

# Indigenous People's Experience in Transporting Agricultural Products from the Mountain of Imulnod, Brooke's Point, Palawan, Philippines

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## Index Terms:

Indigenous communities, rural transport, agricultural logistics, labor-intensive transport, rural infrastructure, Palawan, Philippines

**Abstract.** Transport systems are essential in facilitating economic activities, particularly in rural and indigenous communities where access to markets remains limited. This study examined the experiences of indigenous Palaw'an farmers in transporting agricultural products from the mountainous areas of Barangay Imulnod, Brooke's Point, Palawan, Philippines, and aimed to provide a basis for an appropriate logistics plan. A descriptive-evaluative research design utilizing a mixed-method approach was employed. Data were gathered from 100 Palaw'an farmers and selected local stakeholders through survey questionnaires, interviews, and field observations. Quantitative data were analyzed using frequency, percentage, and ranking, while qualitative responses were interpreted through thematic analysis. Findings revealed that the majority of respondents are young male farmers aged 15–24, with household sizes of three to six members and monthly incomes ranging from ₱500 to ₱1,000. Most respondents rely on walking as their primary mode of transportation, carrying agricultural products weighing more than 40 kilograms over distances exceeding five kilometers, requiring more than four hours of travel along steep and rugged foot trails. Traditional materials such as "kiba" (basket) are commonly used. These practices expose farmers to physical strain, health risks, and economic inefficiencies, limiting their productivity and access to markets. The study concludes that inadequate transport infrastructure significantly affects the quality of life and economic opportunities of indigenous farmers. The findings highlight the need for appropriate logistics interventions, such as intermediate transport technologies, to reduce labor burden, improve efficiency, and enhance market accessibility. The study provides valuable insights for local government units and policymakers in designing inclusive and sustainable transport systems for indigenous communities.

## Introduction

Transport remains a fundamental driver of economic development, social integration, and market accessibility, particularly in rural and geographically isolated communities. Historically, the evolution of transport systems has paralleled the advancement of civilization, facilitating trade, mobility, and the distribution of goods and services. In contemporary contexts, efficient transport infrastructure is considered a critical component of economic growth, as it enhances accessibility, reduces transaction costs, and improves productivity across sectors (Badejo, 2012; Filani, 2000).

Recent studies further emphasize that transport infrastructure development significantly contributes to rural livelihoods by improving access to markets, resources, and services. For instance, infrastructure investments have been shown to enhance human, physical, and financial capital in rural communities by transforming agricultural production systems and enabling better access to natural resources. Similarly, improvements in rural transportation systems have been linked to increased accessibility, reduced logistics costs, and enhanced economic opportunities for farmers and small-scale producers.

In rural and mountainous regions, transport plays a crucial role in agricultural supply chains, serving as the link between production areas and markets. Efficient transport systems create both place and time utility by ensuring that goods are delivered to consumers in a timely and cost-effective manner. However, in many developing countries, rural transport infrastructure remains inadequate, resulting in high transportation costs, limited market participation, and reduced competitiveness of agricultural products.

Indigenous communities are among the most affected by these transport challenges. Due to their location in remote and often inaccessible areas, indigenous populations frequently experience limited mobility options and inadequate infrastructure. Studies show that many indigenous groups rely on basic or informal transport systems, which restrict their economic activities and access to essential services. Furthermore, mobility constraints among indigenous populations are closely linked to broader issues of poverty, social exclusion, and limited development opportunities.

Globally, rural isolation continues to be a major barrier to development. A significant proportion of rural populations still lack access to reliable road networks, limiting their ability to engage in economic activities and access basic services. Evidence suggests that improved transport systems can reduce isolation, enhance social inclusion, and create new economic opportunities for marginalized communities. In addition, recent policy-oriented studies highlight that affordable and well-planned transportation systems can improve access to employment, education, and social services, thereby enhancing overall quality of life in rural areas.

In the Philippines, indigenous peoples continue to face socio-economic disadvantages despite legal recognition and policy support. Many indigenous communities reside in mountainous and remote areas where infrastructure development remains limited. Palawan, in particular, is home to several indigenous groups, including the Palaw'an, who depend primarily on agriculture for their livelihood.

In Barangay Imulnod, Brooke's Point, Palaw'an farmers produce various agricultural products such as vegetables and fruits. However, due to poor road conditions and limited transport infrastructure, they rely heavily on human-powered transport systems. Farmers carry heavy loads ranging from 35 to 60 kilograms over distances exceeding five kilometers, often requiring several hours of travel along steep and rugged foot trails. These practices not only result in physical strain and health risks but also limit productivity, reduce product quality, and restrict market access.

The continued reliance on labor-intensive transport methods highlights the urgent need for appropriate and sustainable logistics solutions. Recent literature underscores the importance of intermediate transport technologies and context-specific interventions that reduce drudgery while remaining affordable and adaptable to local conditions.

Despite the growing body of research on rural transport and infrastructure, there remains a gap in localized studies focusing on the lived experiences of indigenous communities, particularly in the Philippine context. Most existing research emphasizes large-scale infrastructure development, with limited attention to culturally appropriate and community-based logistics solutions.

Thus, this study aims to examine the experiences of indigenous Palaw'an farmers in transporting agricultural products from the mountainous areas of Barangay Imulnod, Brooke's Point, Palawan, Philippines. Specifically, it seeks to analyze their demographic profile, transport practices, and the impact of these practices on their quality of life. The findings of this study are expected to serve as a basis for developing a logistics plan that can improve transport efficiency, reduce physical burden, and enhance the socio-economic well-being of indigenous communities.

#### *Statement of the Problem*

This study described and evaluated the experiences of indigenous Palaw'an people in transporting agricultural products from the mountainous areas of Barangay Imulnod, Brooke's Point, Palawan, Philippines. Specifically, it sought to answer the following questions:

1. What is the demographic profile of Palaw'an individuals who transport agricultural products in terms of:
  - 1.1 age;
  - 1.2 gender;
  - 1.3 household size;
  - 1.4 monthly income; and
  - 1.5 source of livelihood?
2. What are the practices of Palaw'an people in transporting agricultural products?
3. What is the contribution of the Palaw'an transport practices to the community?

## Methodology

This study used a descriptive-evaluative research design with a mixed-method approach to examine the experiences of indigenous Palaw'an farmers in transporting agricultural products. The study was conducted in Barangay Imulnod, Brooke's Point, Palawan, a mountainous area with limited transport infrastructure. The respondents consisted of 100 Palaw'an farmers who are actively involved in transporting agricultural products, along with five local stakeholders who provided additional insights. Data were collected through survey questionnaires, interviews, and field observations. The researchers conducted face-to-face data gathering, including house-to-house visits, with the assistance of local guides when necessary. Quantitative data were analyzed using frequency, percentage, and ranking, while qualitative responses were interpreted through thematic analysis. Ethical standards were observed throughout the study. Participation was voluntary, and the confidentiality of the respondents was ensured.

## Results and Discussion

Variable	Category	f	%	Rank
Age	15–24	33	33	1
	25–34	25	25	2
	35–44	17	17	3
	45–54	10	10	4
	55–64	6	6	5
	65–75	6	6	5
	10–14	3	3	6
Gender	Male	57	57	1
	Female	43	43	2
Household Size	3–6	61	61	1
	7–10	24	24	2
	0–2	15	15	3
Monthly Income	500–1,000	54	54	1
	1,001–2,000	22	22	2
	2,001–3,000	18	18	3
	3,001–4,000	6	6	4
Source of Livelihood	Farming	100	100	1

Note.  $N = 100$ .  $f = \text{frequency}$ ;  $\% = \text{percentage}$ .

Table 1 Demographic Profile of the Respondents

The data show that the majority of respondents fall within the 15–24 age group (33%), followed by those aged 25–34 (25%). This indicates that younger individuals are primarily responsible for transporting agricultural products, likely due to the physically demanding nature of the task. In terms of gender, 57% are male and 43% are female, suggesting that while males dominate transport activities, a significant proportion of women are also involved. This reflects shared labor responsibilities within households despite the physical challenges.

Most respondents belong to households with 3–6 members (61%), indicating relatively large family sizes, which may increase economic pressure and the need for income generation. Regarding income, the majority earn ₱500–₱1,000 (54%), highlighting the low economic status of the respondents. This suggests that inefficient transport systems may limit their earning potential. All respondents (100%) identified farming as their primary source of livelihood, emphasizing the dependence of the community on agriculture and the importance of efficient transport systems in sustaining their income.

Mode of Transportation	f	%	Rank
Walking	93	93	1
Motorcycle	4	4	2
Karosa	3	3	3

Note.  $N = 100$ .  $f = \text{frequency}$ ;  $\% = \text{percentage}$ .

Table 2 Mode of Transportation Used by the Respondents

The findings reveal that 93% of respondents rely on walking as their primary mode of transportation, while only a small percentage use motorcycle (4%) and karosa (3%). This indicates a heavy dependence on human labor due to the lack of

accessible and reliable transport infrastructure. The minimal use of motorized transport reflects both geographic constraints and limited economic capacity. The reliance on walking highlights the physical burden experienced by the respondents and underscores the need for improved transport systems in the area.

Materials Used	f	%	Rank
Basket (Kiba)	63	63	1
Sack	37	37	2

Note. N = 100. f = frequency; % = percentage.

*Table 3 Materials Used in Transporting Agricultural Products*

The results show that 63% of respondents use baskets (kiba), while 37% use sacks. The use of traditional baskets reflects cultural practices and adaptation to the local environment. However, these materials may not be ergonomically efficient and can contribute to physical strain when carrying heavy loads over long distances. This finding indicates the absence of modern transport equipment and suggests the need for improved tools that can reduce labor intensity and enhance efficiency.

Travel Time	f	%	Rank
>4 hours	58	58	1
3 hours	21	21	2
2 hours	16	16	3
1 hour	5	5	4

Note. N = 100. f = frequency; % = percentage.

*Table 4 Transporting Time of Respondents*

The majority of respondents (58%) spend more than four hours transporting agricultural products, followed by 21% who spend three hours. This indicates that transporting goods is highly time-consuming, limiting the time available for other productive activities such as farming, rest, or family responsibilities. Long travel time also reflects poor accessibility and infrastructure, which negatively affects productivity and overall efficiency in agricultural operations.

Weight (kg)	f	%	Rank
>40 kg	39	39	1
30–35 kg	28	28	2
20–25 kg	24	24	3
10–15 kg	9	9	4

Note. N = 100. f = frequency; % = percentage.

*Table 5 Weight of Agricultural Products Carried*

The data reveal that 39% of respondents carry loads exceeding 40 kilograms, while others carry between 20–35 kilograms. Carrying such heavy loads over long distances poses serious health risks, including fatigue, musculoskeletal strain, and potential long-term physical injury. This finding highlights the physically demanding nature of transport activities and the urgent need for labor-saving transport technologies.

Distance (km)	f	%	Rank
>5 km	41	41	1
3–4 km	33	33	2
1–2 km	26	26	3

Note. N = 100. f = frequency; % = percentage.

*Table 6 Distance Travelled in Transporting Agricultural Products*

The results show that 41% of respondents travel more than five kilometers, while 33% travel 3–4 kilometers and 26% travel 1–2 kilometers. This indicates that most respondents must travel long distances to bring their products to the market, reflecting the geographic isolation of the community. The combination of long distances, heavy loads, and extended travel time significantly increases the difficulty of transporting goods and reduces overall efficiency.

## Conclusion and Recommendations

This study examined the experiences of indigenous Palaw'an people in transporting agricultural products in Barangay Imulnod, Brooke's Point, Palawan. The findings revealed that most farmers rely on manual transport methods, particularly walking long distances while carrying heavy loads using traditional baskets. The respondents are mostly young individuals with low income who depend on farming as their primary source of livelihood. They travel long distances, spend several hours transporting goods, and carry heavy weights, which results in physical strain and reduced productivity. Despite these challenges, Palaw'an farmers play an important role in supplying agricultural products to the community. However, the lack of proper transport infrastructure limits their efficiency and income. Overall, the study concludes that improving transport systems is necessary to enhance the productivity and quality of life of indigenous farmers.

It is recommended that local government units improve transport systems by introducing appropriate technologies such as ropeways or similar solutions to reduce the physical burden on farmers. There is also a need to develop and maintain farm-to-market roads to improve accessibility and reduce travel time. In addition, providing better transport tools and equipment can help lessen the physical strain experienced by farmers. The government and other agencies should continue to support indigenous communities through programs and policies that enhance their livelihood and economic opportunities. Finally, further studies should be conducted to explore sustainable and effective transport solutions that will provide long-term benefits to the community.

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## Competing Interests Statement

The authors declare that there are no conflicts of interest, financial or otherwise, that could have influenced the outcomes of this study.

## Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. Access to the data is subject to ethical considerations and the protection of the respondents' confidentiality.

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## Appendices

No appendices are attached to this study.