Walking Street in Copenhagen, Denmark.

Legal framework

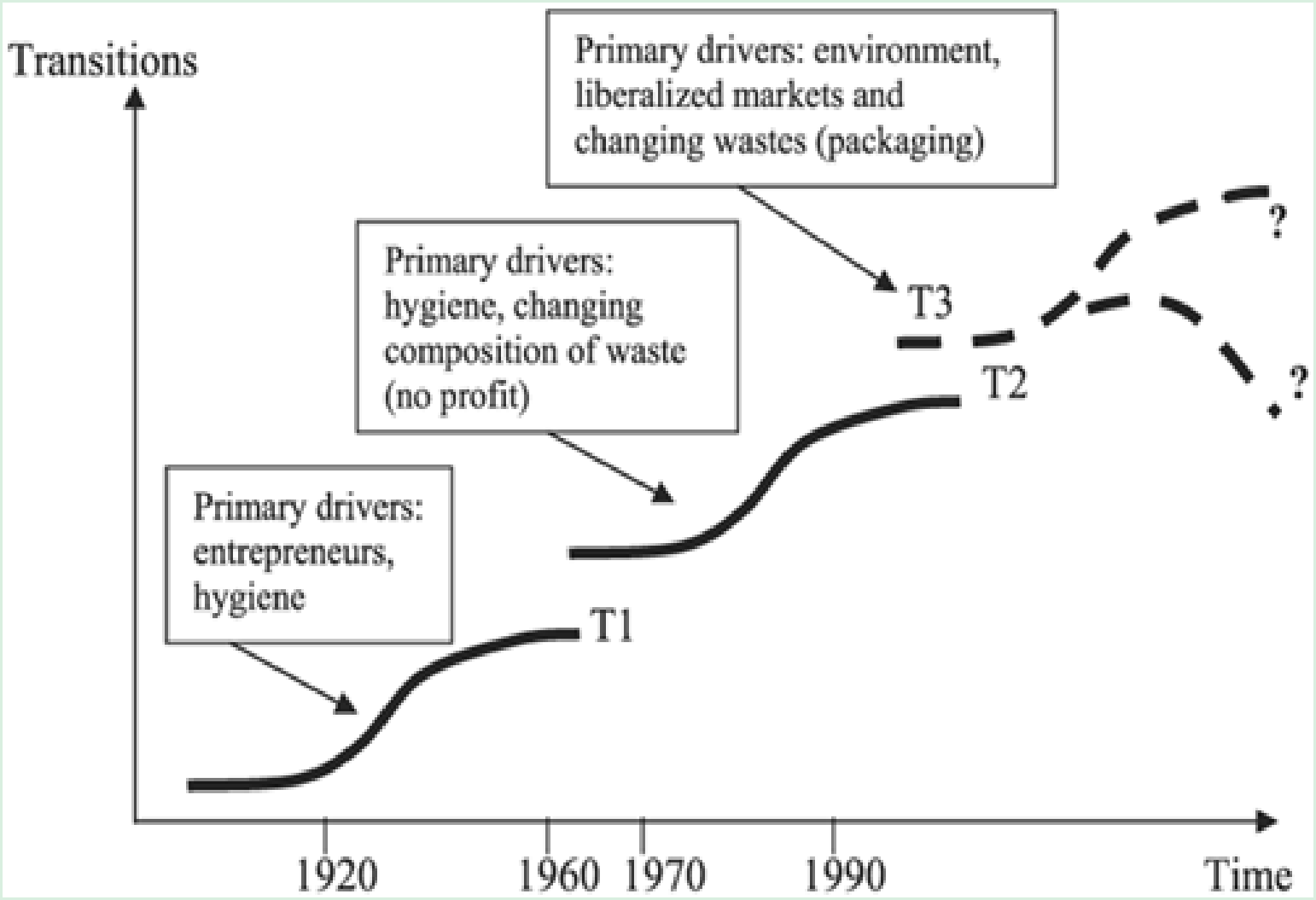
- In Japan: Japan Home Appliance Recycling Law
  - In 2001,recycling of electrical appliances increased by 20%.
- The European Union (EU) directives on restrictions on the use of certain hazardous substances:
  - 2002/95/EC - in electrical and electronic equipment (RoHS);
  - 2002/96/EC on waste electrical and electronic equipment (WEEE); and
  - 2005/32/EC on the eco-design of energy-using products

Recycling of e-waste is commonly practiced in Europe

E-waste recycling

Legislative framework on recycling

- Also important to increase participation.
  - Consumers
  - Manufacturers
- Increase recycling rate
- Reduce litter



Transition in the Danish WM trend

Deposit-refund scheme for drinking bottles and cans reduce littering and increase recycling in EU and UK

Zero-waste strategy promotes recycling in Singapore

Improvement of WM by action program

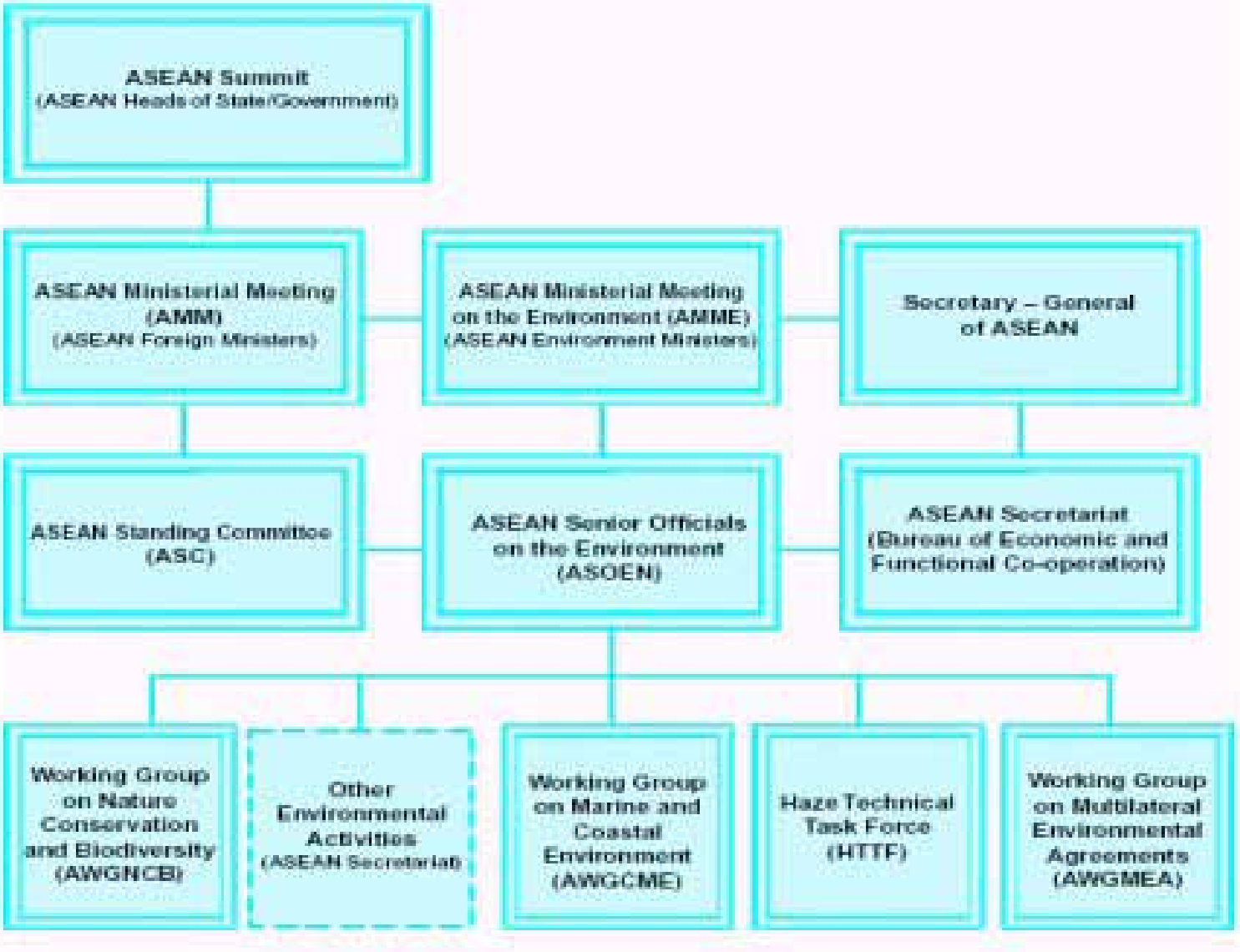
- Appropriate policy
  - Semakau Landfill, Singapore
- Privatization
  - Improve urban WM in Nepal cities
  - Larger collection capacity in Accra, Ghana
  - More efficient collection services in Cairo, Egypt.

Singapore’s offshore Semakau Landfill

Streets in Biratnagar, Nepal are cleaner after the privatization of WM

Regional Cooperation

- cooperation for investment and operation of WM
- positive consequence of a harmonized policy
- improved waste collection efficiency, and the recycling rate
- Common among EU countries:
  - Italy, Hungary, Republic of Croatia
  - Municipalities in Portugal



Source: ASEAN State of the Environment Report 2000

Regional cooperation among ASEAN

Turning wastes into valuable resources

- 3Rs strategies
- aimed to maintain public health and sanitation
- economical benefits
- waste into value-added products
  - Recyclables,
  - Biogas
  - Compost
  - RDF/ Energy

Chips from plastic bottle-caps at the end of the recycling process

Blaabjerg **Biogas** plant, **Denmark**

RDF processing system in Malaysia

Successful stories

- Denmark: 13 organic household composting plants, 33 incinerators, 134 garden waste composting plants and five biogas facilities.
- India: economic gains in recycling with 9-15% of total waste generated
  - Biogas from organic waste
- The Philippines: Material Recovery Facilities (MRFs), conducting recyclables collection events, partnership and networking.
- Bangladesh: composting capacity of 700 tonnes produce 50,000 tonnes
- Sweden: 35% of the Swedish municipalities sending compostable household waste to a central treatment making a total of 344 500 tonnes of organic waste.
- Many more.

Public-Private-Partnership (PPP) for waste management

- private sector involvement in providing public infrastructure.
- Four main factors of PPP implementation in EU:
  - value-for-money project,
  - identification of risks (description and allocations) between public and private sectors,
  - effective performance monitoring strategies via quantitative performance indicator, and
  - its affordability level to users

Main Players in PPP

- provide capacity development
- Includes
  - World Bank,
  - UN
  - International Solid Waste Association (ISWA),
  - JICA,
  - IWWG,
  - Danida
  - European Investment Bank etc
- act as the Expert-Group Organizations

Successful PPP strategies

- European Investment Bank (EIB) finance PPP between Viridor Laing (Greater Manchester) and Ineos Runcorn, and TPS Greater Manchester Waste Disposal Authority for incineration project→ increase recycling and composting by 50% and divert 65% of the waste from landfill.
- World Bank USD25 million PPP project in Jordan with the Amman City Authority → improve the operational, financial and environmental performance of its municipal solid waste system.
- JICA and local NGO in Sao Paolo, Brazil→ formalized 'Coopamare' (privatizing informal recycling activities) improvement of the recycling rate and lowering the poverty line.
- Many more.

Mixed waste for composting purpose in Egypt

Community based waste management

- Categorized into three main types:
  - Type 1- the CBWM-community activist set-up identifying service provider,
  - Type 2- the private entity community service provider, and
  - Types 3- the CBWM-community activist set-up planning and managing the services.

Zero-waste community

- In Canberra, Australian – in 2001,
  - waste sent to landfills were reduced by 40%
  - >80% recycled and reuse.
  - Harvest CH_4 from landfills to power 3,000 homes for 30 years.
  - Active participation of the citizen.
- In Kamikatsu, Japan – in 2003,
  - aimed to achieve a zero-waste community by 2020.
  - recycling rate increased to 80%
  - 98% of the population practice home composting
  - the community is willing to do more to improve their current achievement.

Waste segregation by local Kamikatsu residents

timtak on flickr

Wastes are segregated into 34 categories at the Zero-waste centre in Kamikatsu.

Conclusions

- The implementation of various strategies is important
- Appropriate policy and effective WM are crucial
- WM should be economically appealing
- PPP and community based waste management can enhance sustainable WM system.