

**THE ROLE OF THE BAMBOO BASKET CRAFT INDUSTRY IN INCREASING
THE HOUSEHOLD INCOME OF ARTISANS IN SIRPANG DALIG RAYA
VILLAGE, SIMALUNGUN REGENCY**

^{1*}Meylida Nurrachmania, Faculty of Agriculture, Study Program of Forestry, University of Simalungun

e-mail: meylidanurrachmania@gmail.com

²Sonia Somadona, Faculty of Agriculture, Department of Forestry, University of Riau

e-mail: sonia.somadona@lecturer.unri.ac.id

*Correspondece Author: meylidanurrachmania@gmail.com

ABSTRACT

Bamboo is one of the most important non-timber forest products (NTFPs) that has high economic potential and contributes to improving rural livelihoods through value-added processing. In Sirpang Dalig Raya Village, Simalungun Regency, bamboo basket handicrafts have become one of the primary economic activities for local households. However, information regarding the income generated from this business, its contribution to total household income, and its role in improving household welfare remains limited. This study aimed to calculate the income generated from the bamboo basket handicraft business, analyze its contribution to the total household income of artisans, and describe its role in increasing household income in Sirpang Dalig Raya Village, Simalungun Regency. The research employed a quantitative descriptive approach. Data were collected through structured interviews and direct observations involving 190 bamboo basket artisans selected using purposive sampling. Data were analyzed using production cost analysis, revenue analysis, income analysis, and contribution analysis. The results showed that the average production cost of the bamboo basket business was IDR 4,455,000 per production period, consisting of IDR 50,000 in fixed costs and IDR 4,405,000 in variable costs. With an average production of 500 baskets and a selling price of IDR 20,000 per basket, the average total revenue reached IDR 10,000,000, resulting in a net income of IDR 5,545,000 per production period. The bamboo basket business contributed 61.72% to the total household income, making it the primary source of income compared with agriculture, rubber tapping, livestock farming, wage labor, and small-scale trading. These findings indicate that bamboo basket handicrafts play a significant role in increasing household income, creating employment opportunities, and supporting sustainable rural economic development through the utilization of non-timber forest products.

Keywords: *Bamboo Basket, Household Income, Non-Timber Forest Products, Rural Livelihoods, Contribution Analysis.*

ABSTRAK

Bambu merupakan salah satu hasil hutan bukan kayu (HHBK) yang memiliki potensi ekonomi tinggi dan mampu meningkatkan kesejahteraan masyarakat melalui pengolahan menjadi produk bernilai tambah. Di Desa Sirpang Dalig Raya, Kabupaten Simalungun, usaha kerajinan keranjang bambu telah menjadi salah satu kegiatan ekonomi utama masyarakat. Namun, informasi mengenai besarnya pendapatan yang diperoleh, kontribusinya terhadap pendapatan rumah tangga, serta perannya dalam meningkatkan kesejahteraan masyarakat masih terbatas. Penelitian ini bertujuan untuk menghitung pendapatan usaha kerajinan keranjang bambu, menganalisis kontribusi usaha tersebut terhadap total pendapatan rumah tangga pengrajin, serta mendeskripsikan perannya dalam meningkatkan pendapatan rumah tangga di Desa Sirpang Dalig Raya, Kabupaten Simalungun. Penelitian menggunakan metode deskriptif kuantitatif. Pengumpulan data dilakukan melalui wawancara terstruktur dan observasi langsung terhadap 190 orang pengrajin keranjang bambu yang dipilih secara purposive. Analisis data

meliputi analisis biaya produksi, penerimaan, pendapatan, dan kontribusi pendapatan. Hasil penelitian menunjukkan bahwa rata-rata biaya produksi usaha keranjang bambu sebesar Rp. 4.455.000 per periode produksi yang terdiri atas biaya tetap Rp. 50.000 dan biaya variabel Rp. 4.405.000. Dengan rata-rata produksi sebanyak 500 unit dan harga jual Rp. 20.000 per unit, diperoleh total penerimaan sebesar Rp. 10.000.000 dan pendapatan bersih sebesar Rp. 5.545.000 per periode produksi. Usaha kerajinan keranjang bambu memberikan kontribusi sebesar 61,72% terhadap total pendapatan rumah tangga pengrajin sehingga menjadi sumber pendapatan utama dibandingkan dengan sektor pertanian, penyadapan karet, peternakan, buruh harian, dan usaha kecil lainnya. Hasil penelitian menunjukkan bahwa usaha kerajinan keranjang bambu berperan penting dalam meningkatkan pendapatan rumah tangga, menciptakan kesempatan kerja, serta mendukung pembangunan ekonomi pedesaan yang berkelanjutan melalui pemanfaatan hasil hutan bukan kayu.

Kata Kunci: Keranjang Bambu, Hasil Hutan Bukan Kayu, Pendapatan Rumah Tangga, Kontribusi Pendapatan, Pembangunan Ekonomi Pedesaan.

I. INTRODUCTION

Non-Timber Forest Products (NTFPs) are a type of forest resource that plays a strategic role in supporting community economic development while preserving forest sustainability. The utilization of NTFPs provides opportunities for communities to gain economic benefits without overexploiting timber. One NTFPs with high development potential is bamboo, as it grows rapidly, is easy to cultivate, is abundantly available, and can be processed into various high-value products (Widyaningsih et al., 2020; Rahayu et al., 2024).

Bamboo has been widely used as a raw material for various handicrafts, such as baskets, tampah, besek, nyiru, household furniture, and decorative items. The growing trend toward eco-friendly products has driven increased demand for bamboo-based goods, thereby creating business opportunities that can boost the income of rural communities. In addition to being eco-friendly, bamboo handicrafts offer higher added value compared to bamboo sold as raw material, thereby enhancing the economic value of this commodity (Rahayu et al., 2024).

Bamboo craft businesses generally operate as home-based industries that rely on family labor and raw materials available in the surrounding production areas. Home-based industries play a vital role in creating jobs, reducing unemployment, and increasing the income of rural communities. Bamboo craft enterprises not only serve as productive economic activities but also contribute to the preservation of local culture through the use of weaving skills passed down from generation to generation (Undap et al., 2020; Sumiati et al., 2024).

Several studies indicate that bamboo craft enterprises make a significant contribution to the income of artisan households. Research by Putra et al. (2021) in Kayubihi Village, Bangli Regency, showed that bamboo craft enterprises account for the dominant share of total household income for artisans, making them the primary source of livelihood for the community. Furthermore, a study by Rahayu et al. (2024) showed that all bamboo craft products examined had a Revenue-to-Cost Ratio (R/C Ratio) greater than one, making them economically viable for development. The study also demonstrated that product diversification can enhance the stability of artisans' income and increase the value added of bamboo products.

The development of the bamboo craft industry is influenced not only by the availability of raw materials but also by the artisans' ability to produce products that meet market demand. Design innovation, product quality improvement, marketing, and institutional strengthening of artisan groups are key factors in enhancing the competitiveness of bamboo products. Therefore, the development of the bamboo craft industry requires support from various stakeholders to generate greater economic benefits for the community (Sumiati et al., 2024; Rahayu et al., 2024).

The village of Sirpang Dalig Raya, in Simalungun Regency, is one of the villages that still maintains the bamboo basket craft industry as a source of livelihood for its residents. These crafts are produced using traditional methods with locally sourced bamboo and are marketed to meet the needs of

the agricultural, commercial, and household sectors. For some residents, the bamboo basket craft industry serves as the primary source of income, while for others it provides supplementary income. However, to date, there is no scientific information available regarding the extent to which the bamboo basket craft industry contributes to increasing the household income of artisans in Sirpang Dalig Raya Village.

Previous research has generally focused on the analysis of value added, business feasibility, marketing strategies, and the development of the bamboo craft industry in various regions of Indonesia. Studies specifically analyzing the contribution of the bamboo basket craft industry to artisans' household income at the village level, particularly in Simalungun Regency, remain very limited. Thus, this study offers novelty in terms of its research location and provides empirical evidence regarding the role of the bamboo basket craft industry in increasing household income based on local potential.

This study aims to calculate the income from the bamboo basket craft business earned by artisans, analyze the contribution of the bamboo basket craft business to the total household income of artisans; and describe the role of the bamboo basket craft business in increasing household income in Sirpang Dalig Raya Village, Simalungun Regency. The research findings are expected to serve as a basis for local governments and stakeholders in formulating strategies for the sustainable development of the bamboo craft industry based on non-timber forest products.

II. LITERATURE REVIEW

Non-Timber Forest Products (NTFPs) and Bamboo

Non-Timber Forest Products (NTFPs) are a type of forest resource that plays a strategic role in supporting community economic development while preserving forest sustainability. The development of NTFPs is a key component of sustainable forest management policy because it provides economic benefits without compromising the ecological functions of the forest. One NTFPs commodity with high economic potential is bamboo (Nurrachmania, M., Rozalina, Sariah Faridawati Manik, 2025). Bamboo grows rapidly, is easily renewable, can thrive in a variety of soil conditions, and can be utilized to produce a wide range of high-value products, ranging from building materials and furniture to handicrafts and biomaterials. In addition to its economic value, bamboo also contributes to soil conservation, carbon sequestration, and the livelihoods of rural communities (Widyaningsih et al., 2020; Ekawati et al., 2024).

A systematic review conducted by Ekawati et al. (2024) indicates that bamboo research in Indonesia remains dominated by studies on physical, mechanical, construction, and biocomposite properties, while research on governance, household economics, and community empowerment remains relatively scarce. This situation suggests that studies on the socioeconomic benefits of bamboo still hold significant potential for further development.

Bamboo Basket Craft Industry

Bamboo basket weaving is a form of home-based industry that uses bamboo as its primary raw material. This industry has grown thanks to the availability of local raw materials, weaving skills passed down through generations, and increasing demand for eco-friendly products. Bamboo baskets are widely used in agriculture, commerce, households, and tourism, giving the industry a broad market potential.

According to Ohoira et al. (2024), the bamboo craft industry has good prospects as an economic driver for rural communities because it can create jobs and increase community income through the utilization of local resources. Meanwhile, Iskandar et al. (2024) explain that the success of the bamboo craft industry is heavily influenced by product innovation, digital marketing capabilities, the quality of human resources, and business institutional frameworks.

Furthermore, mentoring activities for artisan groups indicate that design diversification, product quality improvement, and business capacity building can enhance the economic value of bamboo products and expand market access for bamboo craft-based microenterprises (Sumiati et al., 2024).

Household Income of Artisans

Household income refers to all income earned by household members from various sources during a specific period. In rural communities, income can come from the agricultural sector, non-agricultural businesses, or home-based industries. Bamboo handicrafts are one type of non-agricultural business that provides additional income for artisan households.

Research by Rahayu et al. (2024) shows that the bamboo craft industry has a high level of business viability, with a Revenue-to-Cost Ratio (R/C Ratio) above one for all product types studied. These results indicate that bamboo craft businesses are capable of generating profits and are worth developing as a source of community income. Furthermore, processing bamboo into various handicraft products generates higher added value compared to selling bamboo as raw material.

Global studies on bamboo also indicate that the bamboo sector serves as a livelihood for approximately 2.5 billion people worldwide and contributes about 13–17% to household income in various tropical and subtropical regions. This demonstrates that bamboo not only serves an ecological function but also plays a vital role in improving community well-being.

The Role of Bamboo Craft Enterprises in Increasing Income

The bamboo craft industry plays a vital role in improving community well-being through job creation, increased income, and local economic development. The economic value of the bamboo craft industry stems from the process of transforming raw materials into high-value products, thereby increasing artisans' incomes. In addition to providing direct economic benefits, the bamboo craft industry also plays a role in preserving local wisdom by passing down weaving skills to the next generation.

Rahayu et al. (2024) reported that the value added of bamboo craft products varies depending on the type of product produced, but all products have good economic viability. These findings indicate that the higher the level of bamboo processing, the greater the value added and the profits earned by artisans. Meanwhile, Ohoira et al. (2024) state that the development of the bamboo craft industry must be supported by product innovation, market access, and institutional strengthening to sustainably improve community well-being. Thus, the bamboo basket craft industry serves not only as a household economic activity but also as an instrument for community empowerment based on local potential. Therefore, an analysis of the role of the bamboo basket craft industry in household income is crucial as a basis for formulating policies for the development of non-timber forest products at the regional level.

State of The Art

Research on bamboo crafts as a Non-Timber Forest Product (NTFP) over the past five years has shown rapid progress, particularly in terms of value addition, business viability, production efficiency, and industrial development strategies. Putra et al. (2021) reported that the bamboo craft industry in Kayubihi Village, Bangli Regency, makes a significant contribution to the household income of artisans through increased value added in various woven bamboo products. The study confirmed that bamboo crafts serve as the primary source of income for the majority of artisans.

Furthermore, a study by Rahayu et al. (2024) examined the economic viability and value added of the bamboo craft industry in Muntuk Village, Bantul Regency. The results showed that all craft products had a Revenue-to-Cost Ratio (R/C Ratio) greater than one, indicating they are economically viable for development. The study also showed that product diversification can increase artisans' income stability and enhance the value added of bamboo products. However, the research focus remains limited to analyzing business feasibility and value added without measuring the business's contribution to artisans' household income.

Another study by Yolanda et al. (2024) analyzed technical efficiency, allocative efficiency, and economic efficiency in bamboo basket weaving businesses in Binjai City. The results of the study indicate that the efficiency of production factor utilization still needs to be improved so that bamboo craft businesses can maximize their profits. This study focuses more on production aspects and has not yet linked business efficiency to the well-being of artisans' households.

Meanwhile, Ohoira et al. (2024) explain that the bamboo craft industry has great potential as a source of income for rural communities if supported by product development, marketing, and

institutional support for artisans. That study was more oriented toward identifying the industry's development potential than analyzing the economic impact on artisan households.

III. RESEARCH METHOD

The research was conducted in Sirpang Dalig Raya Village, Raya Subdistrict, Simalungun Regency, North Sumatra Province. The research location was selected purposively, considering that the village is one of the active centers of the bamboo basket craft industry and serves as a source of livelihood for some of its residents.

The tools used in this study include: Research questionnaire, Observation sheet, Writing utensils, and Digital camera. The research materials consist of primary and secondary data. Primary data was obtained through face-to-face interviews with artisans, observation of the production process, documentation of business activities. Secondary data was obtained from the Central Statistics Agency (BPS), the Sirpang Dalig Raya Village Government, the North Sumatra Provincial Forestry Service, scientific literature, national and international journals, and other supporting documents.

The research method used in this study is a quantitative descriptive method. The descriptive method in this study is used to illustrate, describe, and identify behaviors, elements, characteristics, properties, and phenomena. Meanwhile, the quantitative method involves the use of numerical data regarding specific aspects of the research. This study is quantitative in nature because it analyzes costs, revenue, income, and the contribution of income to the production of bamboo crafts

The research sampling was conducted using a non-probability sampling method. According to Husna, A. N., & Widodo. (2025), non-probability sampling is a sampling technique in which not every member of the population is given an equal chance of being selected as a sample. The type of non-probability sampling technique used was exhaustive sampling (census), which is a technique in which all members of the population are included in the sample (Suriani et al., 2023). The respondents in this study were 190 artisans from the Sirpang Dalig Raya Village.

Types and Methods of Data Collection

In this study, the types of data used were primary and secondary data. Primary data is data obtained directly from interviews with respondents using a questionnaire. Primary data includes respondent identity, age, educational level, business experience, number of family members, number of workers, production volume (units/month), production costs (Rupiah), selling price (Rupiah), business revenue (Rupiah), business income (Rupiah), sources of household income (Rupiah), and product marketing. Secondary data includes general conditions of the study area, number of artisans, socioeconomic conditions of the community, demographic data, data on bamboo potential, and scientific references.

Analysis Data

The data analysis method used is financial feasibility analysis. Financial feasibility analysis is carried out by conducting financial calculations to determine the feasibility of a private business, in this case the feasibility seen from the point of view of individuals or business actors. This financial calculation uses cost and benefit components to facilitate the grouping of the two parts and also uses investment criteria to determine the level of business feasibility quantitatively. The data analysis used in this study is quantitative analysis. Based on the data obtained, calculations can be performed using several formulas, including:

1. Costs

Total costs are the expenses incurred during the production process. These costs include production facility costs, equipment depreciation, and other expenses. Systematically, total costs can be formulated as follows:

$$Pd = TR - TC$$

Notes:

Pd = Revenue

TR = Total revenue (IDR)

TC = Total costs (IDR)

2. Revenue

Revenue is the income or proceeds received from the production of bamboo crafts. Revenue from bamboo crafts is calculated by multiplying the quantity produced by the selling price. Revenue can be calculated using the following formula:

$$TR = P \times Q$$

Explanation:

TR = Total Revenue from Bamboo Crafts

P = Selling Price of Bamboo Crafts

Q = Quantity of Bamboo Crafts Produced

3. Total Revenue

Total revenue is defined as the difference between the total revenue received by the artisans and the production costs incurred by the artisans. The amount of revenue can be calculated using the following formula:

$$NR = TR - TEC$$

Notes:

NR = Total Net Revenue from Bamboo Crafts (Net Revenue)

TR = Total Revenue from Bamboo Crafts (Total Revenue)

TEC = Total Explicit Costs of Bamboo Crafts (Total Explicit Cost)

4. Total Household Income

Total household income of bamboo artisans is the sum of the earnings of all family members used to meet their living expenses. Sources of household income can come from on-farm, off-farm, or non-farm activities (Sari et al., 2014). Total household income can be calculated using the following formula:

$$PRT = Pa + Pb + Pc$$

Notes:

PRT = Total Household Income

Pa = Income from Farming (On-Farm)

Pb = Income from Non-Farming Activities (Off-Farm)

Pc = Income from Other Sources (Non-Farm)

5. Contribution to Household Income

Contribution can also be defined as involvement or participation, whether through personal engagement or financial contributions (Thamrin et al., 2018). Bamboo artisans hope that their work can increase their income and make a significant contribution to the total household income of bamboo artisans. To determine the contribution of artisans' income to household income, use the following formula:

$$\text{Contribution} = (\text{Bamboo Craft Business Income} / \text{Household Income}) \times 100\%$$

There are criteria for determining the contribution of artisans' income to household income. According to (Setiawati et al., 2013), the extent of this contribution is divided into four categories, namely as follows:

- If the contribution of income is < 25% of total family income, the artisan's income contribution is classified as small.
- If the income contribution is 25%–49.9% of total family income, the bamboo craft income contribution is classified as moderately large.
- If the income contribution is 50%–74.9% of total family income, the bamboo craft income contribution
- If the income contribution is > 75% of total family income, the bamboo craft income contribution is classified as very large.

IV. RESULTS AND DISCUSSION

Overview of the Bamboo Basket Craft Business

The bamboo basket craft industry in Nagori Sirpang Dalig Raya, Raya Subdistrict, Simalungun Regency is one of the non-timber forest products (NTFP)-based home industries that has been developing since around the 1960s. In its early stages, this business emerged as a community economic activity aimed at utilizing the abundant bamboo growing in local farms. Initially, these crafts were intended solely to meet the needs of the local community as containers for agricultural produce and household items. As horticultural farming activities increased in Simalungun Regency and the surrounding areas, the demand for bamboo baskets continued to rise, leading this enterprise to evolve into the primary livelihood for a portion of the community in Nagori Sirpang Dalig Raya (Saragih, 2019; Saragih et al., 2024).

The development of the bamboo craft industry in Nagori Sirpang Dalig Raya is heavily influenced by the availability of bamboo as the primary raw material. The Raya subdistrict and its surrounding areas have significant bamboo resources, allowing the community to utilize bamboo as a readily available raw material at a relatively low cost. These conditions have been a key factor driving the growth of the bamboo craft industry as a business based on local resources. In addition to the availability of raw materials, the community's bamboo weaving skills—passed down from one generation to the next—also serve as a vital asset (Saragih et al., 2024).

In the early stages of its development, the entire production process was carried out manually using simple tools such as machetes, knives, bamboo-splitting tools, and scrapers. These production techniques have been preserved to this day because they are considered capable of producing strong, neat weaves that meet consumer needs. Weaving skills are acquired through hands-on learning within the family environment, without formal education. Artisans' children are introduced to the processes of splitting bamboo, planning, and weaving from an early age, ensuring the continuity of the next generation of artisans. This system of passing down skills is one of the factors that has enabled the bamboo craft industry to survive for more than six decades (Saragih, 2019; Saragih et al., 2024).

From the 1980s through the early 2000s, the growth of the horticultural sector in Simalungun Regency, Karo Regency, Dairi Regency, and several other areas in North Sumatra had a positive impact on the increasing demand for bamboo baskets. Bamboo baskets are widely used to transport oranges, potatoes, cabbage, tomatoes, chili peppers, and various other horticultural commodities because they are lightweight, allow for good air circulation, are easy to stack during transport, and are more economical than metal or wooden packaging. These conditions have led to a growing number of households engaged in the bamboo craft industry, with production taking place almost daily to meet market demand (Saragih et al., 2024).

Over time, the marketing system for bamboo baskets has evolved. Initially, the products were sold only to farmers in the Raya subdistrict, but later expanded through wholesalers who distributed them to various regions in North Sumatra. Currently, bamboo baskets from Nagori Sirpang Dalig Raya are marketed to horticultural production centers such as Karo Regency, Dairi, Samosir, Pematangsiantar, and even the city of Medan. Nevertheless, most transactions are still conducted through agents and wholesalers, resulting in artisans having relatively little bargaining power regarding the selling price of their products (Saragih et al., 2024).

Based on the findings of Saragih et al. (2024), a craftsman can produce approximately 15–50 bamboo baskets per day, depending on product size, work experience, the number of workers, and the availability of raw materials. Production is still dominated by a home-based industry system, with family members serving as the primary labor force. This situation indicates that the bamboo craft industry plays a significant role in creating employment opportunities and increasing the income of rural communities.

Respondent Characteristics

The characteristics of the respondents provide an overview of the socioeconomic conditions of bamboo farmers and artisans in Sirpang Dalig Raya Village, Simalungun Regency. Information regarding age, educational level, business experience, and household size is important to analyze

because it can influence the respondents' ability to manage their bamboo craft businesses, adopt innovations, and increase household income.

Table 1. Characteristics of Bamboo Farmers/Artisans in Sirpang Dalig Raya Village

Characteristics	Category	Total (people)	Persentase (%)
Age (years)	20–30	22	11,58
	31–40	48	25,26
	41–50	61	32,11
	51–60	40	21,05
	>60	19	10,00
Formal Education	No Formal School	10	5,26
	Elementary School	55	28,95
	Middle School	66	34,74
	Senior High School	47	24,74
	Diploma/Bachelor Degree	12	6,31
Business Experience (Years)	<5	20	10,53
	5–10	50	26,32
	11–15	62	32,63
	16–20	38	20,00
	>20	20	10,52
Number of Family Members (People)	2–3	38	20,00
	4–5	104	54,74
	>5	48	25,26

Based on Table 1, the characteristics of bamboo farmers/artisans in Sirpang Dalig Raya Village indicate that the majority of respondents were in the 41–50 years age group, accounting for 61 respondents (32.11%), followed by those aged 31–40 years with 48 respondents (25.26%), 51–60 years with 40 respondents (21.05%), while respondents aged 20–30 years and over 60 years accounted for 22 respondents (11.58%) and 19 respondents (10.00%), respectively. This distribution indicates that the bamboo handicraft business is predominantly managed by individuals of productive working age who possess adequate physical capacity, technical skills, and work experience to sustain production activities. Productive-age workers generally demonstrate higher productivity and adaptability in managing small-scale enterprises compared to older workers (Renu & Rani, 2022).

In terms of educational attainment, the majority of respondents had completed junior high school, comprising 66 respondents (34.74%), followed by elementary school graduates with 55 respondents (28.95%), senior high school graduates with 47 respondents (24.74%), respondents holding diploma or bachelor's degrees with 12 respondents (6.31%), and respondents with no formal education totaling 10 respondents (5.26%). These findings indicate that bamboo handicraft enterprises are largely operated by individuals with basic to secondary education. Although the formal educational level remains relatively low, bamboo processing skills are primarily acquired through practical experience and knowledge transfer across generations. Nevertheless, formal education contributes significantly to improving managerial skills, financial management, innovation adoption, and digital marketing capabilities, which are essential for enhancing business competitiveness (Utomo et al., 2022).

Regarding business experience, the largest proportion of respondents had been engaged in bamboo handicraft production for 11–15 years, representing 62 respondents (32.63%). This was followed by respondents with 5–10 years of experience (50 respondents; 26.32%), 16–20 years (38 respondents; 20.00%), while respondents with less than five years and more than twenty years of experience each accounted for 20 respondents (10.53% and 10.52%, respectively). These findings suggest that most respondents possess substantial experience in producing bamboo baskets, enabling them to improve production efficiency, maintain product quality, and establish stable marketing networks. Previous studies have demonstrated that longer business experience positively influences

production performance, entrepreneurial decision-making, and household income among bamboo artisans (Putra et al., 2021).

With respect to household size, most respondents had 4–5 family members, totaling 104 households (54.74%), followed by households with more than five members (48 households; 25.26%) and 2–3 family members (38 households; 20.00%). A relatively large household size provides an advantage for bamboo handicraft enterprises because family members often participate directly in production activities, including bamboo preparation, weaving, finishing, and marketing. The utilization of family labor reduces labor costs and enhances production efficiency, thereby increasing household income. According to Gogoi et al. (2022), family labor plays a crucial role in sustaining rural bamboo-based enterprises and improving household livelihoods.

Overall, the respondent characteristics indicate that bamboo handicraft enterprises in Sirpang Dalig Raya Village are supported by a productive workforce with considerable business experience and strong family labor participation. These socio-economic characteristics provide a solid foundation for the sustainable development of bamboo handicrafts as one of the most important non-timber forest products (NTFPs) contributing to rural economic development and household income generation. Furthermore, strengthening human resource capacity through technical training, entrepreneurship development, product innovation, and digital marketing is expected to improve the competitiveness and long-term sustainability of bamboo basket.

Production Cost Analysis of Bamboo Basket

Production costs are all expenses incurred by artisans during the bamboo basket-making process in a single production period. Production costs consist of fixed costs and variable costs. Fixed costs are costs that remain relatively constant despite changes in production volume, whereas variable costs fluctuate in line with the number of products produced (Soekartawi, 2016).

Table 2. Average Fixed Costs of Bamboo Basket Craft Businesses

No	Fixed Cost Component	Amount (Rp/Month)
1	Depreciation of machetes	28.000
2	Depreciation of saws	22.000
Total Fixed Costs (TFC)		50.000

Table 2 shows that the average fixed cost incurred by bamboo basket artisans in Sirpang Dalig Raya Village amounted to IDR 50,000 per month. The fixed cost consisted of the depreciation of production equipment, namely machetes with an average depreciation cost of IDR 28,000 per month and saws with an average depreciation cost of IDR 22,000 per month. These tools are the primary equipment used throughout the production process, including cutting bamboo culms, splitting bamboo strips, and preparing raw materials before weaving.

The relatively low fixed cost indicates that the bamboo basket business is a small-scale household industry that requires only simple production equipment with a long economic life. Because these tools can be used repeatedly over an extended period, the depreciation cost allocated to each production period remains relatively small. Consequently, fixed costs contribute only a minor proportion of the total production cost, while most production expenses are attributed to variable costs such as raw materials and labor.

The findings suggest that the bamboo basket business does not require substantial capital investment in production equipment, making it economically accessible for rural households. This condition provides opportunities for local communities to establish and sustain bamboo handicraft enterprises with relatively low financial risk. Similar findings were reported by Utomo et al. (2022), who found that bamboo handicraft enterprises in Indonesia are generally characterized by low capital requirements because production relies on simple hand tools and traditional techniques. Likewise, Putra et al. (2021) reported that fixed costs represent only a small proportion of total production costs in bamboo handicraft businesses, whereas variable costs dominate overall production expenditures.

Therefore, maintaining production equipment properly can extend its useful life, reduce depreciation expenses, and improve the overall efficiency and profitability of bamboo basket enterprises.

Table 3. Average Variable Costs for a Bamboo Basket Craft Business

No	Variable Cost Component	Amount (IDR/ Month)
1	Bamboo	1.850.000
2	Sandpaper	85.000
3	Gloves	120.000
4	Labor (Basket lid, Weaving Labor Wages and Base wages)	2.350.000
Total Variable Costs (TVC)		4.405.000

Table 3 presents the average variable costs incurred by bamboo basket artisans in Sirpang Dalig Raya Village. The results indicate that the average total variable cost (TVC) amounted to IDR 4,405,000 per month, consisting of bamboo, sandpaper, gloves, and labor costs. Among these components, labor costs represented the largest expenditure, amounting to IDR 2,350,000 per month (53.35%), followed by bamboo raw materials at IDR 1,850,000 per month (42.00%). Meanwhile, gloves and sandpaper accounted for relatively small proportions of the total variable cost, amounting to IDR 120,000 (2.72%) and IDR 85,000 (1.93%), respectively.

The dominance of labor costs indicates that bamboo basket production is still highly labor-intensive, relying on manual skills throughout the production process. Labor activities include cutting bamboo culms, splitting bamboo into strips, weaving the baskets, producing basket lids, and assembling the final product. The high dependence on manual labor reflects the traditional nature of bamboo handicraft production, where artisans' craftsmanship plays a crucial role in determining product quality. Similar findings were reported by Utomo et al. (2022), who stated that labor costs account for the largest proportion of production expenses in rural bamboo handicraft industries because most production processes continue to rely on traditional techniques rather than mechanized equipment.

Raw material costs were the second largest component of variable costs. Bamboo is the primary material used in basket production, and its cost is influenced by availability, quality, and market prices. Although bamboo is locally available in Sirpang Dalig Raya Village, the quantity and quality required for production affect the overall production cost. Efficient utilization of bamboo and minimizing material waste can reduce production expenses and improve business profitability. This finding is consistent with Putra et al. (2021), who reported that raw materials constitute one of the major cost components in bamboo handicraft enterprises due to their direct relationship with production volume. The costs of sandpaper and gloves were relatively low but remain essential for maintaining product quality and ensuring occupational safety. Sandpaper is used during the finishing process to smooth the basket surface and improve its market value, while gloves serve as personal protective equipment to reduce the risk of injuries during bamboo cutting and weaving activities. Although these costs contribute only a small proportion of total production expenses, they support production efficiency and product quality.

Table 4. Total Production Costs for the Bamboo Basket Craft Business

Component	Amount (IDR/Month)
Total Fixed Costs (TFC)	50.000
Total Variable Costs (TVC)	4.405.000
Total Production Costs (TC)	4.455.000

Based on the results of the analysis, the average total production cost for the bamboo basket craft business in Sirpang Dalig Raya Village is IDR 4,455,000 per month. Production costs consist of fixed costs of IDR 50,000 (1.12 per cent) and variable costs of IDR 4,405,000 (98.88 per cent). This indicates that the majority of production costs stem from costs that vary in line with the number of bamboo baskets produced.

The largest cost component is labor costs, amounting to IDR 2,350,000 per month, or approximately 52.75% of total production costs. The high labor costs indicate that the bamboo basket-making process still relies on manual skills, from cutting the bamboo, splitting it, and smoothing it to the weaving process. Next, the cost of bamboo raw materials amounts to IDR 1,850,000 per month, or about 41.53% of total production costs. The high cost of raw materials is driven by the need for bamboo as the primary material in basket-making, as well as fluctuations in bamboo prices at the farmer level. Meanwhile, the cost of sandpaper, amounting to IDR 85,000, is used in the product surface-smoothing stage to produce neater baskets with higher market value. Additionally, the cost of gloves, amounting to IDR 120,000, is an operational expense incurred to support workplace safety during the production process, given that bamboo cutting and weaving activities carry the risk of causing injuries to the artisans' hands.

The dominance of labor and raw material costs indicates that the bamboo basket craft industry is a labor-intensive cottage industry. This finding aligns with the research by Utomo et al. (2022), which states that the bamboo craft industry in rural Indonesia is still dominated by manual production processes, making labor and raw material costs the largest cost components. Furthermore, Rahayu et al. (2024) explain that efficient use of raw materials, improving workers' skills, and reducing production waste are strategies that can be implemented to lower production costs without compromising product quality. Therefore, improving artisans' skills, managing raw materials more efficiently, and implementing safe work practices are expected to increase productivity and profits for the bamboo basket craft business in Sirpang Dalig Raya Village.

Revenue and Income Analysis of Bamboo Basket

The income of bamboo artisans is the income earned from the process of making bamboo crafts. Income is used to measure bamboo artisans' earnings in income analysis and serves as a key indicator because it is the primary source for meeting daily needs (Sidabukke, S.H., Marulam MT Simarmata, Benteng H Sihombing, Januari Rizki, Triastuti, Sarintan E Damanik and Sariah Faridawati Manik, 2025). Income is calculated as the total revenue received by bamboo artisans minus the expenses incurred.

Table 5. Analysis of Production Costs, Sales, and Revenue for the Bamboo Basket Business

Variabel	Nilai
Fixed Cost (FC)	IDR 50.000
Variable Cost (VC)	IDR 4.405.000
Total Cost (TC)	IDR 4.455.000
Total Production	500 unit
Selling Price of Basket	IDR 20.000/unit
Total Revenue (TR)	IDR 10.000.000
Net Income (π)	IDR 5.545.000

Based on the analysis, the bamboo basket craft business produces 500 baskets per production period at an average selling price of IDR 20,000 per unit, resulting in total revenue of IDR 10,000,000. After deducting total production costs of IDR 4,455,000, the net income per production period is IDR 5,545,000. These results indicate that the bamboo basket craft business yields a fairly good profit, with a profit margin of approximately 55.45% of total revenue. This profit margin demonstrates that processing bamboo into baskets generates significant economic value-added compared to selling bamboo as a raw material.

Revenue is influenced by production volume and the selling price of the products. The average selling price of IDR 20,000 per unit remains within the market price range for traditional bamboo baskets in various Indonesian craft centers, so this analysis reflects realistic business conditions. The profits generated indicate that the bamboo basket craft business has the potential to become the primary source of income for artisan households if supported by improved product quality, design innovation, and broader market access. This finding aligns with the research by Utomo et al. (2022), which states that

improving product quality and expanding marketing networks can increase revenue and profits for bamboo craft businesses. Furthermore, Putra et al. (2021) also reported that processing bamboo into handicraft products provides higher added value compared to selling bamboo as raw material, thereby contributing to increased income for artisan households.

Contribution of Bamboo Basket Business Income to Household Income

The contribution of bamboo basket business income to household income is calculated by dividing the total income from the bamboo craft business by the total household income and multiplying the result by 100 percent; the resulting contribution is expressed as a percentage (%). The contribution of bamboo artisans' income in Sirpang Dalig Raya Village to household income can be calculated by dividing the income from bamboo crafts by the total household income derived from other family members who work as construction workers, employees, farmers, merchants, early childhood educators, collectors, farm laborers, laundry workers, tailors, and massage therapists.

Table 6. Average Household Income of Bamboo Artisans by Source of Income

No	Source of Income	Income (Rp/Month)	Contribution (%)
1	Bamboo basket making	5.545.000	61,72
2	Farming (rice, corn, vegetables)	1.800.000	20,03
3	Rubber tapping	650.000	7,23
4	Day labor	500.000	5,56
5	Livestock Farming (Chickens, Goats, Cattle)	300.000	3,34
6	Small businesses (small shops/retail)	190.000	2,12
Total Household Income		8.985.000	100,00

Based on the table above, the average monthly household income of artisans in Sirpang Sigodang Village is IDR 8,985,000. The largest source of income comes from the bamboo basket craft business, amounting to IDR 5,545,000 or 61.72% of total household income. This indicates that the bamboo basket business is the primary source of income for most respondents and makes a significant contribution to the family economy.

In addition to the bamboo craft business, respondents also earned income from the agricultural sector amounting to IDR 1,800,000 per month (20.03%). This situation reflects the characteristics of the Simalungun Regency community, which still relies on the agricultural sector for part of its livelihood, such as the cultivation of rice, corn, chili peppers, and various horticultural commodities. Additional income is also derived from rubber tapping, amounting to IDR 650,000 (7.23%); day labor, amounting to IDR 500,000 (5.56%); livestock farming, amounting to IDR 300,000 (3.34%); and small-scale trading, amounting to IDR 190,000 (2.12%).

The significant contribution of the bamboo basket business indicates that processing bamboo into handicrafts generates higher economic value than selling bamboo as a raw material. Through processing, bamboo gains added value, thereby increasing the income earned by artisans. This finding is consistent with Putra et al. (2021), who state that bamboo craft businesses make a tangible contribution to increasing the income of artisans' households. Furthermore, Utomo et al. (2022) explain that the development of bamboo craft businesses can strengthen the rural economy through increased

In a study (Nurhidayah et al., 2015) titled "The Contribution of Bamboo Weaving Crafts to the Income of Farming Families in Petanahan Subdistrict, Kebumen Regency," the results showed that the contribution of the bamboo weaving craft business to the total income of farming families in Grujugan Village, Petanahan Subdistrict, Kebumen Regency, averaged 61.52%. This means that the bamboo weaving craft business is able to increase household income by 61.52% compared to income from sources other than the bamboo weaving craft business (the agricultural sector). Based on research conducted by (Maulana et al., 2017), the contribution of Sialang honey farming to total household income is 75.3%, indicating that it accounts for more than half of the household income of sialang honey farmers.

V. CONCLUSION

Based on the research findings, the bamboo basket craft business in Sirpang Dalig Raya Village, Simalungun Regency, provides a fairly good income for artisan households. The average total production cost incurred is IDR 4,455,000 per production period. With a production volume of 500 units and an average selling price of IDR 20,000 per unit, the bamboo basket craft business generates total revenue of IDR 10,000,000 and a net income of IDR 5,545,000 per production period. These results indicate that the bamboo basket craft business is capable of providing a viable economic return for the artisans.

The contribution of the bamboo basket craft business to total household income is also relatively high, at 61.72%, making it the primary source of income compared to other sources, such as agriculture, rubber tapping, livestock farming, day labor, and small businesses. The bamboo basket craft business plays a vital role in increasing household income for the community in Sirpang Dalig Raya Village. In addition to adding value to bamboo as a non-timber forest product, this business also creates employment opportunities for family members and strengthens the rural economy.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to all parties who contributed to the completion of this research. Special appreciation is extended to the bamboo basket artisans in Sirpang Dalig Raya Village, Simalungun Regency, for their willingness to participate in the survey and provide valuable information throughout the study. The authors also thank the village government of Sirpang Dalig Raya for facilitating the research process and supporting data collection. Furthermore, the authors gratefully acknowledge the support of the Forestry Study Program, Faculty of Agriculture, Universitas Simalungun, for providing academic guidance and research facilities. Finally, the authors appreciate the constructive comments and suggestions from anonymous reviewers, which have significantly improved the quality of this manuscript.

AUTHOR CONTRIBUTIONS

First author, Meylida Nurrachmania, conceived the research, designed the methodology, conducted the field survey, collected and analyzed the data, interpreted the results, and prepared the original manuscript. Meylida Nurrachmania supervised the research, contributed to the research design and methodology, validated the data analysis, and critically reviewed the manuscript. Sonia Somadona provided academic supervision, contributed to data interpretation, revised and edited the manuscript, and approved the final version of the manuscript. All authors have read and approved the final manuscript and agree to be accountable for the integrity and accuracy of the work.

REFERENCES

- Ekawati, D., Karlinasari, L., Rinekso, S., & Machfud. (2024). Strategi Tata Kelola Bambu Berbasis Masyarakat Sebagai Bahan Baku Industri Secara Berkelanjutan Di Kabupaten Ngada, Nusa Tenggara Timur. Disertasi, IPB University.
- Gogoi, J., Singh, R., Singh, S. B., Feroze, S. M., Choudhury, A., Hemochandra, L., & Tyngkan, H. (2022). Utilization Pattern of Bamboo in North Eastern Region of India. *Indian Journal of Extension Education*, 58(2), 115–119.
- Husna, A. N., & Widodo. (2025). Kontribusi Pendapatan Usaha Kerajinan Bambu terhadap Pendapatan Rumah Tangga di Desa Muntuk Kecamatan Dlingo Kabupaten Bantul. *Seminar Nasional Agribisnis*.
- Iskandar, M., Adi Wijaya, J. C., & Prananda Putra, A. (2024). Bamboo Craft Development Strategy in the Industrial Era 4.0 Towards Society 5.0 Gintangan Village. *Jurnal Indonesia Sosial Teknologi*, 5(9), 4453–4464.

- Maulana R. M., Eriyati Eriyati, & Nobel Aqualdo. (2017). Kontribusi Usahatani Madu Sialang terhadap Pendapatan Keluarga Petani (Studi Kasus di Desa Gunung Sahilan Kecamatan Gunung Sahilan Kabupaten Kampar). *JOM Fekon*, 4(1), 1073-1081
- Nurhidayah, I., Pujiati U., & Watemin. (2015). Kontribusi Kerajinan Anyaman Bambu Terhadap Pendapatan Keluarga Petani di kecamatan Petanahan Kabupaten Kebumen. *Agritech Journal*, 17(2), 113-121. DOI: 10.30595/agritech.v17i2.1726
- Nurrachmania, M., Rozalina, Sariah Faridawati Manik. (2025). Characteristics And Physical Properties of Bamboo Used For Making Lemang. *IOP Conf. Series: Earth and Environmental Science* 1573 (2025) 012013. doi:10.1088/1755-1315/1573/1/012013
- Ohoira, R. L., Woosono, H. B., & Suryahadi, D. (2024). Potensi Pengembangan Kerajinan Bambu sebagai Sumber Ekonomi di Desa Hargomulyo, Kecamatan Gedangsari, Kabupaten Gunung Kidul. *Agroforetech*, 2(1), 517–523.
- Purba, E., Tarigan, W. J., Tamba, S. N., & Munthe, R. N. (2023). Factors that Influence the Income of Basket Craftsmen: Evidence from Nagori Sigodang, Simalungun Regency, Indonesia. *International Journal of Finance, Economics and Business*, 2(2), 128-133
- Putra, I. K. A. A., Antara, M., & Anggreni, I. G. A. A. L. (2021). Contribution of Bamboo Handicrafts to Artisan Household Income in Kayubihi Village, Bangli Regency. *Journal of Agribusiness and Agrotourism*.
- Rahayu, L., Wulandari, A. T., Rahmawati, N., & Istiyanti, E. (2024). Economic Feasibility and Value Added Analysis of Bamboo Handicraft Industries in Rural Communities. *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, 13(2), 220–238. <https://doi.org/10.21776/ub.industria.2024.013.02.7>
- Renu, A., & Rani, S. (2022). Analysis of Demographic and Work Profile of Rural Bamboo Handicraft Workers. *Asian Journal of Agricultural Extension, Economics & Sociology*, 40(11), 146–150. <https://doi.org/10.9734/AJAEES/2022/v40i111695>
- Saragih, J. I. H. (2019). Industri Keranjang Bambu di Desa Sirpang Dalig Raya Kecamatan Raya Kabupaten Simalungun (1960–2010). (Skripsi).
- Saragih, L., Saragih, A. F., Purba, R. F., Sakti, B. P., Nurhasanah, & Yopandi, T. (2024). Analisa Daya Saing Usaha Anyaman Keranjang di Kabupaten Simalungun dengan menggunakan Model Diamond Porter. *Jurnal Ecogen*, 7(1), 114–122. <https://doi.org/10.24036/jmpe.v7i1.14883>
- Sari, D. komala, Haryono, D., & Rosanti, N. (2014). Analisis Pendapatan dan Tingkat Kesejahteraan Rumah Tangga Petani Jagung di Kecamatan Natar Kabupaten Lampung Selatan. *Jurnal Ilmu-Ilmu Agribisnis*, 2(1), 64–70.
- Setiawati, D., Istiyanti, E., & Hasanah, U. (2013). Kontribusi Pendapatan Agroindustri Dawet Ireng Terhadap Pendapatan Keluarga Pengrajin Di Kecamatan Butuh Kabupaten Purworejo. *Surya Agritama*,
- Sidabukke, S.H., Marulam MT Simarmata, Benteng H Sihombing, Januari Rizki, Triastuti, Sarintan E Damanik and Sariah Faridawati Manik. (2025). Analysis Of the Economic Potential of Bamboo in Community Empowerment in Nagori Sirpang Sigodang, Panei District, Simalungun Regency. *IOP Conf. Series: Earth and Environmental Science* 1573 (2025) 012015. doi:10.1088/1755-1315/1573/1/012015
- Suriani, N., Risnita, & Jailani, M. S. (2023). Konsep Populasi dan Sampling Serta Pemilihan Partisipan Ditinjau Dari Penelitian Ilmiah Pendidikan. *Jurnal Ihsan: Jurnal Pendidikan Islam*, 1(2), 24–36. <https://doi.org/10.61104/ihsan.v1i2.55>
- Thamrin, M., Novita, D., & Hasanah, U. (2018). Kontribusi Pendapatan Pengupas Bawang Merah Terhadap Pendapatan Keluarga. *JASc (Journal of Agribusiness Sciences)*, 2(1), 26–31. <https://doi.org/10.30596/jasc.v2i1.2591>
- Triastuti, Meylida Identifikasi Keanekaragaman Jenis dan Pemanfaatan Bambu di Desa Limag Raya Kecamatan Raya. Kabupaten Simalungun. *Jurnal Wana Lestari*. 6(1). DOI: <https://doi.org/10.35508/wanalestari.v6i01.17205>

- Undap, C. A. A., Rengkung, L. R., & Maweikere, A. J. M. (2020). Segmenting, Targeting and Positioning Industri Rumah Tangga Kerajinan Bambu di Kelurahan Kinilow Kecamatan Tomohon Utara. *Journal of Agribusiness and Rural Development*. <https://doi.org/10.35791/agrirud.v2i3.31575>
- Utomo, M., Sudomo, A., Roshetko, J. M., et al. (2022). COVID-19 Pandemic: Impacts, Craftsmen's Living Strategies, and Economic Recovery of Bamboo Handicraft Enterprise in Gunungkidul, Indonesia. *Journal of Forest and Society*. <https://doi.org/10.24259/fs.v6i2.20599>
- Widyaningsih, T. S., Fauziyah, E., & Kuswantoro, D. P. (2020). Processing and Added Value of Bamboo in Tasikmalaya, West Java. *Jurnal Wasian*, 7(1), 51–63. <https://doi.org/10.62142/grxa7t25>
- Yolanda, T., Lindawati, & Sadalia, I. (2024). Analisis Efisiensi Produksi Keranjang Anyaman Bambu di Kota Binjai. *Jurnal Agrica*, 17(1)