

## **Woven Networks Scoping Study**

**Designing the Panublix Weaving Enterprise Digital Enabler (PWEDE):  
a study on the needs, desirability, and perceived benefits of weaving communities in the  
Sierra Mountain Ranges in onboarding the digital economy**



**Panublix Innovations Inc.**

**August 2022**

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## Acronyms and Abbreviations

AE	Artisan Enterprises
DENR	Department of Natural Resources
DFA	Department of Foreign Affairs
DOLE	Department of Labor and Employment
DOST-PTRI	Department of Science and Technology - Philippine Textile Research Institute
DOT	Department of Tourism
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
FFP	Forest Foundation Philippines
FGD	Focus Group Discussion
ICT	Information and Communications Technology
IEC	Indigenous Enabel Craft
ISAT-U	Iloilo Science and Technology University
ISU	Isabela State University
LGU	Local Government Unit
MSMEs	Micro and small medium enterprises
NCIP	National Commission for Indigenous Peoples
NCCA	National Commission for Culture and the Arts
NGO	Non-Government Organization
NTFP	Non-Timber Forest Products
PENRO	Provincial Environment and Natural Resources Office
PWEDE	Panublix Weaving Enterprise Digital Enabler
SWWA	Santos Women Weavers Association
TELA	Textiles Empowering Lives Anew
TESDA	Technical Education and Skills Development Authority
UK	United Kingdom
YKLW	Young Kankanaey Loom Weavers

## 1. Introduction

The Woven Networks Scoping Grants created by the British Council and Forest Foundation Philippines aims to initiate new collaborations and support projects that champion indigenous knowledge systems towards sustainable resource management and improved livelihood of craft communities. Panublix Innovations Inc. is one of the grantees which conducted a scoping study from March to July 2022 in one of the focal landscapes of the Forest Foundation, the Sierra Madre ranges, specifically the province of Isabela in the Cagayan Valley region of the Philippines.

### About Panublix

Under the recovery theme of this scoping grant, Panublix, a women-founded tech startup, executed research activities that aims to implement new organisational approaches, frameworks or partnerships that empower craft communities by strengthening sustainable value chains and systems that they are already employing (i.e. *between nature, community, technology and market*). Founded in Iloilo City, Panublix has been connecting different weaving communities in Western Visayas with Philippine tropical yarns to replace fossil-fuel produced polyester and onboard the enterprises on the digital economy so they can access international markets and co-design with sustainability-driven designers.

### The Sustainable Fashion Opportunity for Artisans & Designers

Sustainable fashion & design is no longer a niche trend. Prior to the COVID-19 pandemic, the textile, garments & fashion industries have been facing pressures to innovate amidst shifting consumer behaviours. These trend drivers include digitization, sustainability, transparency, and social responsibility. The coronavirus further amplified this, forcing more players to consider “rewiring the industry” and more brands are addressing this growing consumer clamour for sustainable and ethical fashion.<sup>1</sup>

This places an opportunity for Filipinos to harness their artisanal textile heritage that has sustainability embedded in their culture with tropical textiles and handwoven craft. Weaving on a handloom is a traditional skill passed down to modern generations from Philippine ancestors' tribes. There are about 450 weaving communities across the Philippines<sup>2</sup> and the regions in which textile production is prominent are those in Ilocos, Cordillera, Panay island, and Mindoro.<sup>3</sup>

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<sup>1</sup> BOF & McKinsey (2021). The State of Fashion 2021.

<sup>2</sup> Costelo, W. (2020), Support the weaving industry from home: Likhang HABI goes online. Rappler | Filipino Traditions retrieved on July 13, 2022

<sup>3</sup> Moya, J. (2021), Weaving Patterns in the Philippines: Heritage, Design, and Their Meanings. Tatler Asia | Fashion retrieved on July 13, 2022

Local designers have also started the shift towards sustainability, causing a resurgence of local Philippine weaves used in mainstream fashion as observed in recent years.<sup>4</sup> According to an article in Metro.Style, a premiere Philippine fashion magazine, the rising demand in local weaves reflects the values of slow fashion, sustainability, and conscious consumption. However, these are not without their issues. Limited access to markets, need for capacity building, logistical barriers, and low income of weavers surface as major challenges.<sup>5</sup> Since many of the weaves are from indigenous communities, cultural appropriation also becomes a concern when traditional elements of culture are being used without acknowledging context.<sup>6</sup>

### **RYPIC: Solving Access to Sustainable Materials**

Further, the weavers need access to environmentally-friendly raw materials because their traditional sources of natural fibres are at risk of being depleted with climate change and man-made environmental threats, making them reliant on unsustainable synthetic fibres. The absence of readily available raw materials leaves the weavers with no choice but to use yarns made of polyester or cotton blended with polyester which brought about a decline in quality and a reduced market value of handwoven cloth.<sup>7</sup> On the other hand, for artisans who can still rely on non-timber forest produce for their livelihood, an overproduction of products has led to exploitation of natural resources, increasing their vulnerability to climate change.

Fortunately, the Philippine Textile Research Institute of the Department of Science and Technology (DOST-PTRI) has been at the forefront of innovating local raw materials like cotton, abaca, pinya, and natural dyes for innovative and sustainable textiles.<sup>8</sup> A Regional Yarn Production and Innovation Center (RYPIC) in Iloilo was inaugurated in 2019 that produces yarns from cotton, abaca and pineapple. In 2021, Panublix signed a Memorandum of Agreement with the DOST-PTRI to be the marketing partner for RYPIC.

A second RYPIC will be launched in the province of Isabela, and will focus on bamboo<sup>9</sup>. Bamboo also happens to be a non-timber forest product. According to the The Non-Timber Forest Products-Exchange Programme (NTFP-EP), bamboo has long played a significant role in rural communities in tropical Asia, where it is extensively employed as a sustainable resource for a

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<sup>4</sup> Madsen, M. (2020, March 30). The Future of Fashion: Philippine Brands and Local Designers Focus On Sustainability. Retrieved from <https://ph.asiatatler.com/style/the-future-of-fashion>

<sup>5</sup> British Council (2020). Crafting Futures - Sustaining handloom weaving in the Philippines.

<sup>6</sup> Neri (2019, June 30). How To Wear Philippine Indigenous Textiles Responsibly, According To A Textile Expert. Retrieved from <https://metro.style/fashion/style-inspirations/culturalappropriation-indigenous-textiles/8035>

<sup>7</sup> The Story of HABI: The Philippine Textile Council. December 7, 2021. <https://www.habiphilippinetextilecouncil.com/blogs/what-we-do/the-story-of-habi-the-philippine-textile-council>

<sup>8</sup> PTRI's 42nd Anniversary. PTRI website. <https://ptri.dost.gov.ph/86-new-articles/106-ptri-s-42nd-anniversary>

<sup>9</sup> Yarn innovation center to rise in Ilagan. May 13, 2022. Philippine News Agency. <https://www.pna.gov.ph/articles/1174434>

variety of uses. With the use of bamboo as material weaving yarns, it will add diversity to the livelihood of weavers in the area. According to the Forest Foundation, diversity in livelihoods particularly those derived from non-timber forest products (NTFP) can boost the ethno-competitiveness of indigenous people who live in the forestlands. This could help to alleviate pressure from exploitation on a particular forest commodity.

These investments by the Philippine government is good news for weavers as they now can have more access to sustainable tropical yarns. This solves the problem of access to materials, which designers also have a problem with. But another problem for them is sourcing from rural weaving enterprises themselves.

### **Panublix Weaving Enterprise Digital Enabler (PWEDE) and Tech Platform**

It is a challenge for designers if they do not have direct contacts to the communities. This was further exacerbated by the lockdowns at the height of the COVID19 pandemic. E-commerce could be an enabler, but rural artisan enterprises experience the digital gap brought about by limited internet infrastructure and connectivity. Furthermore, the limited information available about weavers contributes to a lack of transparency and traceability that is much needed in the sustainable fashion & design industry.

This is why Panublix is building a technology platform to connect designers, weavers & customers so they can source, co-design, and wear sustainable products while creating a data-driven supply chain built for transparency & traceability. As more weaving enterprises, designers and consumers are onboarded on the platform, this can create network effects to generate insights on sustainability.

Figure 1 shows the conceptual framework of the Panublix platform, where we have weaver, designer and customer interacting in one ecosystem through three business models namely Material Sourcing, Marketplace and a Digital Atelier. But for this to happen, the digital gap of weavers needs to be bridged by having a holistic program to guide them towards a digitalization journey. Such is the intent of the Panublix Weaving Enterprise Digital Enabler or PWEDE.

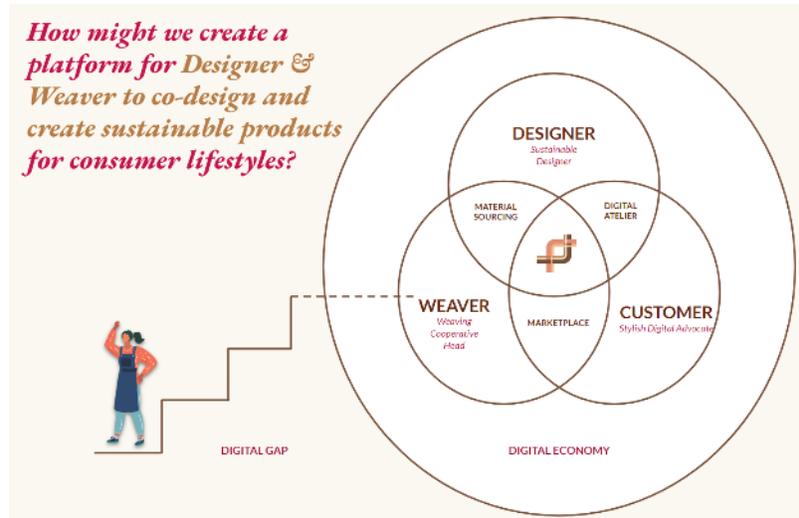


Figure 1. Panublix Platform Concept

### Exploring how the digital platform can help forests

With this scoping grant aimed at exploring the connection between weavers and forests, the platform can be designed to capture relevant data to generate insights, not just for supply chain information & socio-economic data on weaving communities, but also on environmental impact especially for forests.

According to The United Nations Economic Commission for Europe (UNECE), there is a significant link between fashion & the forests. With a significant share of fashion made from synthetic fossil-fuel produced fibres, forest fibres that are sustainably harvested and renewable are solutions for a sustainable fashion industry. That is why in 2014, the Forests4Fashion program was established in order to promote sustainable forest management. It is in line with the objectives of the UNECE/FAO Integrated Programme of Work, which is to increase awareness of the value of forests, forest products, and forest services to many industries, including the textile and fashion industries<sup>10</sup>. The initiative is also in partnership with the UN Alliance for Sustainable Fashion<sup>11</sup> and the UN Forum on Forests<sup>12</sup>, along with various independent fashion brands and associations.

In a webinar last January 20, 2021, Textile Exchange, a global nonprofit that creates leaders in the preferred fibre and materials industry and the Programme for the Endorsement of Forest Certification (PEFC), they examined how certification helps the fashion industry's push for

<sup>10</sup> <https://unece.org/forests/forests-fashion>

<sup>11</sup> <https://unfashionalliance.org/>

<sup>12</sup> <https://www.un.org/esa/forests/index.html>

sustainability<sup>13</sup>. Third party certification is a powerful enabler to ensure platforms and business models contribute effectively to forest resource management and other environmental, social and governance (ESG) metrics.

But third-party certification requires several data points to collect. This is where technology can play a role. If the technology platform of Panublix can be designed to include the necessary data that can help secure these certifications, such as from PEFC, the Sustainable Forest Initiative<sup>14</sup>, this would give visibility to the weaving and textile ecosystem.



Figure 2: <https://pefc.org/news/a-sustainable-fashion-industry-forests-can-help>

<sup>13</sup>

<https://pefc.org/events-training/textile-exchange-webinar-creating-lasting-value-for-forests-with-sustainable-manmade-cellulosic-fibre>

<sup>14</sup> <https://www.sfidatabase.org/>

## Statement of the Problem

With the presence of a RYPIC in the province of Isabela, which is in the same region as the Sierra Madre Mountain range, there is an opportunity to explore how technology can not only bridge the digital gap of weaving communities, but also aid in generating data-driven insights to contribute to forest management and conservation. The Panublix technology platform, especially its Panublix Weaving Enterprise Digital Enabler (PWEDE) can be designed, deployed & utilised in the region to address the digital gap while being able to create the necessary insights to inform how weaving benefits forest management.

However, digitization is a journey, and what works in one region may not work in another. There is a need to assess to what extent do weaving enterprises in the new region adopt digital solutions. Are they also aware that these digital solutions can contribute to forest management? What are the barriers and challenges of weavers in adopting these digital solutions? Is there training necessary to bridge knowledge and skills gaps? And lastly, considering the region where the Sierra Madre mountain range is located, what impact and sustainability-related data points can be captured to provide as much transparency of products to consumers?

Figure 3 shows the Gap Analysis of the problem.

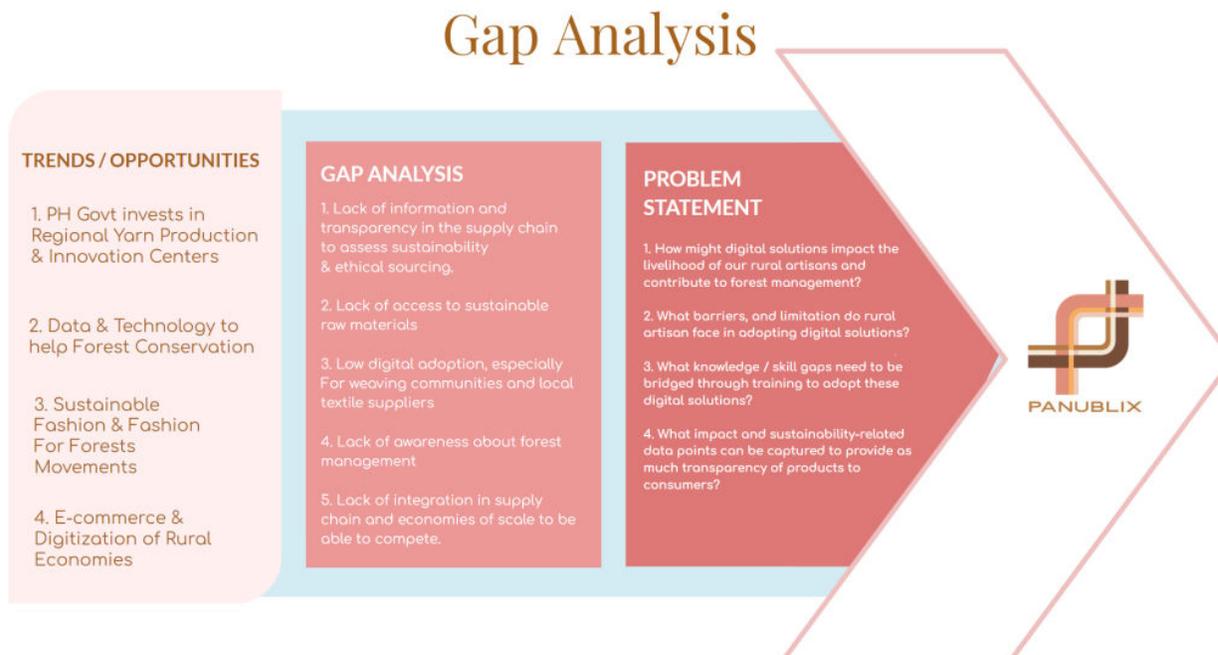


Figure 3. Gap Analysis

## **Objectives**

This study, focusing on three weaving communities in Isabela, aims to:

1. Explore the impact of digital solutions to the livelihood of our rural artisans and forest management
2. Identify key priorities, barriers, and limitations of a digital sourcing platform to rural artisans
3. Find out the necessary training required of communities to adopt these digital solutions
4. Capture any impact and sustainability-related data points to provide as much transparency of products to consumers

## **Scope and Limitations**

This study will focus on the province of Isabela located in the Cagayan Valley Region (Region II). The province also houses the Northern Sierra Madre Natural Park. It is also the site of the second Region Yarn Production and Innovation Center (RYPIC), funded by the Department of Science and Technology. Three weaving communities were identified in order to discover their lived experiences of weaving, raw material sourcing, and their awareness of their role in forest management. These enterprises have been identified to be the potential users of nature-derived yarns that the RYPIC will produce.

The recommendations of this study are based on the results of our engagement among the participants, including secondary data gathered from involved stakeholders. Due to the current Covid-19 restrictions in the community, research methodologies were limited to a small face-to-face focus group discussion, and secondary data gathering.

## **Significance of the Study**

The weaving industry has been a huge part of the intergenerational culture of the Philippine communities. However, the development of this industry has obliged it to subscribe to “fast fashion” and utilise the cheapest but unsustainable raw material— polyester.

The fashion industry has embraced sustainable development as they align with the Sustainable Development Goals (SDGs), and look for alternative sources and promote sustainable fashion and equitable livelihood while promoting the conservation of the natural environment. Thus, this study aims to assess the current weaving practices in Isabela Province and identify

mechanisms to align it with a web application in development that aims to address the barriers among local weavers through a technology platform - PWEDE.

The results of this research will be an added value in lobbying policy recommendations and basis for future research initiatives, project implementation, capacity building workshops, and the likes in support to local weavers of Isabela.

It is within the hopes that the information that was discovered during the conduct of this impact and sustainability-related data points to provide as much transparency of products to consumers research would help the industry by enhancing its methods, tactics, and craft production that will ultimately also help the environment.

Technology is the bridge to greater accessibility, resulting in life-changing impacts. The goal of the research was to learn how technology can be harnessed to not only help designers with a one-stop shop for sourcing sustainable materials and weaves but also get the rural artisans, indigenous weavers, and their products to be accessed, without having the need for a physical visit. The study also aims to assess the artisans' resources, level of tech readiness and openness, and challenges when it comes to technology, so that these factors will be taken into consideration in the design of the PWEDE sourcing platform.

This scoping study falls under the "Recovery" theme of the Woven Networks Scoping Study Grant of the British Council and Forest Foundation Philippines. It aims to explore how a digital platform can support the recovery of the communities' livelihoods post pandemic by providing them with better access to market and natural raw materials. In parallel, it aims to influence the artisans to adopt a more sustainable practice that will not only increase their attractiveness to conscious consumers but also do the environment good.

Due to this development, this scoping research will focus on three weaving communities in Isabela - the Indigenous Enabel Craft, Santos Women Weavers Association, and the Young Kankanaey Loom Weavers. These enterprises have been identified to be the potential users of nature-derived yarns that the RYPIC will produce.

With these factors, there exists an opportunity to aggregate local weavers and textile producers. As most of the weavers are in rural areas which limits their market access, the feasibility of a digital platform to bridge the identified gaps in the weaving industry is explored. Currently in development by a local tech startup called Panublix, the "PWEDE" platform (or the Panublix Weaving Enterprise Digital Enabler) aims to not only solve the artisans' pain points, but also to

cater to a growing demand from designers who are looking to serve an increasing number of conscious consumers looking for transparency and traceability in the products they purchase.

## **2. Situational Analysis**

### **Panublix Weaving Enterprise Digital Enabler (PWEDE)**

Panublix Innovations Inc., also known as Panublix, is a sourcing platform and marketplace connecting designers with tropical textiles and artisan craft. Founded in 2021 in Iloilo City, Panublix comes from the Hiligaynon word, “panubli-on”, which means heritage as it aimed to revive the title of Iloilo as the Textile Capital of the Philippines and promote the use of Philippine tropical textiles to replace fossil-fuel produced polyester.

Through strategic partnerships with yarn producers like the RYPIC, Panublix has direct access to tropical yarns (fibre from cotton, abaca, pineapple, etc.). This provides both designers and rural artisans the materials needed to co-create products for the conscious consumer and shift them away from unsustainable synthetic fibres like polyester. A sourcing technology and development program is also in progress, aiming to put data points to production capacity, costs, and impact metrics. Capturing these details will give confidence for both designers and end customers to visibly see the impact of their consumption.

It is developing new technology and information products: the Panublix sourcing for designers, the Panublix co-design for end consumers, and the Panublix Weaving Enterprise Digital Enabler (PWEDE) for artisan enterprises.

One of the topics explored in this research is the role of online technology in business enhancement and recovery. As weaving enterprises in the Philippines have not yet fully embraced digital adoption, Panublix aims to be their bridge towards the digital economy by providing an online platform and an enterprise support initiative.

Panublix Weaving Enterprise Digital Enabler or “PWEDE” also spells out the Filipino word that means “Possible” i.e. it’s possible to enable our heritage and craft bearers for the digital economy! A partnership and social development program, it also has a digital platform that aims to track the different impact metrics in weaving communities, including sourcing of raw materials, introduction of the NonTimber Forest Products, and sustainability learning resources of communities. This will aid in the promotion and sales of local products and garments, and in lowering the carbon footprint of the textile industry. It initiates innovation for artisan crafts as well as reintegrate weaving, not just in the local community but also in a global aspect. It is a

platform for artisan enterprise to have the means to become prominent in the world of textile and trade.



Figure 4 - Panublix Weaving Enterprise Digital Enabler

### The Regional Yarn Production and Innovation Center

The Regional Yarn Production and Innovation Center (RYPIC) is the realization of the DOST Philippine Textile Research Institute's (PTRI) Textiles Empowering Lives Anew (TELA). It serves as an innovation hub to promote textile research and development activities in a region, thus igniting economic activity in weaving communities across the country. The RYPIC uses local raw resources, expertise, and talents to meet the yarns and fabric needs of micro, small, and medium enterprises (MSMEs) in the fashion industry, academia, and government institutions.

The first-ever RYPIC was established In Miag-ao, Iloilo as a result of cooperation between the PTRI, the DOST, and the Iloilo Science and Technology University (ISAT-U). This microscale yarn spinning plant has a fifty (50) kilogram per day yarn production capability that creates blends of natural textile fibres including abaca, banana, and pineapple coupled with cotton.<sup>15</sup>

The next RYPIC will soon rise in Cagayan Valley, within the premises of the Isabela State University (ISU), in an effort to kickstart local ecosystems for the textile industry. The ISU-based

<sup>15</sup> Regional Yarn Production and Innovation Center. PTRI Website. <https://dost-ptri-rypic.com/pages/index.php>

yarn facility, which will process bamboo and other natural textile fibres (NTF) is positioned to cater to the material needs of the local weavers, especially those of the indigenous which will strengthen both culture and commerce in the region.<sup>16</sup> Moreover, it will be supported by the Cagayan State University - Gonzaga campus, as the leading provider of bamboo and bamboo products in Cagayan Valley. It is also envisioned to be one of the emerging providers of bamboo raw materials that can be used in the RYPIC. The collaboration with the agroforestry experts from the academe, specifically CSU-Gonzaga campus, ensures the sustainability of forest management in the province.

As the country's textile innovation center, RYPIC initiates and nurtures multi-stakeholder relationships to ensure sustainability of the supply and value chain, promote development in academic research, and improve the technical competencies of the sector.

## **The Sierra Madre Madre Region**

### **Region 2**

The Region of Cagayan Valley, designated as Region 2, is at the northeastern tip of the Philippines and is surrounded by extensive mountain ranges: the Cordillera to the west, the Caraballo to the south, and the Sierra Madre to the east. To the north lies the Babuyan Channel which is next to the North China Sea.

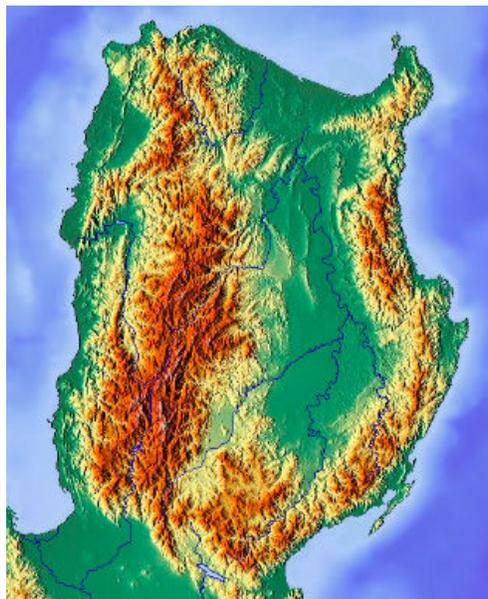


Figure 5. Relief Map of the Philippines showing Cagayan Valley surrounded by mountains  
(source: Wikimedia Commons)

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<sup>16</sup> Isabela State U to house P40-M yarn center to boost Region 2 textile industry. March 31, 2022. The Manila Times.

The provinces of Cagayan, Isabela, Quirino, Nueva Vizcaya, and the Batanes group of islands make up this fourth largest region in the country, with a total area of 2,683,762 sq. kms. 59% of its land area is best suited for forest and wildlife. About 992,992 sq. kms. is suitable for planting crops with 595,95 sq. kms deemed suitable for rice and corn, and 49,650 sq. kms. is suitable for fruit trees and perennials.<sup>17</sup>

Cagayan Valley is home to various indigenous peoples, cultures, and languages as the area is physically separated from the rest of Luzon by the abovementioned mountain ranges. Cagayan River, the longest river in the Philippines, runs through its center and the region has more than 1 million hectares of forest cover, the largest in the country.<sup>18</sup>

The Sierra Madre in the Cagayan Valley is one of the country's remaining forest blocks. This forest is one of the areas in the Philippines with a rich biodiversity, however is continuously threatened due to anthropogenic activities. The demands for sustainability in the textile industry has also influenced the demand for sustainable yarns. These yarns are sourced from natural fibres which includes abaca, bamboo, cotton, pinya, and the likes.

Having an abundant source of bamboo in the province, the utilization of bamboo fibres has been advocated including the reforestation of bamboo in the forest of Cagayan Valley which covers the Sierra Madre forest. The NTFP-Extension Program also entails capacitating the community in implementing a sustainable mechanism from planting, harvesting, up to weaving bamboo fibres in the province. Thus, the protection of the Sierra Madre forest also entails cultural responsibility to the indigenous communities which also helps them preserve cultural heritage and ecological diversity, while advancing economic empowerment.

## **The Province of Isabela**

Isabela is a landlocked and coastal province in the northeastern Philippines with a total land area of 13,102.05 square kilometers.<sup>19</sup> As of 2020, its total population is at 1,697,050 which represents 46.04% of the total population of the Cagayan Valley region.

As of 2016, this agricultural province has tallied an annual income of approximately 2.6 billion pesos, and is considered as the 10th richest province in the Philippines as of 2020. Acknowledged as the Regional Trade and Industrial Center of north-eastern Luzon, the province

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<sup>17</sup> Cagayan Valley Profile. Department of Agrarian Reform website. <https://www.dar.gov.ph/regions/cagayan-valley/profile>

<sup>18</sup> Department of Environment and Natural Resources. (2019, October 19). Regional Profile retrieved on Aug 18, 2022 from <https://r2.denr.gov.ph/index.php/about-us/regional-profile>

<sup>19</sup> PhilAtlas (n.d.), Province of Isabela retrieved on July 13, 2022 from <https://www.philatlas.com/luzon/r02/isabela.html>

takes pride with its agricultural products which are rice, corn, and bamboo. Its major urban centers, Ilagan, Cauayan, Santiago, and the town of Roxas, are the main commercial areas of the province.

### **Cauayan City, Isabela**

Established in 1970 as a town of Cagayan province in northeastern Luzon, Cauayan was named after the *kawayan* (bamboo) groves that once grew in abundance along the meandering river. Cauayan is a 3rd class component city in the province of Isabela with a total land area of 33,641,844.77 hectares of which 59.33% is occupied by the agriculture industry. Its total population is 143,403 and the main sources of livelihood are agriculture trade and commerce services.<sup>20</sup>

While Cauayan was founded in 1739 by Spanish missionaries, the city traces its roots to the Gaddang ethnolinguistic group.<sup>21</sup> It is now considered a melting pot of cultures with residents of different ethnicities.

Rogus, the site of the Young Kankanaey Loom Weavers, is the landlocked border of Cauayan City to the neighboring municipalities of San Guillermo and Benito Soliven. It has a total land area of 2005 hectares and is situated 45 kilometers from the poblacion. It is also home to the migrant Kankanaeys of the Cordilleras, Ilokano, and Yogad.

The Kankanaeys of Rogus settled in Cauayan City late in the 1960's from the Cordillera Range. Rogus was derived from the word Ragas which means excess fabric. Rogus used to be a part of San Mariano but was later moved to Cauayan. According to the community's elders, Rogus was like a discarded fabric from San Mariano that was then attached to Cauayan's outskirts.

### **Quezon, Isabela**

Quezon, a 4th class municipality, is where the Indigenous Enabel Craft, and the Santos Women Weavers Association is situated. With a land area of 29,415.18 hectares, 47% of its land is occupied by the agriculture industry. It has a population of 27,037 and the municipality primarily relies on agro-trade and commerce services with rice, corn, and root crops as its primary agricultural product.<sup>22</sup>

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<sup>20</sup> Philippine Statistics Authority (2020), Provincial Census of Isabela

<sup>21</sup> City of Cauayan. (2014) Know Cauayan City. Retrieved on August 17, 2022 from <https://cityofcauayan.gov.ph/know-cauayan-city/>

<sup>22</sup> Municipality of Quezon, Isabela (n.d.). Creation of the Municipality. Retrieved on August 17, 2022 from <https://quezonisabela.gov.ph/general-information/>

Quezon's original settlers are the Igorot and Kalinga people from the neighboring region of Cordillera. In the 1930s, the Philippine government opened up the area for settlement and rural development which attracted migrants from Ilocos and Central Luzon.<sup>23</sup> Today, the dominant spoken languages in Quezon are Ilocano, Tagalog and Kankanaey.

### **An Abundance of Bamboo**

Bamboo is one of the top raw materials that has been identified for yarn production in Cagayan Valley which is a good replacement to petrochemical based synthetic fibres. Quick to grow, it usually requires no pesticides and fertilisers, thus naturally organic.

All municipalities in Isabela have established bamboo nurseries and plantations, with approximately 50 hectares initiated by Isabela State University in partnership with LGUs. There has been a total of 1,118 hectares of bamboo plantation recorded from 2015-2017.

According to DENR, in November 2020, an extensive propagation of bamboo in Cagayan Valley was launched to serve as a long-term solution to flooding and landslides in the city. There were 80.68 Ha of bamboo planted along riverbanks in support of the Build Back Better Initiative as of April 2021. Further, the Bureau of Fisheries in Region 02 has just started its massive bamboo planting project near the Cagayan River, under the Oplan Sagip Ludong (OSL) project. Bamboo has been considered as a tool for climate change mitigation for its capability to sequester five metric tons of carbon dioxide per hectare of plantation.<sup>24</sup>

Besides its environmental benefits, this resource has huge economic benefits. Bamboo has been identified by the Cagayan Valley-Local Industry Management Strategy (CV-LIMS) as one of the priority commodities of the region on the basis of Growth Potential, Poverty Reduction, Job Generation, Prospects for Success, Outreach and Existence of Value Chain Analysis. To raise awareness on the importance of bamboo, some towns and provinces in the region started bamboo propagation, spearheaded bamboo livelihood programs, developed Bamboo Eco Park to sustain the Bamboo Development Project.

Overall, bamboo farming can help build climate-resilient communities because it will not only control flooding but it will also save the forests, increase income, and at the same time protect the environment, biodiversity and the ecosystem.

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<sup>23</sup> Municipality of Quezon, Isabela (n.d.). Creation of the Municipality. Retrieved on August 17, 2022 from <https://quezonisabela.gov.ph/general-information/>

<sup>24</sup> Rivera, D. (2022), Philippines looking into bamboo's economic potential, The Philippine Star retrieved on July 23, 2022.

## **The Weaving Communities**

In this scoping research, participants come from three (3) identified weaving communities in Isabela Province, specifically two (2) from Quezon, Isabela, and one (1) in Cauayan City (*Brgy. Rogus*).

The two weaving communities in Quezon, Isabela are the Santos Women Weavers Association (SWWA) and the Indigenous Enabel Craft (IEC). The SWWA started as a church organization among women wovers in the community. They specialize in finished products, including bags, masks, and the likes. The IEC was established by a previous member of the SWWA who envisioned running her personal weaving business. With experiences and learnings from her previous engagement with SWWA she envisioned IEC to be independent and for her products to be competitive to the market.

Meanwhile, the Young Kankana-ey Loom Weavers (YKLW) is a newly established organization in 2021. It's establishment was born from a training conducted by the LGU of Cauayan and DTI in order to preserve the weaving culture among Kankana-eyes. The YKLW were trained by one of the weavers of IEC, thus knowledge transfer of some basic weaving techniques were also shared to them. However, since the members of YKLW are mostly full-time students, production of the YKLWA is relatively slow compared to IEC and SWWA.

## **4. Methodology**

### **Sampling**

This research utilised a descriptive qualitative analysis in assessing existing weaving practices among artisan communities in Quezon and Cauayan in Isabela. The participants came from three groups, assumed to be at three different stages of growing their enterprise. This was intended to surface each cluster's unique needs, common experiences, and readiness to be onboarded into the digital economy. Sampling was also based on the accessibility and pre-existing established connections of the research team.

### **Data Gathering**

Pertinent data were gathered through Focus Group Discussion (FGD), a useful method for bringing together individuals with comparable backgrounds or experiences to talk about a

particular topic of interest.<sup>25</sup> It was utilised as the main data gathering method as it provided a chance to reveal the values, ideas, and experiences that a group holds.

FGD's were facilitated per area - one in Quezon and one in Rogus, respectively. Due to the close vicinity and close ties of Indigenous Enabel Craft and Santos Women Weavers Association, these two groups were merged into one session. The other FGD was conducted with the Young Kankanaey Loom Weavers. The two sessions were casual and informal to enable a more organic, intuitive, and equal discussion between the researcher and the respondent.

Thoughtful introductions of each researcher were held, along with the objectives and supporting organisations of the study. Consent forms for the research and taking of photos were distributed and explained at the beginning of the FGD session to ensure that they understand the intentions of the research and have agreed to participate in the study. Prior to visiting the community, the researchers have also gained permission and coordinated with the heads of communities through email, call, and via Facebook messenger. The consent forms which are in Tagalog are attached in the appendices.

This study also gathered data through desk research, reviewing information from newspaper articles, academic journals, books, and other references. All sources are enumerated at the last part of this document.

### **Data Analysis**

This research utilized the PESTEL Framework of Analysis in identifying the challenges and opportunities of the identified weaving communities. PESTEL Analysis is a widely used tool that helps analyze the Political, Economic, Socio-Cultural, Technological, Environmental, and Legal changes in a business environment. It is meant to provide a better understanding of the "big picture" forces of change that one is exposed to, and, from this, take advantage of the opportunities that they present.<sup>26</sup>

It will also guide the partner industry on how they can facilitate the introduction of a digital platform as an innovative approach to push for market access and sustainability. The results of this analysis will be utilized in crafting interventions through solutions-oriented technology and training among identified weaving communities.

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<sup>25</sup> Stewart, D.W. and Shamdasani, P.N. (1990) Focus Groups: Theory and Practices. Sage, UK.

<sup>26</sup> Aguilar, J. (1967), PESTEL Framework, Scanning the business environment retrieved on July 13, 2022



Figure 6. PESTEL Framework in the Province of Isabela [IEC, SWWA, YKLW]

Some weaving communities in Isabela include the Indigenous Enabel Craft (IEC), the Santos Women Weavers Association (SWWA) and the Young Kankaney Loom Weavers (YKLW). The respondents from YKLW range from between 18 to 23 years old while those from the other focus group (IEC & SWWA) are from 16 to 65. These communities are connected in an intertwined history of its establishment and development.



Image 1. FGDs conducted at (left) Santos, Quezon and (right) Rogus, Cauayan

**Establishment.** SWWA was first established as a church organization that aims to empower women through weaving and crafts. This later turned into a cooperative among women weavers

in Santos, Quezon, Isabela. As the years progressed, a member of SWWA established her own weaving business, the IEC. On the other hand, the YKLW, trained of loom weaving by the IEC, was established as an association as assisted by the DTI and the City of Cauayan. This weaves the narratives among the three research communities of this study and how we can traverse through their respective practices and identify avenues to facilitate the introduction of a technology platform in support to their respective weaving industries.

**Demographics.** The YKLW has members which are mostly in senior high or in college level, while the IEC and SWWA have a broader range of ages 16 to 65. The three communities is composed of predominantly women, but there would be a few males as well.

**Products.** IEC and SWWA create items such as coin purses, bags, apparel and shawls, other than the weaves that are bought by designers to turn into products. During the pandemic, IEC managed to pivot to selling face masks. YKLW, as a starting organization, would mostly sell weaves on its own.

Items from IEC and SWWA are made of imported polyester, regularly ordered from a trader in Baguio. YKLW also uses polyester, as provided to them by the Department of Trade and Industry. For all of them, polyester is cheap, accessible and easy to work with as it is the material that they are used to. The consciousness of any environmental impact of their livelihood was not very present since their usual customers also do not demand this from them. After having an awareness that polyester is not biodegradable and is most likely piling up in the landfills, they became open to try nature-derived alternatives when made available and affordable.

**Operations.** IEC's customers are textile apparel brands that have specifications for textile or specific products they want to create. In transacting with textile apparel brands, IEC learned to implement a 30% deposit plus raw materials rule after experiencing unpaid commissions during the onset of the pandemic. As IEC is privately-owned, owners can make decisions right away. As for SWWA, an approval from the officers is required for major decisions, such as when accepting big orders. Both entities pay the weavers appropriately, whereas YKLW uses its profits to fund organizational expenses.

**Marketing and Sales.** Weaving enterprises in Isabela are extended of some support from government entities. IEC administrative personnel mentioned that Region 2 is not letting the weavers be left behind. IEC and SW gain customers by participating in bazaars and trade fairs initiated by DTI.

IEC has a proactive approach of cold calling potential customers, with having more customers from outside their vicinity. Products are usually transported through Victory Liner, a bus company. In some cases, the weavers earn less than the middlemen who mark up their products at a premium cost. SWWA, on the other hand, tends to rely more on local customers through referrals of churchmates and consignment to pasalubong centers. For YKLW, their products are posted on Facebook through the facilitation of their barangay officer and products are sent through community members who are bound to the city center in exchange of a small inconvenience fee. All three enterprises have used Facebook in marketing their products to a degree but the posts are seasonal and there are still no strategies in place.

**Working as a unit.** Weavers value their relationship with one another and consider the weaving community as a social network beyond their family life. The YKLW was able to improve a sense of collective identity as “weavers”, rooting from their ancestors of the Kankanaeys in the Cordillera.

For IEC and SW, they see the addition of two (2) high school and (3) college students as an opportunity to increase their labor force as well as train them and pass this intergenerational tradition of weaving. These students work on weekends and during school breaks, especially during the lockdown. They receive phone load as support for their studies and avail free food and accommodation from IEC.

**Livelihood.** Weaving eventually gave income to the high-school aged weavers and they saw it as a means to support their education. All weavers hope that work will be continuous for them. Other than weaving, some augment their income in farm work planting corn and rice, and drying unhusked rice.

For YKLW, economic gain was not much of an impact since they are still honing their skills. The lockdowns afforded them more time to practice and gain skills in warping. As all of them are pursuing their studies, most of them did not see it as something that they will do full-time but if they can develop their weaving association and earn more than the usual paid job, they might continue weaving to support the life they want while becoming culture bearers.

**Challenges.** In the three communities, several issues and challenges have been found out. Access was pointed out as one of the primary issues, specifically for the YKLW since they are located in the farthest community in Cauayan City. Because they are also in college-level, the struggle is in sustaining activity within the organization as most of them are moving out of the community for their tertiary education once face-to-face classes resume. For both IEC and

SWWA, their challenge is to be found by new customers and to increase orders to keep the business financially sustainable.

When they were asked how they perceive opportunity in the [weaving] industry, all of them answered “add more looms”. Some of the women dream of owning their own shop. They dream of more job opportunities for their communities [i.e. increase in orders; part-time to full-time]. Moreover, for YKLW, opportunity means more capacity building workshops and guidance towards establishing an [weaving] identity in terms of craft.

### PESTEL Analysis

**Political.** The regional and national political environment is relatively stable. As the government pushes for more free trade agreements with other countries, the barriers to import and export are reduced. The Department of Trade and Industry (DTI) has been making efforts to revive the local garments and textiles industries, to generate more employment - as part of the administration’s inclusive growth agenda. Besides the DTI, TESDA, DOT, DOLE, DSWD, and their local LGU have programs that can provide assistance to MSME’s. These are elaborated further under the stakeholder identification section.

**Economic.** Inflation is the gradual rise in the general level of prices for goods and services in a given economy. When the inflation is high, consumers have less purchasing power. Similar to the trend at the national level and in Cagayan Valley region, inflation in Isabela increased to 5.5 percent in July 2022, from 5.2 percent in May 2022. In June 2021, inflation in Isabela stood at 7.0 percent. This uptrend was mainly due to the higher annual hike in the housing, water, electricity, gas, and other fuels and transport.<sup>27</sup>

Table 1. A Year-on-year Inflation Rates (Source: Philippine Statistics Authority)

AREA	June 2021	May 2022	July 2022	Year to Date
Philippines	3.7	5.4	6.1	4.4
Cagayan Valley	6.5	5.1	5.3	3.7
Isabela	7.0	5.2	5.5	3.2

<sup>27</sup> Summary Inflation Report - June 2022. Philippine Statistics Office Region 2.  
[http://rso02.psa.gov.ph/sites/default/files/SPECIAL%20RELEASE\\_CPI\\_ISABELA\\_JUNE%202022.pdf](http://rso02.psa.gov.ph/sites/default/files/SPECIAL%20RELEASE_CPI_ISABELA_JUNE%202022.pdf)

Like the global textile industry, the weaving communities have been negatively affected by the Covid-19 pandemic. Amidst the economic difficulty, IEC experienced serving a long-time client whose business suddenly halted due to financial issues. The outstanding balance to them was left unpaid and the said business remained unoperational up to this date. When stocks started piling up, IEC pivoted to creating masks. For YKLW, they earned a small amount from selling weaves beginning 2021, which was spent to cover their operational expenses.

Full-time weavers are able to augment the income of their family. For the youth at IEC, they see weaving as a means to finish their studies. The economic well-being of the weavers that depend on the enterprise is a motivation to continue.

## **Social**

Globally, consumers and designers are becoming conscious of their lifestyle and support the sustainable and ethical activities of local brands. They are shifting their interests in knowing the materials used, their origin and processing methods, and demand for a more transparent way of sourcing from local markets. This increase in interest in sustainability is also seen in the Philippines. There is a growing number of local designers and brands who are rethinking production cycles to make materials last longer and to reduce environmental footprint. Also, small businesses are working with local communities to support their livelihood. More consumers are avoiding fast fashion, and this shows that there is a growing demand for sustainable fabric in the country.<sup>28</sup>

## **Technological**

Over the years, the Philippines has advanced in terms of innovation and technology. The demand for tech-related goods, services, and automation is growing across all industries. The main factors driving this increase in demand include a young, middle-class population that is expanding, as well as their enjoyment of tech-related goods and services. Social classes across the socioeconomic spectrum use smartphones for e-commerce and social media. In general, the ordinary Filipino youth increased their level of digital literacy, driven by the shift of traditional face-to-face classes to virtual learning due to the Covid pandemic.

## **Environmental**

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<sup>28</sup> Madsen, M. (2020, March 30). The Future of Fashion: Philippine Brands and Local Designers Focus On Sustainability. Retrieved from <https://ph.asiatatler.com/style/the-future-of-fashion>

The fashion world is strongly affected by the new approaches to sustainability and circular economy to economic development. As reported by the UN Alliance for Sustainable Fashion, the textile industry is responsible for 8-10% of the world's greenhouse gas emissions and 20% of industrial wastewater pollution worldwide.<sup>29</sup> The attention to sustainability, respect and protection of the environment, enhancement of human resources, the safety of working conditions, and protection of health have become fundamental drivers for the development of the fashion industry. With the effects of the global climate crisis, sustainability is a primary factor to look for in brands.

## **Legal**

The Republic Act 9242, also known as, "An Act Prescribing The Use Of The Philippine Tropical Fabrics For Uniforms Of Public Officials And Employees And For Other Purposes," mandates the use of tropical fibres in all government uniforms to represent culture.<sup>30</sup> As an advocate of indigenous Philippine textiles, Senator Loren Legarda urges the national and local government to continue investing their support for the local weaving industry that goes beyond fashion. With these initiatives, there is a favorable outcome in reviving and preserving the local textile industry if implemented well.

One of the Philippine laws that support enterprises is Republic Act No. 10644: "An Act Promoting Job Generation and Inclusive Growth Through the Development of Micro, Small and Medium Enterprises", otherwise known as the "Go Negosyo Act". Its salient features include establishment of Negosyo Centers in all provinces, cities and municipalities nationwide; establishment of a Start-up Fund for MSMEs to be sourced from the MSME Development Fund and BMBE Fund; technology transfer, production and management training, and marketing assistance for SMEs; and recomposition of the MSME Development Council and its additional functions.

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<sup>29</sup> United Nations. (2019, July 12). United Nations Fashion Alliance. Retrieved from <https://unfashionalliance.org/>

<sup>30</sup> Implementing rules and regulations of Republic Act 9242. (2004). [http://www.csc.gov.ph/phocadownload/GovtIssuances/IRR\\_RA9242.pdf](http://www.csc.gov.ph/phocadownload/GovtIssuances/IRR_RA9242.pdf)

## SWOT Analysis

A SWOT analysis is one of the tools used in situation analysis that examines an entity's strengths, weaknesses, opportunities, and threats, both from a current and future perspective.

Table 2. SWOT Analysis

<p style="text-align: center;"><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>● Weavers are adaptable and teachable [open to exploring other alternatives for polyester]</li> <li>● Weaving experiences</li> <li>● Social capital in community / tribe connection</li> <li>● Organized associations</li> <li>● LGU has enacted DTI's lobbied Bamboo Development Ordinance along with neighbouring municipalities Benito Soliven and San Guillermo</li> <li>● Creation of proposal addressed to LGU, supported by DAR on allotment of a piece of land with bamboo propagules.</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>● Insufficient knowledge on technological and digital platforms</li> <li>● Weak organizational management skills</li> <li>● Poor handling of funds</li> <li>● Access to community</li> <li>● Is not easily accessible during the rainy season</li> <li>● Water levels can rapidly rise, covering the bridge connecting the forest region to the poblacion</li> <li>● Lack of weaving looms</li> <li>● Have not attended any sustainability-related events</li> </ul>
<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>● Support from institutions / government agencies [BLGU MLGU, PGO, DTI, DOST, academe, church]</li> <li>● Trade fairs</li> <li>● Existing online platforms for selling</li> <li>● Has communal access to Internet in barangay hall</li> </ul>	<p style="text-align: center;"><b>THREATS</b></p> <ul style="list-style-type: none"> <li>● Power Outage</li> <li>● Weak internet connection</li> <li>● Climate Change</li> <li>● COVID -19 Pandemic</li> <li>● Price range of polyester vs bamboo yarns</li> <li>● Expensive logistics cost</li> <li>● Lacking sources of regenerative textiles</li> </ul>

## **5. All-Hazards Analysis**

It was also pointed out that the frequent power outage in the province, especially during the night and rainy season, is also seen as a big factor that could hamper the time of their [weaving] production process. As per respondents, “a single lightning can put off the electricity of the entire community.” IEC and SW have also mentioned that they are concerned about their enterprises’ survival during this pandemic. Livelihoods of weavers who depend on these two communities are at stake.

Natural calamities also pose a threat in the community, specifically flooding and landslides. Floods are almost a natural occurrence for adjacent barangays. Although indirectly affected, Rogus, being connected by a bridge (that’s easily flooded by continuous drizzle), along with other barangays in the forest region remains cut off from the rest of the Poblacion due to this. Moreover, a total of five (5) landslides have occurred in Rogus in the past years alone, specifically in Purok 1(2); Purok 5 (1); Purok 2 (1); Boundary (1). All of them occurred in the past year’s rainy season. The community’s loom weaving facility is temporarily sheltered at the Barangay Hall situated near a landslide prone area in Purok 2.

## **6. Exploring a Possible Digital Solution**

Isabela is as accessible to the world as any major city or key destination is. A dependable telecommunications and multimedia infrastructure ensures 24/7 connectivity through the internet, satellite, cable, and cellular services. Television channels, radio stations, and national and local newspapers are accessible in all of Isabela.

### **Impact of digital solutions to the livelihood of our rural artisans and forest management**

The leaders of each community are usually contactable over Facebook messenger. By being able to receive and take pictures or even do a video call, transactions such as showing products or explaining designs become clearer and more straightforward. As all three enterprises have their own Facebook pages, they would get occasional inquiries from random potential customers.

Because of IEC’s and SWWA’s presence on Google Maps, they have more chances of getting walk-in customers. Once, IEC had a celebrity visitor turned customer because the enterprise showed up in Google search. In terms of payment, they are able to use GCash for personal and professional transactions. YouTube, on the other hand, was utilized to learn new weaved designs.

From the FGD, it was noted that the weavers show strong commitment, and willingness to adopt to using an online technology that can help solve their pain points. Their younger members who are more digitally-savvy can take over the use of a digital sourcing platform. Other than incentives, experiencing concrete benefits will make them actively use such service.

For the external environment, there is already some support from the local government and other players. With more support from the market, and other related industries, weavers can harness their e-commerce potential.

### **Features of PWEDE**

Panublix has started working on PWEDE featuring two products: Panublix Sourcing and Co-Design. Currently, Panublix Sourcing requires information from Artisan Enterprises (AEs) in order for Designers to avail of their products. The information to be gathered from AEs for Panublix Sourcing are their demographic profile, products, raw materials and sources of raw materials. A Sourcing Curator (SC) acts as a conduit between AEs and Designers. SCs are in the position to gather the information needed for Panublix Sourcing because of their role.

PWEDE is being custom-built by Panublix and will integrate HubSpot, Quickbooks and other softwares. Based on the Gartner Design Thinking, Lean Startup and Agile model, PWEDE is still in the building phase. Several iterations are needed to measure the benefits of enterprises onboarded. Some mock-ups are available at the annex part of this study.

Feedback from its target users are in the center of this design. Consultations with designers and weavers from Western Visayas were conducted in 2021 (from a previous study), and reconfirmed with the three weaving communities in this study. This mobile-first browser app will be used by communities who have a certain level of readiness and from initial assessment, IEC, SWWA, and YKLW can be the users of this online technology (but at varying degrees) after having undergone some foundational training. IEC, as the most mature business from the three, would benefit most from its features.

PWEDE will provide the following features:

- Access to sustainable tropical yarn (to replace polyester)
- Access to international markets / fashion designers
- Profile in a nationwide mapping which includes information on impact and sustainability
- Full-stack e-commerce support and digital marketing

- Built-in digital payments for financial inclusion
- Focused product development designed specifically for end customers
- Community of support with fellow Panublix Artisans

### **Training of Sourcing Curators**

Sourcing Curators will be trained using the Panublix Sourcing Curator Handbook. They will be familiarized with their functions in customer relationship management, community development, product design and adaptive communication. They will be trained to gather data for PWEDE and aid in documentation of user experience.

### **Coordination with Stakeholders**

Panublix will coordinate with local government units (LGUs) and national government agencies (NGAs) that are involved in providing services for AEs will be informed about data gathering for PWEDE. Their inputs will be considered in developing PWEDE.

### **Deployment of Sourcing Curators and Data Gathering from AEs**

SCs will be deployed in the top 5 regions with the most number of artisan enterprises based on DTI. The ratio of the number of SCs to the number of AEs will be 1:5. All the requirements for the ethical conduct of data gathering under Philippine laws will be observed.

### **Key Priorities of a digital sourcing platform to rural artisans as verified by the artisans themselves**

The key priorities of a digital sourcing platform will possess the features based on what needs the rural artisans expressed. All features listed for the PWEDE platform have been confirmed as 'good to have' by the three weavign communities.

One of the AEs we interviewed shared how some clients did not push through helping their community. Since one of the communities fear that this might happen again, a sourcing platform should also have reliable customers and partners.

The ease in using a digital platform should be a key priority. A sourcing platform with a user-friendly interface might further user engagement. Availability to switch to main local languages are also being explored.

## **Barriers & Limitations**

Geographical location of the communities can prevent communities from using a certain digital sourcing platform. In the communities that we encountered in Isabela, their area gets intermittent connection and blackouts during typhoons. Logistics for the products to be sent can also be affected by geographical location since some of the communities are located in areas without logistics companies.

While a learning curve is expected, younger members of the community has been assessed to be able to handle navigating an app like PWEDE, due to familiarity with apps like Facebook, Instagram, Shopee, Lazada, and Tiktok. As such, the application management can be delegated to them.

The weaving communities are not fully utilizing the internet in growing their enterprise. They rely on word of mouth and trade fairs to find customers. IEC has experience in conducting cold calls but still credits word of mouth and trade fairs to the increase in number of customers. They are aware of how the use of the internet increases their market access but could use more solid online strategies, better ad copy, branding and higher resolution photos. They would rather leave the use of e-commerce platforms to their designer clients.

Digital solutions may be of use to them if this answers their challenge in finding courier services for their products. The weaving communities may likely adapt the digital solutions if these can be proven to increase their number of customers and connect them to designers that will improve their products.

## **Training requirements of communities to adopt digital solutions**

Besides learning how to navigate the sourcing platform, the weaving communities could use more holistic trainings via the app. In Panublix's PWEDE, aside from training on the use of digital solutions, learning modules on sustainable sourcing and other topics upskilling topics in relation to the business (such as basic marketing and branding) could be included. Foundational basics could cover topics like 'how to send emails' which are animated content in Filipino that Microsoft has extended to us. These learning modules from Microsoft are currently available in the Grab drivers app.

In terms of in-person training opportunities, existing reproductive and productive activities and schedules must be considered. Moreover, equal opportunity will also be given to both men and

women in undergoing the trainings designed by Panublix in order to address the digital gap between producers (weavers) and consumers.

### **Identification of sustainability-related data points to provide as much transparency of products to consumers**

Upon interviewing the weavers, sustainability was not their concern. It would be difficult to include sustainability-related data that did not matter to the weavers. Thus, the sustainability-related data points that Panublix should consider initially are the type of raw material used and its source. Other sustainability-related data points may be gathered in the future once the weavers understand sustainability.

## **7. Stakeholder Identification**

Stakeholder identification gives a perspective on who are involved, what their roles and motivations are, including how they influence the industry. Stakeholders are generally considered to be a person, group, community, or organisation who are impacted by, or can influence, the implementation of a project. In this case, any entity that affects the handloom weaving textile industry directly or indirectly in the market. When stakeholders are engaged, they become advocates and supporters, and bigger and better outcomes can come out of it. This identification will help in the formulation of recommendations.

In order for our local weavers to prosper, they need an environment that will help them scale up. The identified stakeholders of the weaving enterprises in Isabela include their own community members, local government entities, the academe, non-profit organizations and aid agencies, the private sector including business intermediaries, design associations, fashion groups, creative professionals, and others.

During the scoping phase, several individuals and organizations were engaged, as summarized in Table 1. Potential stakeholders are also enumerated in Table 2, which serves as a list of future collaborators who may be involved in different capacities.

Table 3. Overview of Engaged Stakeholders for this Scoping Research

STAKEHOLDER	POTENTIAL ROLE
Indigenous Enabel Craft, Santos Weaving Women’s Association & Young Kankanaey Loom Weavers	The IEC, SWWA, and YKLW are the community weaving enterprises that were identified to be potential users of bamboo yarns that will be processed at the upcoming Regional Yarn Production and Innovation Center (RYPIC).
Department of Science and Technology - Philippine Textile Research Institute (DOST-PTRI)	DOST-PTRI leads the establishment of the RYPIC. Isabela is the site of the second DOST yarn facility in the country that will produce natural textile fibres like bamboo.
Isabela State University (ISU)	One of the ISU campuses will be the location of the upcoming RYPIC. ISU has 29 Research and Development Centers in support of the establishment of RYPIC within the campus. The university shall offer degrees in Textile Engineering and Textile Technology to sustain the textile industry in the region.
Department of Trade & Industry (DTI)	DTI provides local support to enterprises in the region in the form of marketing assistance and capacity development.
Provincial Environment and Natural Resources Office (PENRO)	PENRO is responsible for the implementation of DENR policies, programs and projects in the province such as bamboo planting activities.
British Council	The British Council promotes creative enterprises through several programs, one of which is the Woven Networks initiative, in partnership with the Forest Foundation Philippines. This one-year collaboration aims to showcase local communities' sustainable practices and significant role as artisans through research funding. <sup>31</sup>

<sup>31</sup> British Council and Forest Foundation to champion craft changemakers. December 8, 2021. <https://www.britishcouncil.ph/British-Council-Forest-Foundation-craft-changemakers>

Forest Foundation Philippines (FFP)	By encouraging cooperation and knowledge sharing between craft groups that depend on forests for their livelihoods and larger society, the project promotes more inclusive and gender-sensitive forest management.
Ben Alderson	Ben Alderson held Management Consulting and Strategy roles for the UK Government and the corporate sector. A previous Startup founder himself, and as the former Sr. Head of Investments & Strategy at the IdeaSpace Foundation from 2020 to 2022, Ben has helped Panublix in ensuring the viability of the PWEDE platform.

The weaving communities build relationships based on trust among local industry players. The stakeholders in the Isabela weaving industry are the weavers, customers, designers, local government units (municipal and provincial), and local department agencies.

The Department of Trade & Industry has been a key stakeholder in supporting the enterprises, offering capacity development programs in relation to their craft. The DTI has been the main actor in establishing the Young Kankanaey Loom Weavers through its young entrepreneurs program which included training and materials provision. The DTI also organizes trade fairs where enterprises, at a subsidized rent space, can showcase their products at an area with higher foot traffic like malls and other public spaces. Some marketing support are extended as well, such as when Indigenous Enabel Craft was featured at an article<sup>32</sup> and a video<sup>33</sup> at the DTI website and DTI YouTube page respectively, and there would be some product promotions on the DTI’s Facebook page as well.

The Municipality of Quezon Isabela also promotes local products on their website through an online directory<sup>34</sup> where images, videos, and contact details of IEC and SWWA are included.

<sup>32</sup> Enabel Enables a Community. DTI website. [https://www.dti.gov.ph/zero-to-hero/zth\\_luzon/zth\\_region-2/isabela-indigenous-enabel-craft/](https://www.dti.gov.ph/zero-to-hero/zth_luzon/zth_region-2/isabela-indigenous-enabel-craft/)

<sup>33</sup> Enabel Enables a Community. DTI YouTube page. <https://www.youtube.com/watch?v=zvEXNNZF99g>

<sup>34</sup> Local Products. Municipality of Quezon Isabela website. <https://quezonisabela.gov.ph/local-products/>

Table 4. Overview of Potential Stakeholders

STAKEHOLDER	POTENTIAL ROLE
Technical Education and Skills Development Authority (TESDA)	TESDA serves as the Philippines' Technical Vocational Education and Training authority, tasked to both manage and supervise technical education and skills development. In development, TESDA is set to accredit IEC to be a TESDA training center in the province. Further, TESDA offers dressmaking national certificates (NC II) that the weavers can take up to increase their skills and expertise. <sup>35</sup>
Department of Tourism (DOT)	The DOT promotes tourism in the municipality including the local products in the area.
Department of Foreign Affairs (DFA)	The DFA undertakes activities that aim to promote Philippine culture, such as showcasing Philippine weaves and textiles in different countries.
Department of Labor and Employment (DOLE)	DOLE provides livelihood assistance in the form of working capital or tools provision (such as sewing machines) to MSME's, including indigenous community enterprises. SWWA had been a recipient of this in 2010. <sup>36</sup>
Department of Social Welfare and Development (DSWD)	Through its Sustainable Livelihood Program, DSWD provides assistance through Seed Capital Fund which enhances financial assets; Skills Training Fund which enhances human assets through technical-vocational and life skills training; and, Cash for Building Livelihood Assets which rebuilds or enhances natural and physical assets necessary for livelihood operations. <sup>37</sup>

<sup>35</sup> DOST, TESDA supports indigenous enabel carftmaking in Quezon. July 11, 2022. PIA website.

<https://pia.gov.ph/news/2022/07/11/dost-tesda-supports-indigenous-enabel-carftmaking-in-quezon>

<sup>36</sup> DOLE Regional Office 2 Tuguegarao City. Notes to Financial Statement for the year ended December 31, 2018.

<http://ro2.dole.gov.ph/fndr/mis/files/COA/notes%20to%20fs%20final.pdf>

<sup>37</sup> DSWD's livelihood program continues to support women amid the pandemic. May 12, 2021.

<https://www.dswd.gov.ph/dswds-livelihood-program-continues-to-support-women-amid-the-pandemic/>

Academe (interns, researchers)	Schools can be a valuable resource of information, and researchers may learn something from the communities as well. Further, students in marketing, design, or IT may come in as interns for the enterprises to assist in brand development, for instance, and overall develop a mutually beneficial learning relationship.
Non-government organizations (NGOs) (e.g. Angat Buhay, Bayan Academy, Go Negosyo, SPARK, etc.)	NGOs that are into social development can assist by offering entrepreneurship, management and education training programs and services, as well as livelihood and skills training courses, microfinancing, and small scale funding for micro and small enterprises.
Corporate partners (hotels, cafes, resorts, other private entities)	Institutions that focus on economic empowerment, cultural advocacy, and sustainable development in their corporate social responsibility programs can be tapped to support the weaving communities. Through procurement, these businesses make good business by doing good.
Creative collaborators (fashion designers, clothing companies)	With an eye for design and the knowhow on materials and the latest trends, artists and designers can elevate the value of the products by bringing in a more contemporary design that is more attractive to the market. They transform the weaves into different products for the home and wardrobe.
Fashion groups (e.g. Philippine Fashion Coalition (PFC), Fashion & Design Council of the Philippines, Fashion Revolution)	Business support organizations in the fashion industry, such as PFC, has a mission is to create a roadmap for recovery during this post-pandemic phase, as well as a sustainable development plan for the future.
HABI: The Philippine Textile Council	HABI is tasked to preserve, promote, and enhance Philippine textiles through education, communication, and research. HABI can assist through webinars and lectures, competitions, and providing direct support to weaving

	communities by helping them market their creations as well as source better tools and materials for their use. <sup>38</sup>
Business intermediaries	Business intermediaries help products reach consumers. Stalls in shopping malls where there is high visibility and significant foot traffic.
E-commerce platforms	Online selling platforms connect individual product sellers to consumers, also providing marketing and shipping assistance.
Tech companies (e.g. Microsoft, Meta)	Besides tech companies offering free tech credits to social enterprises and startups, free digital upskilling programs are usually part of their corporate social responsibility. For instance, Microsoft has video courses in Filipino that can be plugged in to the PWEDE app. Courses range from the foundational lessons such as digital literacy, how to use email. Facebook also has a global #SheMeansBusiness initiative, offering free programs such as basic branding and digital marketing using the free services of Facebook.

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<sup>38</sup> HABI: The Philippine Textile Council. <https://www.habiphilippinetextilecouncil.com/pages/who-we-are>

## **8. Recommendations**

### **SWOT and PESTEL Recommendation**

In reference to the PESTEL framework of analysis, this research recommends the following strategies in advancing a holistic development among research community participants.

#### **S-O Strategies**

- Inter-agency and community collaboration among government and public institutions on conducting feasibility and market research on regenerative textiles and conducting an initial trade fair.
- Inter-agency and community collaboration in crafting and providing technical (weaving, technology and digital, and e-commerce) capacitating among weavers
- Utilizing the weaver's experiences and creating an online platform to capacitate weavers on regenerative textile and also establish an avenue for e-commerce.

#### **S-W Strategies**

- Utilizing existing collaborative projects with DTI and DAR in improving access roads to communities, creating efficient floodways, procurement of additional looms, and establishing more areas with stronger internet access
- Facilitation of organization and lobby capacity building projects on technology and digital platforms, organizational and resources management, and sustainability

#### **S-T Strategies / O-T Strategies**

- Conduct capacity building workshop on effects of COVID-19 pandemic and climate change to the weaving industry
- Facilitate organizations to lobby the following - a) access roads to communities, especially in Brgy. Rogus; b) sufficient electricity supply; c) cellular sites
- Lobby and conduct dialogues on market research of optimization of logistics costs and mapping of regenerative textiles in Isabela
- Lobby to optimize DAR project in conducting feasibility studies on polyester vs regenerative textiles
- Optimization of online platform to address lowering of logistics costs

#### **W-O Strategies**

- Organize a network among stakeholders in crafting a comprehensive capacity building workshop in organizational and financial management, climate change and sustainability science, regenerative textiles, including technology and digital platform solutions

These strategies are derived from the SWOT and PESTEL frameworks of analyses. These could be bases in crafting a development program or lobbying a comprehensive ordinance in implementing sustainable weaving practices in the province of Isabela. Thus, further research on the optimum capacity of bamboo fibre or other regenerative textiles as alternative materials in the weaving and clothing industry. Further research on the forest management and establishment of a regenerative textile map and network in Isabela is also recommended. We also highly recommend that government and private institutions find a sustainable way in lessening their respective carbon footprint as they advocate for sustainability in the clothing and fashion industry. Furthermore, this research recommends inter-agency cooperation in the implementation of every strategy mentioned above in order to optimize avenues in supporting Isabela weavers.

### **Ways to ensure effective engagement with hard-to-reach communities with limited digital connectivity**

The three communities are accessible by motorbike, tricycle, passenger and utility vehicles. Since both locations, Quezon and Rogus, have cellular networks and access to internet connection (both broadband and data), the leaders of these community enterprises may be reached via mobile and usually, Facebook messenger. In Rogus, there is wifi at their town hall, free to access by residents who may not have the resources to connect to the internet.

### **Compliance with Third Party Certification for Forest Management**

Much of the work for traceability of forest management also falls under the Regional Yarn Production and Innovation Center. The Department of Science and Technology must institutionalise mechanisms to be able to trace how the prospective material bamboo is sourced. If it is from forest resources, it must pass through third party certification such as the Programme for the Endorsement of Forest Certification (PEFC).

## **Integrating Technology for Material Traceability in the Textile Supply Chain**

Once these standards are accessed, digitization can be utilized to make sure all tiers in the supply chain comply with these standards. Once this has been integrated in the platform, weavers can be assured that the yarn that they are weaving complies with the necessary standards. The technology can also be designed to better inform the weavers about the forest management impact of their use of tropical yarns made from the non-timber forest product.

## **Using Data to Develop Financial Cases for Sustainability Financing**

Eventually, with the network effects generated from the platform, the data can be used for funding of environmental, social and governance (ESG) funds, which can be additional sources of capital for weaving artisan enterprises.

Society's everchanging systems contribute to better spaces for future generations to come. But these systems need to be reassessed because certain problems arise and are often overlooked. For instance, in the fast fashion industry, it is thriving as a result of the high levels of consumption that have been accepted in society. Fast fashion is a word used to describe clothing companies that create large quantities of goods faster and cheaper for their customers. To meet customer demands, industry trends are always changing. The newest current trends are accessible to consumers on a budget because of this apparel, which is mass-produced at a low cost. However, it is controversial whether the danger this poses to the lives of workers and the negative consequences it has on the environment are worth it. (Potempa, 2022).

According to the United Nations Economic Commission for Europe (2018), an environmental and social emergency might be used to define the status of the fashion industry as a whole today. The global emissions of greenhouse gases from the fashion industry are estimated to be between 2 and 8% of the total. Additionally, it has been noted recently that the textile sector plays a significant role in the entry of plastic into the ocean, which is an increasing issue due to the adverse effects on the ecosystem and human health. There is a challenge in the fashion industry on how to make it more sustainable. Together with fashion and design, other industries like finance must work together to build a more sustainable future. With that, here comes sustainable finance.

Financial institutions have a significant impact on funding and raising public awareness of sustainability-related issues, whether through enabling the development of alternative energy sources or by assisting companies that employ ethical and sustainable labor standards. Investment choices that consider an economic activity's environmental, social, and governance (ESG) factors are referred to as sustainable finance. Environmental factors include utilizing sustainable resources or reducing the impact of the climate catastrophe. Meanwhile, for social

factors, they include human and animal rights; consumer rights; and diverse hiring policies. As for governance factors, both public and private enterprises' management, employee relations, and remuneration procedures are covered (Bakken, 2021). In line with that, Morgan Stanley (2022) spoke with the investors of Calvert Research & Management. Their discussion revolves around the greatest sustainability problems that the fashion industry and its supply chains face, as well as the ideas that might have the most impact on reducing problems like waste and climate change. The investors consider the whole supply chain when thinking about sustainable fashion, including design, material sourcing, processing and production, distribution, end-of-life, and understanding business strategies. Also, due in large part to the industry's emphasis on overproduction for expansion, apparel businesses frequently fall short when it comes to tackling fundamental environmental concerns directly. However, there are those businesses that minimize the environmental impact at every level of the garment value chain, while some do not rely on production. In addition, they discussed the innovations in sustainable fashion, one of which is the process of digitization in business and e-commerce. As well as the exploration of how to upcycle and the importance of next-generation textiles. Other companies opt for using recycled polyester (rPET) but this may be a problem since it may release microplastics into the ocean when washed. Apart from that, they may also opt for using certified responsible animal, plant, or regenerative fibers.

In summary, creating a sustainable future takes a lot of work. In the fashion industry, there is a problem with how to make it more sustainable because of its negative impacts on the environment and the lives of its workers. Its integration with sustainable finance helps in dealing with concerns about the environment, society, and governance. It is important to consider the whole supply chain, especially when thinking about sustainable fashion, including design, material sourcing, processing and production, distribution, and business strategies. With that, the future of sustainable fashion involves the use of technology in digitization business processes, upcycling and recycling, the use of next-generation textiles, and the use of responsible animal, plant, or regenerative fibers.

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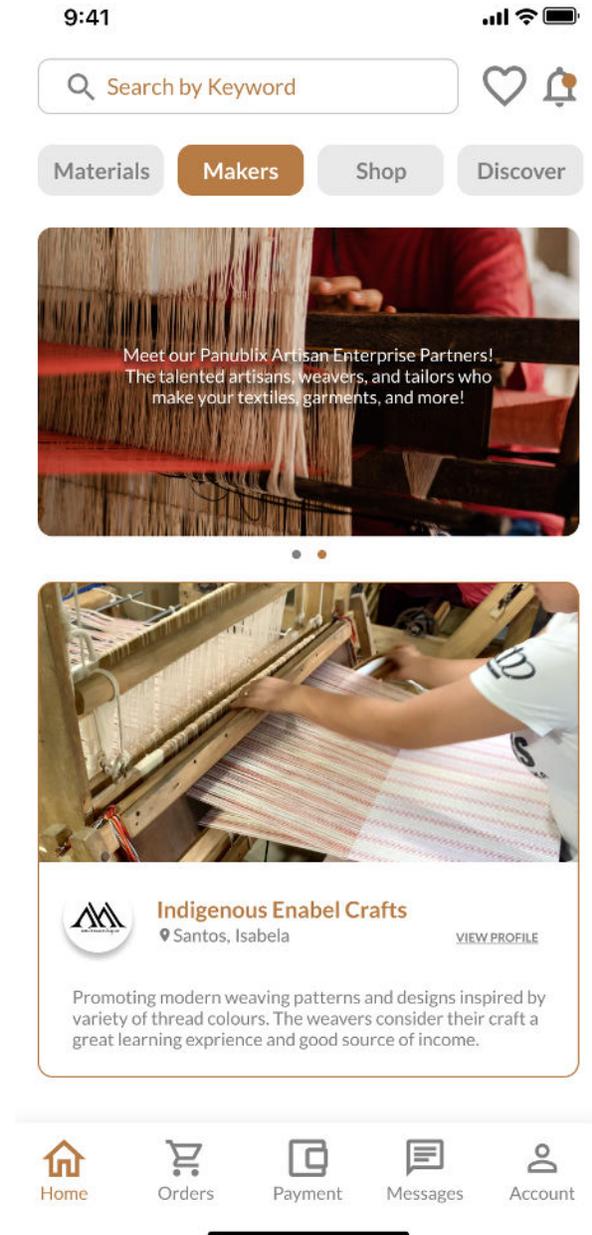
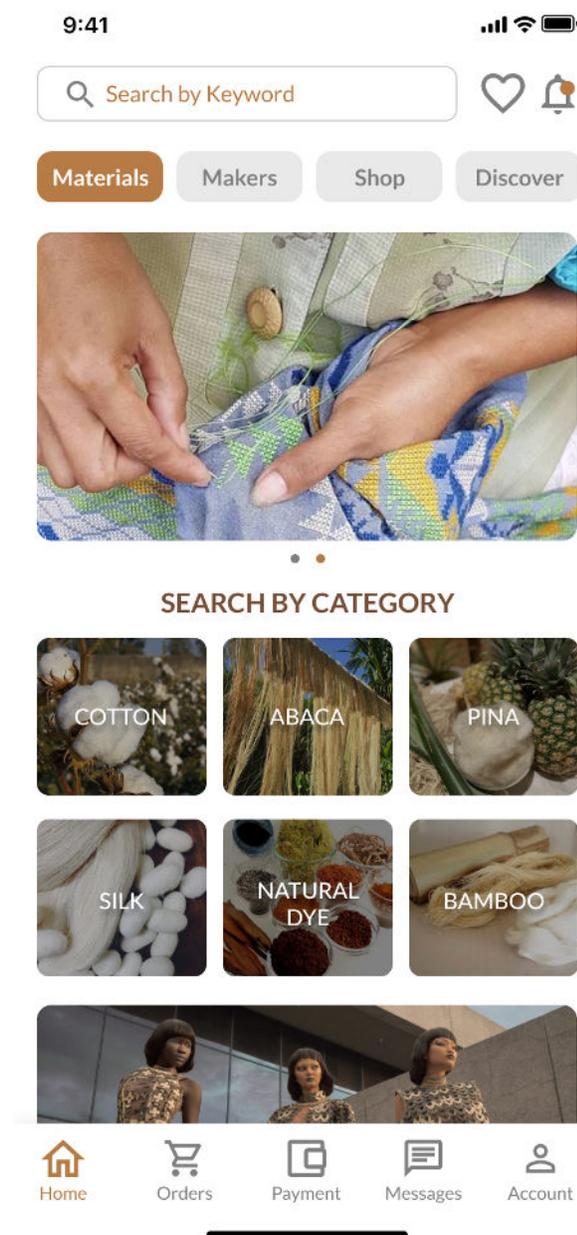
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# 10. Annex

## Mock up of the PWEDE APP





SHOP BY ARTISANS



ALL PRODUCTS

↑↓ Sort | 🗑️ Filter | 📄 View

100 items found



**Patadjong 1318**  
 Php 2,019.00  
 Php 2,849.00 29% OFF



**Patadjong 0118**  
 Php 2,019.00  
 Php 2,849.00 29% OFF

Home Orders Payment Messages Account



**Indigenous Enabel Crafts**

Promoting modern weaving patterns and designs inspired by variety of thread colours. The weavers consider their craft a great learning experience and good source of income.

- 📍 Location Santos, Isabela
- 🕒 Experience 00 years
- 👥 Active Members 00
- 📦 Production Volume 000 meters/month

OUR PRODUCTS

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et.



**Product Name**  
SKU NO. 000000



**Product Name**  
SKU NO. 000000



**Product Name**  
SKU NO. 000000



**Product Name**  
SKU NO. 000000

Home Orders Payment Messages Account