



50 years together

**Assessment and design of local regulation
in solid waste management
in low- and middle-income countries**

Marco Caniato

SET4food Innovation Advisor

COOPI – COOPERAZIONE INTERNAZIONALE

AGENDA

- Municipal solid waste management: characteristics
- MSWM in low- and middle-income countries
- The importance of the informal sector
- Assessment of MSW management
- Design of a new system
- Conclusions

MSW management: characteristics

Basics

- Definition of waste (several available)

“Wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law”

(Basel convention)

- **Municipalities** in charge of municipal solid waste (MSW):
residential and residential-like
- Largely **non-hazardous**, but batteries, HCW, etc.

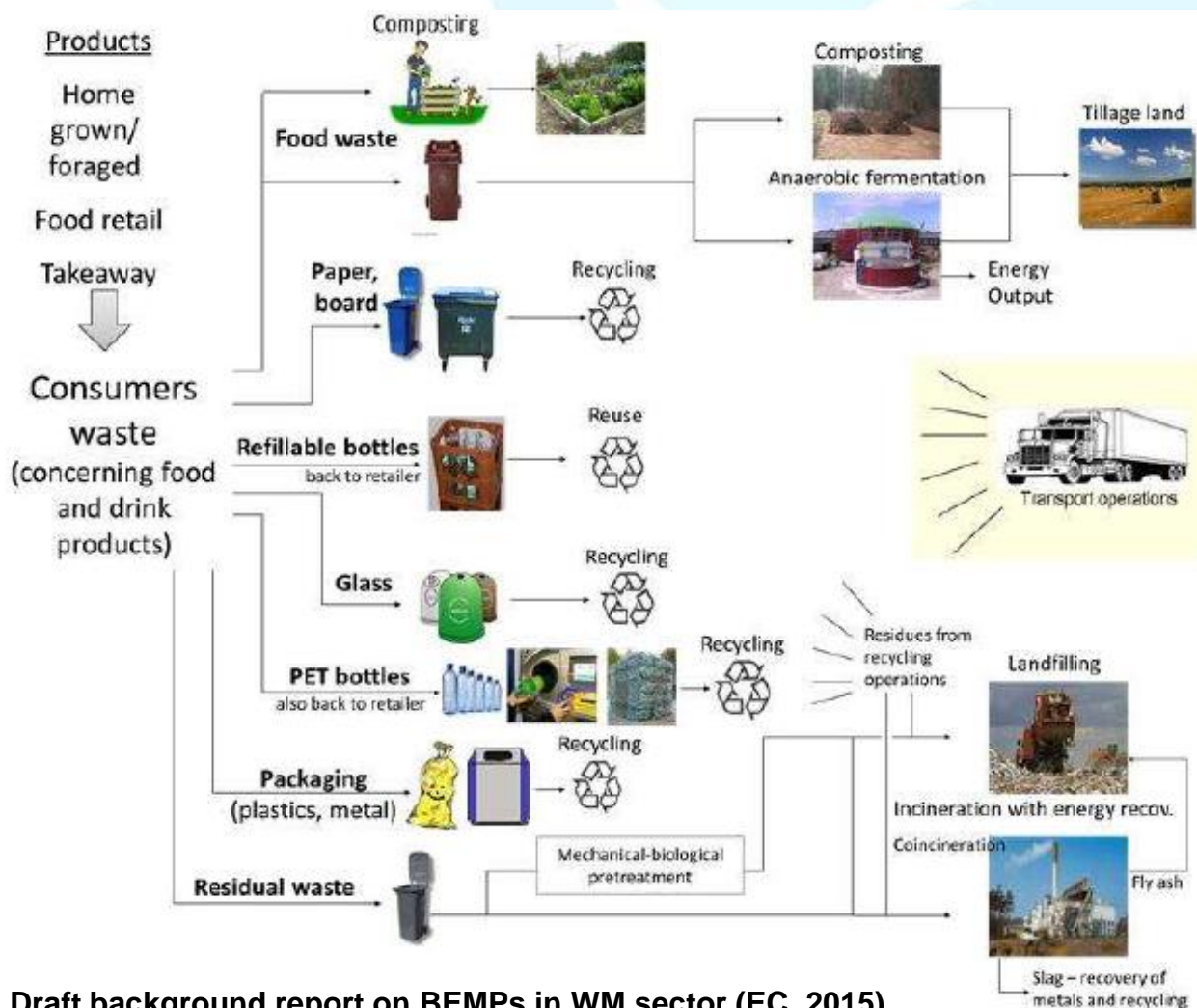
MSW management: characteristics

Basics

- «Polluter pays» principle
- Public and private subjects are common users
- Protection of: 1) **public health**; 2) **environment**
- Provider: municipality or public utility
- Municipality should protect citizens from abuse due to monopolistic market

MSW management: characteristics

Material flow



Natural monopolies:

- Collection (and informal sector?)
- (landfilling)
- (incineration)
- (material recovery)

MSW management: characteristics

Importance

- **Very high visibility** (public opinion)
- High impact on **municipal budget**
- From 1.3 billion tonnes (2012) to 2.2 billion tonnes (2025) due to urbanization. Megacities (over 10M): 3 in 1975, 17 in 2000, 39 in 2025, mostly in Asia

MSW management: characteristics

Importance

- Urban waste generation: from 35M/day or 1.2 kg/capita/day (2005) to 60M/day or 1.4 kg/capita/day
- Need for **decoupling** waste production and economic growth
- Material recovery depends on local conditions (e.g. brokers, productive activities) → **circular economy**

MSWM in low- and middle-income countries

Characteristics

- Very strong **generation increase**
- Very **high organic content** (packaging, especially paper, is lower than HICs)
- Small and medium municipalities: **little access** to technology & innovation, financial resources and experienced technicians

MSWM in low- and middle-income countries

Characteristics

- **Constraints** for collection, recycling and management (equipment, budget, management, community involvement and awareness)
- Most of municipal budget for collection
- **Low fee collection rate**
- **Lacking regulation** (both national and local)

MSWM in low- and middle-income countries

Some data

Activity	Low Income	Middle Income	High Income
Collection	Sporadic and inefficient. Service is limited to high visibility areas, the wealthy, and businesses willing to pay. High fraction of inerts and compostables impact collection—overall collection below 50%.	Improved service and increased collection from residential areas. Larger vehicle fleet and more mechanization. Collection rate varies between 50 to 80%. Transfer stations are slowly incorporated into the SWM system.	Collection rate greater than 90%. Compactor trucks and highly mechanized vehicles and transfer stations are common. Waste volume a key consideration. Aging collection workers often a consideration in system design.
Landfilling/ Dumping	Low-technology sites usually open dumping of wastes. High polluting to nearby aquifers, water bodies, settlements. Often receive medical waste. Waste regularly burned. Significant health impacts on local residents and workers.	Some controlled and sanitary landfills with some environmental controls. Open dumping is still common. CDM projects for landfill gas are more common.	Sanitary landfills with a combination of liners, leak detection, leachate collection systems, and gas collection and treatment systems. Often problematic to open new landfills due to concerns of neighboring residents. Post closure use of sites increasingly important, e.g. golf courses and parks.
Costs (see Annex E)	Collection costs represent 80 to 90% of the municipal solid waste management budget. Waste fees are regulated by some local governments, but the fee collection system is inefficient. Only a small proportion of budget is allocated toward disposal.	Collection costs represent 50% to 80% of the municipal solid waste management budget. Waste fees are regulated by some local and national governments, more innovation in fee collection, e.g. included in electricity or water bills. Expenditures on more mechanized collection fleets and disposal are higher than in low-income countries.	Collection costs can represent less than 10% of the budget. Large budget allocations to intermediate waste treatment facilities. Up front community participation reduces costs and increases options available to waste planners (e.g., recycling and composting).

The importance of the informal sector

Several aspects of the same situation

- **Primary collectors** with different names (scrap collectors, scavengers, waste pickers, bottley walla, etc.)
- **Several layers** (collectors, scrap yards, brokers, process stations, ... , up to factories + craftsmen)... About 20M people!
- Some of them struggle for **recognition** (e.g. Zabbaleen)
- **Discrimination**, exclusion, child work, health risks, etc.

The importance of the informal sector

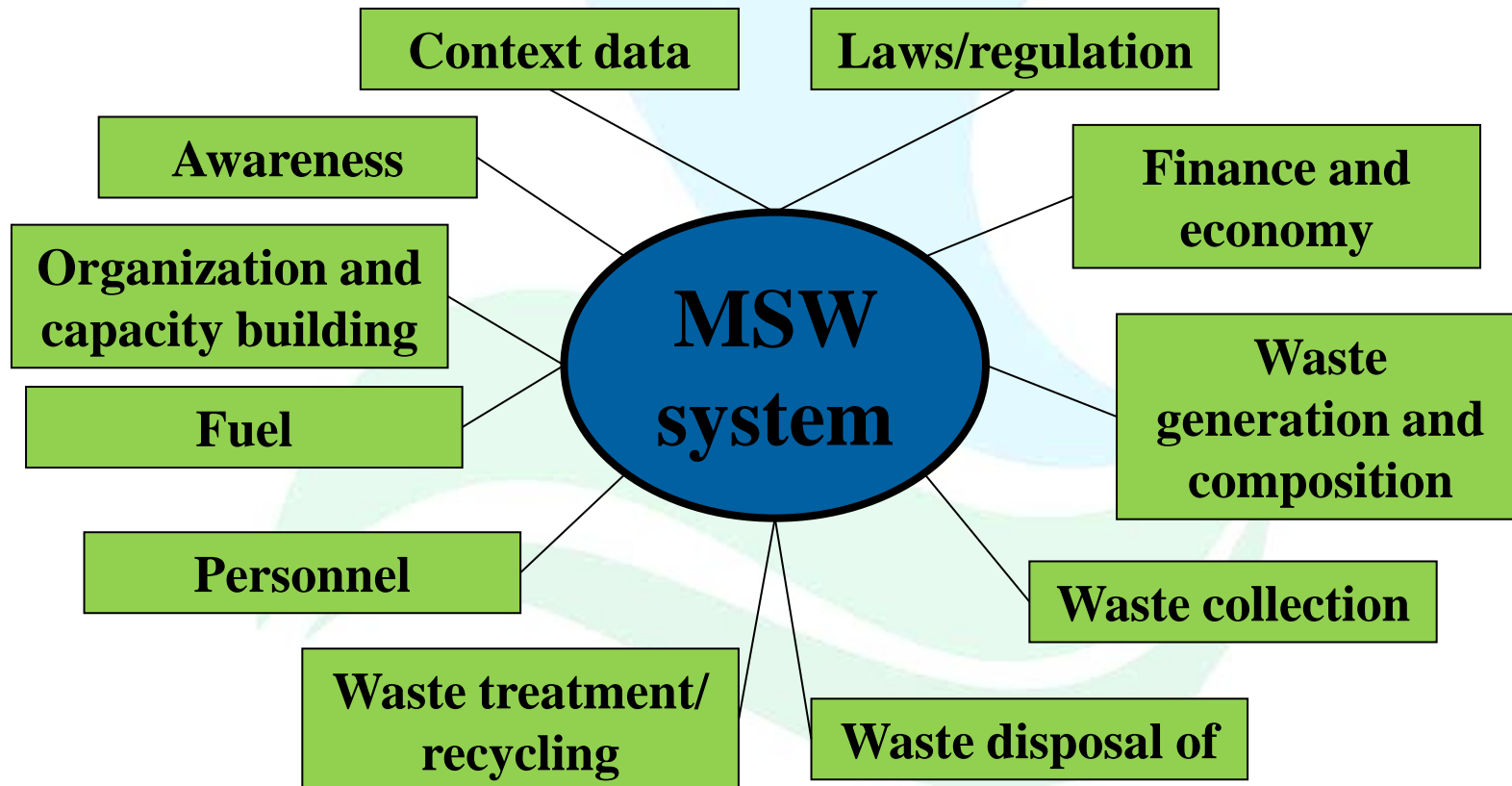
Several aspects of the same situation

- However informal sector is **well-structured** and organized
- It can recover even 20-30% of generation
- It is a clear **benefit for local economy**
- Often municipalities do not want to acknowledge the issue...
lack of dedicated regulation
- “Informal sector” instead of “black market”...

Assessment of MSW management

Why is it important for regulation?

- A clear picture of the situation
- A clear idea of target, objectives, and resources required



Assessment of MSW management

Assessment steps

Preliminary
activities

Definition of aim and objectives

Definition of boundaries of the
assessment area

Identification of available
resources

Identification of the partners to
involve

Desk review

Collection and analysis of
documents (primary and
secondary sources)

Topography of the MSW
management system (e.g. disposal
sites, transfer stations)

General
data

Laws and
regulation

Facilities

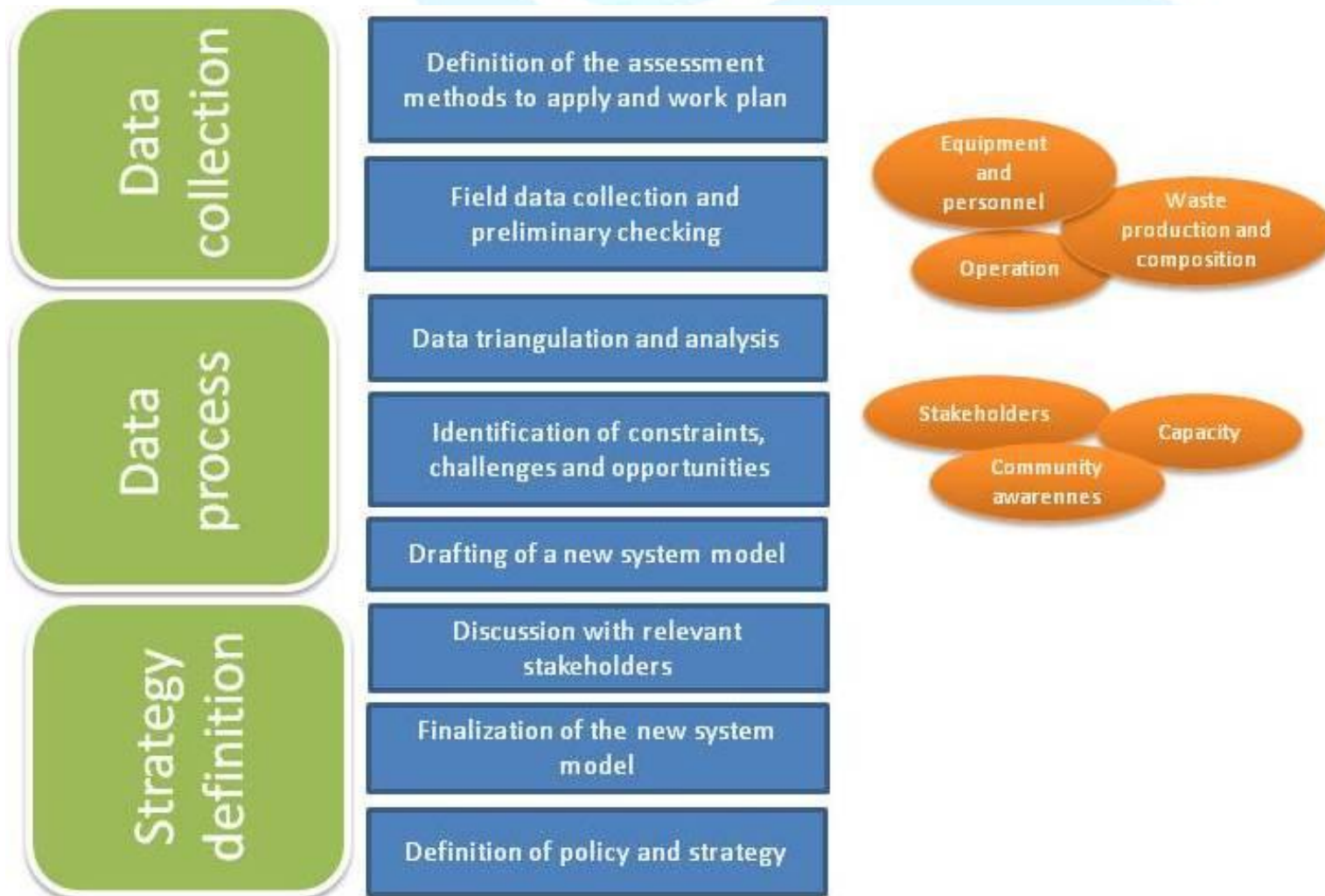
Population
and area

Finance and
economy

Sites of
interest

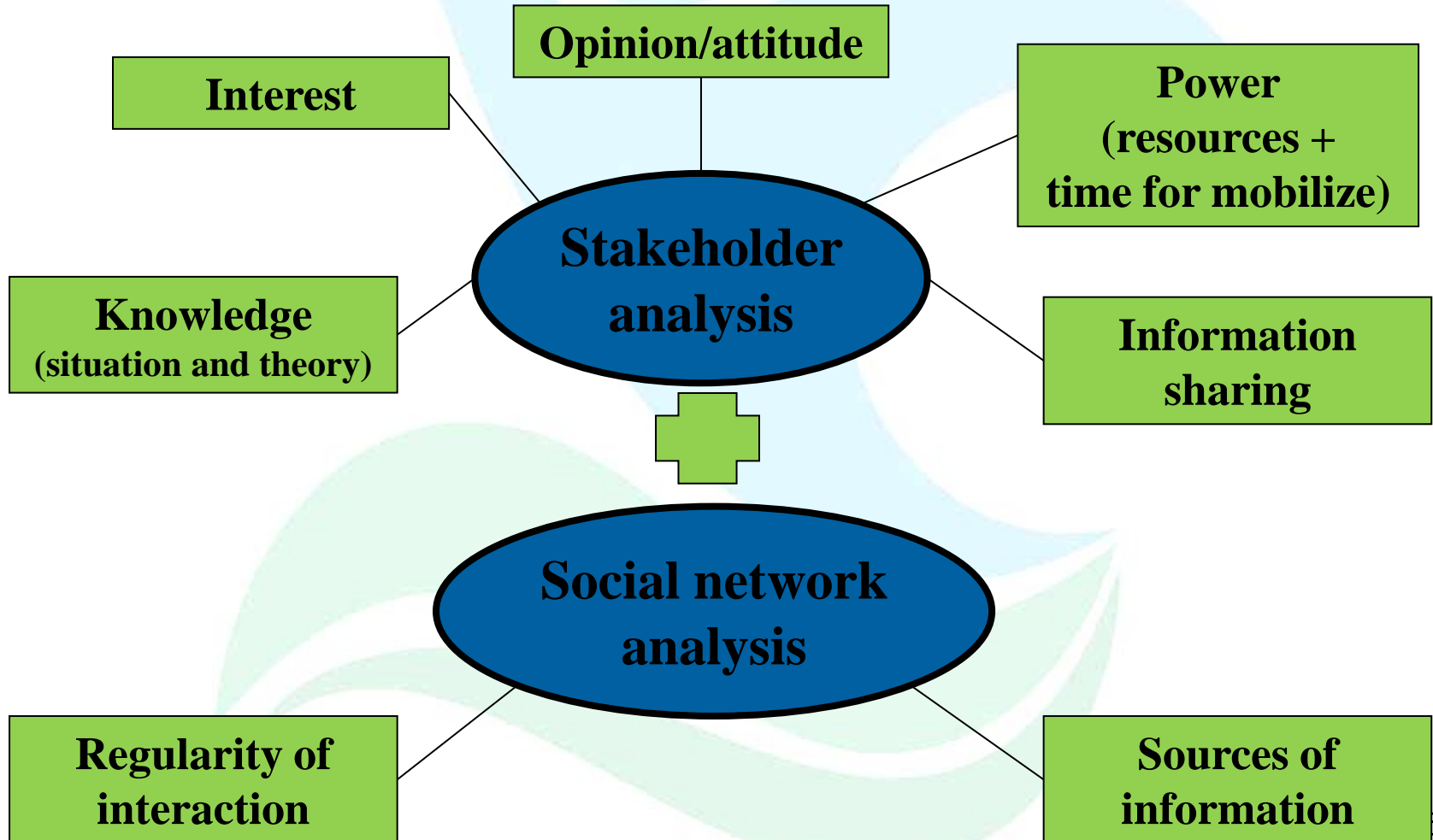
Assessment of MSW management

Assessment steps



Assessment of MSW management

Importance of players (stakeholders)



Design of a new system

A new regulation

- **Goal and targets** can be defined, considering resources available in the system (not in municipality!)
- **Targets** have to be **achievable**
- A **strategy** is required... first of all, a set of rules for stakeholder involvement and incentive/penalty mechanisms
- **Alliances** are important... as well as **champions!**

Design of a new system

A new regulation

- Municipality does not have to implement all the steps required... It has to set the rules, establish an **enabling environment**, and start and boost the process
- First, **simple and evident activities!**
- **Perfect regulation does not exist**

Conclusions

Regulation design is a long process

- **Regulation cannot be imported!**
- Clear knowledge of the situation
- Stakeholder involvement
- Municipalities can be **forerunners** (even regarding regulation)

Thanks for you attention!

caniato@coopi.org



COOPI - COOPERAZIONE INTERNAZIONALE ONG

HEADQUARTERS: VIA F. DE LEMENE 50 - 20151 MILANO - ITALIA

TEL. +39.02.3085057 r.a. - FAX +39.02.33403570

C.F. e P.IVA 80118750159

COOPI@COOPI.ORG

WWW.COOPI.ORG