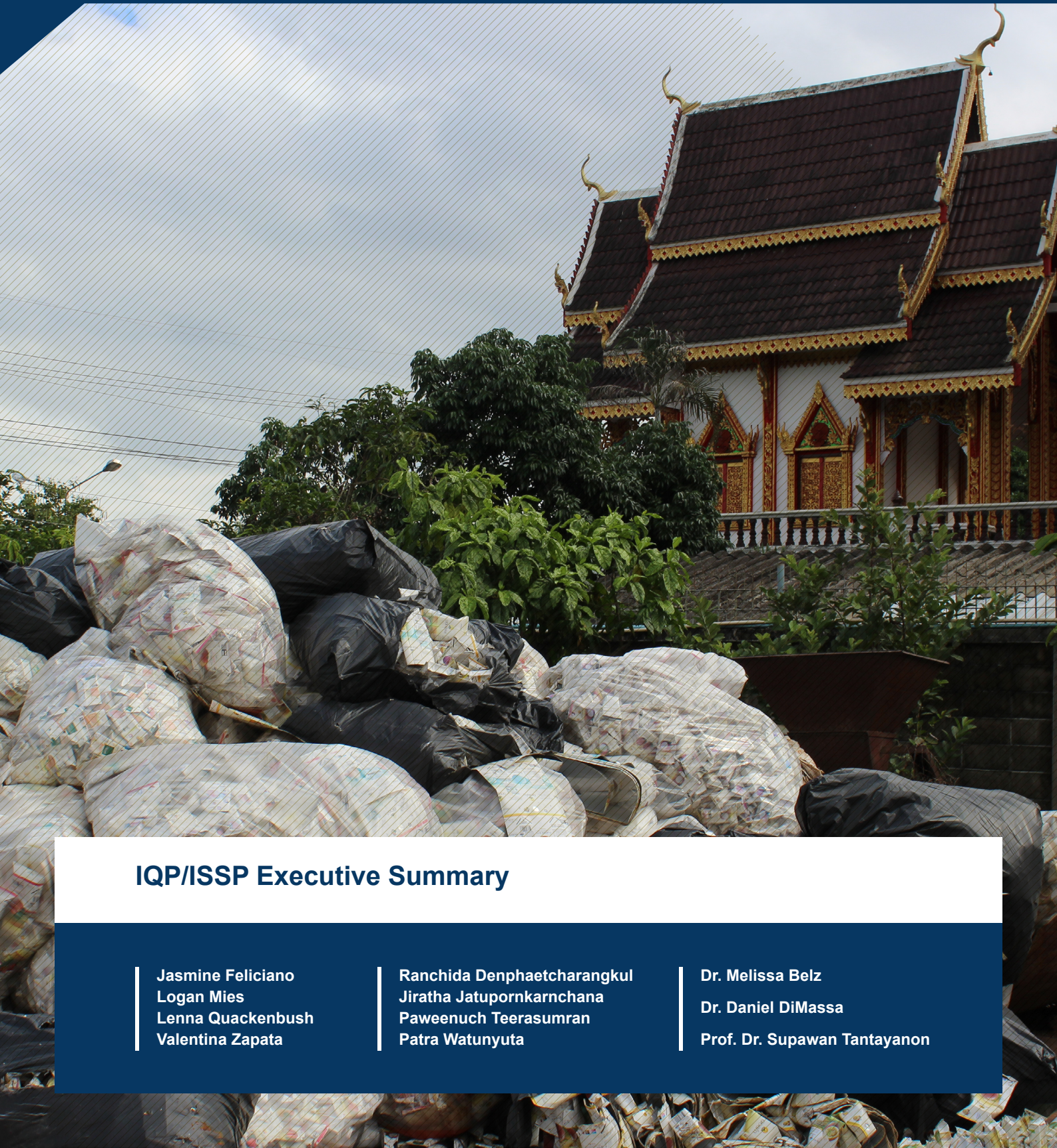


Developing **Value-added, Community-appropriate** Options for **Repurposing Wasted Juice Cartons**

Worcester Polytechnic Institute
Class of 2018

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Class of 2018

Doi Kham Food Products Co. Ltd.



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Problem

Doi Kham Food Products Co. Ltd. is facing a waste generation problem at their juice factory located in the Chiang Rai province. The factory produces over 3,000 wasted juice cartons every day as a byproduct of their manufacturing process. With no recycling plants nearby, the wasted cartons are building up at a local waste facility. Doi Kham has asked us to find repurposing or recycling solutions for the waste that benefit the local community.

Background

Doi Kham was founded in 1969, under his majesty King Bhumibol Adulyadej, as a Royal Foundation project initiative designed to provide an alternative source of income to opium poppy farming. While the company now operates independently from the Royal Foundation, the original Corporate Social Responsibility (CSR) goals and community focus of the late King are still fundamental to the company.

In conjunction with their CSR goals, Doi Kham is also focused on minimizing the negative environmental effects of their manufacturing process. Waste generation is rapidly increasing around the world and packaged food containers, such as the ones that Doi Kham produces, are significant contributors to the waste problem. For this reason, Doi Kham has made it a goal to mitigate the detrimental effects of their waste production.



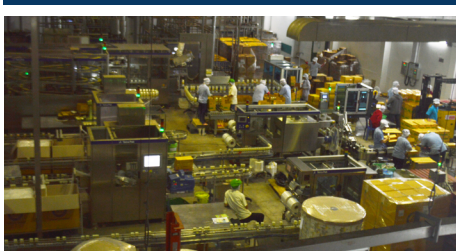
Project Goal

The goal of our project was to develop the most effective and feasible plan for repurposing Doi Kham Food Products' waste juice cartons in order to benefit the Pa Sang community.

Methodology

To understand Doi Kham's waste generation problem, we toured the Doi Kham factory in Mae Chan and interviewed Doi Kham employees and community members. We researched and contacted recycling organizations in Thailand, which are familiar with beverage carton waste problems. Using the information from our research and interviews we evaluated possible reuse techniques based on their feasibility and the impacts they would have on Doi Kham and the local community. Finally, we developed microenterprise and corporate partnership plans that would best fulfill Doi Kham's CSR and waste management goals.

Key Finding One:



Doi Kham's equipment and manufacturing process is extremely productive at approximately 99 percent efficiency. For this reason, the team determined that altering the machinery or production process would not be a feasible solution to the waste problem. There are several sources and types of waste being generated, but wasted beverage cartons are the most abundant and concerning.

Key Finding Two:



Both Doi Kham and the community expressed interest in making upcycled goods, such as baskets, from the wasted juice cartons, and in incorporating reuse programs into local schools' curriculums. These projects could serve as an alternative source of income for community members, and could spread awareness of reuse throughout the community.

However, due to the large volumes of waste being generated, Doi Kham wanted to find a solution that could manage the entirety of the waste produced. For these reasons, Doi Kham decided they needed multiple options that, enacted together, could fulfill their CSR goals and manage all the waste.

Key Finding Three:



We learned that Doi Kham is very interested in forming a partnership with a recycling organization to manage all of their waste. After contacting several recycling companies in Thailand and around the world, the Thai company Fiber Pattana seemed best fit to form a partnership with Doi Kham. This is because we discovered that Fiber Pattana's CSR ambitions are

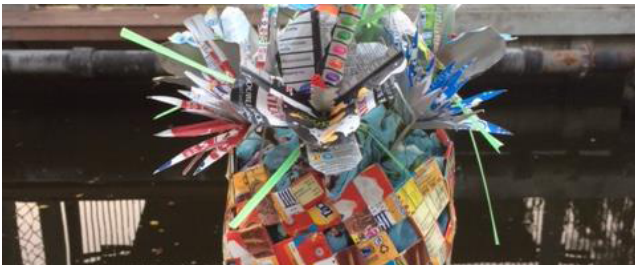
consistent with Doi Kham's ambitions. Fiber Pattana recycles waste cartons into building materials. In their not-for-profit accounts, Fiber Pattana uses donated waste cartons to make products for victims of natural disasters. The paper pulp byproduct from these donations, and the ensuing sales from Fiber Pattana's 'Eco-Paper' products, allows the company's not-for-profit account to be economically feasible.

Reccomendations



We recommend an agreement and partnership to be formed between Doi Kham and Fiber Pattana that results in a collaborative CSR project.

The solution we have found most effective in addressing Doi Kham's waste generation problem, and in augmenting Doi Kham's CSR ambitions, is a partnership between Doi Kham and the beverage carton recycling company, Fiber Pattana. Doi Kham would donate their wasted juice cartons to Fiber Pattana, and in turn, Fiber Pattana would repurpose them into green building materials and donate the products to those in need or sell them at reasonable prices in the Chiang Rai province. Fiber Pattana needs more beverage cartons and Doi Kham aims to mitigate the effects of its waste production. This partnership would be mutually beneficial to both companies' CSR goals.



We recommend a small portion of the wasted beverage cartons be repurposed into upcycled goods such as baskets.

We recommend a microenterprise, where wasted juice cartons are repurposed into upcycled goods, such as baskets, to support the relationship between Doi Kham and the local community. Doi Kham would buy the baskets from the local residents, which would provide an added income for the local residents. The baskets would be sold for special occasions at the Doi Kham store.



We recommend Doi Kham send a small fraction of their wasted juice cartons to local schools in the Pa Sang district.

We recommend that Doi Kham send some of their wasted juice cartons to the local schools in Pa Sang to be used as planters or art supplies. This would not only help educate children on how to repurpose waste and develop their creativity skills, but it would also fulfill Doi Kham's CSR goal. If this project is successful, we recommend that Doi Kham's wasted juice cartons be sent to other schools in Chiang Rai as well.

Conclusion

With these recommendations, we hope that Doi Kham is able to mitigate the effects of the waste generated in their packaging processes, while strengthening their relationship with the Pa Sang community.