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臺灣在培養商業專業知識與瓜地馬拉竹產業永續成長中的角色：以培訓與產業發展為案例研究

Taiwan's Role in Developing Business Expertise and Sustainable Growth in Guatemala's Bamboo Industry: A Case Study on Training and Industry Development

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中文摘要

本研究以個案研究方式，探討臺灣如何協助瓜地馬拉竹產業發展商業技能與永續成長。研究聚焦於「竹產業化推廣計畫」，分析當國際合作超越短期援助、轉向透過技術培訓、機構夥伴關係與實地支援來建構長期能力時，實際會發生什麼樣的情況。

透過對十二位利害關係人進行訪談、包括臺灣技術團成員、瓜地馬拉政府官員、在地工藝師與創業者、以及分析計畫相關文件，本研究探討該計畫的成果與面臨的挑戰。儘管多數參與者獲得實用技能，並對竹材的發展潛力抱持正面看法，然而將這些知識轉化為可持續的商業模式仍具困難，主要障礙包括缺乏後續支援、基礎設施不足，以及對臺灣持續協助的依賴。研究結果指出，有意義的國際合作不僅止於提供工具與培訓，更應協助建立在地行動者能夠主導的制度與信心。本研究建議未來的技術合作應強化在地主體性與永續規劃，以更有效支持社區導向的發展。

關鍵詞：臺灣、瓜地馬拉、竹產業、知識移轉、創業、國際合作、永續發展

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Abstract

This case study explores how Taiwan has supported the development of business skills and sustainable growth in Guatemala's bamboo industry. Focusing on the "*Bamboo Industrialization Project"*, the research looks at what happens when international cooperation moves beyond short-term aid and tries to build lasting capacity through technical training, institutional partnerships, and hands-on support.

Using interviews with twelve stakeholders, from Taiwanese mission staff and Guatemalan officials to local artisans and entrepreneurs, as well as project documents, the study examines both what the project achieved and what challenges it faced. While many participants gained valuable skills and saw bamboo as a promising resource, turning that knowledge into sustainable businesses proved difficult. Lack of follow-up, poor access to infrastructure, and reliance on Taiwan's support presence were common barriers.

The findings suggest that meaningful cooperation requires more than sharing tools and training; it also means building the systems and confidence needed for local actors to lead. The findings emphasize the need to plan for long-term local ownership and offer recommendations for how technical cooperation can better support community-driven development.

Keywords: Taiwan, Guatemala, bamboo industry, knowledge transfer, entrepreneurship, international cooperation, sustainable development

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List of Abbreviations

ANABAMBU	Asociación Nacional del Bambú
ENCA	Escuela Nacional Central de Agricultura
ICDF	International Cooperation and Development Fund (Taiwan)
ICTA	Instituto de Ciencia y Tecnología Agrícolas
INTECAP	Instituto Técnico de Capacitación y Productividad
MAGA	Ministerio de Agricultura, Ganadería y Alimentación
MOFA	Ministry of Foreign Affairs (Taiwan)
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
SSC	South–South Cooperation
SOSEP	Secretaría de Obras Sociales de la Esposa del Presidente
UNCTAD	United Nations Conference on Trade and Development
UNOSSC	United Nations Office for South-South Cooperation
USAC	Universidad de San Carlos de Guatemala

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Chapter 1- Taiwan's Role in Developing Business Expertise and Sustainable Growth in Guatemala's Bamboo Industry

1.1 Background

Guatemala is a country with a strong connection to nature and a rich cultural heritage. Its name comes from the Nahuatl word *Quauhtlemallan*, which means "land of many trees" a reflection of the country's natural wealth and identity (Popol Vuh, n.d.). Bamboo, although native to several parts of the country, was not widely used for industrial or commercial purposes for many years. It was often seen as a basic material with limited economic value, mostly used in rural areas.

This situation began to change in the 1980s with the support of international cooperation. In 1983, Dr. Wei Chi Lin, a Taiwanese bamboo expert, visited Guatemala to assess the existing species and provided technical advice on how to improve their use. His visit led to the introduction of new bamboo species from Taiwan and the launch of the project "Promoción del Cultivo del Bambú en Guatemala" in 1984. This project was carried out by INTECAP and Taiwan's Technical Mission, focusing on establishing plantations, training artisans, and distributing planting materials across several departments such as Alta Verapaz and Suchitepéquez (Taiwan Technical Mission in Guatemala, 2025)

A second phase started in 1988, which included hands-on workshops on bamboo crafts and furniture. Trainers were sent to different parts of the country to help people learn how to work with bamboo. By 2003, a new project "Desarrollo Integral del Cultivo del Bambú y sus Diferentes Usos" was introduced by MAGA, ICTA, and Taiwan's Technical Mission. This phase aimed to increase the bamboo supply to meet the growing demand for construction and handicrafts (Taiwan Technical Mission in Guatemala, 2025)

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In 2014, the focus shifted to industrial development through the "Bamboo Industrialization Project" This project introduced modern tools, processing equipment, and business training. It also established a national Center for Bamboo Transformation and Research in Villa Nueva, where hundreds of Guatemalans have received training in bamboo production, furniture, and value-added products (Taiwan Technical Mission in Guatemala, 2024)

As of recent years, more than 1,400 hectares of bamboo have been planted with technical support from Taiwan. New nurseries and workshops have also been developed, and bamboo is now used in different areas such as construction, interior design, and even environmental protection (Plan Estratégico Agrocadena, 2022).

1.2 Importance and Significance of Study

This study is important because it looks at an area of international cooperation that hasn't been studied much, how Taiwan's involvement has contributed to developing Guatemala's bamboo industry. Guatemala has a lot of bamboo resources that could be used to build a sustainable industry, help the economy grow, support rural communities, and protect the environment.

Studying Taiwan's role in knowledge transfer offers practical insights for understanding how Taiwan's knowledge transfer, training programs, and technical support have helped improve business skills, entrepreneurship, and institutional capacity in Guatemala can be useful not only for the people directly involved but also for policymakers, researchers, and organizations working in international development. The results of this study could help improve existing cooperation frameworks and guide future projects aimed at building sustainable industries in other countries with similar resources.

This research contributes to ongoing discussions about international cooperation by looking at how partnerships and knowledge transfer can help promote sustainable development and build capacity. This case study evaluates how effective Taiwan's support has been and how it has

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impacted the bamboo industry in Guatemala. This is important as more countries search for sustainable growth strategies to grow their economies in a rapidly changing world.

1.2 Research Problem

Guatemala has favorable conditions for bamboo cultivation, with an estimated 12,000 hectares of natural bamboo forest (Taiwan Technical Mission, n.d.), the sector remains largely underdeveloped. Bamboo has been positioned as a strategic resource for rural development, climate resilience, and sustainable livelihoods (Plan Estratégico Agrocadena, 2022), yet its industrial potential has not been realized. Even with years of international support, especially from Taiwan, the bamboo sector still faces structural barriers that limit its ability to grow into a self-sustaining industry, and prevent it from functioning as a competitive or self-sustaining industry.

Project reports and stakeholder interviews point to several specific, recurring challenges. Many participants trained through the cooperation framework, particularly in rural departments, it was mentioned of being unable to apply their skills after training due to lack of tools, untreated bamboo, or basic infrastructure (Author's interviews, 2025). Geographic distance from central processing facilities, created logistical and financial barriers for rural producers, limiting their ability to engage in production or commercialization. Furthermore, while training sessions focused on technical skills such as weaving or furniture making, participants were not given clear routes to market access or income generation, making it difficult to sustain bamboo-related work over time.

The project hasn't only faced individual challenges, weak institutions have also made things harder. Organizations such as ANABAMBU have taken on growing responsibilities in coordination and promotion, but continue to operate without stable funding, or long-term

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national policy support. Follow-up mechanisms to track training outcomes or maintain engagement with participants remain informal or nonexistent. These limitations point not only to implementation challenges, but to deeper institutional fragility that makes it difficult to retain knowledge and build continuity after external support phases out.

A more complex issue lies in the structure of the partnership itself. While Taiwan has provided key resources, technical guidance, and infrastructure through its Technical Mission, most decisions regarding design, budgeting, and strategic direction have remained externally controlled. Many Guatemalan participants said Taiwan was leading the project, but they worried it wouldn't work without Taiwan staying involved. One municipal official remarked, "When Taiwan is involved, people take it seriously. But when we try to do it alone, no one listens" (Interview with local partner, 2025). This suggests a kind of symbolic dependency that contradicts the principles of horizontal partnership promoted in South–South Cooperation frameworks (Heryadi et al., 2024). The issue isn't just technical reliance, it's also that local institutions haven't been able to fully use or carry forward the knowledge that was shared.

Despite visible outputs such as training workshops, nurseries, and demonstration sites, few academic studies have evaluated whether these interventions have led to long-term entrepreneurship, skill retention, or institutional strengthening in Guatemala's bamboo sector. Most evaluations focus on immediate delivery metrics rather than structural outcomes. This points to a lack of evidence and deeper analysis: We still don't fully understand how international support plays out in places where local institutions are underfunded, lack capacity, and don't have strong policy coordination.

The central objective of this research is to evaluate how Taiwan's cooperation has influenced the long-term development of business expertise, institutional capacity, and sustainability in Guatemala's bamboo sector. This study addresses that gap by examining Taiwan's knowledge

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transfer and technical assistance in Guatemala's bamboo industry, with particular attention to how cooperation is received, interpreted, and constrained at the local level. The research aims to assess whether Taiwan's involvement has contributed to sustainable institutional development and entrepreneurial capacity, or whether it has reinforced a pattern of dependency through a donor-led model.

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Chapter 2 Literature Review

2.1 Introduction

Taiwan's cooperation with Guatemala in developing the bamboo industry provides a useful example to explore how technical training, knowledge sharing, and long-term partnerships can support sustainable development. This cooperation is not only focused on rural development, it also reflects a deeper diplomatic relationship. As one of Taiwan's few official allies in Latin America, Guatemala plays an important role in Taiwan's international strategy, and projects like the bamboo initiative help to strengthen these diplomatic ties through practical, locally grounded collaboration (Su & Ellis, 2024).

Unlike standard aid programs backed by major international funders, Taiwan's approach focusses on technical cooperation, shared learning, and capacity building. It aligns with the principles of South–South Cooperation (SSC), which highlight mutual benefit, local ownership, and context-specific solutions (UNOSSC, 2022; Cabral, 2010). These ideas are especially visible in the bamboo project, which combines sector-specific training with support for entrepreneurship and institutional development.

Taiwan's model has been described as a form of development diplomacy, where technical missions and long-term partnerships are used to maintain diplomatic relationships and deliver practical benefits on the ground (Su, 2024; Kamanga, 2022). The bamboo project follows this approach by supporting local livelihoods through practical training, applied research, and product development. Its structure helps connect Taiwan's foreign policy goals with real, meaningful development outcomes in different communities

Training is a key part of this cooperation model. Salas et al. (2012) argue that training is most effective when it includes not only technical content but also opportunities to apply skills, adapt them to local needs, and continue learning over time. In the Guatemala case, Taiwanese specialists have worked with local institutions and producers to share practical knowledge on

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bamboo cultivation, transformation, and design. These efforts have supported both technical capacity and small-scale entrepreneurship.

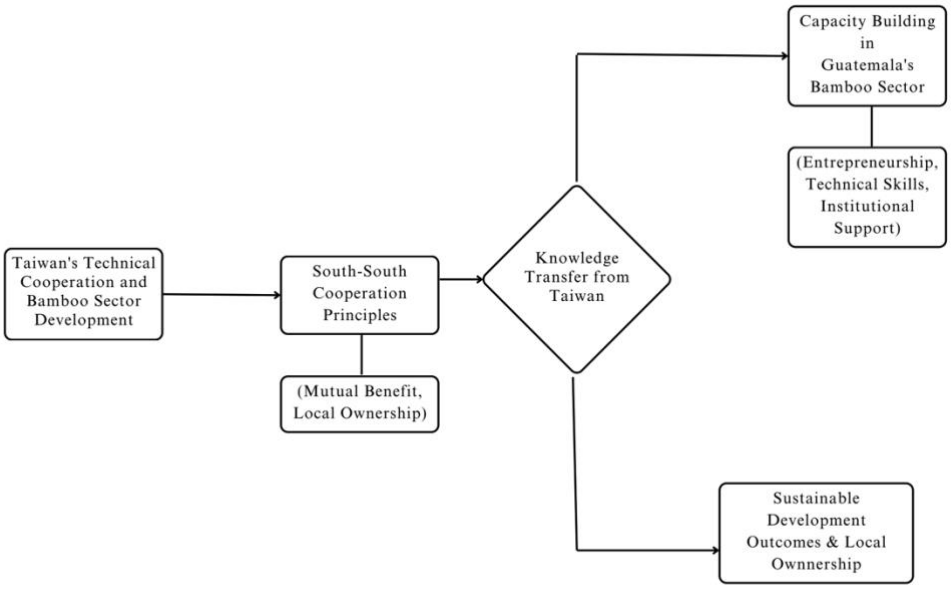
The link between bamboo training and sustainable development has also been highlighted by Dai and Hwang (2019), who examined how bamboo craft education in Taiwan promotes environmental awareness and local economic activity. Their study supports the idea that targeted, practice-based training can have broader social and economic effects when it is part of a long-term strategy.

Based on these perspectives, this literature review addresses the following research questions:

- How has Taiwan's involvement contributed to the development of business expertise and sustainable growth in Guatemala's bamboo industry?
- In what ways has knowledge transfer from Taiwan influenced entrepreneurship and skill development within the industry?

By situating the Taiwan–Guatemala bamboo project within these scholarly debates, the chapter critically assesses the relevance of each framework and identifies how this case contributes to or challenges existing literature.

Figure 1 **- Conceptual Framework: Technical Cooperation and Bamboo Sector Development in the Taiwan–Guatemala Partnership**



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2.2 South-South Cooperation and Mutual Benefit

South–South Cooperation (SSC) is a development model based on mutual learning, shared experience, and respect among countries in the Global South. Unlike traditional aid, which often follows a top-down approach, SSC promotes partnerships that are more equal and focus on sharing knowledge, empowering local people, and building long-lasting capacity (UNOSSC, 2022). Today, SSC is viewed not only as a way to support development that fits local needs but also as a way to build diplomatic and institutional connections.

Cabral (2010) explains that SSC offers a fairer and more flexible way to cooperate. It highlights the importance of strong partnerships, programs designed together by all involved, and ongoing commitment. SSC works best when both partners actively participate in shaping the project, making sure it fits their needs and that both feel responsible for its success. Although Cabral's work looks at SSC broadly, these ideas apply well to technical collaborations like Taiwan's partnership with Guatemala on bamboo development.

The Taiwan–Guatemala bamboo project is a good example of this mutual benefit in action. Since 2014, Taiwan has supported Guatemala through its International Cooperation and Development Fund (TaiwanICDF) and the "Taiwan Technical Mission". The project focuses on improving Guatemala's bamboo industry by sharing advanced farming and processing techniques, training local experts, and strengthening institutions. Guatemala contributes its natural resources, local knowledge, and demand for bamboo products. This cooperation reflects SSC's idea of shared value: Taiwan gains diplomatic support and international presence, while Guatemala builds a more sustainable industry and creates new opportunities for rural entrepreneurs.

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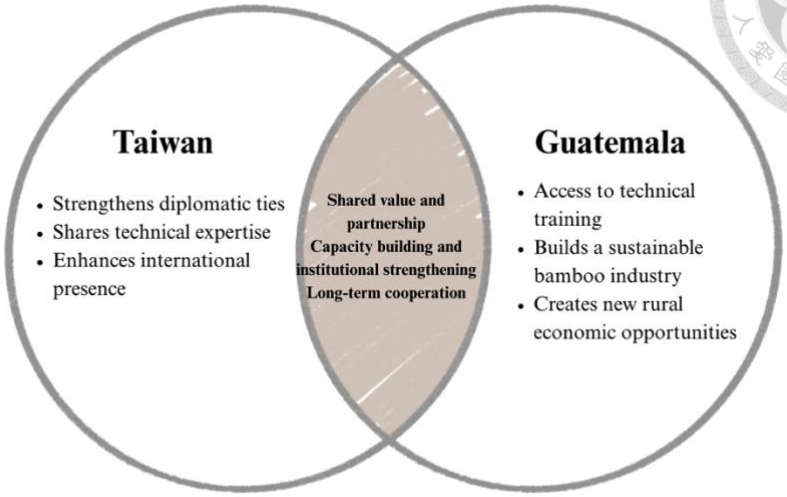
Figure 2- **Mutual Benefits of South South Cooperation in the Taiwan- Guatemala Bamboo Project**



This view is supported by regional research. (ECLAC,2021) shows that SSC projects in Latin America are most successful when they align with national development plans, empower local organizations, and promote entrepreneurship. The bamboo initiative fits all these points by supporting income generation in rural areas and working closely with government agencies through training, infrastructure, and technical support. The creation of the Centro de Transformation and Investigation of Bamboo provides a lasting base for innovation, learning, and business growth.

In summary, the Taiwan–Guatemala bamboo project shows how SSC can move beyond just political talk and become a practical way to build skills, promote sustainable growth, and encourage entrepreneurship. It reflects a growing shift in development thinking that values equal partnerships, technical knowledge, and shared learning. Because of this, it adds an important perspective to SSC research that often overlooks cases like Taiwan's.

While the Taiwan–Guatemala project reflects many SSC principles, scholars have noted that such partnerships may still reproduce certain asymmetries. Mawdsley (2012) and Kamanga (2022) argue that South–South Cooperation, although rhetorically framed as horizontal, often

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involves power imbalances when one partner has greater financial or technical control. In Taiwan's case, key decisions around project design, budgeting, and implementation remained largely in the hands of the Taiwanese technical mission (Su, 2024). This may limit local ownership and reinforce a form of symbolic dependency, where project legitimacy depends on the donor's ongoing presence.

2.3 Technical Development and Sector-Specific SSC

Countries such as India, Brazil, and Japan have implemented South–South Cooperation (SSC) programs focused on agriculture and applied technologies. Examples include India's ITEC program (Ministry of External Affairs, India, 2022), Brazil's agricultural research collaborations (de Medeiros *et al*., 2021), and Japan's SATREPS initiative (Japan Science and Technology Agency, 2020). These programs provide technical know-how, vocational training, and institutional development support, demonstrating the potential of technical partnerships to promote local innovation and capacity building. However, most operate at a national scale or through large institutions, which makes it challenging to draw lessons for smaller, sector-specific collaborations like the one between Taiwan and Guatemala.

The Taiwan–Guatemala bamboo cooperation offers a unique perspective in this regard. Since 2014, the project has targeted technical development within the bamboo sector, addressing gaps in production, transformation, and commercialization through training, infrastructure, and consulting. The initiative was designed to strengthen local knowledge while adapting Taiwanese bamboo technologies to Guatemala's environmental and social contexts. Training programs have covered cultivation techniques, construction applications, and product design, with a strong focus on promoting business viability and creating long-term employment opportunities in rural communities (TaiwanICDF, 2023).

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One of the project's main strengths lies in its technical depth and practical orientation. The Taiwan Technical Mission has provided hands-on guidance in nursery development, machinery setup, and design improvements, while Guatemala's Ministry of Agriculture, Livestock & Food (MAGA) has facilitated outreach to local communities and ensured alignment with national agricultural priorities. This partnership structure has enabled the implementation of solutions that are both innovative and locally grounded, transforming bamboo from an underutilized resource into a viable industrial input (Su, 2024).

What distinguishes this initiative from broader SSC examples is its emphasis on directly linking technical cooperation with entrepreneurship. Rather than offering one-off training sessions or infrastructure support, the program encourages beneficiaries to apply technical knowledge toward market-oriented goals. The establishment of the Centro de Transformación e Investigación del Bambú exemplifies this approach: as a hub for knowledge transfer, enterprise support, and experimentation, it aims to build a self-sustaining local ecosystem (ECLAC, 2021).

By situating technical cooperation within a specific productive sector, the Taiwan–Guatemala project demonstrates that SSC can support rural industry transformation not only through knowledge sharing but also through the creation of lasting institutional and business capacities. This case adds valuable insight to the SSC literature by showing how targeted technical development supports sustainability and local empowerment (Cabral, 2010), while also promoting economic inclusion through practical entrepreneurship and institutional capacity building, as seen in Latin American contexts (Kamanga, 2022)

2.4 Knowledge Transfer and Institutional Learning

A key component of international collaboration is knowledge transfer, especially in development contexts where the goal is to strengthen institutional capacities and empower local actors. Contemporary perspectives emphasize that knowledge transfer is not a one-time

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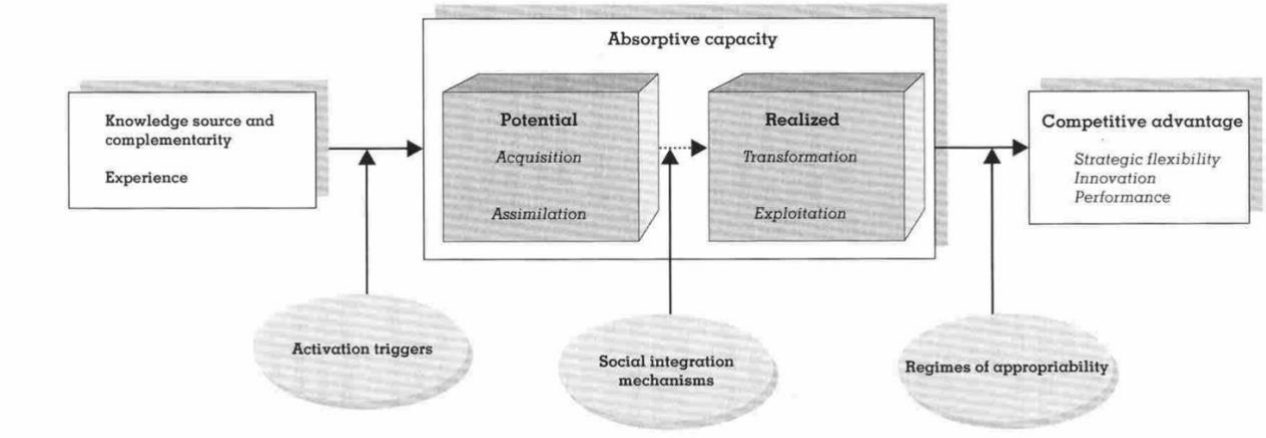
transaction between donor and recipient, but a complex, adaptive process. Zahra and George (2002) propose that successful knowledge transfer depends on three elements: absorptive capacity, institutional compatibility, and supportive learning mechanisms. These determine whether transferred knowledge can be acquired, retained, and effectively applied. Expanding on this, Abinbuhaybeha (2023) highlights the importance of trust, context alignment, and iterative learning, stressing that knowledge exchange must be tailored to local realities and embedded within existing institutional practices.

***Figure 3*- A Model of Absorptive Capacity (ACAP)**



Adapted from: Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. Academy of Management Review, 27(2), 185–203.

This model provides a useful lens to analyze how Taiwan's technical knowledge was gradually absorbed and operationalized within Guatemala's bamboo sector. The cooperation's alignment with Guatemala's development goals, such as income generation and sustainable resource use, demonstrates a high degree of institutional compatibility. Although Guatemala lacked a formal bamboo policy during this period, the Taiwan Technical Mission adapted its methods to local needs, drawing from Taiwan's experience in bamboo cultivation, processing, and commercialization.

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The development of local absorptive capacity was a gradual process, made possible through long-term, hands-on support from the Taiwan Technical Mission. Guatemala's Ministry of Agriculture, Livestock and Food (MAGA) also played a key role in facilitating coordination and institutional alignment. Implementation reports highlight how training covered not just technical competencies (e.g., production, transformation, and commercialization), but also soft skills, such as adaptability and problem-solving, reflecting a holistic learning strategy aligned with Abinbuhaybeha's (2023) emphasis on long-term knowledge embedding.

2.5 Bamboo Industry and Sustainable Development

Bamboo is widely recognized as a sustainable and renewable resource due to its rapid growth, carbon sequestration capacity, and minimal environmental impact compared to traditional timber. Its versatility spans construction, handicrafts, furniture, and even bioenergy, making it an economically promising material for rural development and green industries (Dai & Hwang, 2019). The global push for sustainable materials has elevated bamboo's importance, especially in regions seeking climate-smart agricultural alternatives and livelihood diversification.

In many rural communities, bamboo cultivation and processing contribute significantly to local livelihoods and economies. It provides income opportunities through value-added products, such as furniture and crafts, which can engage small-scale producers, artisans, and entrepreneurs. The integration of bamboo into rural economies often supports poverty reduction and women's empowerment by creating accessible business activities within agricultural systems.

Taiwan has developed extensive expertise in bamboo cultivation, craftsmanship, and industry over decades, positioning itself as a leader in sustainable bamboo technologies and design. Taiwanese bamboo industries have successfully combined traditional knowledge with modern

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processing and product innovation, producing high-quality, marketable goods while maintaining environmental sustainability (Dai & Hwang, 2019). This expertise forms the basis of Taiwan's technical cooperation with Guatemala, where proven cultivation techniques and manufacturing processes are adapted to local conditions to support the emerging bamboo sector.

Training and skill development are critical components in ensuring the sustainable growth of the bamboo industry. Effective training programs not only transfer technical know-how but also build entrepreneurial capacities and improve product quality, enabling participants to compete in regional and international markets (Salas et al., 2012). In the Taiwan–Guatemala partnership, capacity building initiatives have focused on hands-on training in bamboo cultivation, product design, and business management, fostering a sustainable industry that benefits rural producers and local economies alike (TaiwanICDF, 2023).

2.6 Latin American Context and Regional Gaps

South–South Cooperation (SSC) has expanded significantly across Latin America in recent years. However, many initiatives have primarily focused on macroeconomic policy dialogue, institutional capacity building, or humanitarian aid, with relatively few targeting productive sectors such as industry development and rural entrepreneurship. Countries including Colombia, Cuba, and Paraguay have established bilateral SSC agreements, but these often lack strategic alignment with local industrial priorities and sustained institutional support. Moreover, technical cooperation programs frequently remain disconnected from entrepreneurial development and value chain integration, limiting their broader economic impact (Economic Commission for Latin America and the Caribbean [ECLAC], 2021, pp. 6, 12–13).

Against this backdrop, the Taiwan–Guatemala bamboo project represents a notably integrated model of cooperation. Between 2014 and 2023, this initiative has fostered rural development by combining technical training, product innovation, and commercialization strategies within

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a cohesive cooperation framework. Unlike many SSC efforts in the region, the project adopts a multi-component approach addressing bamboo production, transformation, applied research, and market development. This comprehensive strategy encourages skill-building and supports small-scale entrepreneurship directly within local communities (ECLAC, 2021, p. 23).

Taiwan's unique diplomatic status often places it outside mainstream SSC analyses; however, its long-standing presence in Guatemala has facilitated sustained knowledge exchange, policy adaptation, and local entrepreneurship growth. By equipping beneficiaries with entrepreneurial and technical capabilities, the partnership extends beyond institutional training to enable participation in revenue-generating ventures. Although this model remains underrepresented in academic literature, it offers valuable lessons for designing future SSC programs in Latin America, particularly those linking rural innovation with sustainable industry growth (ECLAC, 2021, pp. 30, 45–50).

2.7 Conceptual Framework

This study employs a multidimensional conceptual framework that integrates South–South Cooperation (SSC) Theory, Knowledge Transfer Theory, Capacity Building, Innovation Systems Theory, and Entrepreneurship Theory. Together, these frameworks help us clearly understand Taiwan's partnership with Guatemala, showing not just the results but also how the cooperation supports sustainable growth in the bamboo industry.

South–South Cooperation (SSC) Theory frames the geopolitical and developmental context of this partnership. SSC emphasizes principles of mutual benefit, equality, and solidarity among developing countries, fostering partnerships that prioritize co-creation, capacity building, and long-term institutional engagement (Cabral, 2010). This framework allows analysis of Taiwan's cooperation beyond traditional aid, focusing instead on strategic knowledge exchange and sustainable development aligned with Guatemala's needs. However, SSC theory

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also recognizes inherent challenges, such as power imbalances and geopolitical dynamics that may influence cooperation outcomes (Economic Commission for Latin America and the Caribbean [ECLAC], 2021).

Knowledge Transfer Theory explains how technical expertise and how knowledge moves between people and becomes part of local organizations and communities. Central to this theory is absorptive capacity, defined by Cohen and Levinthal (1990) as the ability of recipients to recognize, assimilate, and apply external knowledge. Zahra and George (2002) expand absorptive capacity into phases: acquisition, assimilation, transformation, and exploitation of knowledge. Abinbuhaybeha (2023) further highlights the socio-cultural and organizational complexities involved in successful knowledge transfer, emphasizing factors such as trust, institutional compatibility, and sustained learning mechanisms. These ideas help explain how Taiwan's skills in growing, processing, and selling bamboo have been adopted by Guatemalan institutions and rural communities.

The Capacity Building framework focuses on developing the skills, resources, and institutional structures necessary for sustainable growth. It underscores the importance of training and empowerment to create lasting local capabilities that persist beyond project lifecycles (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). This framework helps analyze how technical training in the Taiwan–Guatemala project strengthens human capital and institutional capacity in the bamboo industry.

Innovation Systems Theory provides insight into the complex networks of actors, firms, government agencies, research centers, that interact to foster innovation and knowledge diffusion (Lundvall, 2010). Viewing the bamboo industry as an innovation system highlights the importance of these interactions and the enabling environment for the sector's growth,

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including the role of the Taiwan Technical Mission and Guatemalan institutions in facilitating knowledge flows and technological adaptation.

Lastly, Entrepreneurship Theory connects technical knowledge and capacity building with economic development through entrepreneurial activities. It explores how individuals and communities recognize and exploit opportunities, driving business creation and growth, especially in rural contexts (Shane & Venkataraman, 2000). This theory helps explain how knowledge transfer translates into practical entrepreneurship and sustainable industry development in Guatemala.

Building on these concepts, this study focuses on two central research questions:

1. How has Taiwan's involvement contributed to the development of business expertise and sustainable growth in Guatemala's bamboo industry?
2. In what ways has knowledge transfer from Taiwan influenced entrepreneurship and skill development within the industry?

By explicitly linking the research questions to the conceptual framework, the study seeks to examine both the practical impacts and the underlying processes driving cooperation, learning, and local capacity building. This theoretical foundation also informs the interview design, focusing on participants' experiences with knowledge exchange, institutional collaboration, and entrepreneurial development within the bamboo sector.

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2.8 Key Terms

This section defines important terms used throughout the study to ensure clarity and consistency in the analysis:

- South–South Cooperation (SSC): A development framework for collaboration among developing countries based on mutual respect, equality, and shared goals. It emphasizes horizontal partnerships, co-creation, and capacity building rather than traditional donor-recipient aid models (United Nations Office for South-South Cooperation [UNOSSC], 2022).
- Knowledge Transfer: The process by which technical skills, expertise, and institutional practices are shared across organizations or countries. Effective knowledge transfer involves not just delivering information but also its absorption, adaptation, and ongoing use by the receiving party (Abinbuhaybeha, 2023).
- Absorptive Capacity: The ability of individuals, organizations, or communities to recognize, assimilate, and apply new knowledge effectively, which is crucial for successful knowledge transfer and innovation (Cohen & Levinthal, 1990).
- Institutional Compatibility: The degree to which partnering organizations or institutions share aligned goals, values, and operational practices, facilitating smoother collaboration and knowledge exchange (Zahra & George, 2002).
- Sustainable Industry: An industry or production system that balances economic growth with environmental protection and social well-being. It follows long-term strategies to minimize ecological impact while promoting inclusive economic participation (Organization for Economic Co-operation and Development [OECD], 2020).
- Capacity Building: Activities and processes aimed at developing and strengthening the skills, abilities, and resources of individuals, organizations, and communities to achieve sustainable development goals (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012).

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- Innovation System: A network of institutions, organizations, and policies that interact to promote innovation and technological development within a sector or region (Lundvall, 2010).
- Entrepreneurship: The identification and exploitation of business opportunities by individuals or groups, often involving innovation and risk-taking, which drives economic growth and development, particularly in rural contexts (Shane & Venkataraman, 2000).
- TaiwanICDF (International Cooperation and Development Fund): Taiwan's government agency that implements international development projects, focusing on human resource development, infrastructure, and technical assistance in countries with diplomatic ties to Taiwan, including Guatemala.
- MAGA (Ministerio de Agricultura, Ganadería y Alimentación): Guatemala's Ministry of Agriculture, responsible for promoting agricultural development, food security, and rural welfare. MAGA is a key partner in Taiwan's technical cooperation project in the bamboo sector

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Chapter 3: Methodology

The following section describes the design, participants, data collection, analysis method, validity, and reliability of this research.

3.1 Research Design

This study uses a qualitative case study to understand how Taiwan has supported business development and sustainability in Guatemala's bamboo sector. The case focuses on the "*Proyecto de Industrialización del Bambú"*, a cooperation project that began in 2014 between the Taiwan Technical Mission and Guatemalan institutions like MAGA, ICTA, and ANABAMBU.

The research is guided by two main questions:

1. How has Taiwan's technical assistance, such as training and knowledge sharing, helped Guatemalan bamboo entrepreneurs build skills and start businesses?
2. What factors have influenced whether the cooperation model can be sustainable over time?

A case study is a good fit for this topic because it allows for a deep look into a real-life project from different perspectives. As Creswell and Poth (2018) explain, case studies use multiple sources of information to understand a complex situation. Yin (2018) adds that a strong case study also considers issues like trustworthiness and consistency in how the research is done.

To answer the research questions, this study uses two types of data:

- Interviews with people involved in the project, such as trainers, local leaders, and Taiwanese technical staff.

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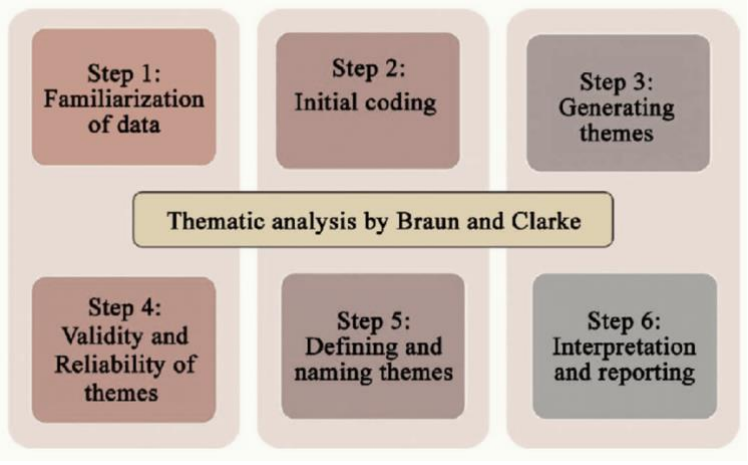
- Documents from the project, including reports, training materials, and planning documents.

The bamboo project is also a unique case because it reflects elements of South–South Cooperation, a form of collaboration between developing countries that is not yet widely studied. An exploratory case study allows the researcher to look for both expected patterns (like knowledge transfer) and unexpected issues (such as why some participants may not plan for the long term).

The interviews followed a semi-structured format, meaning there were guiding questions but also space for open discussion. This approach helped participants talk about their experiences in their own words and made it easier to explore new ideas, such as what motivates or limits their future planning.

To analyze the data, the study used thematic analysis based on the method by Braun and Clarke (2006).

***Figure 4*- Thematic Analysis by Braun and Clarke.**



Adopted From: Braun and Clarke (2006) [10]. *Thematic Analysis by Braun and Clarke. Source: Braun and Clarke (2006) [10].*

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This involves going through the interviews and documents to find key ideas (codes), then grouping those ideas into bigger themes. Some of the main themes expected to come up include:

- Knowledge transfer and learning
- Local involvement and leadership
- Challenges to long-term sustainability
- Perceptions of Taiwan's role as a development partner

3.2 Participants and Demographics

Patton (2015) explains that in qualitative research, participants are selected based on their ability to provide rich and relevant information related to the research questions. This study used purposive sampling to identify individuals who had direct experience with the Taiwan–Guatemala bamboo cooperation project and could offer insights into its implementation and outcomes.

The selection criteria for participating in this study were:

a) Being directly involved in the Taiwan–Guatemala bamboo cooperation project

b) Having knowledge or experience in training, entrepreneurship, or technical aspects of the bamboo industry

c) Representing an institution or business linked to the sector (e.g., MAGA, ICTA, Asociación Nacional del Bambú, Taiwan Technical Mission)

d) Willingness to participate and share their experiences in a research setting

Participants were contacted through formal emails and follow-up messages. Some were recommended by institutional partners, while others were identified through project records and official documentation.

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All participants were informed about the purpose of the study and their rights, including the option to withdraw at any time. Interviews were conducted remotely via video calls, calls or written responses, depending on internet access and participant preference

3.2.1 Sampling Strategy

This study used purposive sampling to identify participants who could speak from diverse positions within the Taiwan–Guatemala bamboo cooperation initiative. The sampling strategy was not driven by the goal of statistical representativeness, but by the intention to capture a rich variety of experiences, roles, and perspectives relevant to the research questions. Emphasis was placed on selecting individuals who were not only involved in the project, but who represented distinct stages of the cooperation process, from policy formulation and training delivery to real application and community-level reception.

Participants were selected from three analytically meaningful categories:

- Project implementers: This group included technical and administrative staff from the Taiwan Technical Mission. Their inclusion aimed to capture insights on the formal design, training methodology, and operational challenges of the cooperation project, as well as the assumptions guiding its implementation.
- Local partner organizations: This group included actors such as ANABAMBU who acted as intermediaries between donors and local communities. These participants were uniquely positioned to comment on how training programs were localized, how community engagement was managed, and how institutional coordination evolved throughout the project.
- Community-level actors and proxy voices: This included entrepreneurs, local business owners, community leaders, church representatives, and NGO coordinators working in rural or low-infrastructure areas. Some of these participants had only indirect contact

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with the Technical Mission, yet their views were crucial for understanding how the cooperation effort was experienced "on the ground." These proxy participants were intentionally included to address possible blind spots in top-down narratives and ensure that the study captured the lived consequences of the project, not just its intended design.

3.2.2 Participant Demographics and Profiles

The final sample included 12 participants representing a range of gender, institutional affiliations, and geographic locations.

***Table 1*- Participant Demographics and Interview Locations**

Participant	Gender	Role/Position	Affiliation	Location (Interview)
P1	Male	Project Manager	Taiwan Technical Mission	Guatemala City
P2	Female	Technical Trainer	Taiwan Technical Mission	Villa Nueva
P3	Male	Proyecto el Bambú Director	Proyecto el Bambú	Guatemala City
P4	Female	Entrepreneur (Bamboo Handicrafts)	ANABAMBU	Chimaltenango
P5	Male	Local NGO Coordinator (Proxy)	Local NGO	Alta Verapaz
P6	Female	Government Official (policy oversight, MAGA)	MAGA	Chimaltenango
P7	Male	Community Leader (Proxy)	Community Council	Baja Verapaz
P8	Female	Microentrepreneur (Bamboo Furniture)	Private Business	Sacatepéquez
P9	Male	Training Facilitator (Bamboo Techniques)	ICTA	Guatemala City
P10	Male	ANABAMBU President	ANABAMBU	Escuintla
P11	Male	Church Leader	Local Church	Alta Verapaz
P12	Male	ICDF Trainee	ICDF	Taipei, Taiwan

3.2.3 Regional Context and Its Influence on Participant Perspectives

Understanding how participants perceived Taiwan's cooperation model and the bamboo initiative requires more than institutional mapping, understanding these outcomes requires

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looking at the local context, regional social, economic, and ecological contexts that shaped how individuals interpreted knowledge, opportunity, and sustainability. Each interviewee lived in a specific local context that shaped not only their daily living conditions, but also how they talked about the project, what they focused on, and what challenges they faced

Figure 5- Map of Guatemala Highlighting Regional Variation in Bamboo Project Participation

Villa Nueva and Guatemala City: Between Formal Employment and Informal Enterprise

Participants based in urban and peri-urban areas like Villa Nueva and Guatemala City tended to express more structured expectations of technical training, often framing success in terms of job creation, market readiness, and institutional support. This may be linked to higher educational attainment (88% literacy, 50% high school completion) and daily exposure to industrial employment norms, where outcomes are measured through income and productivity. Their responses reflected a transactional view of development: if bamboo doesn't lead to visible economic returns, it's seen as a side activity, not a viable livelihood. Being close to government offices and donor organizations may make people more familiar with how

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development projects usually work, and more likely to feel disappointed if the results don't match what was promised.

Chimaltenango and Sacatepéquez: Highland Heritage and Artisan Adaptation

In Chimaltenango and Sacatepéquez, where artisan traditions and smallholder farming remain dominant, participants described bamboo less as an "intervention" and more as something to be integrated into existing livelihoods. Here, regional identity is strongly shaped by Mayan cultural heritage, multilingualism (Kaqchikel, K'iche'), and seasonal labor cycles. Interviewees showed greater interest in blending bamboo with crafts or using it for local structures, rather than scaling it as a standalone business. Their narratives emphasized "adaptability," "community use," and "family-scale work", This reflects values often seen in community-based or traditional systems. But because fewer people go to college and roads are hard to access, especially during the rainy season, people focused more on whether the technical knowledge could actually be used in their daily lives.

Alta Verapaz: Linguistic Marginalization and Infrastructure Constraints

Participants from Alta Verapaz, particularly proxy voices like church leaders and NGO coordinators, highlighted language barriers, geographic isolation, and mistrust of top-down initiatives. Many live in Q'eqchi'-speaking communities where Spanish is not fully dominant, and where literacy and formal schooling rates are among the lowest nationally. This created a context in which training materials and outreach efforts were often misaligned with community needs. Their reflections often questioned the long-term value of the project, not because of resistance to bamboo, but because basic participation was structurally difficult: roads washed out, tools unavailable, or training misunderstood. In these narratives, "cooperation" was described not as shared decision-making, but as something externally managed. Still, when

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local leaders were involved in translation or coordination, the tone shifted, participants spoke more positively when local ownership mechanisms were present.

Baja Verapaz: Between Agricultural Tradition and Emerging Engagement

People from Baja Verapaz had different opinions: some thought bamboo was an "interesting idea," while others pointed out that it has to compete with important crops and the local wood industry. With moderate education levels and mixed-language use (Q'eqchi', Poqomchi', Spanish), This region combines traditional farming with some early efforts to form cooperatives. Whether the bamboo project worked well here often depended on how well it connected with local groups like schools, churches, or forestry programs. In the interviews, people often shared examples of using bamboo for small things, like fixing houses or making chicken coops, but not as a way to earn income. This suggests that bamboo was useful for practical needs, but didn't lead to bigger changes in how people work or make a living.

Escuintla: Tropical Economy and Industrial Opportunity

In Escuintla, the most tropical and commercially industrial region in the sample, participants were highly attuned to market dynamics, pricing, and value chains. The region's integration into export-oriented agriculture (sugarcane, bananas, palm oil) and its port proximity influenced how people thought about bamboo: not just as a crop, but as a potential input in a larger industrial system. Interviewees here were most likely to discuss logistics, scale-up potential, and product diversification. However, they also felt frustrated by paperwork, delays, and the lack of support to develop real markets. Even though they valued the technical training, it wasn't enough without better infrastructure and financial backing. Their comments showed they expected the project to grow and continue over time, likely because they live in a region used to large-scale farming and more formal business systems.

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3.2.3 Sample Size and Rationale

This study is based on twelve semi-structured interviews with participants from different regions, institutions, and backgrounds, including representatives from government agencies, NGOs, local associations, community groups, and one international trainee. The sample was carefully selected to balance diversity and depth: it was large enough to reflect a range of experiences but small enough to allow for in-depth analysis of each person's perspective. Although the goal was not to produce statistically generalizable results, the number of interviews was enough to reach thematic saturation, that is, after about ten interviews, most key ideas and patterns began to repeat. This approach allowed the study to capture both national policy-level insights and voices from local communities, offering a well-rounded view of the Taiwan–Guatemala bamboo cooperation project.

3.2.4 Proxy Interviews

In cases where direct interviews with rural or end-user participants were difficult, due to poor internet access, time constraints, or limited formal engagement in the project, proxy interviews were conducted. These included community leaders, church representatives, and NGO staff who work closely with bamboo producers or small-scale participants in their regions.

These proxies were chosen through recommendations by institutional contacts (e.g., ANABAMBU and local NGOs) and had firsthand or observational knowledge of how the project was received and adapted at the community level. Although they did not always participate in trainings themselves, they were able to speak about patterns of adoption, barriers to access, and community attitudes toward the initiative.

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3.3 Data Collection Methods

This study used two primary data collection methods: document analysis and semi-structured interviews. Document analysis helped establish a baseline understanding of the project's institutional goals, official discourse, and planned activities. Semi-structured interviews, in turn, provided deeper insight into how those plans were interpreted, implemented, or contested by individuals across different roles and regions. This combination was chosen to allow for triangulation, comparing written records with lived experience, and to explore both the formal structure and the human side of Taiwan's technical assistance. These methods are well-established in qualitative research on international cooperation and knowledge transfer (Yin, 2018; Braun & Clarke, 2006), particularly when the goal is to connect policy frameworks with practical outcomes.

3.3.1 Interview Guide

- Semi-structured interview guides were created for each group of participants, with questions designed to match their roles and how involved they were in the project. The questions were grouped by themes that connect to the main ideas in the study's framework.
- Knowledge Transfer and Training
- Institutional Role and Ownership
- Sustainability and Long-Term Adoption
- Community-Level Impact and Empowerment

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A. ANABAMBU Representative

This interview was conducted with the President of ANABAMBU, who generously shared his time and offered detailed reflections based on his leadership role in the organization. The discussion focused on understanding ANABAMBU's internal structure, the types of training and technical support offered to communities, and the association's experience working directly with Taiwanese cooperation efforts.

The questions were designed to gather insights on:

- ANABAMBU's organizational goals, structure, and strategies for long-term sustainability
- The nature of training programs provided to rural and semi-urban communities
- The contribution of Taiwan's technical assistance to local production processes and skill development
- Opportunities and challenges in promoting bamboo-based entrepreneurship and maintaining project continuity

Questions:

1. What is the main mission of ANABAMBU, and what goals does it aim to achieve in the bamboo sector?
2. How is the organization structured, and what kind of staff or volunteers are involved in its activities?
3. What kinds of regular activities are carried out with communities (e.g., workshops, training, production)?
4. What is the bamboo production process like within ANABAMBU, from nursery to final product?

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5. How has Taiwan's support contributed to developing technical and business knowledge within ANABAMBU?
6. What concrete changes have you observed in participating communities since the start of the cooperation with the Taiwan Technical Mission?
7. Do you believe the knowledge and technologies shared by the Taiwanese team have helped create a sustainable bamboo value chain in Guatemala?
8. Are there examples of local businesses or entrepreneurship initiatives that have emerged due to this cooperation?
9. From ANABAMBU's perspective, what are the main strengths and limitations of the Taiwan–Guatemala cooperation model in promoting sustainable bamboo development?

Interview Questions for the Taiwan Technical Mission in Guatemala

This interview was conducted with a representative of the Misión Técnica de la República de China (Taiwán). The purpose of this conversation was to understand Taiwan's institutional perspective on the bamboo industrialization project and to evaluate how international cooperation contributed to its development, execution, and perceived success.

The questions aimed to capture:

- The original development problem the project intended to address
- The rationale behind selecting bamboo as a strategic solution
- The overall purpose and structure of the project
- The types of activities and components included during implementation
- The scope and distribution of beneficiaries by region
- The monitoring and evaluation indicators used, and their reported results
- Reflections on the broader significance of Taiwan–Guatemala cooperation

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Questions:

1. What was the main problem the project sought to solve through its implementation?
2. What were the reasons behind selecting bamboo as a solution for the project?
3. What were the overall goals and intended outcomes of the project?
4. What components and activities made up the project's core structure?
5. What were the direct, indirect, and intangible benefits of the project?
6. How many beneficiaries did the project reach, and how were they distributed geographically?
7. What criteria were used to select the project's beneficiaries?
8. What indicators were used to measure the project's results?
9. Can you share the results based on those indicators?
10. In your view, what is the significance of international cooperation between Taiwan and Guatemala in the context of this project?

The interview provided critical insights into the institutional logic behind the cooperation model and highlighted the mechanisms used by the Taiwanese side to evaluate success and impact. It also served to contextualize the project within broader South–South or bilateral cooperation frameworks, even if the initiative was not officially labeled as such.

C. Interview Questions for Guatemalan Beneficiaries of the Bamboo Project

Interview Guide for Guatemalan Bamboo Producers (Project Beneficiaries)

This interview guide was designed for Guatemalan producers who directly participated in the *Proyecto de Industrialización del Bambú*. The questions are open-ended and exploratory, allowing participants to reflect on their personal experiences, challenges, and outcomes related

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to the project. The goal is to capture in-depth insights on how Taiwanese cooperation affected local livelihoods and capacities.

Interview Questions:

1. Could you tell me a little about your family or household?
    - How many people rely on your income?
    - Has your participation in bamboo-related activities influenced your household's economic situation?
2. What kind of support or assistance did you receive through the Bamboo Project?
    - For example: training, technical advice, access to plants or equipment, help with commercialization, etc.
    - Which of these forms of support were most useful or relevant to your needs?
3. In your view, did the project help improve your income or economic opportunities?
    - If so, how noticeable was that change?
    - Were there any specific moments where you saw a difference in your earnings or sales?
4. How would you describe your overall experience with the project?
    - Was it something you found helpful, empowering, or inspiring?
    - Were there areas where you felt disappointed or where things could have been done differently?
5. What skills or knowledge did you gain from your participation in the project?
    - Have you applied these in your own work or community since then?
    - What lasting impact do you think the training has had?
6. In your opinion, what aspects of the project were the most valuable?

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- Was it the production process, transformation of bamboo, commercialization support, or research and development? Why?

7. Would you recommend that projects like this continue or expand to other communities?
    - What advice would you give to organizers or donors if they wanted to improve the project?
8. Looking back, how satisfied are you with the project overall?
    - What words would you use to describe it, useful, beneficial, limited, motivating, etc.?
    - What rating would you give it if you had to evaluate it from 1 to 10?
9. Have you noticed any changes in your community because of the project?
    - For example: new businesses, more interest in bamboo, better income for neighbors, etc.
    - Do you think the project created long-term changes?
10. Is there anything else you'd like to share about your experience or about how the bamboo project affected your life or community?

C. Interview Questions for ICDF Trainee (Taiwan-Based Assistantship)

Main Themes: Training experience, knowledge transfer, empowerment, and reflections on international cooperation

This interview provided a unique perspective on the Taiwan–Guatemala cooperation model through the lens of a Guatemalan participant who completed an assistantship under the International Cooperation and Development Fund (ICDF) in Taiwan. His role positioned him as both a recipient of Taiwan's technical training and an intermediary who later supported implementation efforts back in Guatemala. As such, his insights offered valuable reflections

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on the internal dynamics of Taiwan's training approach and how knowledge was adapted, or not, to local contexts.

The interview sought to explore:

- The quality, structure, and relevance of Taiwan's training programs
- Specific examples of technical or business knowledge transferred and later applied
- Whether the training led to feelings of empowerment or limitations in applying skills back home
- Suggestions for how Taiwan's development assistance could be improved to better support long-term local impact

Interview Questions:

1. From your experience, how did Taiwan's support contribute to developing business expertise in Guatemala's bamboo sector?
2. Can you share any concrete examples where the training or technical knowledge you received in Taiwan was later used or adapted successfully in Guatemala?
3. What kinds of skills, technical, business, or organizational, did you gain during your time with the ICDF program?
4. Did you feel that the training empowered you to support your community or workplace more effectively? Why or why not?
5. Were there any specific training activities or learning moments that stood out to you during your time in Taiwan?
6. Based on your experience, what aspects of Taiwan's cooperation model worked well, and what areas could be improved to better align with local needs and realities in Guatemala?

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A complete list of interview questions, grouped by stakeholder and theme, is provided in Appendix 1 and 2

3.3.2 Interview Conditions

Interviews were conducted using a mix of in-person and remote formats, depending on the availability and location of each participant.

- Mode: Interviews with ANABAMBU representative was conducted via video calls. The ICDF trainee was interviewed in person at a public café in Taipei. Interviews with the Taiwan Technical Mission were conducted remotely using platforms such as Zoom or WhatsApp.
- Environment: Most interviews were held in informal or semi-structured settings, such as offices, homes, or cafés. In some cases, background noise (e.g., street sounds, construction, or café ambience) and minor connectivity issues were present, particularly during remote interviews. These factors were noted but did not significantly affect the quality of the interviews. In one case, simultaneous translation support was used to clarify technical terms.
- Duration and Language: Interviews typically lasted between 45 and 60 minutes. All interviews with Guatemalan stakeholders were conducted in Spanish, while the interview with the ICDF trainee was held in English.

3.3.3 Consent and Recording

Prior to each interview, participants were informed of the study's purpose, the voluntary nature of their participation, and their right to withdraw at any time. Informed consent was obtained either verbally or in writing, depending on the interview format.

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With the participants' permission, most interviews were audio-recorded to ensure accuracy. In cases where recording was not allowed or technically feasible, detailed notes were taken during the conversation and expanded immediately afterward. All recordings and notes were securely stored in password-protected folders accessible only to the researcher, in compliance with ethical research standards.

3.3.1 Document Analysis

As a first stage of data collection, this study conducted a comprehensive analysis of documents related to the Taiwan–Guatemala bamboo cooperation project. Document analysis was used to understand the evolution, goals, and implementation strategies of the *Proyecto de Industrialización del Bambú* between 2014 and 2023. According to Bowen (2009), document analysis allows researchers to trace institutional developments, verify claims from interviews, and identify consistent patterns over time.

The documents reviewed were divided into two categories:

3.3.1.1 Primary Project Documents

These documents were directly linked to the design and implementation of the bamboo project:

- *Plan Estratégico Agrocadena del Bambú 2022–2032*
- Annual reports and progress updates from the Taiwan Technical Mission in Guatemala
- Technical manuals, workshop materials, and strategic briefs from MAGA and ICTA
- Project evaluations, internal memos, and meeting summaries

Each document was reviewed to extract specific types of information, including:

- Project objectives and timelines

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- Institutional roles and responsibilities
- Knowledge transfer strategies
- Training activities and target outcomes
- Financial, technical, or logistical support provided
- Evidence of challenges, adjustments, or community feedback

3.3.1.2 Secondary Sources

To contextualize the primary data and triangulate findings, the following secondary sources were also consulted:

- Academic publications on bamboo industry development in Central America
- Reports from NGOs and international agencies working on sustainable agriculture in Guatemala
- Government statistics on rural employment, natural resources, and trade in forest products
- News articles, policy briefs, and press releases covering milestones in the Taiwan–Guatemala cooperation.

3.3.1.3 Purpose and Contribution

Each document served a distinct purpose in the study. For example, strategic plans and reports helped clarify long-term goals, while training materials illustrated the structure and focus of knowledge transfer. These documents also allowed the researcher to cross-check the information provided in interviews, particularly regarding timelines, training frequency, and reported project outcomes. This triangulation enhanced the credibility of the findings and helped detect gaps or contradictions between official narratives and stakeholder experiences.

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3.4 Data Analysis

To analyze the collected data, this study employed a thematic analysis approach, following the steps outlined by Braun and Clarke (2006). This method was chosen because it allows for identifying recurring patterns and underlying meanings across both interview transcripts and documentary evidence, an approach particularly suited for case studies in international cooperation.

3.4.1 Coding Strategy and Codebook

Thematic analysis followed the approach proposed by Braun and Clarke (2006), beginning with the development of initial codes based on close reading of interview transcripts and project documents. While the process was largely inductive, it was also guided by the study's theoretical framework.

These codes were organized using a spreadsheet and annotated documents, allowing for comparison across participants and institutions.

Through iterative review, codes were grouped into broader patterns and refined into five major themes:

1. Knowledge Transfer
2. Entrepreneurship and Business Development
3. Institutional Ownership and Project Continuity
4. Symbolic Dependency and Credibility
5. Gender and Social Inclusion

For a detailed breakdown of each theme, including sub-themes, descriptions, and supporting participant quotes, see Appendices A through E.

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3.4.2 Thematic Analysis Process

The analysis followed these sequential steps:

1. All interviews were written out word-for-word to keep the original meaning of what participants said.
2. Similar ideas were grouped together into larger themes based on the research questions and main concepts of the study.
3. These themes were carefully checked and improved to make sure they were clear, did not overlap, and each represented a different idea.
4. In the final step, the themes from the interviews were compared with the information found in documents. This helped identify where the two sources agreed, disagreed, or showed missing information.

3.4.3 Integration and Interpretation

Combining the interviews with document analysis helped uncover deeper insights into how the cooperation model actually worked. While the documents often focused on institutional goals and expected outcomes, the interviews showed how these goals were experienced, positively or not, by people directly involved in the project. For instance, some participants pointed out problems like limited follow-up, mismatched expectations, or lack of decision-making power, which were not mentioned in the official reports. By comparing these two sources of data, the study was able to identify both areas of agreement and contradiction. This method, known as triangulation, strengthened the credibility of the findings by highlighting where institutional narratives matched local experiences, and where they didn’t.

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Chapter 4: Results

This chapter presents the main findings of the case study, based on interviews with key stakeholders involved in the Taiwan–Guatemala bamboo cooperation project. These include representatives from the Taiwan Technical Mission (ICDF), which implemented the project on the ground, Guatemalan institutions such as ANABAMBU, and the local participants who received training and support. The chapter explores how the project was experienced from both sides and connects these perspectives with the theoretical framework and research questions introduced earlier in the thesis. Understanding both the provider and recipient perspectives is essential to evaluate not only the outcomes of the project, but also how knowledge, technical expertise, and development goals were shared and interpreted within this cooperation model.

The interviews revealed valuable insights into how the project worked in practice. On one hand, Guatemalan beneficiaries shared how they learned technical skills, started businesses, and in some cases, became employers themselves. On the other hand, members of the Taiwanese mission explained how the project was designed, why bamboo was selected, and what kind of long-term impact they hoped to achieve. Looking at both sides helps to understand how cooperation was not only delivered, but also received and adapted locally.

To organize the results, a thematic analysis approach was used. This allowed to group common ideas and patterns from the interviews into key areas of focus. These include: (1) knowledge transfer and capacity building; (2) institutional collaboration and sustainability; and (3) how Taiwan's role as a development partner is understood in the Guatemalan context. These themes will be discussed in detail throughout this chapter.

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This chapter also builds on the theoretical lens introduced in Chapter 2, particularly Knowledge Transfer Theory and South–South Cooperation (SSC). These frameworks help explain how Taiwan's technical support was transferred, how it was received and applied in Guatemala, and how power dynamics and institutional relationships influence long-term sustainability and local ownership.

4.1 Knowledge Transfer and Capacity Building

Knowledge transfer was a central part of the Taiwan–Guatemala bamboo cooperation project, especially in its goal of helping local communities gain technical and entrepreneurial skills. The project aimed not only to introduce bamboo as a sustainable resource but also to make sure that people could apply what they learned in real, meaningful ways. This section looks at how that knowledge was shared and received, using both project documents and interviews with Taiwanese and Guatemalan participants.

Between 2014 and 2023, the project ran activities in several regions of Guatemala, including Alta Verapaz, Chimaltenango, Escuintla, Suchitepéquez, and Baja Verapaz. These areas were chosen because they already had bamboo, agricultural potential, or interest from local institutions. Through workshops, live demos, and nursery development, the project tried to offer both training and long-term infrastructure. In total, 254 people, 182 women and 72 men, took part in training sessions on bamboo weaving, making furniture, treating materials, and construction.

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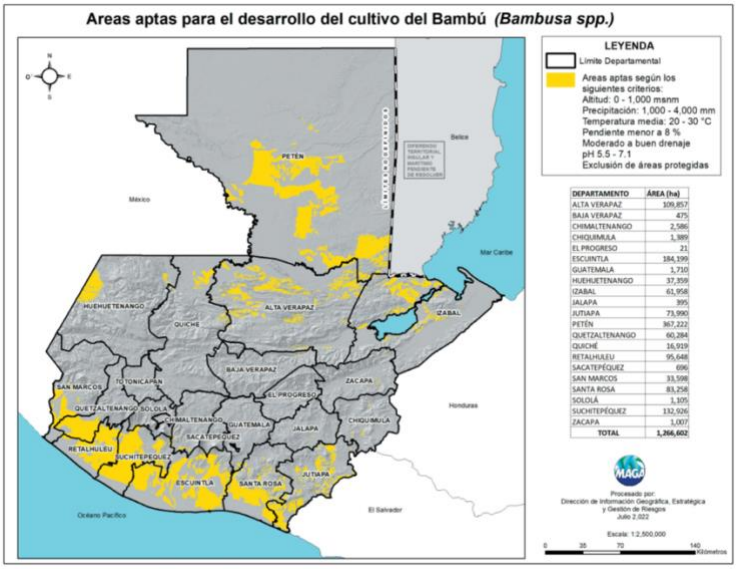
At the same time, three bamboo nurseries were set up in Sabana Grande, San Jerónimo, and Chimaltenango, growing over 8,300 seedlings of species like *Dendrocalamus asper* and *Guadua angustifolia*.

***Figure 6*- Potential Areas for Bamboo Cultivation. Republic of Guatemala**



Adapted from : Geographic Information System (SIG/MAGA) Ministerio de Agricultura, Ganadería y Alimentación (MAGA)

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***Table 2* - Summary of Bamboo Training Activities by Location, Theme, and Gender Participation (2014–2023)**

INSTITUCIÓN BENEFICIARIA	PLACE	THEME	DATE	WOMEN	MEN	NUMBER OF PARTICIPANTS
SOSEP/ Grupo de Mujeres San Jerónimo, Rabinal, Salamá y San Miguel Chicaj	Rabinal, Baja Verapaz	Bambo Weaving	February 18 to March 1	18	0	18
Maga Central /Administración Central	Cafetería Bambú, MAGA central	Maintenance of Bamboo Structures	March 1	0	6	6
SOSEP/ Grupo de Mujeres San Jerónimo, Rabinal, Salamá y San Miguel Chicaj	San Miguel Chicaj, Baja Verapaz	Bamboo Handicrafts	March 25 to 28	17	0	17
SOSEP/ EL TAJARAL	aldea El Tajaral, Zacapa	Transformation	June 10 to 14	15	0	15
SOSEP/ Oquen	Jocotan	Handicrafts and Furniture	June 17 to 21	19	0	15
SOSEP/GUIOR	La Unión, Zacapa	Transformation	June 24 to 28	18	0	18
SOSEP/LAGUNETAS	Lagunetas, Chiquimula	Weaving	July 15 to 19	13	0	13
Municipalidad de San Juan Chamelco	San Juan Chamelco	Crop Management, Harvesting, and Seed Extraction	July 17, 18, and 19	3	10	13
APROCAZA/ALDEA ZAPOTALITO	Esquipulas, Chiquimula	Weaving	July 22 to 26	11	0	11
Oficina de la mujer, Municipalidad de La Unión	Unión, Zacapa	Weaving / Handicrafts	August 12 to 16	5	15	20
INEB/ Municipalidad San Juan Chamelco	Micro región de Chamisun, San Juan Chamelco, Alta Verapaz	Bambo Handicrafts	August 13 to 16	7	8	15
Asociación de mujeres Olopenses	Olopa, Chiquimula	Weaving	August 19 to 23	17	3	20
Administración de finca San Julián Veterinaria USAC	Finca San Julián, Suchitepéquez	Treatment	September 2, 3, and 4	0	4	4
(ENCA) Escuela Nacional Central de Agricultura	Bárcena, Villa Nueva	Furniture	September 5, 6, 12, 13, 19, and 20	10	10	20
Asociación Entre Ríos, Siquinala Escuintla	Aldea San Andrés Osuna, Siquinala	Handicrafts / Furniture	September 9 to 11	12	9	21
Artesanos aldea Guior	Aldea Guior, Chiquimula	Handicrafts and Furniture	September 23 to 27	7	7	14
SOSEP/ Rabinal / San Jerónimo	San Miguel Chicaj	Weaving	September 28 to 30	4	0	4
				182 WOMEN PARTICIPANTS	72 MEN PARTICIPANTS	254 MALE AND FEMALE PARTICIPANTS

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People who took part in this study came from different departments, professions, and levels of experience. Their backgrounds affected how they viewed the project and how easily they could apply what they learned.

Beneficiaries interviewed for this case came from multiple departments including Chimaltenango, Alta Verapaz, and Baja Verapaz, regions where the project had significant training activity . Most of these areas are classified as rural and face common challenges such as limited public infrastructure, transportation barriers, and irregular access to markets. According to the project evaluation, participants ability to apply training varied by region: those individuals based in more connected departments, such as Chimaltenango, which is located in Guatemala's central-western highlands and lies within relatively close proximity to the city, tended to remain linked to institutional networks such as ANABAMBU or INTECAP. The department's central location, paved road access, and established educational and municipal infrastructure contributed to more consistent engagement with post-training opportunities. Although specific municipalities like Ixcán, Quiché were not included in the interview data, the overall pattern confirms that spatial and institutional proximity were key to sustaining knowledge application.

Participants with previous experience in carpentry or construction generally adapted the bamboo techniques more easily. Some were able to incorporate bamboo into their existing workshops, while others saw it as a complementary skill rather than a primary livelihood. However, even among these participants, several reported difficulties in obtaining the tools or materials needed to sustain production after the training. The project report also notes that market access was inconsistent across regions, limiting commercialization potential for many trained individuals.

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In terms of institutional feedback, the tone of the interview with ANABAMBU emphasized optimism about the long-term relevance of bamboo in Guatemala. They described ongoing coordination with INTECAP and municipal governments to support training requests and sustain momentum. However, they also acknowledged constraints such as limited staffing and the absence of a formal post-training follow-up mechanism, particularly in rural municipalities.

These different reactions also reflect their professional and educational backgrounds. Some had carpentry or construction experience; others, especially women in programs like SOSEP, were trying bamboo for the first time. One woman from Baja Verapaz explained that while the training helped her gain skills, she lacked a proper workspace and had to borrow tools, which made it hard to keep going.

The tone and focus of the interviews varied by stakeholder role. ANABAMBU representatives emphasized long-term institutional objectives, including the coordination of training events, partnerships with INTECAP, and their role in promoting bamboo across municipal and national platforms. Their approach centers on responding to community requests and mobilizing technical experts to deliver training. In contrast, the official evaluation and field observations showed that many artisans and trainees remained concerned with practical challenges such as accessing materials, maintaining equipment, or identifying local buyers. These day-to-day concerns shaped how they interpreted the value and sustainability of the training.

Putting all this together helps explain why people's views of the project were not the same. It also shows where the project made an impact and where it might need better alignment with people's actual living conditions.

According to the interviews (Author's interviews, 2025), the majority of participants considered the training useful, particularly in developing basic competencies in bamboo

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treatment and fabrication. The most positive outcomes were reported among those who engaged in transformation activities, such as producing furniture or crafts, often in areas where small workshops or productive spaces already existed. These individuals were more likely to continue using bamboo after training. However, participants also identified critical gaps. Many lacked access to essential equipment, and the report documents frequent difficulty sourcing properly treated bamboo, especially in rural departments. Commercialization was another unresolved issue: the evaluation notes that few participants received support in market identification, sales strategy, or linking with buyer networks. As a result, while technical learning occurred, the pathway to generating stable income was limited for a large portion of the trainees (Author's interviews, 2025).

From ICDF's perspective, the goal was to pass on technical skills that local actors could maintain. One ICDF member said, "We introduced the techniques, but it's up to local partners to maintain the system" (*Interview with ICDF representative, 2025*). On the Guatemalan side, ANABAMBU described itself as key to ensuring that the training would have a lasting impact. "Our goal is to create every possible link, public, private, and institutional, so that bamboo is taken seriously as a sustainable alternative in Guatemala," a representative explained (*Interview with ANABAMBU, 2025*). The organization continues to work with partners, lead bamboo-related events, and respond to training requests from communities.

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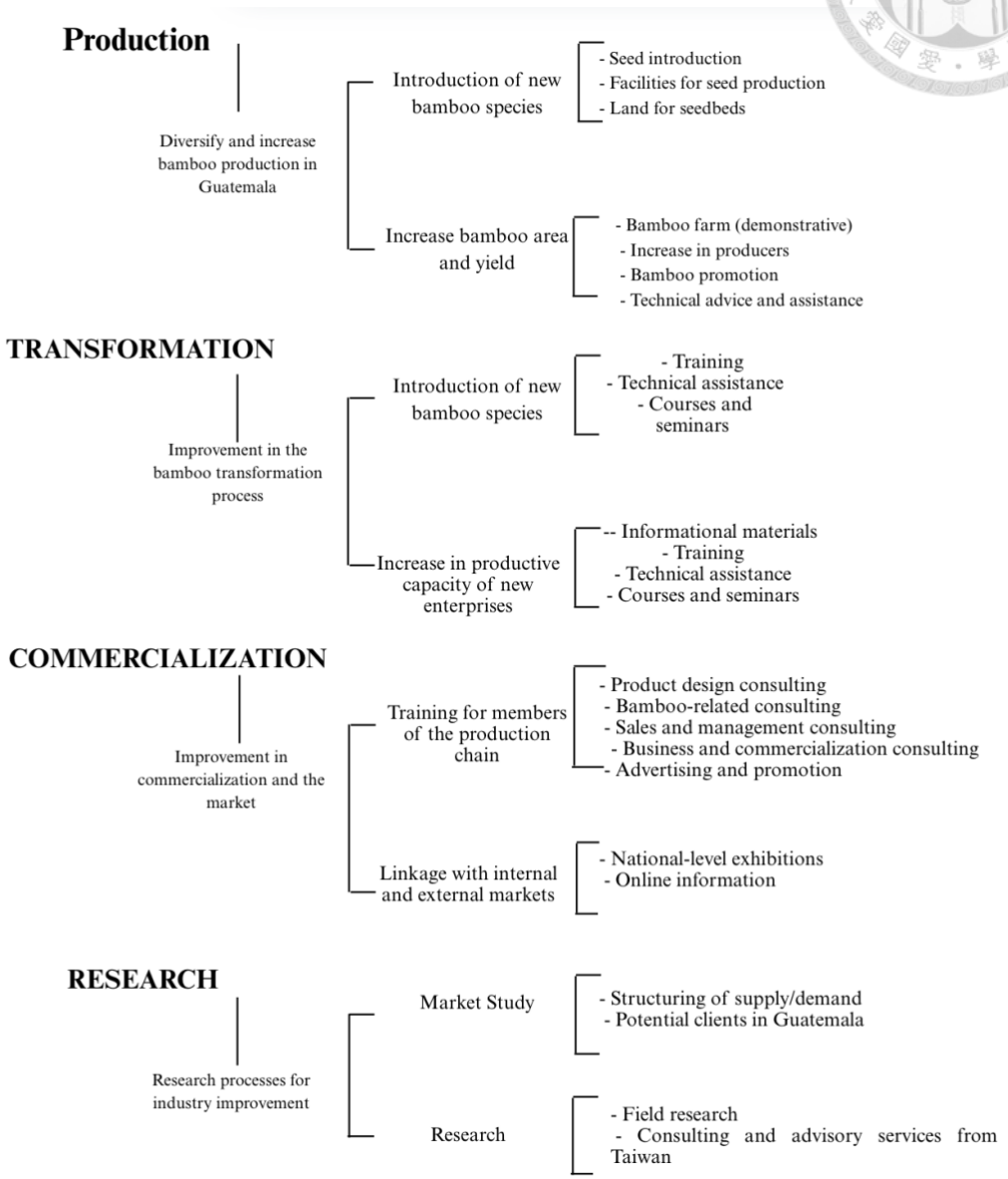
Figure 6. - *Planned Components of the Bamboo Value Chain According to Project Documentation*



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According to project planning documents, the bamboo initiative aimed to support a full value chain, from raw material production to commercialization and applied research (see Figure 6). The structure emphasized four pillars: production, transformation, commercialization, and research, each accompanied by strategies such as nursery development, technical training, and market studies. While many of these components were partially implemented, field interviews reveal significant gaps between the project's original design and the lived experiences of participants.

For example, while ANABAMBU has taken on a leading role in coordinating training and outreach, it still faces structural and financial constraints. As one representative explained, "We are the ones who decide what training is needed, and we reach out to INTECAP or other experts. Coordination comes from us" (Interview with ANABAMBU, 2025). Despite their growing institutional role, the challenges of sustaining and scaling the project remain evident in the field.

The project also included several demonstration buildings, like greenhouses and bamboo classrooms, built with help from MAGA, universities, and local governments. These were meant to be both functional and educational. Still, a few participants said they weren't sure how to maintain them or build more on their own.

From a theoretical perspective, the project follows key ideas from Knowledge Transfer Theory. The information was local, practical, and meant to solve real problems. But as the theory also suggests, applying that knowledge in the long term depends on local support systems. Even though the project taught valuable skills, its wider success depended on follow-up, access to materials, and ongoing mentorship.

Looking across the findings, it becomes clear that the transfer of knowledge had a significant influence on participants' ability to develop technical skills and engage in economic activities.

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Many were able to take what they learned and begin building small businesses or applying their skills within their communities. However, these opportunities were not evenly distributed. While some individuals moved forward with new ventures, others faced barriers such as limited access to tools, markets, or ongoing guidance. These differences suggest that although the technical training was valuable, its long-term effectiveness depended on whether participants had the necessary support systems in place to turn learning into lasting outcomes.

While individual learning was clear, a bigger question remained: could institutions keep supporting this knowledge over time? The next section looks at how the cooperation between Taiwan and Guatemalan institutions affected the project's long-term impact and continuity.

4.1.1 Gendered Participation and Barriers to Continuity

While the Taiwan–Guatemala bamboo project successfully reached a large number of women, particularly through SOSEP-supported workshops, interview data reveals that this inclusion did not always translate into lasting participation or empowerment. Of the 254 trainees who participated in bamboo-related activities, over 70% were women, many of whom were engaging with technical tools or business concepts for the first time. In this sense, the project was commendable for opening access and exposing women to new forms of income-generating activities.

However, participants also described challenges that limited the long-term impact of these opportunities. Several women reported difficulties in continuing bamboo work after the training ended, often due to domestic responsibilities, lack of workspace, or the inability to purchase tools and materials. As one participant explained, *"Even if I couldn't continue, the project gave me confidence and pride. It showed me I can learn and teach, but I didn't have the tools."* Another echoed this concern: *"They included women in the training, but no one*

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followed up. I was motivated, but I had no equipment, and I had to care for my children." (P4, Entrepreneur)

These reflections suggest that while the project promoted access, it did not fully address structural barriers that affect women's ability to sustain participation. Unlike their male counterparts, who often had preexisting workshop spaces or trade experience, many women entered the program with no prior exposure to carpentry or entrepreneurship. The absence of post-training support, such as tool provision, financial access, or continued mentoring, disproportionately affected their ability to convert skills into livelihood outcomes.

From a knowledge transfer perspective, this highlights a gap in absorptive capacity: without enabling conditions such as follow-up, contextualized support, and gender-sensitive program design, the knowledge introduced through training risks being underutilized. Furthermore, no mechanisms were in place to support women's progression into leadership roles within the bamboo value chain. While participation rates were high, gender equity in terms of voice, decision-making, and institutional representation remained limited.

Women's participation in the project was meaningful, but incomplete. It illustrates how short-term inclusion, without longer-term empowerment strategies, can unintentionally reinforce preexisting inequalities, rather than dismantle them. Future initiatives should integrate tools for continuity, address caregiving constraints, and actively promote women's leadership in project governance to ensure that inclusion leads to transformation.

4.2 Institutional Collaboration and Sustainability

Institutional collaboration was a central factor in shaping the outcomes of the Taiwan–Guatemala bamboo project. While this thesis analyzes the initiative through the lens of South–South Cooperation (SSC), the findings point to a more complex and layered reality. The

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effectiveness and sustainability of the project depended not only on the technical expertise provided by Taiwan but also on the level of institutional compatibility, local ownership, and long-term capacity development within Guatemalan institutions.

Since the beginning of the project, the Taiwan Technical Mission (ICDF) served as the central implementing body. Backed by funding from Taiwan's Ministry of Foreign Affairs (MOFA), ICDF was not only responsible for training delivery and nursery development but also for managing the bamboo processing center, providing the necessary machinery and technology, and coordinating product development strategies. The factory served as a practical training site and production center, where Taiwanese staff worked alongside local supervisors and interns. One ICDF representative explained, "All of these are the budget of the MOFA… our business model in Guatemala is to help local companies develop products… for sustainable purposes" (*Interview with ICDF representative, 2025*). While profit-making was explicitly excluded due to MOFA's development assistance mandate, the goal was to establish a value chain that could later be transferred to Guatemalan institutions.

On the Guatemalan side, ANABAMBU emerged as a strategic partner. Though not involved at the start, it has since played an increasingly critical role in coordinating trainings, building partnerships, and promoting bamboo as a sustainable development strategy. According to one ANABAMBU representative, "Everything we've advanced in bamboo in Guatemala has been thanks to the support of the Taiwan Technical Mission" (*Interview with ANABAMBU, 2025*). The organization now leads much of the outreach and works closely with institutions like INTECAP to design and coordinate trainings based on national needs. For example, they request specific technical modules from INTECAP, ranging from artisanal lamp-making to plantation management, and lead coordination efforts in remote areas such as Playa Grande and Ixcán.

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Moreover, ANABAMBU's evolving leadership role is tied to its legal establishment in 2022, which allowed it to pursue formal partnerships and oversee a national bamboo strategy. This institutional growth has taken place in parallel with feedback from artisans and community members who directly received the trainings.

Insights from artisans and participants who received training reflect both appreciation and unmet needs. Some participants described the experience as motivating, explaining that the workshops introduced them to bamboo for the first time and inspired them to experiment with new techniques. One artisan shared that learning to shape bamboo by hand made her realize its potential as a locally sourced alternative to wood. However, others pointed out that without a system to connect trained individuals with markets or material suppliers, the knowledge often remained theoretical. A participant from Baja Verapaz mentioned, "I wanted to keep practicing, but there was no one to guide us after the sessions." These reflections suggest that while the training itself was well received, its long-term value depends on continuous engagement and support structures. This issue is particularly evident in remote departments like Alta Verapaz, where participants appreciated the outreach of the bamboo initiative but noted that most machinery and technical equipment are located near urban centers such as Barcenas, Villa Nueva, located over 250 kilometers from Alta Verapaz. For many rural artisans, this distance creates logistical and financial barriers to accessing the production facilities or continuing their learning. As a result, knowledge that was introduced during training often remains disconnected from the material resources needed to apply it. This highlights the gap between the organizations leading the project and the people receiving the training, not just during training, but throughout the post-training phase, including commercialization and supply chain integration. These local insights also reflect broader discussions within the institutions themselves. In addition, interview data and national survey statistics point to another limitation, economic barriers faced by participants.

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According to the CEDE (2024) study, many rural Guatemalan families earn less than the national minimum wage and cannot afford travel or material costs associated with continued training. Even small expenses such as transportation to Barcenas or the purchase of basic tools can prevent artisans from building on their skills. Without accessible income-generating pathways or microcredit opportunities, knowledge transfer alone cannot address the structural challenges participants face in turning skills into sustainable livelihoods. While organizations like ANABAMBU have made notable progress in outreach, they also recognize the need to scale the initiative further. One interviewee mentioned plans to establish more regional training and production sites to reduce geographic barriers, especially for remote communities. However, such expansion is not guaranteed. As ICDF staff noted, any scaling efforts depend directly on MOFA's annual budget allocations, which determine how many sites can be developed and maintained at any given time.

From a theoretical perspective, applying several SSC principles helps interpret the project's strengths and limitations. First, the notion of horizontal partnership, defined as co-design and mutual implementation, was only partially observed. ICDF retained primary control over funding, strategy, and training design, while Guatemalan actors were brought in later. Although this imbalance is common in South–South initiatives (Heryadi et al., 2024), it limits full local ownership.

Second, the idea of mutual benefit also requires careful examination. For Taiwan, the project enhanced its international development profile and supported MOFA's diplomatic goals. For Guatemala, the benefits were more operational: improved training access, demonstration buildings, and the introduction of bamboo as a commercially viable material. Yet these outcomes depended heavily on continuous Taiwanese presence, infrastructure, and tools.

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Interviews with ICDF and ANABAMBU both confirmed that local actors still lack the autonomy and resources to sustain the system without external support.

From a knowledge transfer perspective, the bamboo center allowed for hands-on training across all stages of production, cutting, drying, treatment, and design. Local supervisors were trained to oversee each stage, and Guatemalan staff, were mentored in business negotiations and factory management. However, there were notable gaps in the post-training system. In several cases, participants who completed technical workshops returned to communities where there was limited local support or follow-up. One ICDF team member noted that some trainees felt uncertain about how to move forward with the skills they had acquired, particularly when they lacked access to local networks, mentoring, or the physical infrastructure needed to continue producing. Without a system to connect graduates with ongoing mentorship, inputs, or buyer networks, the momentum created during training was difficult to sustain. This is consistent with the CEDE (2024) findings, which show that only 28% of project participants reported selling a product within the year following their training. Additionally, the report highlights that many women in rural areas face compounded limitations due to low household income and unpaid domestic responsibilities, which further restrict their ability to capitalize on newly acquired skills. ICDF acknowledged these weaknesses, noting that the project lacked a long-term commercialization strategy for trainees in rural areas.

A key point of progress has been the formation of the agrocadena del bambú, jointly coordinated by ICDF, MAGA, and ANABAMBU. This multi-stakeholder structure includes nurseries, plantation owners, artisans, and government ministries. As noted in the ANABAMBU interview, the agrocadena allowed diverse actors to voice their needs and work toward shared goals. Yet challenges persist in integrating indirect actors, such as universities and municipalities, into a long-term strategy. While institutions like USAC and ENCA have

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collaborated on bamboo structures and trainings, their role in sustainability planning remains secondary.

Sustainability also depends on financial and managerial capacity. As ANABAMBU clarified, their leadership is unpaid and relies heavily on volunteer commitment. They now have legal status and a bank account but still lack full-time staff to manage communications, partnerships, or a digital platform. Without stronger institutionalization, their ability to absorb and expand the bamboo project remains limited.

In short, the Taiwan–Guatemala bamboo partnership demonstrates both the potential and challenges of institutional collaboration when viewed through the lens of SSC. Taiwanese actors brought technical depth and strong diplomatic coordination, while Guatemalan partners like ANABAMBU brought local legitimacy and long-term vision. Yet without a clearer transfer plan, diversified funding, and formalized support structures, the model risks stalling once Taiwanese support phases out.

4.3 Perceptions of Taiwan as a Development Partner

While interview participants generally recognized the technical success of the Taiwan–Guatemala bamboo project, their views on Taiwan as a development partner revealed deeper challenges in the cooperation model. These perspectives are important because they show the unequal roles within a partnership that, although very productive, was not always experienced as truly equal.

Across all interviews, Taiwan was acknowledged as the project's driving force. While this recognition reflects Taiwan's credibility and technical leadership, it also reveals a dependency that complicates the ideals of mutual ownership embedded in South–South Cooperation (SSC). Several Guatemalan stakeholders, including ANABAMBU, emphasized their growing role in

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coordination and outreach, yet also expressed those strategic decisions still relied heavily on ICDF. As one representative noted, “We organize things now, but still need Taiwan’s permission to move forward with bigger plans” (Interview with ANABAMBU, 2025).

This dynamic aligns with what Heryadi et al. (2024) describe as “SSC in discourse but not in structure.” Although the project shared technical knowledge, addressed local needs, and promoted sustainable practices, all features commonly associated with SSC, it was still largely designed, funded, and managed by the Taiwanese side. From ICDF’s perspective, this arrangement was transitional: “Our job is to support local actors to eventually take over, but that takes time, and depends on external funding” (Interview with ICDF, 2025). However, from the recipient’s side, the lack of a clear transition or exit strategy created uncertainty and reinforced the perception that Taiwan remained indispensable to the project’s continuity.

More than financial reliance, what emerged was a form of symbolic dependency. As one municipal official put it: “When Taiwan is involved, people take it seriously. But when we try to do it alone, no one listens” (Interview with local government partner, 2025). This sentiment speaks to the challenge of institutional legitimacy. Even when technical skills are successfully transferred, they may not translate into lasting autonomy if local actors lack the political recognition or infrastructure to sustain them.

In the bamboo project, technical skills were indeed shared, but without stronger local visibility, decision-making authority, or financial planning, Guatemalan partners remained in a secondary position.

This imbalance also impacted morale and long-term planning. While ANABAMBU gained legal recognition and led national coordination, many participants still questioned what would happen if Taiwanese support declined. CEDE (2024) warned of this risk, noting that “without

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deliberate capacity-building for independent project management, technical assistance may reinforce dependency rather than reduce it."

In short, Taiwan was widely perceived as a respected, capable, and generous partner, but not yet as an equal co-creator. These perceptions underscore the limits of the current cooperation model. For Taiwan's development partnerships to align more closely with SSC principles, future efforts will need to include clearer co-design processes, stronger financial transparency, and more visible leadership from local institutions. Only then can cooperation shift from being effective to being truly mutual.

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Chapter 5: Discussion

This chapter critically interprets the results of the Taiwan–Guatemala bamboo cooperation project using the conceptual framework developed in Chapter 2. Drawing from Knowledge Transfer Theory, South–South Cooperation (SSC), Capacity Building, Innovation Systems Theory, and Entrepreneurship Theory, the chapter evaluates how technical assistance, institutional collaboration, and training outcomes aligned, or failed to align, with the intended goals of business expertise development and sustainable industry formation.

This chapter is structured around three key themes from Chapter 4:

(1) how knowledge was shared and where it fell short,

(2) the challenges in building true institutional partnerships and the issue of relying too much on Taiwan's presence, and

(3) why the training didn't lead to real business opportunities.

Each part connects what was found in the field with the theories discussed earlier and explores what these findings mean for future development efforts.

5.1 The Structural Limits of Knowledge Transfer

One of the most visible results of Taiwan's cooperation was the large-scale technical training in bamboo treatment, product-making, and craftwork offered in 12 departments out of 22 from all Guatemala. More than 250 people took part, most of them women. However, when we look at this through the lens of Knowledge Transfer Theory (Zahra & George, 2002), we see that while many participants received the knowledge, only some were able to fully understand it, adapt it to their local context, or turn it into practical or business results.

In regions such as Chimaltenango, where participants had previous experience in carpentry and access to workshops, bamboo skills were sometimes integrated into daily work. As one

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participant explained: “I already worked with wood, so for me it was just adding another material. The training helped me improve the finish.” (P8, Microentrepreneur)

In contrast, this was not the case in more remote or marginalized regions. In Alta Verapaz, for example, a municipal staff member shared:

“They gave us a workshop and told us to replicate it with other community members. But it ended up like a broken telephone, each time we tried to explain it, something got lost or misunderstood.” (P4, Entrepreneur)

This quote shows an important issue While the initial workshop was delivered, there was no follow-up or support to ensure participants could accurately pass on what they learned. The lack of clear guidance, teaching materials tailored to the local context, or opportunities to ask questions meant that key information was diluted each time it was shared. As a result, the intended multiplier effect of the training never fully worked.

“They told us we could go to the Bamboo Center and they would help if we brought the raw material. But that place is hours away from where I live. And we don’t have our own bamboo here.” (P2- Technical Trainer)

These findings reinforce Abinbuhaybeha’s (2023) argument that institutional compatibility and absorptive capacity are necessary for true learning. When training is detached from context, linguistically, geographically, economically, knowledge transfer becomes superficial.

So, even though the project gave people technical training, it confused showing people something with actually helping them understand it. Because the training wasn’t adapted to local needs, people didn’t always use what they learned. This challenges the common idea in

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development projects that just counting how many people were trained means the project was a success.

5.2 Institutional Ownership and the Limits of Local Control

Although the Taiwan–Guatemala initiative was not formally framed as a South–South Cooperation (SSC) project, its structure closely mirrored SSC arrangements: technical exchange between developing countries, a focus on capacity building, and an emphasis on government-to-government collaboration. Theoretically, SSC promotes mutual benefit and horizontal partnerships. However, findings suggest that this rhetoric was not fully reflected in institutional realities on the ground.

The creation of ANABAMBU, the establishment of the Bamboo Transformation Center, and the engagement of public agencies such as MAGA and ICTA signaled institutional commitment. Yet, field evidence points to a significant gap between procedural inclusion and strategic ownership. One ANABAMBU staff member noted:

"They help us organize and support the agrocadena, but ultimately no actor acts alone, every step is coordinated between Misión Taiwan and MAGA. Sometimes we wait for approvals, especially on larger initiatives." (P5 - Local NGO Coordinator)

This reflects what Heryadi et al. (2024) describe as formal symmetry masking functional hierarchy. While Guatemalan institutions had visibility, they did not hold strategic power. Decision-making remained donor-centered, with no clear roadmap for transferring leadership to local actors.

The literature on capacity building, particularly Salas et al. (2012), emphasizes that sustainable institutions must be equipped not only to operate within externally driven projects but to function autonomously beyond them. In the case of ANABAMBU, while the organization was

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legally established and operationally active, interviews revealed structural weaknesses namely, the absence of core funding, permanent staffing, and technical autonomy. It functioned as a visible but non-autonomous institution, reliant on external direction and vulnerable to discontinuity in the absence of donor support.

Moreover, symbolic legitimacy remained closely associated with Taiwan. As one local organizer noted,

"People came because they saw Taiwan's logo. If it had just been a government thing, fewer people would have paid attention." (P9, local organizer)

This shows a kind of symbolic dependency, where people trust the project more because it's linked to the donor, not because of the local institution itself. One civil society participant explained this tension clearly: "It's like we're just here to implement, not to imagine. The big ideas always come from them." (P4, Entrepreneur)

These findings reveal a key problem with the usual idea of South–South Cooperation: just because local partners help carry out activities doesn't mean they helped shape the bigger vision. If local institutions don't feel real ownership, they might look empowered on the outside but still depend on the donor in practice. In the Taiwan–Guatemala project, local groups were involved, but they weren't truly given the power to lead or decide on their own.

5.3 The Illusion of Entrepreneurship

One of the project's stated goals was to support bamboo-based entrepreneurship and local income generation. However, the real-life evidence shows there is still a big gap between learning skills and starting a successful business. Fewer than one-third of participants reported selling any bamboo product after the workshops (CEDE, 2024).

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Several participants highlighted the problem:

We learned how to treat bamboo, but then what? We didn't have the chemicals. And to cut it correctly, you need special tools." (P2- Technical Trainer)

This comment reflects a broader problem: having skills alone is not enough to start a business. According to Shane and Venkataraman (2000), entrepreneurship depends on both the ability to do something and the chance to turn it into a real opportunity. In the Taiwan–Guatemala project, the focus was mainly on providing technical skills, but not on helping people connect to markets, access materials, or build support networks, things that are just as important for starting a business.

There were no systems to connect the people making bamboo products with buyers. No cooperatives were formed to help them work together, and no market research was done to figure out what products might actually sell. Participants didn't know how to set prices, how to sell their products, or how to get legal help if they needed it.

While the project aimed to create an ecosystem for bamboo innovation, this vision was only partially realized. After several years of cooperation, there is still only one Bamboo Transformation Center, located near the city. This centralized structure made it difficult for rural artisans to access support. As one interviewee noted, the Center was "hours away," and many communities lacked the transportation or resources to benefit from it.

Rather than functioning as a dynamic hub for experimentation and learning, the Center remained largely disconnected from the day-to-day realities of local producers. There were no structured feedback mechanisms to adapt tools, techniques, or training based on users' needs. If the goal is to promote inclusive growth and long-term sustainability, future investments

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should consider establishing additional centers or mobile support units in more remote areas, where the need for technical follow-up and local adaptation is even greater.

This runs counter to Lundvall's (2010) Innovation Systems Theory, which holds that innovation arises from dense interaction across institutions, not from physical infrastructure alone. Without strong connections between trainers and producers, and between producers and markets, the center turned into a symbol rather than something truly useful.

In the end, the project imagined a clear path from skills to starting a business. But without the right support systems in place, that path never fully formed. What was left was the appearance of opportunity, but not the reality, an illusion of entrepreneurship.

5.4 Dependencies

One of the most surprising findings of this case study was the idea of symbolic dependency, a kind of reliance not on money or technical help, but on the donor's presence as a sign of trust and authority. This issue wasn't mentioned in the project plans or official documents, but it came up often in interviews. It suggests that the success and long-term impact of the project were quietly but strongly connected to Taiwan's visible role in the cooperation. "People came because they saw Taiwan's logo. If it had just been a government thing, fewer people would have paid attention." (P9, local organizer)

"When Taiwan is involved, people take it seriously. If they leave, people start thinking the project is over." (P5 – Local NGO Coordinator)

While South–South Cooperation (SSC) is often praised for avoiding the hierarchies of traditional donor–recipient models, your findings suggest that status asymmetries can persist even when material control is balanced. In this case, Taiwan's symbolic capital, its reputation as an external actor with resources, credibility, and international standing, functioned as a

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stabilizing anchor for the project. However, this symbolic anchoring also created a form of institutional fragility: when Taiwan's visible role diminished, so did the perceived legitimacy of Guatemalan institutions task with continuation.

This situation is similar to a gap mentioned in the literature about South–South Cooperation (SSC). While many studies focus on money or conditions attached to aid, they often overlook how foreign partners can unintentionally shape how a project is seen and trusted. Because of this, local ownership can seem more like a performance than something real, especially if people's trust, motivation, and involvement depend on the presence of the foreign donor.

From a capacity-building point of view, this shows how challenging it can be to build real local ownership in international cooperation. Although the project offered useful resources and support, some participants felt they were mostly carrying out pre-planned tasks instead of helping to shape the project's goals.

Even though participants felt proud of what they contributed, their comments often showed that leadership still came from outside. This means that, although the project reached its technical and material goals, there was less real collaboration in decision-making. Improving these areas could help future projects last longer and adapt better over time.

Because of this, development efforts cannot focus solely on delivering infrastructure, manuals, or training. They must also invest in building local trust and institutional legitimacy. Until Guatemalan institutions are seen as credible actors in their own right, by both communities and state stakeholders, the project's success will remain closely tied to Taiwan's presence and vulnerable to its eventual withdrawal.

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5.5 Gendered Dimensions of Participation and Empowerment

The Taiwan–Guatemala bamboo project made efforts to include women in technical training. Many participants expressed appreciation for this opportunity, with one woman sharing, *"It felt good to be taken seriously and learn something."* For others, the training fostered a sense of pride and visibility: *"They included us. We learned how to use tools not just watch".* These stories show real moments when people felt empowered and included, and they suggest that the project is moving toward more inclusive development.

However, these gains were not always sustained beyond the training phase. Structural barriers, including caregiving responsibilities, lack of tools, and limited mobility, constrained women's ability to apply what they had learned. As one participant put it, *"I was motivated, but I had no equipment, and I had to care for my children."* Despite high participation rates, women remained underrepresented in decision-making spaces, including leadership roles.

This pattern underscores a key limitation: although the project made progress in promoting gender inclusion in terms of access, it was less successful in fostering long-term agency. From a Capacity Building perspective, participation must be supported by enabling conditions that allow women to apply and benefit from the knowledge gained. Without such conditions, empowerment risks remaining symbolic rather than truly transformative.

5.6 Limitations of the Study

This study case offers valuable insights into the cooperation between Taiwan and Guatemala in the bamboo sector, but it's important to recognize its limitations. These don't undermine the findings, but they do highlight where interpretation should be cautious and where future studies could expand. The analysis draws on 12 semi-structured interviews, which provided rich, qualitative detail. Still, the sample doesn't cover all perspectives involved in the initiative. In

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particular, voices from the private sector or community members who stepped away from the project might be missing.

The analysis was based on 12 semi-structured interviews, which allowed for in-depth, qualitative understanding. However, the sample cannot claim to represent all perspectives across the bamboo initiative. Certain voices especially from the private sector or from community members who discontinued participation, may be underrepresented. The study prioritized diversity in role and geography, but it remains a purposeful and partial window into the broader program.

In rural areas with limited internet or telephone access, some responses were gathered through intermediaries such as NGO workers or local officials. While necessary for practical reasons, this introduces a layer of interpretation between participant experience and final analysis. Differences, frustrations, or subtle critiques may have been filtered, especially when interviewers were perceived as aligned with institutions.

The document analysis relied heavily on internal reports and promotional materials produced by the implementing agencies. These sources provided rich contextual information, but likely reflect optimistic or curated narratives. As a result, the documentary record may overemphasize success metrics while underreporting gaps in implementation, local disengagement, or unintended consequences.

This research captured a single moment in time and is unable to assess how outcomes might evolve. Institutional ownership, skill retention, and symbolic dependency are all dynamic processes that unfold over years. A cross-sectional design provides valuable insight into initial impacts and perceptions, but cannot evaluate long-term sustainability or adaptation.

Finally, the researcher's dual position as both an external observer and a regional insider (i.e., Guatemalan but trained in Taiwan) may have shaped both participant responses and

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interpretive framing. While reflexivity was exercised throughout, some biases are inevitable in qualitative inquiry. The study tried to reduce this problem by using different sources of information and being clear about how it analyzed and grouped the data.

5.7 Implications for Policy, Practice, and Research

The findings of this study suggest that technical cooperation, while well-intentioned, risks falling short unless deeper institutional, cultural, and structural dynamics are acknowledged and addressed. The Taiwan–Guatemala bamboo initiative provides a rich case through which to reflect on how policy can move from symbolic inclusion to real ownership, how real-life practice can connect knowledge with opportunities, and how research can better explore the hidden power dynamics in development.

Policy Implications

One of the clearest lessons from this case is the importance of planning for gradual and strategic transitions from the start of a cooperation project. In the Taiwan–Guatemala initiative, local actors such as ANABAMBU played a key role in implementation and collaborated closely with the Taiwanese mission. While they contributed significantly on the ground, certain aspects, such as budget control and strategic planning, remained primarily guided by the foreign partner. To support long-term sustainability, future South–South Cooperation (SSC) frameworks could benefit from including clearer timelines and structured mechanisms for transferring leadership responsibilities. This would help strengthen local capacity, build confidence, and ensure continuity after external support winds down.

Equally important is the need to localize institutional legitimacy. In this case, project credibility remained largely attached to Taiwan's visible presence. Participants and stakeholders frequently noted that the project was "taken seriously" because of Taiwan's involvement. This

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reveals a deeper challenge: local institutions are not automatically perceived as legitimate by communities or officials, even when they are legally recognized. Policy should therefore prioritize not just technical training or infrastructure investment, but also the social work of legitimacy-building ensuring that institutions like ANABAMBU are seen as credible agents in their own right.

Lastly, the case calls for a redefinition of "partnership." The SSC model promotes horizontal relationships and mutual learning, but in practice, Guatemalan actors had limited influence over the project's strategic vision. A meaningful partnership requires more than inclusion in operational roles, it requires co-creation of goals, priorities, and evaluation criteria. Formal symmetry must be matched with real agency, otherwise the cooperation risks reproducing top-down dynamics under a South–South label.

Practice Implications

Participants learned how to treat bamboo, but lacked the chemicals, tools, buyers, or transportation needed to commercialize their work. This indicates that effective practice must go beyond skill-building and invest in the ecosystem around entrepreneurship, from cooperative formation and tool access to market linkage and pricing knowledge. Without this, technical learning becomes a dead end rather than a pathway.

Geographic and infrastructural barriers also need to be addressed. Many rural participants were told they could access support at the Bamboo Transformation Center if they brought their own raw materials. However, the center was often hours away, and bamboo was not even cultivated in some participants' areas. Future initiatives must decentralize support, ensuring that rural and indigenous communities are not left out simply because of distance. This includes mobile training units, local material stockpiles, and distributed mentorship networks.

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Furthermore, the linguistic dimension of access emerged as a serious challenge. Every workshop is conducted in Spanish, excluding many indigenous-language speakers. Some participants were expected to replicate training in their communities, but lacked confidence and clarity to do so. In response, development practice should institutionalize linguistic translation and participatory feedback loops. Training must be delivered in ways that resonate culturally and linguistically, and local actors must be given opportunities to express whether and how the content is making sense. Feedback should not be treated as a final evaluation step, but as a real-time tool for adaptation.

Research Implications

This case shows that short-term evaluations, those that only look at immediate results, have limits. Some important problems, like symbolic dependency and weak institutions, only become clear after the donor's presence starts to fade. We need long-term studies to see how local institutions change over time when outside support ends. Do they become more independent, or do they struggle due to a lack of resources and support? Without this kind of data, it's hard to know what real, lasting cooperation needs.

Another important topic for future research is the idea of symbolic dependency. This study shows that even when South–South Cooperation (SSC) avoids big differences in money or resources, it might still create a different kind of imbalance, where communities and institutions rely on the foreign partner to be seen as credible. This type of dependency is not often discussed in SSC studies, which usually focus on skills or money. Comparing different SSC projects could help us understand how common symbolic dependency is, how it works, and how to reduce it on purpose.

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The study brings up important questions about who gets to share knowledge. When training materials aren't translated, and information only goes from foreign experts to local people, there's a risk of ignoring local knowledge, traditional bamboo practices, or ways of doing things that fit the local context. Future research should look at how development projects can value local ways of knowing and support working together to create knowledge, instead of just passing it down from outside experts.

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Chapter 6: Conclusions

This thesis explored how Taiwan's involvement contributed to the development of business expertise and sustainable growth in Guatemala's bamboo industry. Based on 12 interviews with people involved in the project and documents from the organizations., the study used a thematic analysis grounded in Knowledge Transfer Theory, South–South Cooperation (SSC), and Capacity Building to examine the experiences of those directly involved in the initiative.

Taiwan's support, particularly through the ICDF and Taiwan Technical Mission, played a key role in helping set up the technical base of the bamboo industry. From 2014 to 2023, hundreds of Guatemalans received training in bamboo treatment, weaving, construction, and design. Infrastructure such as nurseries and a Bamboo Transformation Center were established, helping position bamboo as a climate-resilient and economically viable material. These efforts helped fill important missing parts of the project in technical know-how and raised awareness about bamboo's potential. In terms of knowledge transfer, the cooperation achieved notable outcomes.

However, the study also showed that there were important missing pieces that made it hard for many people to turn what they learned into real, long-term business opportunities. While the training itself was widely appreciated, many individuals especially women and artisans in rural areas, found it difficult to continue production afterward. They lacked tools, capital, workspace, or guidance. In some cases, the cost of materials or distance from support centers made it impractical to apply what they had learned. This disconnects between training and entrepreneurship limited the long-term economic impact of the project.

One of the clearest lessons from this research is that skill-building alone is not enough to create sustainable livelihoods. Without follow-up support, coaching, and access to markets, many participants were left with knowledge they could not fully use. Future cooperation projects should treat training not as the end point, but as the beginning of a guided business journey.

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After completing technical instruction, participants should be enrolled in a structured incubation program designed to develop real commercial outcomes. This phase would support them in creating a product line, setting pricing strategies, identifying target markets, and preparing to sell, whether locally or through organized fairs, shops, or online platforms. Business coaching should focus on core topics like cost management, branding, and customer segmentation. At the same time, participants could receive small startup kits ,including tools, materials, and digital support, tailored to their business plans. Financial literacy sessions should go beyond saving tips and introduce basic profit-and-loss tracking and micro-financing options. These are all standard elements in entrepreneurship development programs and would significantly increase the chances of bamboo producers turning their skills into sustainable income. Without this next step, even high-quality training risks becoming disconnected from economic opportunity.

Another major weakness was the lack of a clear market entry strategy. Most trainees finished their technical training without a roadmap for how to commercialize their products. While some tried selling at local fairs, these efforts were informal and disconnected, lacking branding, price consistency, or reliable customer access. What's needed is a coordinated go-to-market strategy. This should include developing a national bamboo product catalog with standardized quality, clear pricing, and artisan profiles a tool that can be used in trade shows, online platforms, or direct pitches to buyers.

Equally important is branding. Guatemala's bamboo artisans need a recognizable, collective brand that communicates quality, sustainability, and local identity. A cooperative label like "Made with Bambú -Guatemala" would allow small producers to market together and benefit from shared promotion.

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Strategic partnerships with eco-conscious retailers, tourism outlets, and export buyers (especially those focused on handmade or sustainable goods) should be actively pursued to open long-term sales channels. At the same time, early demand could be secured by encouraging guaranteed institutional purchases from public schools and local governments, which could source desks, chairs, or planter boxes as part of local procurement policies. This would generate steady orders while helping normalize bamboo in the national market.

The production side also needs restructuring. Currently, artisans work individually, often without access to the tools, space, or packaging needed for high-quality, scalable output. The solution is the creation of regional bamboo business hubs, physical centers where trained artisans can access shared machinery, storage, and quality control support. These hubs would reduce production costs, allow for consistent product standards, and streamline logistics for bulk orders. They would also serve as central nodes for coaching, inventory tracking, and connection to buyers or agencies. This kind of cooperative model has been proven effective in sectors like textiles and coffee, and could become the core support system for bamboo production across the country.

This study case also revealed that local ownership remains limited by an ongoing dependency on Taiwan's presence for project legitimacy and strategic direction. While organizations like ANABAMBU have taken on more visible roles, many participants still perceived Taiwanese actors as the central decision-makers. To address this, future cooperation must include a planned transition of control: gradually shifting financial authority, increasing the visibility of Guatemalan institutions, and establishing co-leadership in decision-making processes.

For bamboo to move beyond a development initiative and become a viable industry, it must be supported by a complete business ecosystem.

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This research has limitations. It offers a snapshot of an evolving initiative and does not fully capture the perspectives of buyers, private sector actors, or former project participants. Future studies could explore long-term business outcomes or evaluate the impact of regional bamboo hubs on market access and income generation.

Despite these constraints, this thesis contributes both conceptually and practically. As a Guatemalan student trained in Taiwan, this project was not only academic, it was personal. I saw firsthand how meaningful cooperation can spark opportunities, and how fragile those opportunities can be without long-term systems in place. The future of the bamboo industry will depend on whether local actors are equipped and trusted to lead it forward.

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Appendix

Appendix A - Thematic Analysis: Knowledge Transfer (Bamboo Project Stakeholders)

Theme	Code	Description	Quote
Knowledge Transfer	Technical and business training	Training covered bamboo planting, harvesting, treatment, design, and commercialization.	"We didn't know anything about bamboo before. Now I can even teach others." P4- Entrepreneur
	National and community workshops	Workshops organized nationally with support from INTECAP, Taiwanese experts.	'Events included congresses with international bamboo experts, especially from Taiwan.' P10- ANABAMBU President
	Local, hands-on delivery methods	Community-based, hands-on demonstrations tailored to local contexts.	"ICDF delivered training directly in rural communities through hands-on demonstrations." P2- Technical Trainer
	Trained artisans and rural women	Focused on empowering rural women and artisans with limited technical background.	"Workshops specifically targeted rural women, many of whom were trained for the first time." P12- ICDF Trainee
	Transferred equipment and tools	Shared tangible resources such as bamboo strips, tools, and basic machinery.	"They transferred machinery, production know-how, and provided technical supervision." P12- ICDF Trainee
	Full value chain knowledge	Knowledge covered the complete bamboo production cycle, from raw planting to commercialization.	"The project transferred complete technical processes, from planting and treatment to furniture and construction." P1 - Taiwan Technical Mission Project

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Appendix B - Thematic Analysis: Entrepreneurship and Business Development Bamboo Project

Theme	Code	Description	Quote
Entrepreneurship and Business Development	Pathways to Entrepreneurship	Training and project design wanted to support participants in launching bamboo-related businesses or income-generating activities.	"The training gave us ideas for a business, but we didn't know where to start." P4- ANABAMBU Entrepreneur
	Barriers to Starting a Business	Challenges such as lack of capital, tools, markets, or formal support systems hindered participants from becoming entrepreneurs.	'We learned, yes, but there was no money or machines to continue." P12 - ICDF Trainee
	Short-Term vs. Long-Term Outcomes	Participants earned money briefly during training, but few maintained long-term income due to weak follow-up.	"I made some sales after the workshop, but then it stopped." P8 – Microentrepreneur
	Business Support and Infrastructure	Access to physical infrastructure, mentoring, market linkages was limited or inconsistent.	"There's no space or tools to keep working. Everything was during the training only." P12 – ICDF Trainee
	Institutional vs. Individual Outcomes	Most entrepreneurial gains were individual and unsustain; there was little institutional scaling or formalization.	"Some women were successful, but most had no guidance after training." P2 – Taiwan Technical Mission Trainer

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Appendix C – Thematic Analysis of Institutional Ownership and Project Continuity in the Bamboo Project

Theme	Code	Description	Quote
Institutional Ownership and Project Continuity	Dependency on External Actors	Reliance on Taiwan for project direction, technical expertise, or legitimacy.	"Once the Taiwanese team don't show, the project basically stopped." P7 - Municipal Official
	Weak Local Institutional Capacity	Guatemalan institutions like ANABAMBU lack sufficient staff, resources, or autonomy to sustain the project independently.	"We have a name (ANABAMBU), but not a team or budget." P10 – ANABAMBU President
	Lack of Follow-Up Systems	Absence of structured post-training support such as monitoring, mentorship, or return visits.	"There was never any follow-up after the trainings. We were left by our own." P4 -ANABAMBU Entrepreneur
	Interrupted or Abandoned Projects	Many bamboo centers and production hubs slowed or stopped after initial support ended.	"There were plans for more, but it didn't happen." P8 – Microentrepreneur
	Perceived Symbolic Value of Taiwan's Presence	Taiwan's visible involvement influenced community participation and perceived credibility of the initiative.	"When Taiwan is involved, people show up. It gives the project weight." P5 – Local NGO Coordinator

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Appendix D – Thematic Analysis of Symbolic Dependency and Credibility in the Bamboo Project

Theme	Code	Description	Quote
Symbolic Dependency and Credibility	Taiwanese Presence as Legitimacy Anchor	Taiwan's visible involvement was seen as central to the project's credibility, professionalism, and value.	"When Taiwan is involved, people show up. It gives the project weight." P5 - Local NGO Coordinator
	Motivation Tied to Donor Visibility	Community and institutional motivation often increased when Taiwanese experts or branding were present.	"They came because they saw the Taiwan flag. Without it, people ignore the project." P7 - Municipality Official
	Perceived Loss of Credibility After Withdrawal	Participants expressed that the project lost legitimacy or momentum after Taiwanese actors left.	"Once the Taiwanese team don't show, the project basically stopped." P7 - Municipality Official
	Symbolic vs. Structural Ownership	Local actors were symbolically associated with the project, but real decision-making remained with Taiwan.	"They called it a national program, but everything was still coming from Taiwan." P10 - ANABAMBU President

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Appendix E - Taiwan Technical Mission Interview Questions

Theme	Code	Description	Quote
Gender and Social Inclusion	Women as Primary Beneficiaries	Many training efforts targeted rural women as key actors in bamboo craft and entrepreneurship.	"We trained rural women in weaving and finishing techniques." P12- ICDF Trainee
	Barriers to Continued Participation	Despite initial access, women often lacked tools, money, or institutional follow-up to continue independently.	"Many women couldn't continue because they had no tools or workspace." P10 - ANABAMBU President
	Empowerment through Technical Skills	Some participants described training as empowering and skill-building for women.	"I felt proud to learn and teach others. It changed how I see myself." P4 -ANABAMBU Entrepreneur
	Symbolic Inclusion without Structural Support	Inclusion of women was visible in training sessions, but structural support and follow-up were often missing.	"The training looked good on paper, but after that, nothing happened" P8 - Microentrepreneur

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Appendix F - Taiwan Technical Mission Interview Questions

國立臺灣大學 National Taiwan University

GMBA National Taiwan University

Guía de entrevista:

Misión Técnica de la República de China (Taiwán)

El objetivo del presente instrumento es analizar los efectos de la cooperación internacional de Taiwán en el fortalecimiento de la experiencia empresarial y el desarrollo sostenible de la industria del bambú en Guatemala. Este instrumento será utilizado como parte del trabajo de tesis de maestría en Administración Global de Negocios de la National Taiwan University.
La entrevista está compuesta por una serie de diez preguntas abiertas, y se agradece de antemano su participación y disposición para compartir información según su experiencia o conocimiento.

Nombre: _____ **Puesto:** _____

Fecha: _____ **Hora:** _____

Modalidad: Cara a cara ☐ Telefónica ☐ Correo electrónico ☐ Videollamada ☐

Preguntas:

1. ¿Cuál fue la necesidad principal que el proyecto buscaba atender dentro del sector del bambú en Guatemala?
2. ¿Qué elementos aportados por la cooperación taiwanesa fueron clave para posicionar al bambú como una oportunidad de desarrollo sostenible en Guatemala?
3. ¿Qué tipo de conocimientos técnicos o empresariales se buscó transferir a los participantes del proyecto?
4. ¿Qué metodologías se utilizaron en las capacitaciones? ¿Incluyeron talleres prácticos, visitas técnicas u otras actividades participativas?
5. ¿Considera que los beneficiarios aplicaron efectivamente los conocimientos adquiridos?
6. ¿Qué tipo de seguimiento se ha realizado para evaluar si los conocimientos siguen en uso?
7. ¿Cuáles fueron los principales factores que facilitaron o dificultaron la transferencia de conocimientos?
8. ¿Se han generado emprendimientos o negocios como resultado de este proyecto? ¿Podría dar ejemplos?
9. ¿Los beneficiarios recibieron apoyo para desarrollar modelos de negocio o comercializar productos de bambú?
10. Desde su punto de vista, ¿qué condiciones son necesarias para que estos negocios sean sostenibles a largo plazo?

Se agradece la participación dentro de la presente investigación y se resalta que es de uso exclusivo para elaboración de tesis.

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Appendix G- Women participants receiving certificates after completing a bamboo weaving workshop.

Source: Asociación Nacional del Bambú – Guatemala. (n.d.). Noticias. https://www.bambu.org.gt/noticias-17.html

Appendix H- Taiwanese and Guatemalan technical and community representatives at a bamboo site visit.

Source: Asociación Nacional del Bambú – Guatemala. (n.d.). Noticias. https://www.bambu.org.gt/noticias-13.html

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Appendix I- Construction of bamboo infrastructure in a rural community using locally harvested materials.

Source: Asociación Nacional del Bambú – Guatemala. (n.d.). Noticias. https://www.bambu.org.gt/noticias-13.html

Appendix J- Participant cutting raw bamboo poles in preparation for product fabrication.

Source: Asociación Nacional del Bambú – Guatemala. (n.d.). Noticias. https://www.bambu.org.gt/noticias-16.html

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Appendix K - Workshop participants learning how to shape bamboo segments for product use.

Source: Asociación Nacional del Bambú – Guatemala. (n.d.). Noticias. https://www.bambu.org.gt/noticias-16.html

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