dimension 2: Caused a catalytic effect.** To amplify the impact of the mitigation solution demonstrated (Dimension 1), the project needs to cause a virtuous catalytic effect in the operating country or region. This can take the form of one or more of the following catalytic changes:
 - **Replication and/or significant scaling-up** of the project's demonstrated solution in other sectors or locations, or of the project itself. This could include kick-starting sector-wide mitigation or the NDC; and/or
 - As a result of the project improving enablers and/or eliminating barriers to the uptake of the mitigation solution, it will result in wider **'systemic' change**, which

could be supported by one or more of the following: a) Increased beneficiaries' capability; b) new market behaviour and economic incentives; c) improved policy, legislative and regulatory frameworks; d) broadened political support for the solution; e) shift in values, ideology and mindset.

By mid-line, projects are expected to have produced some early signals of one or more of these changes (or that they are likely in the near future), which by the end of the project should have been strengthened into interim signals.

- **Dimension 3: Contributed to additional GHG savings.** As a result of contributing to Dimension 1 and Dimension 2, the project will indirectly influence *additional, large-scale and sustained GHG savings*²⁴.

During the project's lifetime, projects are not expected to have achieved this. Yet, by the end of the project, there should be early signals of additional (i.e. indirect) GHG savings and evidence that these will become large-scale and sustained GHG savings in the future.

Box 2: Connection between transformational change Measurement Framework and Knowledge Management and Learning Strategy

One of the key objectives of the Knowledge Management and Learning Strategy (KMLS) is to ensure that learning from both successes and failures is taken into account, changes are implemented accordingly, and innovative approaches are replicated. There is therefore an important connection between the ELEs and this strategy, and the learning documented through the ELEs is expected to be used by the Mitigation Action Facility in its function of 'Knowledge and Learning Hub' for the international climate finance community explained in the strategy. In particular, project-specific learning should be proactively shared and discussed with other projects (at least with those funded by the Mitigation Action Facility). The KMLS also expects to engage with and influence international debates on climate finance and transformational change. The Mitigation Action Facility will use and synthesise learning on supporting transformational change, documented through the ELEs, to inform this engagement.

Measuring project-induced transformational change

As shown, the transformational change dimensions come directly from the Mitigation Action Facility ToC. As the projects are expected to be aligned to the overall Mitigation Action Facility ToC, it should be possible to map the dimensions of transformational change in the project ToCs. All projects must monitor their progress using their Monitoring and Evaluation (M&E) Plans which include Mandatory Core Indicators and project-specific indicators.

The ELE teams will be evaluating and learning from the projects' progress in supporting transformational change, which will include reviewing progress against the indicators and milestones set out in their M&E Plans. In addition, this can be complemented (and verified) with more qualitative ELE questions and data sources. Table 1 below provides some guidance to ELE teams in

²⁴ Additional = the GHG savings achieved are in addition to those achieved by the direct implementation of the project. Large-scale = the additional GHG savings will have a significant impact on overall GHG savings in the geography/sector. Sustained = there is no chance of the GHG savings being reversed.

terms of criteria and evidence for assessing the project-induced transformational change. This includes the three dimensions but also the scoring for the Core Mandatory Indicator M3, which can be seen as the summation of results for the three dimensions.

Table 7. Guidance for ELE teams for measuring project-induced transformational change

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans	How to measure success	Expectations at mid-line and final ELE
1: Promoted a demonstration effect	Viability and benefits of mitigation solution demonstrated on the ground	Effectiveness	Milestones set for outputs and/or Intermediate Outcomes (if used) should represent the scale of uptake needed to demonstrate the solution is viable (meaning it has been shown to work in practice at a large scale in diverse contexts, and provide the expected economic, social and climate benefits) Also aligns with M1: Reduced Direct GHG emissions and M2: Number of people directly benefiting	<i>Quant:</i> Achievement of project milestones for the adoption of the mitigation solution by target users and resulting direct GHG emission savings <i>Qual:</i> Feedback from target users that viability and benefits have been demonstrated.	Mid-line: Interim Signals End-line: Advanced Signals
1: Promoted a demonstration effect	Results of mitigation solution documented and promoted	Effectiveness	Milestones set for outputs on producing knowledge and learning documents and engaging with wider stakeholders to share this insight. Seek alignment with the KMLS.	<i>Quant:</i> Achievement of project milestones for knowledge and communication products/activities <i>Qual:</i> Feedback from other stakeholders (e.g. other funders) on their awareness and understanding of the project and solution.	Mid-line: Interim Signals End-line: Advanced Signals
1: Promoted a demonstration effect	project stakeholders ‘buy-in’ to mitigation solution	Effectiveness	Milestones set for outputs and/or Intermediate Outcomes for the volume of finance expected to be mobilised and/or other examples of ‘buy-in’ (e.g. policy statement). Also aligns with M4-5: Public and Private finance mobilised	<i>Quant:</i> Achievement of project milestones for public and private finance mobilised <i>Qual:</i> Feedback from government and other stakeholders that they are convinced of the viability and benefits of the solution	Mid-line: Interim Signals End-line: Advanced Signals

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans	How to measure success	Expectations at mid-line and final ELE
2: Caused a catalytic effect	<p>Systemic change underway to enable widespread adoption of mitigation solution: Improved policy, legislative and regulatory frameworks New market behaviour and incentives Increased institutional capacity and management practices Shifts in values, ideology and mindset Broadened political support for the solution</p>	Effectiveness	Milestones set for outcomes should indicate specifically what needs to change to enable widespread uptake of the mitigation solution.	<i>Qual:</i> Evidence of contribution to achieving expected systemic change and unexpected changes.	Mid-line: Early Signals End-line: Interim Signals
2: Caused a catalytic effect	<p>Replication and scaling-up of mitigation solution and/or project project Replication in new sectors of the mitigation solution and/or project itself Significant* scaling-up of the mitigation solution and/or project itself Kick-starting and influencing sector-wide mitigation <i>* Significant compared to the size of the project and the overall target user group. For example, if the project promoted the installation of 2,000 Solar PV systems (representing approximately 2% of all target users), significant replication would imply that it has reached around 20% of target users. However, there is no quantitative target to meet, and a rationale can be provided to justify it meeting this criterion.</i></p>	Effectiveness Sustainability	Milestones set for outcomes for replication/ scaling-up by others of project activities.	<p><i>Quant:</i> Volume of scaling-up (e.g. # of new geographies/ beneficiaries or \$ of new funding) <i>Qual:</i> Feedback from other funders and programmes on the influence of project in their decision to scale-up activities and/or invest in the project’s sector.</p>	Mid-line: Early Signals End-line: Interim Signals

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans	How to measure success	Expectations at mid-line and final ELE
3: Indirectly contributes to additional, large-scale and sustained GHG savings	As a result of the changes from dimensions 1 and 2, there is evidence of additional and potentially large-scale and sustained GHG emissions savings	Impact	Milestones set for Impact should represent the scale of GHG emissions savings required for sector decarbonisation. Also aligns with M1: Reduced Indirect GHG emissions and	<i>Quant:</i> Achievement of project milestones for indirect additional GHG emissions savings <i>Qual:</i> Given progress for dimensions 1 and 2, an assessment of the likelihood that this will result in additional GHG savings in the future. This is informed by feedback from wider stakeholders in the sector.	Mid-line: No signals End-line: Early Signals
Overall Transformational Change potential	M3: Degree to which the supported activities are likely to catalyse impacts beyond the projects (potential for scaling-up, replication and transformation)	Impact		<i>Mixed:</i> Based on whether the expected minimum level of signals for each transformational change dimension is found, the ELE gives: 1) a RAG rate to the 'Impact' evaluation criterion; and 2) a rate from 0 to 4 to the M3 indicator.	

Guidance for describing and scoring progress towards transformational change in ELE reports

Although transformational change is ultimately related to the project's Impact, **evaluating progress towards it cuts across different parts of the ELE report related to Evaluation Questions on Effectiveness, Sustainability and Impact (see table above)**. In particular, the Effectiveness and Sustainability sections of the ELE report will describe key aspects of dimensions 1 and 2 (which relate to the projects' outputs, intermediate outcomes and outcomes). Therefore, the Impact section will provide an analytical synthesis of the three transformational change dimensions referring to the previously described evidence and assign an overall score to the project's transformational change potential. ELE reports' authors should avoid duplications across the sections and cross-reference to other relevant parts of the report, if some of the evidence has already been discussed.

Each dimension should be described and assessed according to the following "signal levels":

Table 8. Transformational Change "Signals" assessment by ELEs

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the project, but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway, and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway, and there is little doubt that it will continue.

ELEs would expect projects to have achieved at least the "signal levels" in Table 9 by the project's mid-point and end-point for each dimension.

Table 9. Minimum expected signals of project-induced transformational change

Dimension	Mid-point	End-point
1: Promoted a demonstration effect	Interim signals	Advanced signals
2: Caused catalytic effect	Early signals (of one or more of the types of possible changes)	Interim signals
3: Contributed to additional GHG savings	None	Early signals

Within the relevant dimension's sub-sections, these signal levels should be presented and justified by referring to the evidence provided throughout the report (e.g. in the Effectiveness and

Sustainability sections). Below are some guiding questions to support this (aligned to measures presented in Table 7).

For presenting the evidence on **Dimension 1**, the report could provide a narrative answering the following questions:

- Is the project in line with the expected direct GHG savings per M1 and the number of beneficiaries reached per M2?
- Have the key project stakeholders (i.e. those closer to the project implementation) shown concrete evidence of buy-in/adoption of the project's mitigation solution? Is this demonstrated by public and private sector actors investing resources into it, as per M4 and M5?
- Is the project documenting the key results and lessons from the process of demonstrating the validity of the mitigation solution and sharing these with wider stakeholders?
- Do the answers to the above questions constitute interim/advanced signals of Dimension 1 for the mid-line and end-line ELEs, respectively?

Similarly, for **Dimension 2**, the narrative could present evidence around the following questions:

- Has the project contributed to improving/removing systemic enablers/barriers to the widespread uptake of its demonstrated mitigation solution? What wider effects might this produce?
- What is the evidence that the project's mitigation solution will be scaled up and/or replicated in new sectors and/or locations?
- Is there evidence that the project has informed or kick-started the implementation of the NDC or sector-wide mitigation?
- Do the answers to the above questions constitute early/interim signals of Dimension 2 for the mid-line and end-line ELEs, respectively?

Concerning **Dimension 3**, as no signals are expected at mid-term, the following questions are suggested for the analysis in Final ELEs only:

- Is the project in line with the expected indirect GHG savings per M1?
- What is the evidence that the project's mitigation solution will generate additional and large-scale GHG savings in the long term?
- Do the answers to the above questions constitute early signals of Dimension 3?

Finally, the assessment would conclude by providing an overall rating of transformational change potential. This aligns with M3: "Degree to which the supported activities are likely to catalyse impacts beyond the projects (potential for scaling-up, replication and transformation)".

The project will likely have provided a self-score for M3 within their routine M&E reporting. Therefore, the ELE teams can discuss with the project teams their rationale for this score, and then provide their own independent judgement of it.

To do this, the ELE authors should look back on whether the expected minimum level of signals for each transformational change dimension (Table 9) was found by the ELE and, on that basis, rate from 0 to 4 the M3 indicator using the scale recommended in the Mitigation Action Facility M&E Framework:

- 0 = Transformation judged unlikely;
- 1 = No evidence yet available;
- 2 = Some early evidence suggests transformation likely;
- 3 = Tentative evidence of change – transformation judged likely;
- 4 = Clear evidence of change – transformation judged very likely.

Based on that score, a Red-Amber-Green (RAG) rating will be assigned to the Impact evaluation criterion. The RAG rating can follow the guidelines in the matrix below (Table 10), while leaving some flexibility to account for the project-specific trajectories of progress.

Table 10. Indicative project’s Impact RAG rating based on its M3 indicator score

M3 score	0	1	2	3	4
Mid-term ELE					
Final ELE					

Legend: 0 = Transformation judged unlikely; 1 = No evidence yet available; 2 = Some early evidence suggests transformation likely; 3 = Tentative evidence of change – transformation judged likely; 4 = Clear evidence of change – transformation judged very likely.

Annex B Evaluation and Learning Exercise Matrix

This evaluation and learning exercise matrix is based on the Theoretical Framework provided (version April 2022). It is a working tool that allows the evaluators to focus on a feasible target and assemble information for each question that can be synthesised in the final report, hence creating an integrative overview of the project at large.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
1. RELEVANCE					
1	To what extent does the project address an identified need (by national policy institutions, city government, citizens, and the private sector)?	<ul style="list-style-type: none"> The project design responds to the beneficiaries' (50% of households living in five large Indian cities) needs and strategic priorities at the time of adoption and continues to respond to priorities given the evolving challenges and priorities in the Indian solid waste sector. The project is aligned with the needs of selected Indian cities, the national and sub-national government, solid waste stakeholders, the private sector and individuals. 	<ul style="list-style-type: none"> Source segregation, greater public and private sector investment and increased capacity of public sector entities will reduce GHG emissions by 1.2 million tCO₂e by the end of the project, with further indirect emission reduction targets after 10 and 15 years The pilot cities will show the government how low-carbon SWM benefits the waste sector and reduces its GHG emissions. 	<ul style="list-style-type: none"> Direct beneficiaries (listed as citizens) and their proxies City officials focused on SWM, Circular Economy and Urban Services. GIZ Project Team Project partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Field visit to three pilot cities Semi-structured key informant interviews (KIIs) Document review (Project concepts (logical framework matrix) and progress reports) National plans, strategies and other policy instruments such as norms, standards, etc.
Sub-Questions					
1.1	How well does the project align with government and agency priorities regarding GHG emissions from the solid waste sector?	<ul style="list-style-type: none"> The project is in line with government targets on solid waste sector development, reduction of emissions from the solid waste sector including the ENDC (the 	<ul style="list-style-type: none"> The project SWM approaches responds to climate aspects of national, urban, and solid waste policy and practice. 	<ul style="list-style-type: none"> Stakeholders and officials from the national government 	<ul style="list-style-type: none"> Semi-structured key informant interviews (KIIs)

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		waste sector is a priority sector for the Nationally Determined Contributions (NDC) ²⁵ .		<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. GIZ Project Team Academics Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project and city SWM baselines, operating documents. India NDC strategy
1.2	What other factors or changes in the project-operating context affect the relevance of the project?	<ul style="list-style-type: none"> The project's goals and specific objectives and needs are still valid. Several assumptions and causal pathways outlined in the TOC remain valid, after adaptations and refinements. 	<ul style="list-style-type: none"> India's SWM is coherent with national and specific city policy priorities that are not affected by short-term context changes (e.g. local and general elections, personnel changes, COVID-19). 	<ul style="list-style-type: none"> Direct beneficiaries GIZ Project Team Stakeholders and officials from the national government, city government. 	<ul style="list-style-type: none"> Institutional framework and budget of Solid Waste Division in pilot cities Semi-structured key informant interviews (KIIs) Project annual reports Selected ELE site visits to SWM facilities
2. EFFECTIVENESS					
2	To what extent has the implementation of the project been achieving intended outcomes?	<ul style="list-style-type: none"> The degree to which there is evidence of the expected results / interim outcomes in the ToC: Low-carbon SWM implemented in pilot cities in an inclusive way Two implementation support documents submitted to MoHUA (e.g. rollout plans for 	<ul style="list-style-type: none"> Project activities to implement low-carbon SWM processes and facilities in cities will directly contribute to speeding up the modernisation process making the solid waste systems in Indian cities more climate-friendly, 	<ul style="list-style-type: none"> Stakeholders and officials from the national government City officials focused on SWM, Circular Economy and Urban Services. GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Baseline documents Semi-structured key informant interviews (KIIs) Progress reports City solid waste metrics and reporting

²⁵ India's NDC does not specify quantitative GHG emission targets for the waste sector but prioritises reducing waste-related emissions through "promoting waste to wealth conversion" and "abatement of pollution". GHG emissions from MSW disposal alone are expected to increase from 19.2 million tCO₂e in 2015 to 41.1 million t by 2030 in India.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		national standards, standard operating procedures for MRFs/Recycling and Bio-methanation). <ul style="list-style-type: none"> • Source segregation systems implemented and improved • Institutional, policy, financial and inclusivity aspects of SWM / Circular Economy systems influenced by the project • GHG emissions reduced due to Project activities • SWM investment by public and private sector is mobilised as a result of the RSF. • New stakeholders in the private sector interested in SWM opportunities • The strength of the project contribution to the realisation of those outcomes (see link between outputs and outcomes in Evaluability Assessment) • For each of the outcomes consider the major constraints and opportunities experienced (success and hindering factors) 	inclusive, and financially sustainable <ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • Data from Project monitoring system / Logframe • Selected ELE cities' site visits to SWM facilities •
Sub-questions					
2.1	For each output area, what were the major constraints and opportunities experienced in	<ul style="list-style-type: none"> • Evidence of the delivery of intended outputs 	<ul style="list-style-type: none"> • Implementing the intended activities (as per ToC) will 	<ul style="list-style-type: none"> • Stakeholders and officials from the national government 	<ul style="list-style-type: none"> • Project proposal

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
	implementing the activities? For each output, what were the particular features of the project and context that made a difference in achieving these outputs?	<ul style="list-style-type: none"> The strength of the project contribution to the delivery of those outcomes For each of the output consider the major constraints and opportunities experienced (success and hindering factors) 	<ul style="list-style-type: none"> deliver the expected outputs The project is the main factor in the delivery of the outputs 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Semi-structured key informant interviews (KIIs) Baseline documents City solid waste metrics and reporting Progress reports
2.2	Are results that are reported for the five mandatory core indicators by the MAF (M1-M5) in line with the MAF and the project M&E framework and on track for producing the anticipated results?	<ul style="list-style-type: none"> Level of achievement of M1-M5 targets by the project Circumstances (positive and negative) that influenced the performance on the M1-M5 indicators Delays in specific activities that are key to the causality chain (such as the Technical Assistance) The level of PROJECT contribution to the achievement of the results compared to exogenous factors. Several assumptions and causal pathways outlined in the TOC remain valid, after adaptations and refinements 	<ul style="list-style-type: none"> The project will support the achievement of the Mitigation Action Facility's core indicators Low carbon SWM and related investment in facilities and equipment is a system change which requires relatively intensive support from the project team 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Progress reports In-depth interviews Data from Project monitoring system Semi-structured KIIs
2.3	How well has the project supported promotion of source segregation in India through the project activities and what are other promising approaches that the project could consider?	<ul style="list-style-type: none"> Evidence of revised and improved systems in at source waste segregation. Evidence of behavioural change (that is likely to be sustained) among beneficiary households in terms of source segregation. 	<ul style="list-style-type: none"> The project has identified appropriate source segregation entry points to realise change in household behaviour, collection processes and improved volumes of recyclable and compostable waste being 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> Evidence that the project is actively considering alternative segregation approaches that can support the achievement of the project objectives. 	<ul style="list-style-type: none"> directed to SWM processing facilities. The project is continuously assessing its approach and considering alternatives that may be more effective. 	<ul style="list-style-type: none"> Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	
2.4	How well is the project team considering alternative approaches for increasing the quantity of waste processed through Project support?	<ul style="list-style-type: none"> Evidence that the project is actively considering alternative waste processing approaches that can support the achievement of the project objectives. 	<ul style="list-style-type: none"> The project is actively considering alternative waste processing approaches that can support the achievement of the project objectives. Assessments of possible scenarios (under different approaches) are developed and compared. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs Selected ELE cities' site visits to SWM facilities
2.5	What is the project performance in advancing the secondary resources market for low-carbon waste management approaches, including Composting and the promotion of the use of refuse-derived fuel (RDF) in cement production?	<ul style="list-style-type: none"> Evidence that the project is engaging with producers and buyers of RDF including cement companies. Evidence of assessment of RDF quality and communication of limitations and opportunities to relevant stakeholders. Evidence of operation Compost Facilities (CFs) and piloting innovative organic waste treatment technology (e.g. biomethanation) 	<ul style="list-style-type: none"> The project is able to positively influence cement companies to increase their uptake of RDF. Additional secondary resources market opportunities are identified and facilitated by the project. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs Data from Project monitoring system
2.6	In what ways has the project successfully enhanced the capacities and awareness of key stakeholders for integrated low-carbon waste management?	<ul style="list-style-type: none"> Evidence of training and capacity development activities to public and private sector stakeholders. 	<ul style="list-style-type: none"> Capacities and awareness of key stakeholders for integrated low carbon waste management are enhanced 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> Evidence that capacity development is leading to institutionalised processes within city governments 	<ul style="list-style-type: none"> Capacities are enhanced and performance of SWM facilities in PROJECT cities are improved, which leads to replication of best practices for low-carbon MSWM 	<ul style="list-style-type: none"> GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Data from Project monitoring system Selected ELE cities' site visits to SWM facilities
2.7	How effectively has the project mainstreamed gender equality and social inclusion (GESI), including contributing to job creation and the improvement of livelihoods, particularly for underprivileged individuals and women?	<ul style="list-style-type: none"> Evidence that the project is documenting and acting upon gender and inclusion related barriers and opportunities to overcome those barriers. Evidence that the project is engaging/consulting women and marginalised groups / individuals to inform project activities and approaches. Evidence of additional awareness and employment of women and marginalised groups / individuals in low-carbon SWM. 	<ul style="list-style-type: none"> The project is able to catalyse significant job and livelihood opportunities for women and marginalised groups in low-carbon SWM roles. The project is able to formalise the roles of informal sector workers (ISW), in cases where ISW desire and benefit from formalisation. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs Data from Project monitoring system ELE cities' site visits to selected SWM facilities
2.8	Were there additional outputs and/or outcomes obtained that were not planned in Project design (unintended outcomes)?	<ul style="list-style-type: none"> There is evidence of the project's contribution to unintended or unexpected results If there are positive unintended results, the project team has been able to capitalise on them to sustain the intended outcomes If there are negative unintended results, the project team has been able to appropriately identify, address and learn from them. 	<ul style="list-style-type: none"> The project management has been appropriately designed to identify, address/capitalise from, and learn from unintended outcomes The project is the main cause of the achievement of the intended and unintended outcomes 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. The private recycling sector 	<ul style="list-style-type: none"> Project proposal Progress reports Data from Project monitoring system Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
3. EFFICIENCY					
3	To what extent is the relationship between inputs and outputs timely and to the expected quality?	<ul style="list-style-type: none"> • Timeliness of the delivery of outputs and outcomes (incl. budget spending) • If there are delays in the implementation, what have caused them (Project-specific or external factors) and how seriously have they affected the project implementation? • The presence and effectiveness of the measures adopted to reduce the initial delays in project implementation. • The level of satisfaction of the project direct beneficiaries or their proxies • Feedback from the private sector investing via the RSF etc. 	<ul style="list-style-type: none"> • Technical Component activities run smoothly on time (and on budget). • Co-ordination with MoHUA and other national policy-makers and City officials is frequent and effective • National, state, and local institutions operating in the same landscape (solid waste) are in communication with each other in relation to the project • The cooperation with private sector entities and representative groups will support efficient information dissemination and stakeholder identification. 	<ul style="list-style-type: none"> • Direct beneficiaries • City officials focused on SWM, Circular Economy and Urban Services. • National policymakers (MoHUA, MoEFCC) • GIZ Project Team • 	<ul style="list-style-type: none"> • Project proposal • Annual and Semi-annual progress reports • Data from Project monitoring system • Semi-structured interviews • Scan of press and media •
Sub-questions					
3.1	Structure & steering: Has the project been managed, coordinated, and implemented effectively?	<ul style="list-style-type: none"> • The chosen implementation mechanism is conducive to achieving the expected outcomes • The technical and financial components are tailor-made for achieving the planned outputs • Communication and visibility are implemented according to an integrated approach 	<ul style="list-style-type: none"> • The India Project team has the right governance structure to effectively coordinate with key stakeholders • Key stakeholders fully own and commit to their role in the project • 	<ul style="list-style-type: none"> • GIZ Project Team • Steering Group Members (MoHUA) • City officials focused on SWM, Circular Economy and Urban Services. • National policymakers (MoHUA, MoEFCC) • • 	<ul style="list-style-type: none"> • Project proposal • Progress reports • Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> Stakeholders are invited into the process and are participating and collaborating actively in the intervention. 			
3.2	What risks have/could impact the delivery of the project, and how well have these been managed by the project team?	<ul style="list-style-type: none"> Risks are actively identified and effectively mitigated by the project team Risks are well documented and reported 	<ul style="list-style-type: none"> The project team regularly identify relevant risks and document them Risk mitigation informs the evolving design and approach of the project delivery 	<ul style="list-style-type: none"> GIZ Project Team Steering Group Members (MoHUA) City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) 	<ul style="list-style-type: none"> Project proposal Progress reports Data from Project monitoring system Semi-structured KIIs
3.3	Has the project M&E framework been able to adequately function?	<ul style="list-style-type: none"> The proposed Project M&E framework adequately reflects the challenges, outcomes and impacts of the program The logical framework is used as a reference tool for monitoring (regularly updated) 	<ul style="list-style-type: none"> The M&E is set up and implemented based on appropriate indicators The Logframe is regularly updated and used as a learning tool 	<ul style="list-style-type: none"> GIZ Project Team TSU 	<ul style="list-style-type: none"> Project proposal Progress reports Data from Project monitoring system Semi-structured KIIs
3.4	How has learning been integrated into the project?	<ul style="list-style-type: none"> The presence and effectiveness of institutionalised learning and adaptation mechanisms within the project 	<ul style="list-style-type: none"> The project team regularly identify learnings, reflect on them, and accordingly adapt the ToC and implementation of the project 	<ul style="list-style-type: none"> GIZ Project Team TSU 	<ul style="list-style-type: none"> Progress reports Data from Project monitoring system Semi-structured KIIs
4. IMPACT					
4	What evidence is there that the project is likely to contribute to the intended impact in the ToC (incl. transformational change), as well as any unintended or	<ul style="list-style-type: none"> The strength of the reasoning behind the chain of results/causal connections The robustness of the causal links/pathways to the 	<ul style="list-style-type: none"> Direct: Technical Component activities will build awareness and capacity of public and private sector stakeholders, 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
	unexpected ones?	<p>intended impact (namely, contribution to increased secondary resources market, increased segregation at source, improved SWM processes and facilities in cities and increased private sector investment in SWM facilities)</p> <ul style="list-style-type: none"> The availability of metrics and a tradition of reporting that can indicate or verify the causal links The evidence that key outcomes are going to be achieved and the extent of how transformative the project is likely to be based on current evidence 	<p>improve ability of city gov't actors to implement SWM processes and guide investment towards SWM market opportunities.</p> <ul style="list-style-type: none"> Direct: Financial Component activities will de-risk SWM investments for private and public sector entities, leading to accelerated investment in necessary infrastructure and equipment. Direct: Technical Component will demonstrate viable models for source segregation and integration of informal sector in PROJECT cities and available for replication and upscaling to cities outside PROJECT Indirect: Technical Component initiatives will lead to plans for national standards, standard operating procedures for MRFs/Recycling and Bio-methanation) being rolled out by the Gov't. 	<ul style="list-style-type: none"> GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Data from Project monitoring system Press and media Assessment of Regulatory impact (e.g. new plans for national standards, standard operating procedures for MRFs/Recycling and Bio-methanation)
Sub-questions					
4.1	How well has the project enabled greater public sector understanding and replication of low-carbon SWM processes and investments?	<ul style="list-style-type: none"> The likelihood that the project will raise capacity levels in Indian cities to understand low-carbon SWM and circular economy 	<ul style="list-style-type: none"> The project leverages systemic change in how local authorities in medium-sized Indian cities think about waste management, 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) 	<ul style="list-style-type: none"> Progress reports Semi-structured KIIs Assessment of Regulatory impact

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<p>approaches and apply them in a sustained way</p> <ul style="list-style-type: none"> The likelihood the project will catalyse the solid waste sector to seek for and find additional, large-scale, sustained GHGs savings The plausibility of attracting new business partners in solid waste services, recycling, organics valorisation, or emissions reduction 	<p>shifting their approach from technical and facility-based to a system approach where institutions, budgets, and governance are equally important</p> <ul style="list-style-type: none"> The experience of the project pilot cities leverages change at national level The project approaches are replicated in at least 5 other Indian cities. 	<ul style="list-style-type: none"> GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	
4.2	What is the project's performance in relation to i) the avoidance of and ii) the recycling of single-use plastic (SUP)?	<ul style="list-style-type: none"> Evidence that the project has made contributions to regulatory changes around the avoidance of SUP Evidence that the project has raised awareness about alternatives to SUP 	<ul style="list-style-type: none"> The project raises awareness about alternatives to SUP, building on the 2022 Government SUP ban and 2022 Plastic Waste Management Rules. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. GIZ Project Team 	<ul style="list-style-type: none"> Progress reports Semi-structured KIIs ELE cities' site visits to selected SWM facilities
4.3	How effectively has the project contributed to job creation and the improvement of livelihoods?	<ul style="list-style-type: none"> The likelihood that the project will catalyse social transformation by integrating the informal sector, providing waste management training, and creating more green jobs. 	<ul style="list-style-type: none"> The project is able to catalyse significant job and livelihood opportunities The project is able to formalise the roles of informal sector workers (ISW), in cases where ISW desire and benefit from formalisation. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Annual and Semi-annual progress reports Data from Project monitoring system Semi-structured interviews Scan of press and media MRF facilities visits
5. SUSTAINABILITY					

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
5	What is the likelihood that the outcomes will be sustained after the end of the project funding period?	<ul style="list-style-type: none"> It is possible to see changes in instructions from national to pilot city officials about how to organise, upgrade, and modernise waste management? The changes at the city level are taken up in policy and legal documents at the national level, including plans for national standards, standard operating procedures for MRFs/Recycling and Bio-methanation Other cities asking to join as second-tier implementers of the project approach 	<ul style="list-style-type: none"> Technical and Financial Component activities will help strengthen individual citizen and private sector participation in sustainable SWM practices and connecting solid waste outcomes with reduced GHGs emissions National policymakers adopt the source segregation secondary market improvements facilitated by the project The RSF continues to operate a commercially sustainable model beyond the project lifetime 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs Data from Project monitoring system Press and media
Sub-questions					
5.1	To what extent is the project establishing additional partnerships and alliances that will go beyond the project activities?	<ul style="list-style-type: none"> Evidence of outreach to relevant partners that were not initially involved from the project start. Evidence of learning from partnerships that work well or less well is used to inform improved partnership approaches. 	<ul style="list-style-type: none"> The project continues to explore the most effective partnerships for sustained impact beyond the lifetime of the project, particularly for the RSF and the Grant Mechanism. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Other City authorities Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Progress reports Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
5.2	What early evidence can be found of the appropriateness of the project strategy to push the replication of the experiences of the demonstration cities during their implementation of low-carbon SWM?	<ul style="list-style-type: none"> There is evidence of the appropriateness of the project strategy to push the replication of the experiences of the demonstration cities during their implementation of low-carbon SWM measures and investment. 	<ul style="list-style-type: none"> Through a strategy based on demonstration in key Pilot Cities, the project will foster the scaling up of low-carbon SWM and circular economy processes in other cities throughout India. 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Project proposal Progress reports Semi-structured KIIs Data from Project monitoring system Scholarly, journal, and newspaper articles and publications
6. LEARNING					
6	What key lessons can be learnt to the benefit of this Project in achieving their results?	<ul style="list-style-type: none"> The project's documentation of important lessons for other MAF Projects The understanding of causal pathways and the plausibility of "diffusing up" from local pilots to national policy 	<ul style="list-style-type: none"> The project will generate important lessons for non-Project non-MAF interventions in low-carbon SWM and circular economy in India The elements of the project and particularly the source segregation, secondary market improvements and RSF and GM models, are replicated by GoI and other stakeholders and projects. Climate impacts become a required element in planning, financing, and operating solid waste facilities in India 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. National policymakers (MoHUA, MoEFCC) GIZ Project Team Other City authorities Other SWM / Circular Economy multi-lateral donors (ADB, WB, UNEP) 	<ul style="list-style-type: none"> Progress reports Semi-structured Interviews Grey literature Academic and popular press Social media
Sub-questions					
6.1	What are the lessons from the performance of the Risk Sharing Facility and the Grant Mechanism?	<ul style="list-style-type: none"> Evidence that the project (including SIDBI) is documenting learning from the RSF process. 	<ul style="list-style-type: none"> The learning from the RSF and GM processes is well documented and considered by the project, 	<ul style="list-style-type: none"> City officials focused on SWM, Circular Economy and Urban Services. SIDBI 	<ul style="list-style-type: none"> Progress reports Conference (or other outreach events) papers

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> Evidence that the project is discussing learning points with ULBs. 	<p>leading to continuous improvements.</p>	<ul style="list-style-type: none"> National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	
6.2	How will the learning from this Project be shared with other Projects that seek to improve municipal SWM and circular economy systems in India and elsewhere in the world?	<ul style="list-style-type: none"> The presence or instances where the SWM and investment lessons from this Project have changed the approach/results of other Projects on solid waste in India or elsewhere in the world Uptake at the national level of the idea that waste/climate nexus is critical 	<ul style="list-style-type: none"> The learning from this Project is contributing to change the approach and results of other Projects or other donor-financed SWM / Circular Economy Projects in India 	<ul style="list-style-type: none"> Direct beneficiaries (ULBs) National policymakers (MoHUA, MoEFCC) GIZ Project Team Project research partners / NGOs, e.g. Saahas, TERI, CSE etc. 	<ul style="list-style-type: none"> Progress reports Semi-structured Interviews Conference (or other outreach events) papers "Hits" to the project web page Press and media
6.3	How did the sharing of learning by other Projects contribute to the successful implementation of the project?	<ul style="list-style-type: none"> Documentable instances where the lessons from other projects have resulted in the change of approach or results of this project. 	<ul style="list-style-type: none"> The sharing of learning by other projects is contributing to the successful implementation of the project 	<ul style="list-style-type: none"> Direct beneficiaries NGO and citizen organisations Project Team TERI etc. National officials 	<ul style="list-style-type: none"> Progress reports Semi-structured Interviews Press, media, social media Conference (or other outreach events) papers Downloads of Project documents

Annex C List of ELE sources

C.1 Internal documents

1. Mitigation Action Facility, India Project Proposal.
2. Presentation by GIZ to the ELE team on 22/01/2024.
3. Presentation by TERI to the ELE team on 23/01/2024.
4. Presentation by Saahas to the ELE team on 29/01/2024.
5. Presentation by SIDBI to the ELE team on 01/02/2024.
6. Mitigation Action Facility, India Project. Annual Progress Report, 2020.
7. Mitigation Action Facility, India Project. Annual Progress Report, 2021.
8. Mitigation Action Facility, India Project. Annual Progress Report, 2022.
9. Mitigation Action Facility, India Project. Annual Progress Report, 2023.
10. Mitigation Action Facility, India Project. Semi-Annual Progress Report, 2021.
11. Mitigation Action Facility, India Project. Semi-Annual Progress Report, 2022.
12. Mitigation Action Facility, India Project. Semi-Annual Progress Report, 2023.
13. Mitigation Action Facility, India Project Implementation Phase 1 Report, 2022.
14. Mitigation Action Facility, India Project, Log Frame (Annex 3) Updated 24/01/2024

C.2 Public documents

1. Circular Economy in Municipal Solid and Liquid Waste. <https://mohua.gov.in/pdf/627b8318adf18Circular-Economy-in-waste-management-FINAL.pdf>
2. India's Updated First Nationally Determined Contribution Under Paris Agreement. <https://unfccc.int/sites/default/files/NDC/2022-8/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>
3. Monitoring, Evaluation & Learning. <https://mitigation-action.org/our-approach/monitoring-evaluation-learning/>
4. Potential for Transformational Change. https://mitigation-action.org/wp-content/uploads/Mitigation-Action-Facility_transformational_change-factsheet.pdf.

C.3 List of organisations interviewed

Institution	Position
Project Team	
GIZ	Team Leader
GIZ	Deputy Team Leader
GIZ	City Coordinator for Varanasi
GIZ	City Coordinator for Panjim, Goa
GIZ	City Coordinator for Bengaluru
GIZ	City Coordinator for Trichy
GIZ	City Coordinator for Patna
GIZ	Other team members (4)
Project Stakeholder	
MoHUA	Director-Clean India Mission
Bruhat Bengaluru Mahanagara Palike (BBMP)	Chief Engineer & Chief General Manager
BBMP	Superintend Engineer- Solid Waste Management
Municipal Corporation, Varanasi	Municipal Commissioner
Municipal Corporation, Patna	Municipal Commissioner
Trichy City Corporation	Zonal Chairperson
Goa Waste Management Corporation	Managing Director
Corporation of the City of Panaji	Municipal Engineer & Mayor
Project Delivery Partner	
TERI	Director and team (1 person)
Saahas	Director and team (2 persons)
Shreejee Foundation	Founder and team (1 person)
SIDBI	Chief General Manager and Team (1 person)
WADS Foundation	Managing Director
CAM Industries Pvt Ltd, Panjim	Managing Director
Balancing Bits	Representative
Third Party (Number of people)	
HUDCO	Joint General Manager

RDF to Charcoal Plant, NTPC Vidyut Vyapar Nigam, Varanasi	Project Manager/ Senior Manager
GPS renewables	Chief Financial Officer
MRF, Plastic Fisher, Varanasi	Project Manager
MRF, Nirmandhara, Varanasi	Project Manager
SHG Women	Tailor (beneficiary during Cheela Mela)
Veda, Trichy	Operations Head
Recyclo Power, Varanasi	CEO and team (4 persons)
Nepra	CEO (RSF beneficiary)
ResQpol	CEO (RSF beneficiary)
AYYA	Representative
MRF – Swimsea, Goa	Representative
MRF – Altinho, Goa	Representative
Panjim MRF	Representative