The Price Is Not Right: The Case of Almaciga Resin in the Philippines

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Abstract

The Philippine almaciga resin industry is over a hundred years old. However, resin tappers remain poor. One of the reasons is because the almaciga resin market is controlled by buyers who set prices that are too low relative to the tappers' high production costs. People's Organizations (POs) involved in resin tapping face a lengthy permit application process and incur various costs due to the remote location of natural almaciga stands, forest charges, tree inventory and administrative fees. There is a need to enhance the POs' financial and organizational capacities and implement a straightforward yet efficient mechanism for issuing and renewing permits, among other necessary measures.

Almaciga (Agathis philippinensis) is an indigenous tree species in the Philippines, recognized for its premium quality wood and the hard resin it produces. This resin, known as Manila copal, is an important non-timber forest product (NTFP) in the Philippines. It has been traditionally used to start fires and light torches, and is a key ingredient in incense production for religious ceremonies, boat caulking, mosquito fumigant, spirit solution substitute for shellac in the production of high-grade glossy varnish, lacquer, and road paint (Whitmore, 1980), linoleum, waterproofing, paper print ink (Mantell, 1937), soap manufacturing (Zamora & Co, 1986), pesticides, wax, polishing material, and photogravure (pcaarrd.dost.gov.ph).

The term 'Manila copal' originated from Manila, which was once the resin's most important port of export (Ella, 2020). Historical trade records of almaciga resin date back to the early 20th century, during the initial years of American occupation in the Philippines, with indications of almaciga trade even during the Spanish colonial period. The account of West and Brown (1920) reveals that the Philippines exported over 1,000 tons of almaciga resin annually from 1914 to 1916. At present, Indonesia is the biggest producer and exporter of Manila copal.

Figure 1 shows the domestic production and export of almaciga resin from 1970 to 2022. Except for years where reported exports surpassed production, the difference between production and export represents domestic use or consumption, indicating that local industries utilized a significant proportion of the almaciga resin for most years. This aligns with Razal et al. 2013, showing that local industries consumed approximately 80% of the total volume of almaciga resin produced in the country. The decline in domestic production, export volume, and value of almaciga resin is often attributed to the degradation of almaciga stands caused by timber poaching, unsustainable tapping practices, and difficulty in access, aggravated by typhoons. The decline resulted in the importation of synthetic resin as a substitute for natural resin. It is plausible that the availability of artificial substitutes has also played a role in diminishing the demand for natural resin. Despite this trend, FAO (1995) observed that manufacturers using natural products and labelling them as such still enjoy marketing advantages compared to synthetic materials. The premium given by some sectors of society to the use of natural products can benefit the almaciga resin industry, as almaciga resin is listed as a biodiversity-friendly product of the Biodiversity Management Bureau (BMB) (Biodiversity Management Bureau, 2017). Providing guidelines for the identification and recognition of biodiversity-friendly enterprises (BDFEs), DAO No. 2021-13 defines these enterprises as "economic activities and practices of micro, small and medium enterprises, local government units, and people's organizations that promote the sustainable use of biological resources; create wealth and value; and open opportunities for the equitable sharing of benefits among stakeholders."

However, despite the country's long history of almaciga resin production, the indigenous peoples (IPs) and local communities who directly collect or harvest the resin from the forests have remained poor.

Figure 1. Volume of production and export of Almaciga resin, Philippines, 1970–2022

Data source: Philippine Forestry Statistics, various years

The Experience of Almaciga Resin Tappers in Palawan and Davao Oriental

Almaciga resin tapping continues to be a challenge for resin tappers, with a limited impact on alleviating poverty within the IP and local communities. A comprehensive analysis of almaciga resin's current market conditions, specifically in Palawan and Davao Oriental, revealed several issues hindering industry development and financial improvement of resin tappers:

- Low product prices that do not consider the value of the tappers' travel time
- Difficult access to the almaciga resources, requiring long hours of challenging travel
- Monopsonistic or oligopsonistic markets that place the power to determine price in the hands of a single or few buyers
- Industrial buyers who may be unaware of the situation of resin tappers
- Delayed processing of permit application or renewal, imposing financial burdens on resin tappers who often borrow from financiers due to insufficient funds
- Unclear bases of setting resin quotas

Classes of almaciga resin

The resin prices of people's organizations from North Palawan (PO1), South Palawan (PO2), and Davao Oriental (PO3) vary mainly based on size, purity, or cleanliness. The highest-grade resin, known as "tipak" or chunk in English, is predominantly white, harvested as big chunks, and preferred by buyers for their lower impurity content. Class A resin shares similar characteristics with "tipak" but is smaller, while Class B consists of broken pieces with relatively more impurities. PO1 tappers sell "tipak" for P28/kg and "ladlad," another resin classification for P25/kg, while tappers in PO3 sell the resin for P20/kg. The average annual incomes of the interviewed PO members in 2019 were P88,896 for PO1 and P50,290 for PO2, with 91% and 46% of the income coming from resin tapping, respectively. At the current price levels, the income from resin tapping and other sources are insufficient for the tappers to surpass the poverty threshold of P117,125 for Palawan.

Disregarded value of tappers' travel time

Resin tappers face financial challenges due to three primary reasons. Firstly, prices are determined by buyers who fail to consider the tappers' production costs, which mainly stem from the extensive distances they must travel to and from the forests where almaciga stands are situated.

The cost-return analysis results for PO1 and PO3 using current and fair prices are shown in Table 1, while Table 2 presents the cost-return analysis for PO2 under different resin class assumptions. The fair price of almaciga resin was estimated by including the value of travel time and a 20% mark-up.

The unit price of P26/kg utilized for PO1 represents the average price of Class A (P35/kg) and Class B (P17/kg) resin sold in North Palawan, while PO3 used a fixed price of P20/kg in Governor Generoso (Table 1). The annually granted resin quotas determined the volume of units sold for PO1 and PO2, whereas, for PO3, it was based on the yearly volume shipped to the PO's resin buyer due to the absence of a resin quota. The cost per unit was calculated by combining the opportunity cost incurred per kilogram and the material cost incurred by the tapper per kilogram

Table 1. Cost-return analysis for PO1 and PO3 at current resin production level and current and fair prices

Variable	PO1		PO3	
	Current Price	Fair Price	Current Price	Fair Price
Price per unit (P/kg)	26.00	31.20	20.00	32.45
Units sold (kg)	120,000	120,000	96,000	96,000
Revenue (P/yr)	**3,120,000**	**3,744,000**	**1,920,000**	**3,115,200**
Cost per unit (P/kg)	26.30	26.30	27.04	27.04
Variable costs (P/yr)	3,156,000	3,156,000	2,595,840	2,595,840
Fixed costs (P/yr)	0	0	0	0
Total costs (P/yr)	**3,156,000**	**3,156,000**	**2,595,840**	**2,595,840**
Profit (P/yr)	**-36,000**	**588,000**	**-675,840**	**519,360**

[1]In reality, tappers bring down a mix of resin grades from almaciga stands in Palawan. The resin class assumptions used are for illustration purposes only.

At present prices, resin tappers from both PO1 and PO3 are experiencing annual losses of P36,000 and P588,000, respectively, as the current prices fall below the tappers' opportunity cost of time. Resin tapping will be profitable only if the prices are raised to include the opportunity cost of time and a 20% markup.

Secondly, the allowable resin quotas of some POs engaged in resin tapping are sometimes insufficient to allow tappers to generate profit. PO2's annual allowable cut (AAC) or resin harvest quota is only 30,000 kg (Table 2). At current prices, the resin tappers would experience a slim profit margin of P3.34/kg and P1.34/kg if the collected resin is classified as tipak and Class A resin. However, they would incur a loss of P8.66/kg if the resin is classified as Class B. In reality, however, the tappers collect and sell a mix of resin grades.

Table 2. Cost-return analysis for PO2 resin tappers under different resin class assumptions

Variable	Tipak		Class A		Class B	
	Current Price	Fair Price	Current Price	Fair Price	Current Price	Fair Price
Price per unit (P/kg)	30.00	46.39	28.00	43.99	18.00	31.99
Units sold (kg)	30,000	30,000	30,000	30,000	30,000	30,000
Revenue (P/yr)	**900,000**	**1,391,760**	**840,000**	**1,319,760**	**540,000**	**959,760**
Cost per unit (P/kg)	26.66	26.66	26.66	26.66	26.66	26.66
Profit (P/kg)	3.34	19.73	1.34	17.33	-8.66	5.33
Variable cost (P/yr)	799,800	799,800	799,800	799,800	799,800	799,800
Fixed costs (P/yr)	-	-	-	-	-	-
Total costs (P/yr)	**799,800**	**799,800**	**799,800**	**799,800**	**799,800**	**799,800**
Profit (P/yr)	**100,200**	**591,960**	**40,200**	**519,960**	**(259,800)**	**159,960**

[1]In reality, tappers bring down a mix of resin grades from almaciga stands. The resin class assumptions used are for illustration purposes only.

Thirdly, the POs are burdened with the high cost of conducting the inventory of tappable trees, a prerequisite for obtaining the Ordinary Minor Forest Products License (OMFPL) under DAO 1994-07 at the time of the study, and now called the Tapping, Extraction and Collection Permit (TECP) as provided by DAO 2021-33 that superseded the former. Some of the existing policies that directly cover almaciga are dated, such as Forestry Administrative Order No. 11 (Revised) (FAO No. 11) issued in 1970, and Presidential Decree 705 (Revised Forestry Code of the Philippines, as amended) signed in 1975. In 2021, DAO No. 2021-33 was issued to address some of the concerns faced by almaciga resin tappers, such as extending the permit duration of 1 year under DAO No. 1994-07 to 5 years (Section 6.4). Despite this, the requirement for a 100% inventory of trees to be tapped remains, imposing a financial burden on the tappers. Furthermore, there is a need to rationalize the setting of resin quotas, considering factors such as the capacity of almaciga

trees to produce resin and the accessibility of almaciga stands.

Conclusion and recommendations

The almaciga resin market lacks competitiveness, adversely affecting resin tappers who have been denied fair prices for their resin over the years. The market cannot be expected to resolve these problems independently, thus warranting intervention from the government and other stakeholders in the industry.

Specifically, the following interventions are recommended:

- Strengthen the organizational and financial capacity of POs engaged in almaciga resin tapping by providing them improved access to better credit facilities and market information. Their low organizational and financial capacity have hindered these POs from getting fair prices from resin buyers, resulting in buyer-dictated prices that do not cover the net costs incurred by the tappers.
- Simplify the process, reduce cost, and lessen documentary requirements for permit application or renewal to reduce the financial burden of the resin tappers and avoid added costs arising from the need to store unsold resins due to delays in permit processing.
- Develop a standardized grading system for almaciga resin to ensure fair prices across all suppliers. The lack of a standardized grading system has resulted in inequities among resin suppliers across sites as prices of various resin grades are dictated by the buyers.
- Develop a science-based, practical, cost-effective forest inventory system for almaciga resources. This system aims to minimize the current inventory costs of permit applicants and provide a scientific basis for determining resin quotas. Considerations in setting resin quotas include the growth and yield of almaciga trees, along with sound resource inventory data. Properly establishing the resin quota is crucial to ensure the almaciga resource base's sustainability and potentially increase almaciga resin's availability for domestic industrial users and the export market.
- Promote almaciga plantation development to enhance the natural stock and improve the accessibility of almaciga stands in the future. This will secure the resin supply in the market and help reduce the resin tappers' opportunity costs due to the difficulty of accessing almaciga stands.

For the optimal and sustainable utilization of almaciga resources, it is essential to efficiently conduct tree inventories, properly establish the resin quota for sustainable resin production, ensure fair resin prices, and streamline the permit application or renewal process, particularly favoring permittees such as Indigenous Peoples (IPs) and local communities who have maintained sustainable tapping practices. Implementing these measures will significantly benefit resin tappers and local communities currently facing economic challenges. Furthermore, meeting the industry demands for resin will be effectively addressed.

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References

Biodiversity Management Bureau. (2017, September 13-14). Opportunities in Biodiversity: Promoting Biodiversity-Friendly Enterprises. Tacloban City, Philippines.

FAO. (1995). *Non-Wood Forest Products 6: Gums, resins and latexes of plant origin.* Rome: Food and Agriculture Organization of the United Nations. Retrieved from http://www.mekonginfo.org/assets/midocs/0001704-environment-gums-resins-and-latexes-of-plan-origin.pdf

Mantell, C. L. (1937). Manila Resins Origin, Properties, and Applications. *Industrial & Engineering Chemistry*, 855-859.

Razal, R. A., Maralit, A. A., Colili, N. B., Alsa, L. N., & Canlas, R. P. (2013). *Value Chain Study for Almaciga Resin.* Non-Timber Forest Products Task Force.

West, A. P., & Brown, W. H. (1920). *Philippine Resins, Gums, Seed Oils, and Essential Oils.* Bureau of Printing.

Whitmore, T. (1980). A monograph of Agathis. *Plant Systematics and Evolution*, 41-69.

Zamora, P., & Co, L. (1986). Philippine Gymnosperms. In P. Zamora, & L. Co, *Guide to Philippine Flora and Fauna* (Vol. 2, pp. 213-218). Natural Resources Management Center. Ministry of Natural Resources and University of The Philippines.