

Supporting Climate Resilience through Reduction of Short Lived Climate Pollutants (SLCP) and Organic Waste Management in Battambang Municipality

Ran Yagasa

Policy Researcher,
IGES Centre Collaborating with UNEP on Environmental Technologies (CCET),
Institute for Global Environmental Strategies (IGES)

Institute of Global Environmental Strategies (IGES)

- International policy research institute
- Sustainability Research
- Founded in 1998
- HQ: Hayama, Japan



UN Environment International Environmental Technology Centre (IETC)

- Branch of UN Environment, under Economy Division
- Global Centre of Excellence for Waste Management
- Osaka, Japan



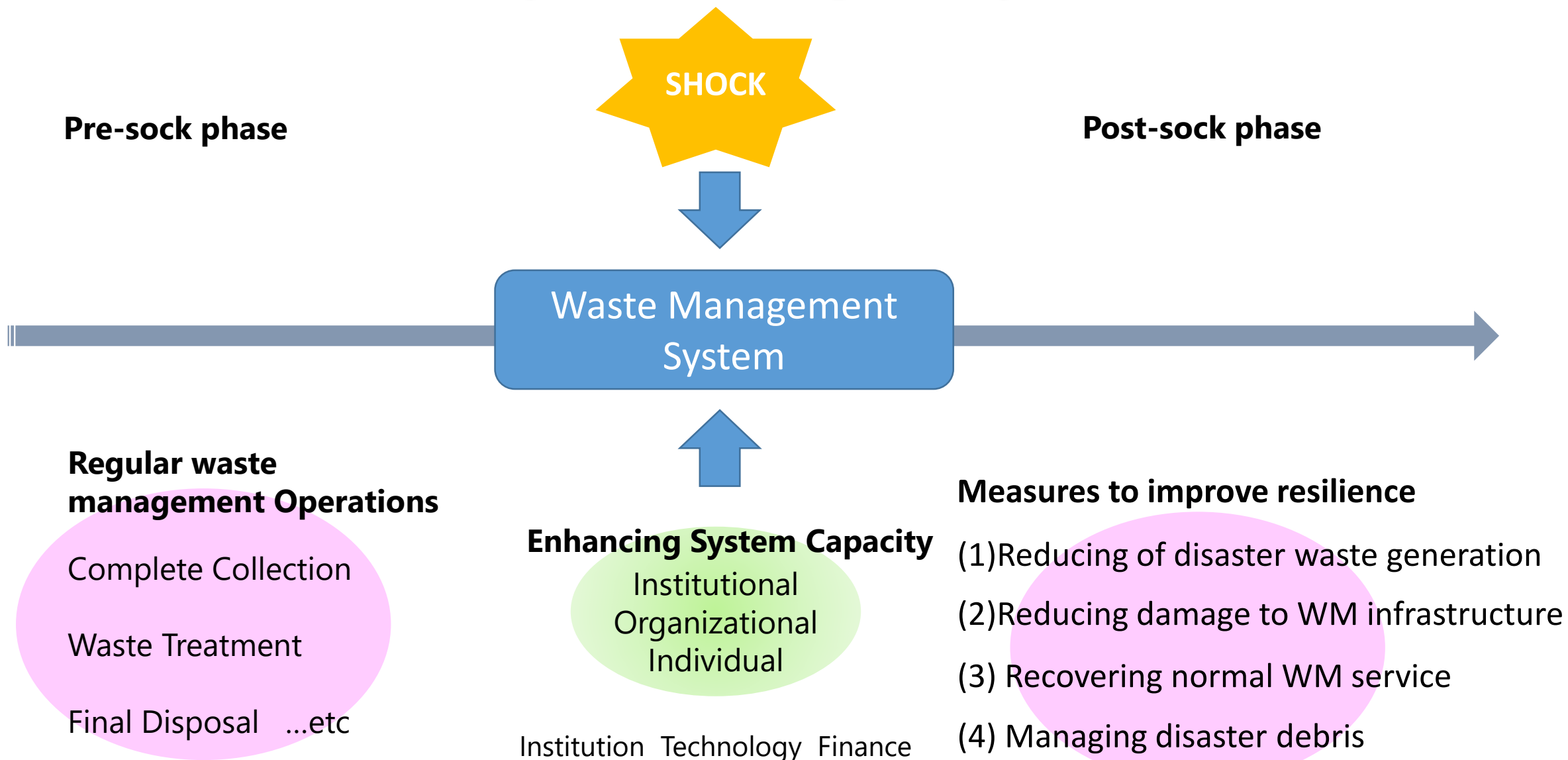
IGES Centre Collaborating with UNEP on Environmental Technologies (CCET)

- Established in March 2015 as a unit within IGES
- Waste Management Strategy
- knowledge products on waste management topics
- Outreach



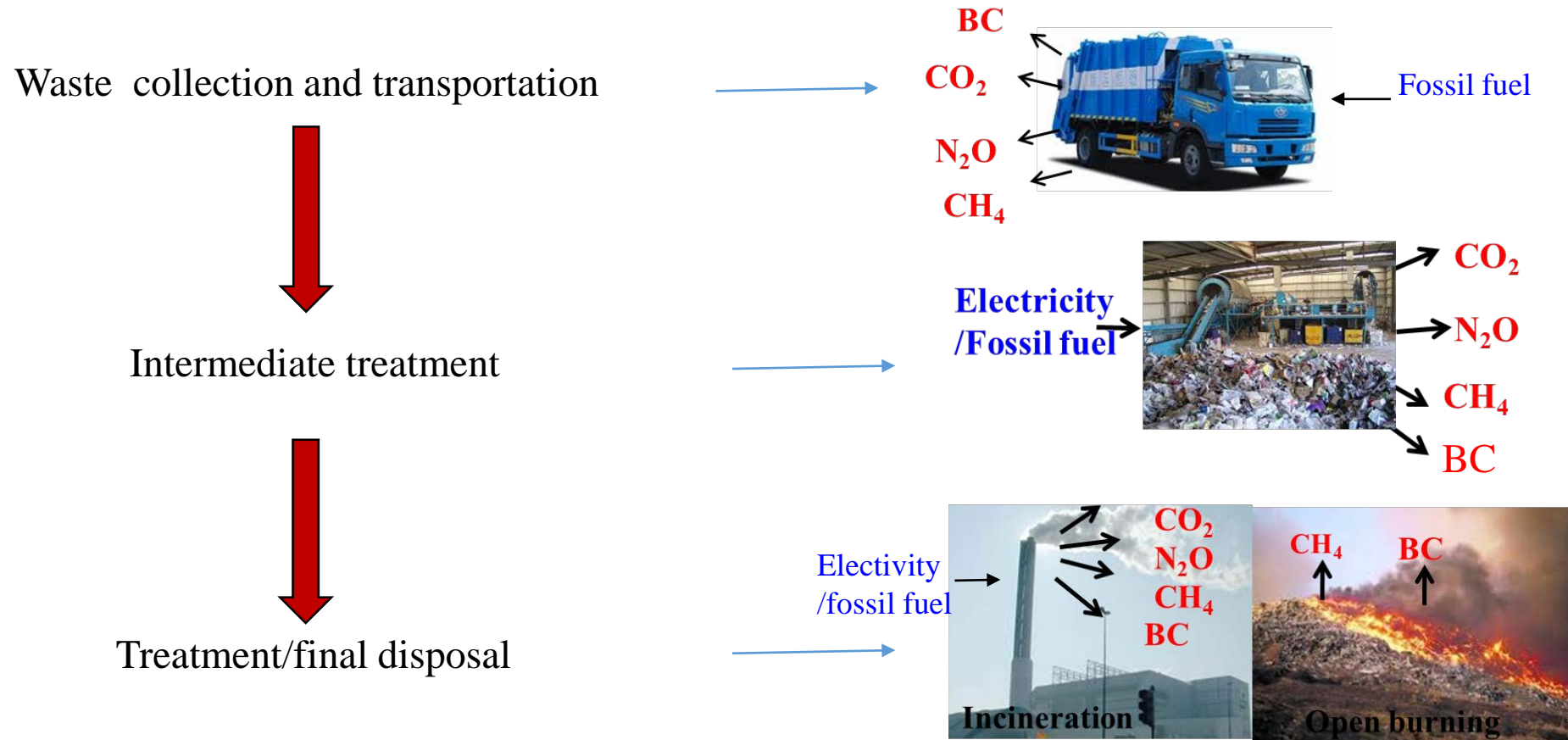
- The contribution of waste management to climate resilience
- Emerging approach to mitigation (Reduction of GHG+SLCP)
- Battambang's Participatory Waste Management Initiative

Role of Waste Management in improving Climate Resilience



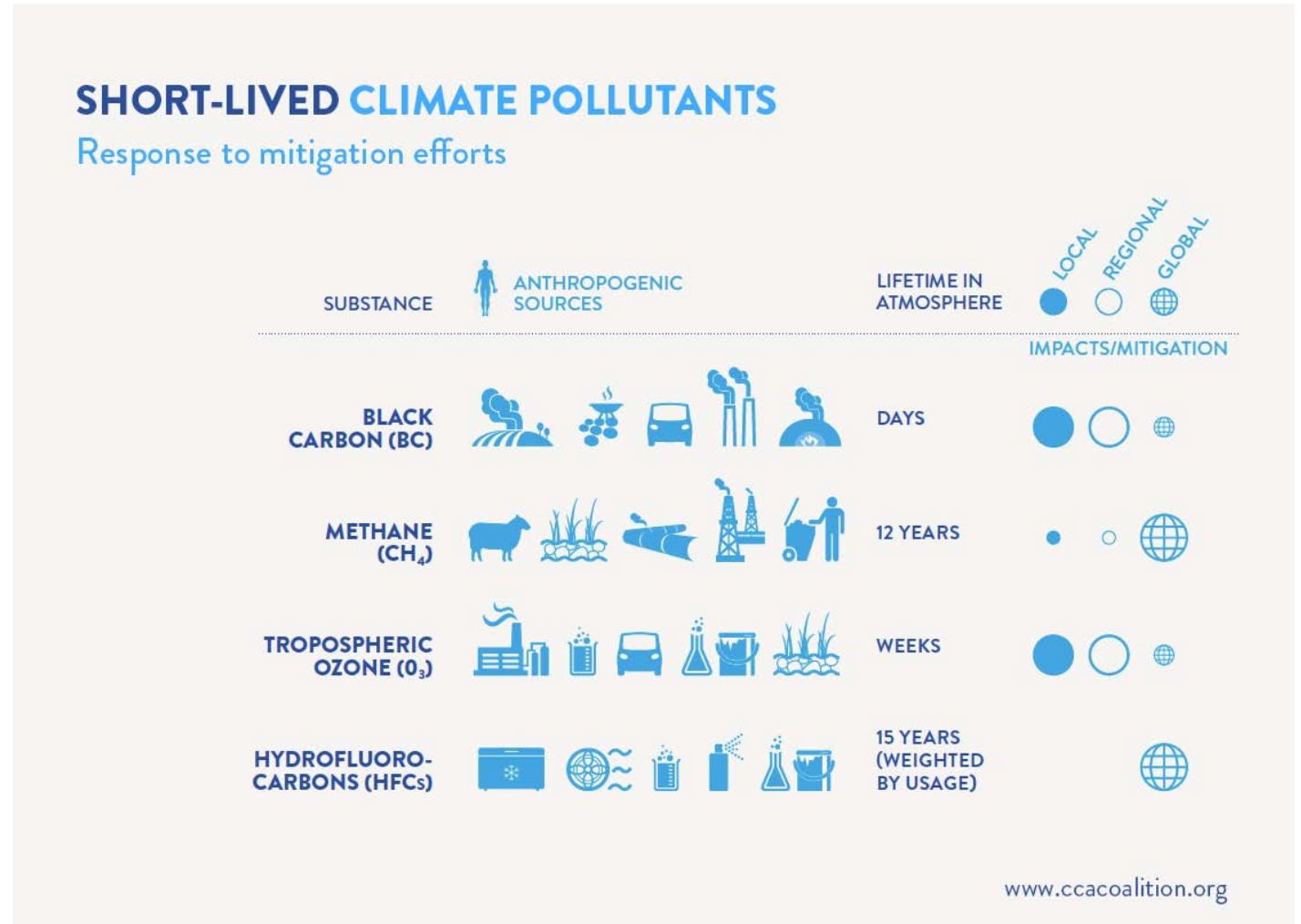
Role of Waste Management in improving Climate Resilience

❖ All the activities in waste management emit GHGs and SLCPs



What are Short-Lived Climate Pollutant (SLCP)?

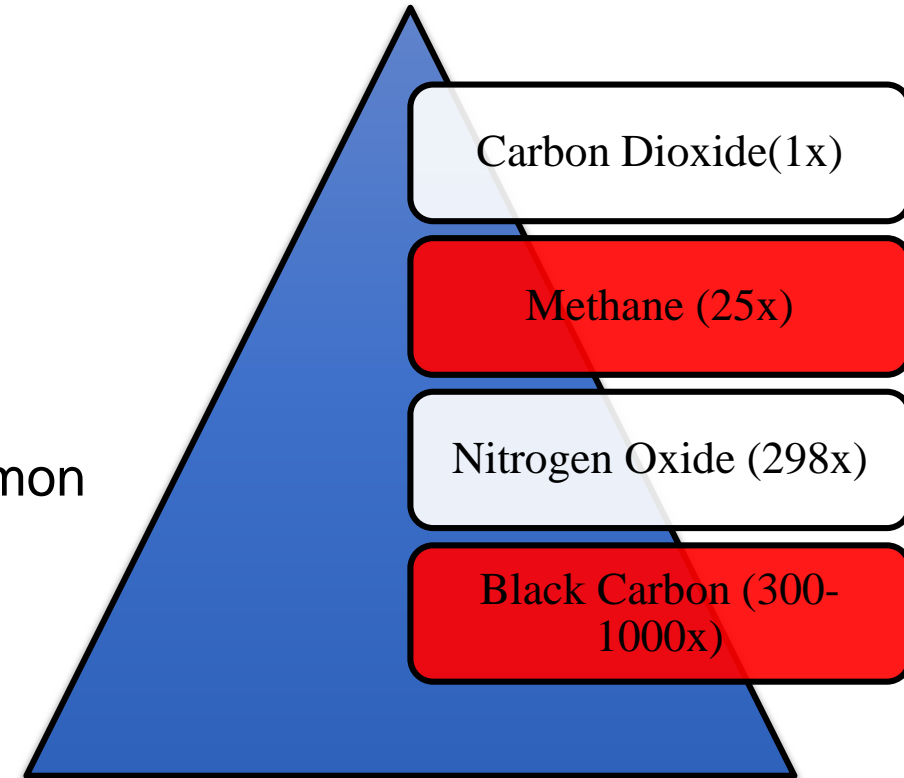
- SLCPs are substances with high GWP and relatively short lifetime in the atmosphere and a warming influence on near-term climate
- They are powerful climate forces and dangerous air pollutants and are detrimental to human health, agriculture and ecosystems.



What are Short-Lived Climate Pollutant (SLCP)?

Black Carbon

- ❖ Small black particles in atmosphere – result of incomplete combustion of bio-mass
- ❖ Typical result of burning waste which is very common in developing countries



What are the Impacts of SLCPs ?

SLCPs have negative impacts on :

- Public health
- Food security
- Global warming
- Ice and snow melting
- Weather patterns

SLCPs threaten economic security of large populations throughout the world.

SLCP Climate Benefits Avoided global warming

Rapid implementation of SLCP mitigation measures, together with measures to reduce CO₂ emissions, would greatly improve the chances of keeping the Earth's temperature increase to less than 2°C relative to pre-industrial levels.

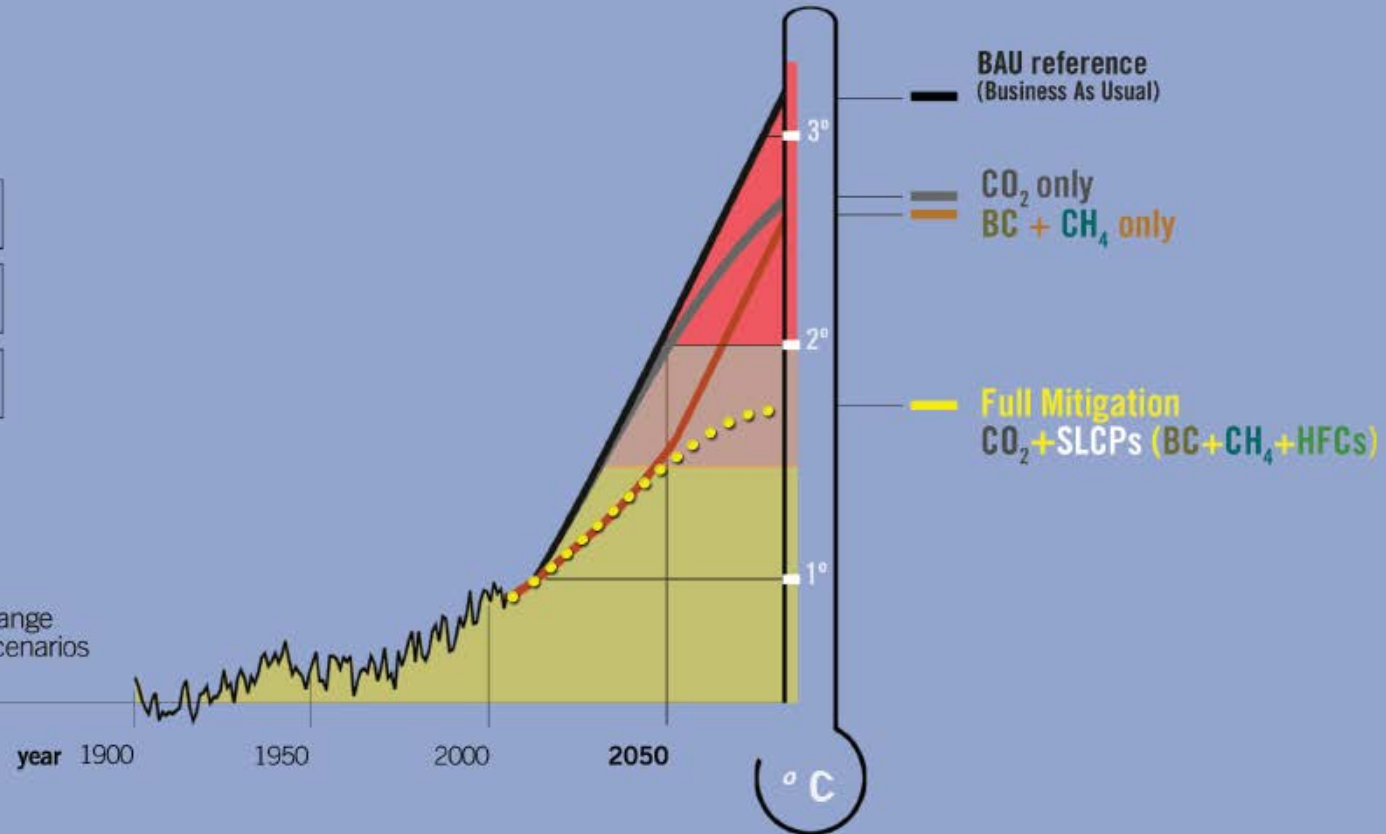
AVOIDED GLOBAL WARMING by 2050

BC + CH₄ 0.5°C

HFCs 0.1°C

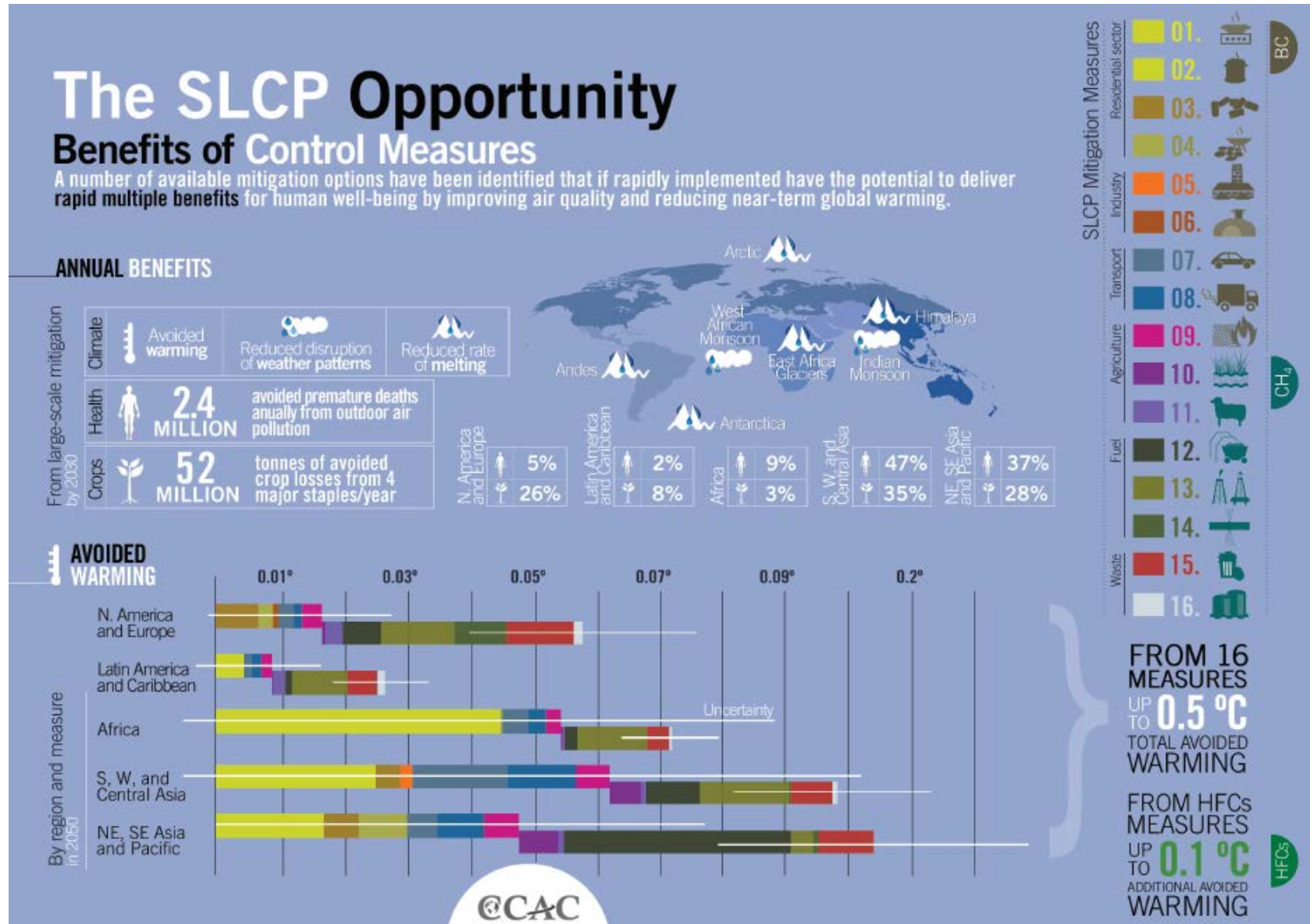
SLCPs 0.6°C

Simulated temperature change under various mitigation scenarios
CO₂, BC, CH₄, HFCs



Source: Shindell (2017)

It is estimated that around **10-20%** of global greenhouse gas emissions could be reduced by waste management sector.

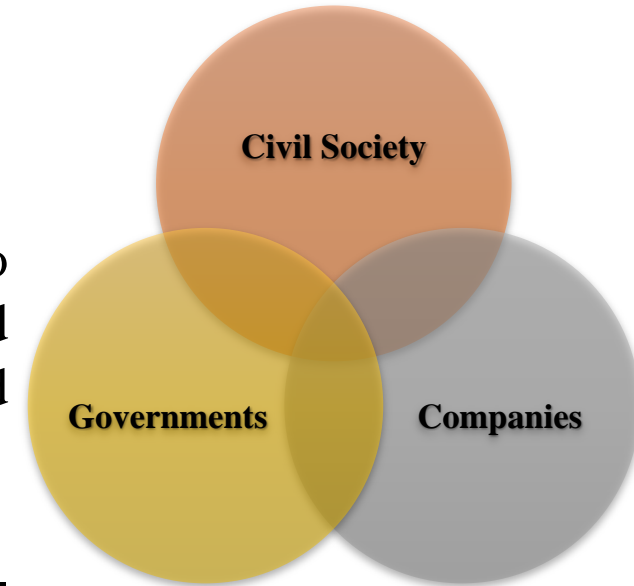


Climate and Clean Air Coalition (CCAC)

The Climate and Clean Air Coalition is a voluntary partnership of governments, intergovernmental organizations, businesses, scientific institutions and civil society organizations committed to improving air quality and protecting the climate through actions to reduce short-lived climate pollutants (SLCPs).

Objective: Leverage high-level engagement and catalyse rapid and concrete action to address SLCPs as a global and collective challenge to protect the environment and public health, promote food and energy security, and address air pollution and near term climate change.

Strategy: Voluntary and non-binding, action-oriented, partner-driven, multi-stakeholders, collaborative, building on sound science, catalytic, targeting high level decision makers, building on and bringing together existing efforts, complementary to CO2.



Source: CCAC

CLIMATE &
CLEAN AIR
COALITION
TO REDUCE SHORT-LIVED
CLIMATE POLLUTANTS



Battambang City Participatory Waste Management Initiative



Waste Composition

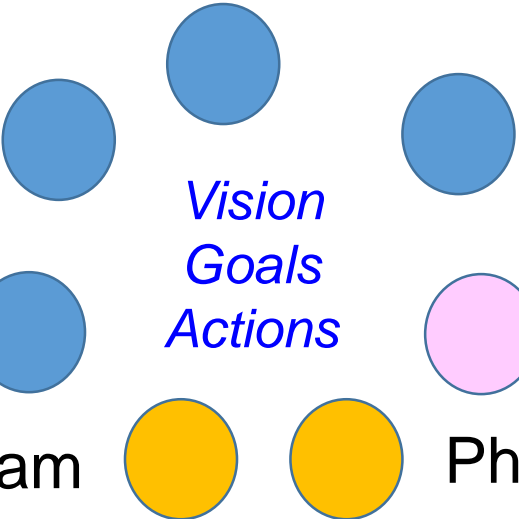
Waste Types	Unsegregated waste at FDS	Market Waset	(Ref.) Yokohama
Organic Waste	72.8	84.8	36
Garden waste	0.0	1.5	14
Wood	0.4	0.2	
Plastics	12.2	9.2	11
Paper	4.1	3.1	26
Glass	1.8	0.1	
Metals - Iron	0.1	0.1	
Aluminum	0.0	0.0	
Cloth	1.9	0.4	
Hazardous waste	0.0	0.0	
Others (diapers, stylo forms, nyrons)	6.8	0.6	Other : 13

Participatory Strategy Development



Lack of communication and trust

COMPED
(composting NGO)



Mayor of Battambang Municipality

Governor of Battambang Province

Project Team

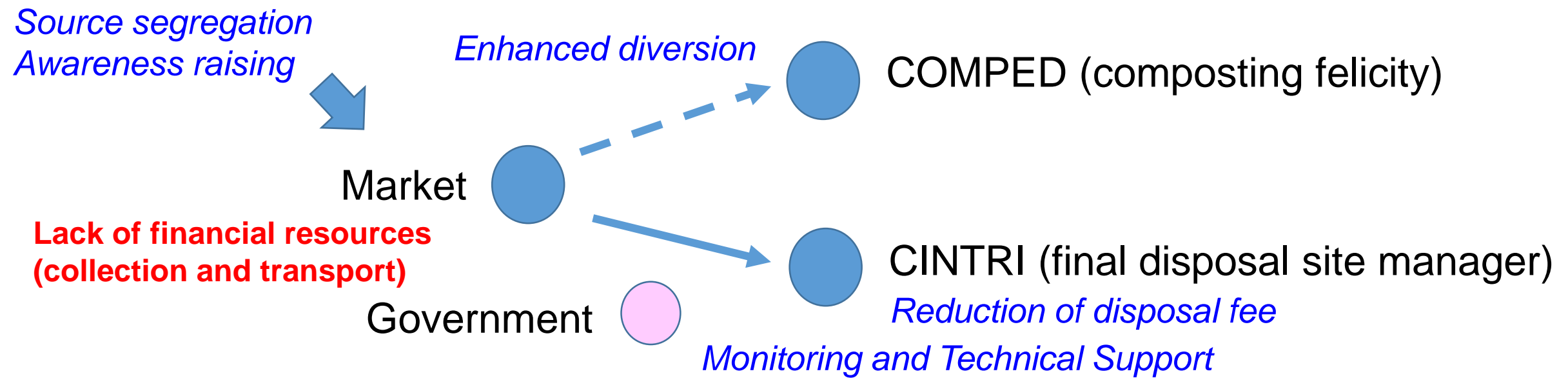
Vision
Goals
Actions

CINTRI
(final disposal site manager)

Waste Management Unit

Phitsanulok City

Diversion of Organic Waste



Combating landfill fire (Landfill management)



Lack of understanding on health impact and merit of fire management



waste pickers

COMPED
(composting facility)

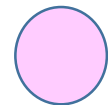
Government



Awareness raising



CINTRI (final disposal site manager)



Operational assistance and financial contribution for landfill fire extinguishing operations

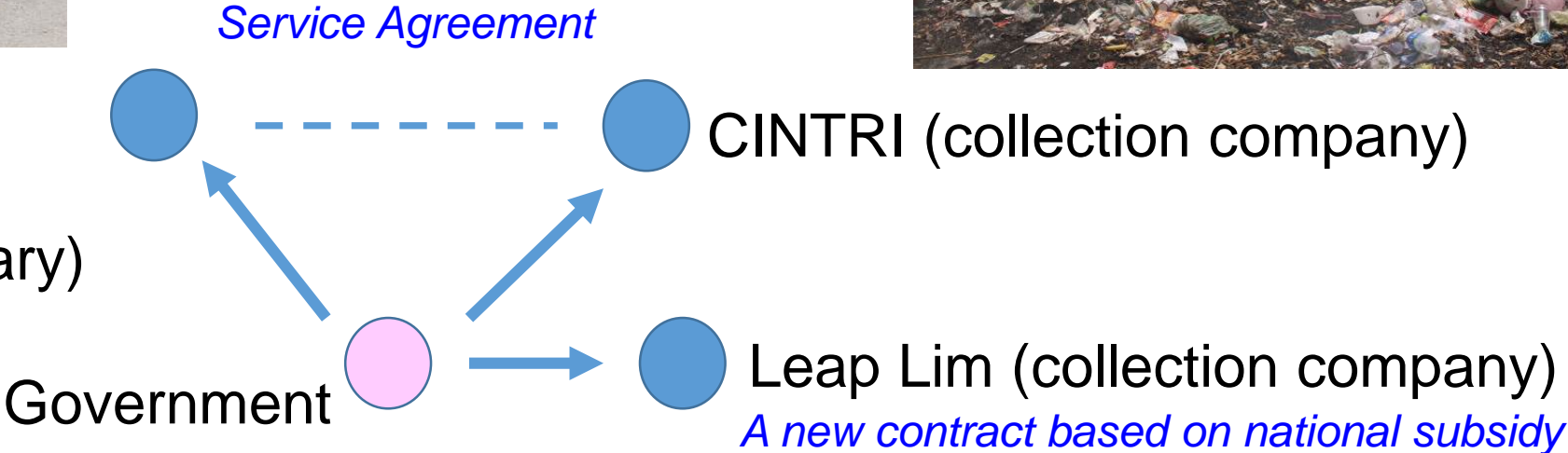
Combating littering / open burning through strengthening collection services (city areas)



Low service coverage
Inadequate service quality
Low WtP
Weak financial / operational
Loss of mutual trust

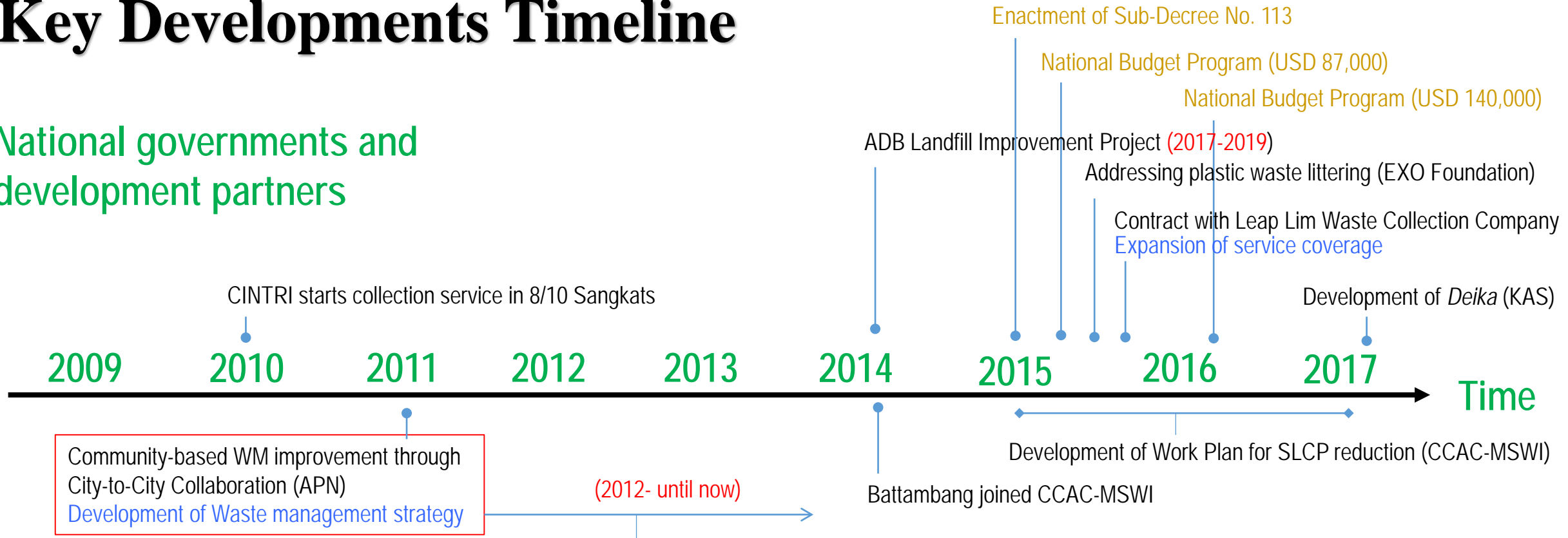


Residents
(waste generator
=service beneficiary)



Key Developments Timeline

National governments and development partners

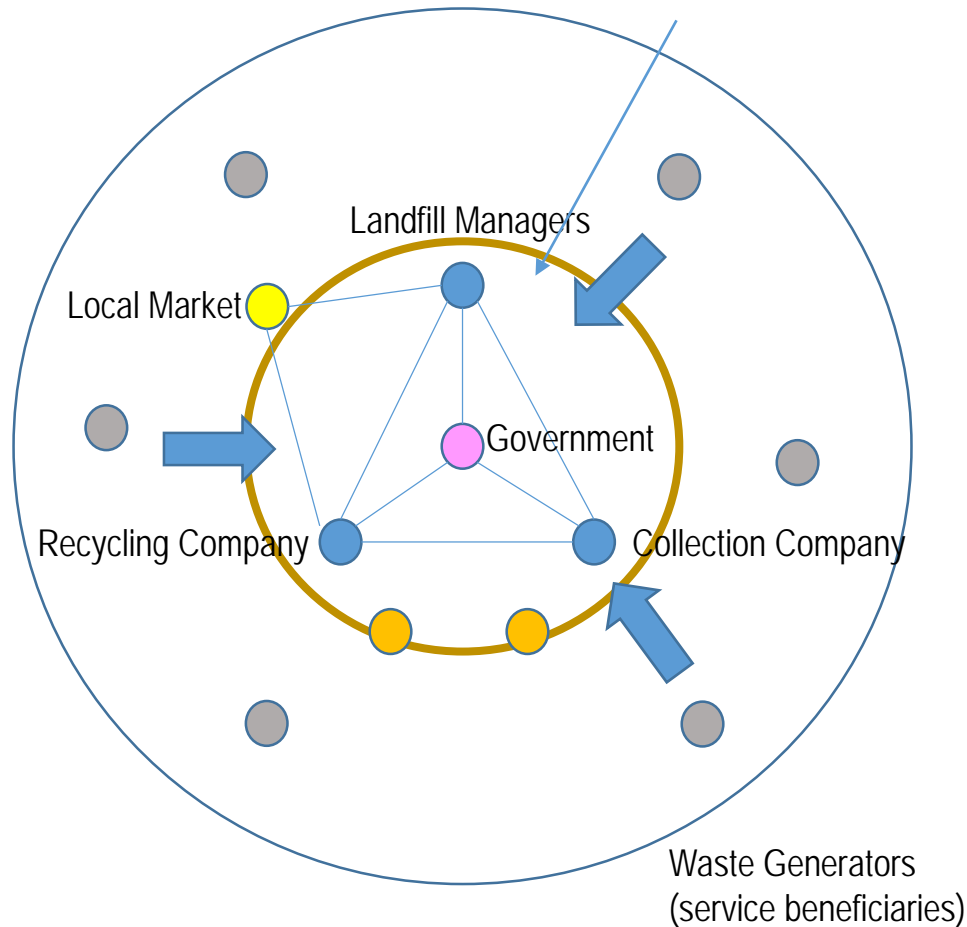


- | | |
|----------------------------|---|
| Diversion of organic waste | <ul style="list-style-type: none"> ❑ Source separation, collection and composting of organic waste (2012 - now) ❑ Separation of recyclable waste (2012 - now) |
| Landfill Fire | <ul style="list-style-type: none"> ❑ Landfill fire management (2015 - now) ❑ Prohibiting open burning (2015 - now) |
| Open burning and littering | <ul style="list-style-type: none"> ❑ Stakeholder agreement on collection service (2016 - now) ❑ Cleaning Campaign (Every year on National and International Environmental Day in the month of June) |

Key Activities under Participatory Waste Management Initiative

Participatory Waste Management Initiative

Implementing Alliance



- Forging an alliance for core waste treatment capacity is critical step for functioning WM system
- Bringing citizens in the front of initiative is indispensable.
- Still, means of implementation required to materialize changes.

Key Learnings

- **Participatory Approach** – inviting stakeholders to strategy development/project designing from early stage is critical in nurturing a sense of ownership among local stakeholders involved, and in inducing their commitment to implementation of the planned activities. In Battambang's case, this resulted in voluntary financial and human resources commitment by the service implementers as well as generators beyond reliance to external support.
- **Strong commitment and support of top-management and senior representatives** of key stakeholders is crucial to sustain the introduced policies, strategies and activities in both during and after the project implementation.
- **On-site visit and participatory training program** in distant environment have a high potential in improving personal relationship amongst the key stakeholders. In Battambang's case, this was an indispensable first step to initiate constructive dialogue and trust building towards goal setting based on shared vision for improving the state of city's waste management.
- Technical supports and guidance from **international facilitators** through a regular monitoring and evaluation program has high impact on building confidence and competence of local stakeholders for project implementation.

Summary

- Waste sector can contribute to city's resilience through mitigation and adaptation measures, and enhancing system capacity at both front is required.
- Simultaneous reduction GHG and SLCPs is an emerging approach for mitigation strategy towards achievement of Paris Agreement.
- Waste system varies in terms of waste characteristics, amount, process flows and technology employed, and the mitigation strategy needs to be tailored to such factors.
- Participatory waste management initiative in Battambang Municipality (Cambodia)
- High-level political commitment, negotiation among key stakeholders mediated by external facilitators, contributed in overcoming implementation challenges.
- The success was the result of multiple interventions by national / municipal governments and development partners which collaboratively provided mix of MoI.

Salamat Po!

www.ccet.jp

Japan's Mitigation Measures in Waste Sector

Type of Reduction Measures	Reduction Methods	Relevant Industries	
		Waste Mgt.	Production
Reduce and Re-use	Reduce GHG from incineration, final disposal, and biological treatment by reducing the amount of waste generated, through promotion of waste prevention and re-use.	○	-
Material Recycle	Reduce GHG and fuel consumption from production process by reducing material inputs through altering virgin materials with recycled materials.	○	○
Thermal / Chemical Recycle	Reduction of GHG and fuel consumption from production process and waste management process through conversion of waste into fuel (RPF/RDF) and/or energy (electricity/heat).	○	○
Efficiency improvement in WM processes	Reduction through altering existing management system / equipment with low-carbon options. e.g. introduction of transfer station, fuel efficient collection vehicle.	○	-
Carbon-neutralizing petroleum-derived products	Reduce GHG from incineration by altering petroleum-derived materials with biomass-derived materials.	○	-

Examples of Adaptation Measures in Waste Sector

Climate Impact	Impact on Waste Sector	Examples of adaptation measures
Frequent flooding Raise of sea level	Flood damage to waste management / recycling facilities such as incinerators and/or final disposal sites.	<ul style="list-style-type: none"> - Introduce measures against high tides for sea surface disposal sites. - Introduce measures against floods for waste management facilities in low lying areas. - Relocate waste management facilities
	Interruption to waste collection and treatment systems due to flood.	<ul style="list-style-type: none"> - Establish collaboration with neighboring municipalities towards recovery of waste collection and treatment system.
	Generation of flood wastes.	<ul style="list-style-type: none"> - Develop disaster waste management plan.
	Loss of energy supply due to flood damage.	<ul style="list-style-type: none"> - Improvement of energy supply capacity of WtE as decentralized energy supply system.
Increase of precipitation	Increased precipitation in final disposal sites.	<ul style="list-style-type: none"> - Improve capacity of leachate treatment facilities. - Measures against precipitation at landfill sites - Secure drainage of semi-aerobic final disposal sites
Increase of temperature	Increase of offensive ordure, vermin, and pathogens in open dump sites	<ul style="list-style-type: none"> - Apply soil coverage - Incineration of organic waste