

# Digitizing Waste with Women at the Center: Insights from Southeast Asia

How digital solutions can strengthen plastic waste management by engaging women as key users

WORLD ENVIRONMENT DAY  
**#BeatPlasticPollution**

ADB Circular Economy Webinar Series



# Focus on digital solutions in Indonesia and Viet Nam



ADB Regional Technical Assistance (TA)  
Indonesia | Philippines | Thailand | Viet Nam



Promote inclusive and sustainable waste management systems to reduce marine plastic pollution and protect ocean ecosystems and coastal communities.

Explore how digital solutions can strengthen plastic waste management by engaging women as key users.

Review data from Indonesia and Viet Nam.

Discuss the importance of designing inclusive platforms that reflect women's roles in household and community waste practices and the informal sector.



Population: 340,000

## Cirebon, Indonesia



**37.8 t**

Total plastic waste generated per day



**96%**

Households that have access to waste collection services



**61%**

Households that have access to door-to-door collection services



**43%**

Households that throw their waste away every day



**2 kg**

Average weight of waste disposed of daily

kg = kilogram, t = metric ton.  
Source: Authors.



**20.1 t**

Total plastic waste generated per day



**99%**

Households that have access to waste collection services



**97%**

Households that pay for waste collection services



**51%**

Households that throw their waste away every day



**1.9 kg**

Average weight of waste disposed of daily

kg = kilogram, t = metric ton.  
Source: Authors.

Population: 148,961

## Tan An, Vietnam

# Women play a key role in managing household waste in both Indonesia and Viet Nam

## Segregation & Disposal Practices

- Women influence most household plastic purchasing decisions
- Plastic is preferred for its convenience and hygiene
- “Reuse” is limited to bags & refillable bottles
- Low interest in other reusable alternatives

## Motivations for Waste Segregation

- Segregation driven by economics and regulations
- Environmental concern has limited influence
- App users are motivated by environmental protection, while lower-income women use app to earn extra income (selling recyclables)



- 35% of households segregate waste.
- Lower-income women more active in segregation
- Higher-income households less motivated due to lesser economic need.
- Women prefer door-to-door waste collectors over waste banks



- 33% of households segregate waste.
- Nationwide waste sorting pilot to start from January 2025.
- Lack of formal collection leads to burning or burying waste

## Challenges

- Inadequate infrastructure & irregular waste collection services.
- Lack of information & public facilities.
- Time constraints & limited space at home for waste sorting.
- About 90% of women indicated that waste management was important for the environment and public health and that they were interested to learn more.
- Women are key influencers in household waste practices.



- Only 25% of women, and close to half of men, had heard about 3R (Reduce, Re-use, Recycle) through district authorities or neighbourhood associations.
- Only 5% of people interviewed were aware of PROs (Producer Responsibility Organisations)



- 68% are aware of policy requiring the segregation of solid waste.
- Nearly 60% had never heard of the 3Rs.

# Informal waste collectors collect nearly all recyclable materials



- 4.2 million informal waste workers
- At Bantar Gebang landfill (Jakarta): About 40% of 3,000 waste pickers are women.
- Many of women waste pickers are homeless and belong to ethnic minorities.
- 50% of female waste pickers have no formal education, compared to 40% of males.
- Common health issues include respiratory infections and gastrointestinal illnesses due to unsafe waste handling practices.



- 3 million informal waste workers
- In Ho Chi Minh City, 80%–90% of informal waste pickers are women.
- Many female waste pickers migrate from rural areas in search of higher income, while others take up waste picking after retiring from other jobs.
- **Flexibility** is an important consideration for women - waste collection's flexible hours attract women balancing family and work obligations.

- Waste picking serves as the primary, full-time occupation for most women, who work daily to support their families.
- The informal nature of their work leaves them particularly vulnerable to exploitation and unsafe practices. Informal waste collectors face health risks, social stigma & unstable incomes
- Waste collection is carried out with minimal protective gear, such as gloves and masks, and only basic tools like hooks, leaving women exposed to injury and disease.
- Informal waste collectors struggle to access government health insurance





## Insights into Collectors' Work and Earnings

- Female waste collectors primarily focus on small items, while male collectors handle heavier, bulkier items (e.g., TVs, cupboards) using motorbikes or trailers.
- Women typically use small, non-motorized vehicles like bicycles and pushcarts limiting the quantity they collect.
- **Trust** is the cornerstone of female pickers' relationships with customers
- Waste pickers sell their collected waste primarily to junk shops or waste collection centers.
- Unsold waste is often burned, sent to landfills, or discarded in rivers or the sea, contributing to environmental pollution

### Cirebon



**\$12.00**

Rp192,000

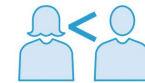
Average  
weekly earnings  
of women



**\$34.00**

Rp511,875

Average  
weekly earnings  
of men



**30%-50%**

Lower prices paid to  
women for the same  
waste products

### Tan An



**\$5.00**

D150,000

Daily earnings of waste  
pickers using bicycles



**\$15.00**

D450,000

Daily earnings of  
waste pickers using  
motorized vehicles



# Championing Female Waste Pickers in Indonesia

**Resa Boenard**

- Founder of the Indonesia Women Waste Collectors Association (Asosiasi Pemulung Perempuan Indonesia)
- Indonesia's first organization focused on empowering women in the waste management sector, especially at Bantar Gebang, Southeast Asia's largest landfill
- Women making up approx. 40% of the workforce. Many marry young, have limited educational and employment opportunities and find themselves trapped in a cycle of poverty
- With the support of EkoLogis, the association aims to provide female waste pickers with the opportunity to sell recyclables directly to buyers, bypassing exploitative brokers
- Also aiming to create pathways for women to gain financial literacy, access microloans, and establish bank accounts, ultimately empowering them to make informed economic choices.



# Digital solutions have emerged as powerful tools to strengthen plastic recycling in Indonesia and Viet Nam



- More developed digital ecosystem for plastic waste solutions
- Platforms connect waste pickers, aggregators, and buyers / collect & track waste data for intermediaries and buyers
- Primary Users; Women aged 25–45, well-educated, upper middle-income
- Users value features that are easy and convenient, like scheduled pickups
- Women aged 50+ prefer working with trusted local collectors offline and using waste banks for recyclables



- Digital solutions still emerging and face commercialization challenges
- Limited consumer interest
- Digital platforms like Grac, VECA, and mGreen connect informal waste workers with households and recycling units.
- Primary users: women in the 30–40 year old age range
- The platforms have also gained traction among student users

## EXAMPLE- VECA

- Operating in HCMC
- App connecting informal waste workers with recycling units (apple & google stores, VN only) – free for pickers
- Digital solution helps junk shops transition from manual bookkeeping to a streamlined process that simplifies accounting tasks and documentation when working with local tax authorities.



Source: [veca.app/about-us](https://veca.app/about-us)

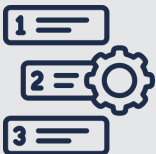


## Waste Platforms included in Digital Consultations

Indonesia	Viet Nam
Griya Luhu	Grac
Bintari Foundation	VECA
Siklus	mGreen
Bunda Rossa	Uncle Fire
Gringgo	Mericulum
Waste4Change	Schoolab
Get Plastic	Kisstartup
Duitin	
Plastic Bank	
EkoLogis	

# Digital Innovations Enabling Inclusive Waste Solutions

## 1. Priorities for Women in Digital Waste Solutions



- Ease and convenience are top priorities for women when choosing digital waste solutions
- Home pickup services supported by prompt and efficient technology are highly valued
- Scheduling flexibility—many women prefer platforms that allow them to arrange pickups according to their busy routines
- Without proper infrastructure to support segregation practices, even informed and motivated communities face setbacks.

## 2. Preferred Digital Platforms Features



- Simple messaging apps for their ease of use (Grac and Uncle Fire continue to use phone calls to schedule pickups with collectors)
- User-friendly digital tools with clear guidance on waste sorting and recyclable values
- Platforms that display transparent pricing, helping them feel fairly compensated without needing to negotiate
- In Viet Nam, collectors generally prefer cash transactions.
- In Indonesia for examples; Plastic Bank use blockchain to securely trace all transactions on the platform.

## 3. Payment and Incentive Models in Waste Management Platforms



- Cash, e-money, or vouchers.
- E-coins that can redeem for: electricity or phone bill payments and tipping waste collectors
- Rewards such as spiritual trips for families and waste bank coordinators.



- Users prefer non-cash payments like vouchers and e-coins
- Vouchers redeemable at partner brands
- Bonus vouchers or e-coins
- Handmade gifts and plants

## Digital Access, Training, and Finance are critical challenges for Female Waste Collectors

- Digital platforms require access to smartphones, internet, and basic digital literacy, which many women collectors lack.
- Ongoing training is often unavailable, limiting women's ability to navigate apps, handle materials safely, and engage consistently.
- In Viet Nam, older women collectors tend to avoid mobile apps, preferring voice calls to reduce data costs or due to low literacy, poor eyesight, or fear of making mistakes.
- Many women use bicycles or pushcarts that suit narrow streets and home storage but reduce collection volume and efficiency.
- Access to financing is limited. Most women operate informally and do not qualify for loans, though some pilot programs have begun exploring microcredit options.



# Digital tools can make plastic waste management more inclusive, but only if they address the specific challenges faced by women

1

## **Strengthen research on the contributions of women and informal waste workers**

- Collect disaggregated data
- Conduct studies to inform inclusive policies and programs

2

## **Enhance infrastructure and develop tailored digital solutions**

- Design user-friendly platforms
- Gather regular feedback
- Ensure access to sorting bins and convenient collection services.
- Integrate digital wallets

3

## **Strengthen awareness of good waste management practices and apply a family-centered approach**

- Women and youth are key drivers of household behavior change.
- Use diverse outreach (social media)
- Adopt family-centered strategies

4

## **Increase women's influence in strategic decisions on plastic waste management**

- Involve women and informal waste collectors in policy development, project planning and implementation.

5

## **Develop targeted solutions and training for women waste workers**

- Design simple, convenient platforms with flexible payments and health benefits
- Add services like cleaning and pickup to boost income
- Improve women's access to basic phones and internet

6

## **Provide access to social benefits and equipment**

- Offer subsidized insurance, safety gear, or flexible payment options
- Provide microfinance to boost collectors' access to capital and income

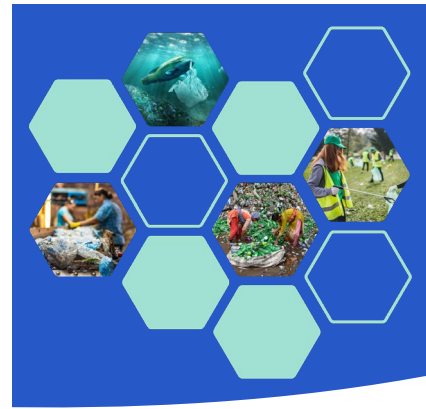
7

## **Foster community-based cooperative models for formal recognition and structured support**

- Formal recognition gives women waste workers access to social benefits
- Women build strong support networks, sharing work and resources



# Thank You



# Education and Awareness

## Use Digital Tools to Educate and Engage

- Integrate daily tips, sorting guides, and FAQs into mobile apps.
- Use social media (e.g., Facebook, TikTok) to share engaging videos, posts, and games—especially for younger audiences. Offer incentive programs (e.g., waste-for-gifts) to motivate action

## Conduct In-Person Education Campaigns

- Organize door-to-door visits, school sessions, corporate training, and community events.
- Demonstrate proper waste sorting and provide printed guides or kits.

## Encourage Community Involvement

- Use local authorities and community leaders for outreach.
- Build trust through face-to-face engagement and consistent follow-ups



## Raise Awareness About Importance of Waste Management

- Explain health and environmental impacts.
- Emphasize individual and collective responsibility.

## Tailor Communication to Different Demographics

- Use digital content for younger people (gamified apps, videos).
- Social media may be less effective for older generations—use alternative methods for them.

## Empower and Engage Youth as Change Ambassadors

- Launch interactive, fun programs in schools and universities.
- Set up waste collection points and reward participation.
- Leverage youth influence on family and community behavior.

## Reinforce Learning with Practical Support and Infrastructure

- Provide accessible waste collection and recycling facilities
- Align education efforts with real tools and systems people can use.



# Annex