Participatory recycling business model: where the informal and the formal meet

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A. How the informal sector contributes

1) Solving constraints of local governments

- Lack of budgets for SWM → unsanitary waste disposal development
- Lack of personnel → Cannot manage the disposal site properly
- Land for disposal site is scarce → high investment is required

Reduction of waste for collection, transportation and disposal is essential

Reduction of recyclable materials for collection, transportation and disposal

Informal sector

Solution need

Local government
2) Circulating recyclable materials to the production side

Estimated exhausted year of virgin resource

Note: Analysed based on data on natural reserves vs mine production from USGS, 2011 and BP, 2010
Status of metal recycling

• The extracted natural resources are stored in the society. Therefore, recycling is a key strategy for a sustainable future.

• However, recycling rate of many metals are lower than 50% (e.g. molybdenum, vanadium, magnesium).

Source: International resource panel, 2011
Price of recyclable materials is increasing due to higher demands

Note: Domestic price of recyclable materials in Thailand (Wongpanit’s price)

1 unit = 1 kg for most of materials expect for E-waste and glass
3) Avoiding greenhouse gas emissions from natural resource extraction and processing

GHG emissions from recycling activities in Nonthaburi, Thailand

Source: Developed after Menikpura et al., 2010

Reducing 4,600 kgCO₂eq/ton of recyclables

1 Ton = 1,000 kgs
B. Case study: Phitsanulok Municipality, Thailand

- Municipality cooperates with local waste buyers → Public-private partnership
- Provide trainings to waste pickers
  (e.g., how to add-value to waste, how to avoid health risk)
- Provide vaccine to prevent tetanus disease
- Improve social status (register and upgrade waste pickers to volunteers for environment; certification and jacket)
- Allow scavenging at waste bin but request for return non-sellable items to the bin properly
- Allow scavenging at dumpsite but not allow to stay overnight
- Promote separation of sellable waste at household and community levels and allow residents to sell the waste to waste buyers → generator owns the recyclables
Achievements: Win-win solutions for all (1)

The formal sector/local government

- Reduced waste flows to disposal site
  - 45% decreased of waste at the dumpsite within 5 yrs (142 → 78 tons/day)
  - 1.8 folds increased of landfill lifetime (16 → 29 years)

- Reduced government budget for waste collection, transportation and disposal
  - Reduced 67,000 USD/yr for waste collection
  - Reduced 33,500 USD/yr for waste transportation
  - Reduced 100,500 USD/yr for waste disposal

- Reduced number of waste pickers
  - 75% decreased at the downtown (200 → 50)
  - 50% decreased at the dumpsite (40 → 20)

- Improved sanitation of the city

- Received more waste management fee from larger numbers of residents

Saving 210,000 USD/yr
The informal sector

- **Generating income**
  - Some earned higher than low skill labourers employed by the municipality (54-215 USD/month for waste pickers (Sunthornchai, 2003) : 180 USD/month for employee)
  - Some are employed at waste sorting facility owned by a big waste buyer

- **Improving social status of waste pickers and junkshops**
  - Recognised as volunteers for environmental conservation

- **Improving working condition**
  - Some become door-to-door waste buyers and junkshop’s owners (>430 USD/month)
  - Less discrimination and received supports from residents

- **Reducing health's risk**
  - Used protective gears such as hand gloves and footwear
  - Vaccinated to prevent tetanus
Achievements: Win-win solutions for all (3)

The business sector

• Increase recyclable materials available for the production side
  ▪ Quantity of recyclables increased
• Increase business opportunity
  ▪ Numbers of junkshops increased (4→ 9 shops)
  ▪ Numbers of tricycle waste buyers increased

The residents

• Earn from selling recyclable wastes
  → (3.3-13.3USD/month)
• Possible to pay for waste management fee
  (1USD/month)
Sustainability of the Phitsanulok Participatory Recycling Model

**Environment**
- Reducing waste for disposal
- Decreasing risk of pollution release from disposal site
- Avoiding GHG emissions
- Saving land for other purposes

**Social**
- Improving working condition of waste pickers (health and social status)
- Residents see recyclable waste as resources

**Economic**
- Creating job and income for waste pickers and unemployed people
- Expanding markets of recyclable materials
C. Phnom Penh Model (Cambodia)

- Good reputation
- Raised fund
- Compost for sale (75USD/ton)

NGO (COMPED)

- Operating the composting facility

Municipality

- Providing free space for composting facility

Contracted waste collection company

- Collecting biodegradable waste from the market to composting facility
- Reduced landfill disposal fee
- Reduced burden for landfill management
- Reduce GHG emission by 1.4tCO₂eq/day

Waste pickers

- Working for the composting facility
- Separating biodegradable waste and put into the waste storage area
- Secured income and improved working condition

Raw food market

- Increased crop productivity → increased income
- Improved cleanliness of the market

Farmers

- Compost user

- Decreased income from landfill disposal fee
- Raised fund
- Compost for sale (75USD/ton)
- Good reputation
- Good reputation
- Raised fund
- Compost for sale (75USD/ton)

- Improved cleanliness of the market
- Good reputation
- Raised fund
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- Good reputation
- Raised fund
- Compost for sale (75USD/ton)
Conclusion

• Even with limited budgets, local governments can improve MSW management through engaging the informal sector and promoting markets for recyclable wastes, e.g. through recognising the contribution of waste pickers, training, and providing essential inputs.

• A participatory recycling business model is a sustainable approach as it benefits all stakeholders.

• Support from national and local government remains essential to further improve and stimulate the extension of the informal recycling activities.
What should central and local governments do?

- Set recycling targets at national and local levels and promote use of products made of recycled materials,
- Promote and implement waste separation at source (esp. for recyclables and organic waste),
- Assist waste pickers and waste buyers to have an accident and health insurance,
- Recognise the waste pickers and waste buyers as providing a valuable social service and give them guidance on social responsibility and health issues,
- Implement environmental controls for junkshops and waste recycling facilities,
- Reduce tax barriers for import and export of recyclable materials (certification may be required to ensure the quality of the materials and avoid waste trafficking) to promote the recycling business
IGES/SCP New Projects in 2011

- Promoting recycling in municipal solid waste management through suitable business models
- A typology of involvement of informal sector to recycling business in Asia
- Recycling certification in Asia
- Measurable, Reportable and Verifiable (MRV) capacity building in Asia for the establishment of new market mechanisms (solid waste management and energy efficient building)
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Thank You