

CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA



PatiHoub

-  Luang Prabang, Laos
-  Plastics
-  patihoub.com
-  Analysis period: 2021-2024

Turning Plastic Waste into Durable Consumer Goods

Business Spotlight

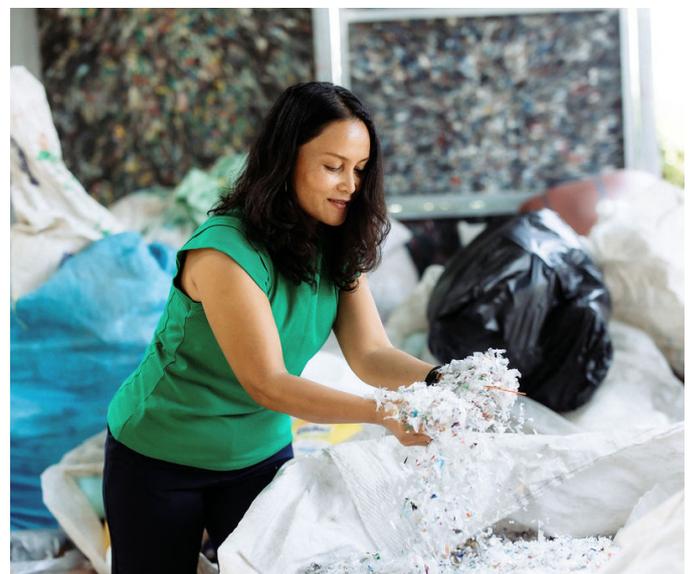
PatiHoub, Laos, converts zero-value plastic waste into valuable, durable and recycled products. The company's main innovation is the conversion of waste plastics, including what is typically considered as non-recyclable, or 'grey' plastic, into versatile boards and other products. This circular solution significantly reduces plastic pollution and provides a second life for previously discarded plastic, as well as diverting it from landfills, open burning and/or littering. PatiHoub creates jobs, and showcases a circular economy in Laos by increasing income for waste collectors and generating revenue from the sale of durable consumer goods that are made of recycled plastics. Future plans include expanding the collection network to businesses, schools, and communities, as well as developing additional unique products that address demand in the Lao market.

 **Keywords**

Plastics Recycling, Waste Segregation and Collection

 **Innovation**

Product/service design, End-of-life management, Resource circularity



Analysis of PatiHoub

Context and baseline

The problem being addressed is the plastic waste crisis in Laos, particularly the lack of effective waste collection and management, which contributes to widespread indiscriminate littering and disposal of wastes in both urban and rural areas. A significant portion of the population in Laos does not have access to waste collection services, leading to trash being discarded in public spaces and burned, which adversely affects public health and the environment. It has been estimated that in 2020 the national rate of waste generation was around 910,000 tonnes per year. Waste collection in the Lao PDR tends to be limited to towns and cities. In Luang Prabang, 23,927 metric tonnes of waste was generated in 2015 and around 80% of this waste ended up in landfill. In Kaysone Phomivane, some 39,575 metric tonnes of waste was produced in 2015, but less than half of this waste went to the landfill.¹

PatiHoub is a waste management business in Luang Prabang. Pa-ti means 'reform' or 'revolution', and Houb means 'design' or 'image' in the Lao language, which together means to 'redesign' plastic waste into valuable products and 'revolutionise' the plastics value-chain. PatiHoub aims to contribute to solving the plastic waste crisis through a circular and inclusive model by converting zero-value plastic waste into durable and versatile products through a unique, low-carbon process – an innovation in Laos.

PatiHoub originated as a social franchisee of ReForm Plastic in Vietnam², a social business model for community-based collection and recycling of plastic waste. Key partners include EXO Foundation, which provided funding and helped establish community waste collection points, and Ock Pop Tok and the Belle Rive Boutique Hotel, which are some of the businesses that partner with PatiHoub for plastic waste collection.

Innovation

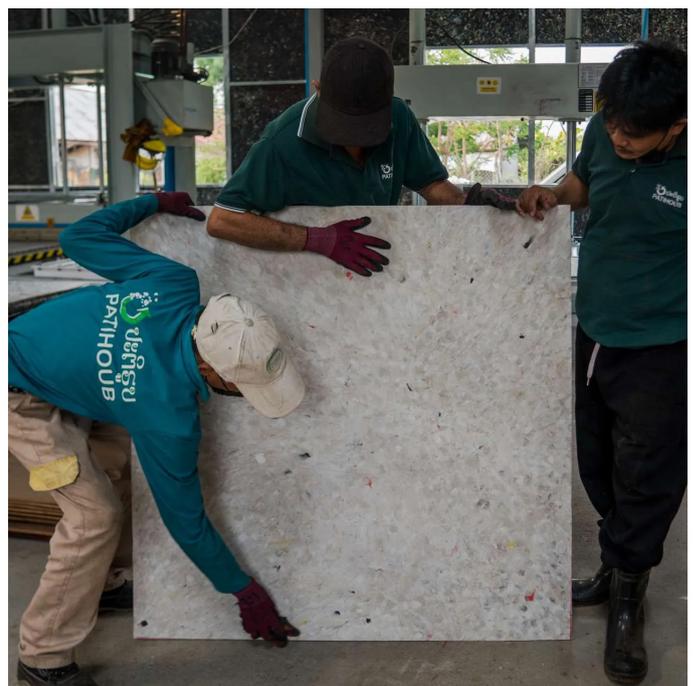
PatiHoub's circular solution is the creation of durable, versatile, and premium recycled plastic boards and other products from zero-value plastic waste. This is a significant improvement over the baseline, where plastic waste typically ends up in landfills or perhaps be burned or simply littered. The solution addresses the end-of-life management stage of plastic products and packaging by turning what formerly ended up as waste into recycled plastic boards that can be repurposed into various products. The initiative is new to Laos, where

PatiHoub has established collaborations with existing waste collection systems, informal waste collectors, and new partners like hotels and temples to collect and recycle plastic waste.

PatiHoub's principal products are recycled plastic boards, which are waterproof, anti-mould, non-toxic, and can be made to varying degrees of strength and flexibility, making them a versatile alternative to traditional materials like wood and particle or composite boards. The products made from these boards are used in a variety of applications, including:

- Furniture: Chairs, tables, shelves, and cabinets
- Construction: Wall panels, roofs, insulation, flooring, and outdoor tiles
- Outdoor items: Playground equipment, outdoor tables and chairs, and pool lounge chairs
- Office and School Supplies: Desks, bins, tables, shelves, and lockers

PatiHoub's operations include collecting, sorting, and shredding plastic waste, and then pressing it into boards. The process can accommodate a variety of plastic wastes, including those considered not economically recyclable. The specific technology used by ReForm Plastic and its franchisees, including PatiHoub, combines heat compression moulding with a computer numerical control (CNC) cutting machine. In this process the shredded plastic waste is pressed into a mould that produces the recycled boards.



1 World Bank (2023), <https://documents1.worldbank.org/curated/en/099100002182296296/pdf/P17101101230c40bc096bf0a757bd16eb65.pdf>
2 <https://www.evergreenlabs.org/reformplastic#>

Circular Economy Impact

PatiHoub's primary strategy for circularity is to convert low-value plastic waste into durable, consumer goods, thereby keeping the previously discarded waste plastic materials in circulation and out of the environment. Resource circularity is achieved by returning plastic waste to the market as a new recycled plastic product.

PatiHoub processes 12,000 kg per year and its machine can process 200 kg per day. Industry and expert estimates indicate that recycling plastic can save between 1.45 to 1.5 tonnes of CO₂ equivalent (CO₂e) per tonne of recycled plastic.³ PatiHoub thus currently saves approximately 18 tonnes of CO₂e in one year of operation. If PatiHoub can secure a supply of discarded plastic for its full installed capacity of 200 kg per day, it could help eliminate an estimated 90 tonnes of CO₂e compared to using virgin polymers.

Business and market impact

The business generates revenue by selling the recycled plastic boards and other products. Partnerships with businesses like Ock Pop Tok and the Belle Rive Boutique Hotel provide a steady stream of materials and a market for PatiHoub's finished products. The company has expanded from an initial 10 local stakeholders to approximately 40, demonstrating a successful scaling up of their collection process.

The initial investment in the machine was approximately USD 70,000. PatiHoub has received grant contributions from EXO Foundation, which funded seven pilot community waste collection points in Luang Prabang (starting in 2021) and participated in the purchasing of a computerised numerical control (CNC) cutting machine to accelerate product prototyping and production. It was also a beneficiary of the US Department of State through the US-ASEAN Smart Cities Partnership (USASCP), which supported micro-, small- and medium-sized enterprises (MSMEs) in pioneering innovative, carbon-neutral solutions in ASEAN member states.

PatiHoub is still in the early investment and build-up stage of its development.

Stakeholders

In the absence of established segregated waste collection and management systems, PatiHoub had to set up community-based plastic waste collection and sorting networks to create a regular supply of recyclable plastic waste for its operations. In doing so, the company is strengthening informal waste collection, e.g. with introduction of 'scheduled pickup' and creation of 'drop off points' in collaboration with community centres, schools, temples and (retail or service) businesses. The aim in fortifying the work of informal waste workers is to create a reliable source of recyclable plastic waste as well as improve the income and livelihood of informal waste workers.

Implementation

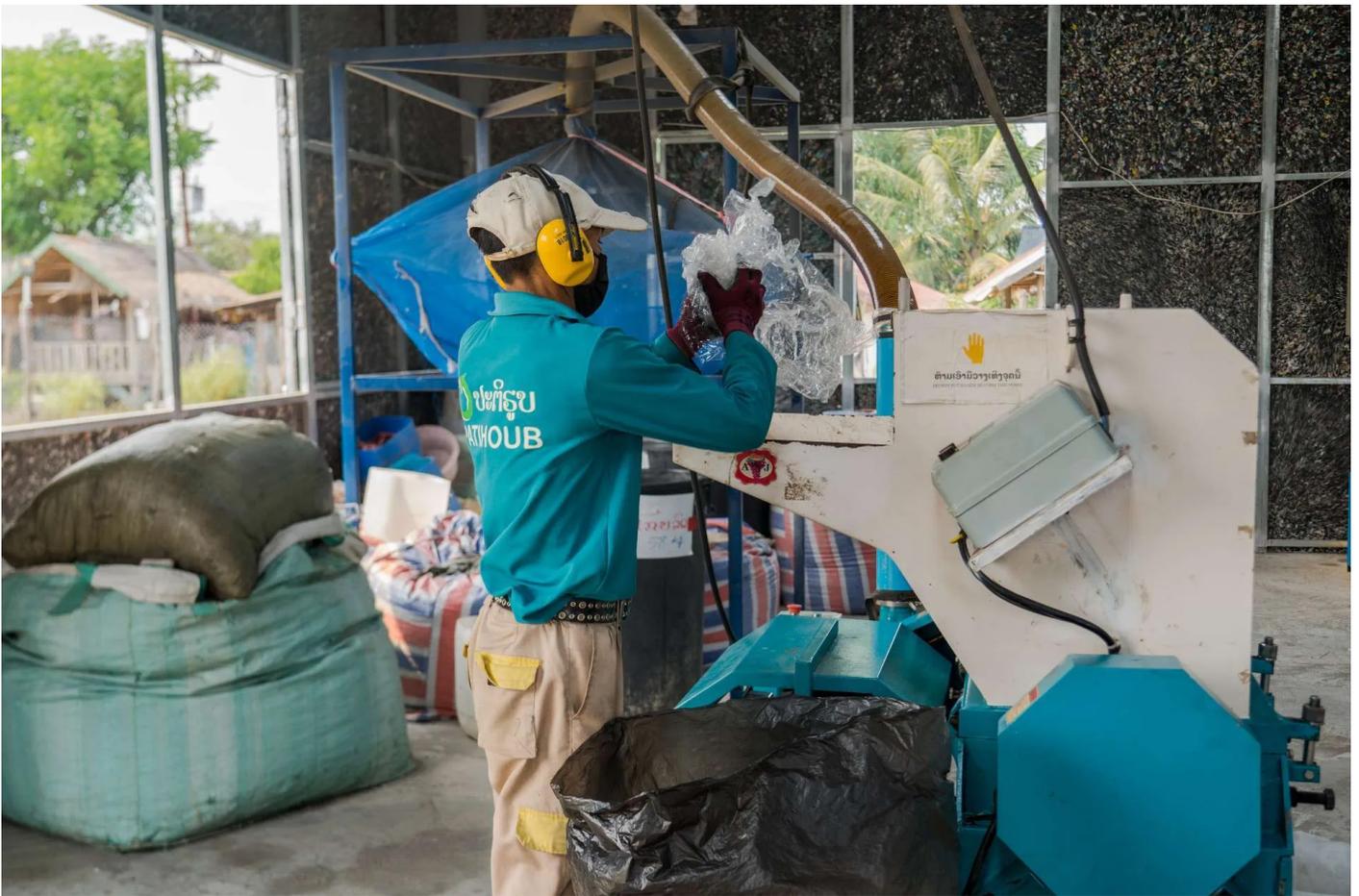
A key barrier for PatiHoub was the lack of awareness about the need to segregate waste, which is essential for creating a steady supply of recyclable plastic waste. The company addressed this challenge by conducting training for hotel teams and creating communication materials to guide waste segregation. They also established collection points in temples to make source segregation of waste for recycling more accessible to communities.

Opportunities for scaling up include extending the network of partners and developing more products suitable for the local market. Challenges remain, including the weak enforcement of waste management rules and regulations in Laos, and the habit of burning trash.

Takeaways

PatiHoub transforms low-value plastic waste into durable, valuable, and marketable boards that can be used for furniture and construction, including in its own workshop. PatiHoub's approach is inclusive, working with a network of informal waste collectors to increase their income, and providing training to businesses, such as hotels, on source segregation of wastes to ensure a consistent supply of recyclable plastic waste. This system helps to put plastic waste back into circulation as durable consumer goods, diverting plastic from landfills, littering and/or burning, and creating positive social and economic benefits for the community.

3 See e.g. Joint Research Centre (2021), Environmental Effects of Plastics Recycling, https://publications.jrc.ec.europa.eu/repository/bitstream/JRC122455/environmental_savings_from_plastic_waste_recycling_-_jrc_report_-_v9.pdf



Funded by the European Union

Acknowledgements

This business case study was prepared for the ASEAN Circular Economy Business Alliance (ACEBA) within the framework of the Technical Advisory project: Mobilising Business Action for Circular Economy in the ASEAN countries under the EU SWITCH-Asia Policy Support Component for the sole purpose of documenting and analysing business experiences with circular economy. ACEBA is an ASEAN-centric and business-led initiative that fosters business leadership and action on circular economy in Southeast Asia. ACEBA is an initiative of ARAIBA Sdn Bhd, a not-for-profit business organization that promotes responsible and inclusive business, in collaboration with national business membership organizations and with technical advisory of the EU SWITCH-Asia Policy Support Component.

The business case was produced by Elodie Maria-Sube (key expert) and reviewed by Rene Van Berkel and Thomas Thomas (regional experts and ACEBA co-convenors) on the basis of information provided and validated by PatiHoub, Lao People's Democratic Republic.

Disclaimer

The content of this publication is the joint responsibility of PatiHoub, Lao People's Democratic Republic and the expert team. This publication does not constitute an endorsement of PatiHoub, Lao People's Democratic Republic by the European Union nor any of the partners of the SWITCH-Asia Policy Support Component, nor necessarily reflect their views.



www.aceba.co



info@aceba.co



www.switch-asia.eu



EU SWITCH-Asia Programme
@EUSWITCHAsia



SWITCH-Asia
@SWITCHAsia



SWITCH-Asia Official
@switch-asia-official