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Assessing timber trade middlemen for development policy actions: a case study in the Caraga region, Philippines

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The timber trade middlemen are examined in this work to understand their functions, work conditions and work outcomes in the Caraga Region (Philippines) for development insights. Investigative practice and comparative observation were the approaches used to assess these middlemen. The results exhibit the essential role of the timber trade middlemen from log cutting to log delivery and in the regularity of timber trade operations across Caraga Region. Merchant middlemen, agent middlemen and service providers are the three general middlemen types observed. The service providers have the largest number and composition with six subtypes. Further results show that the purchase order holders (merchant middlemen) can profit largely (more than 20%) from the buy and sell of logs. The timber trade middlemen's work conditions have issues with personal security, occupational safety, price uncertainty and transparency. They have been involved "incognito" in timber trade operations, rendering some of them vulnerable and less protected in the timber supply chain. Policy actions to enhance transparency and recognize properly these middlemen for the safe conduct of their businesses, for further skills development, for their organization in the timber industry, and for incentivizing their services properly are recommended for the sustainable development of the timber supply chain in Caraga Region.

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Introduction

Caraga Region is located in the northeastern part of Mindanao where the established timberland is the fourth largest in the Philippines at 992,131 hectares (DENR-FMB, 2020). Log production in the region is highest at 573,782.08 cubic meters across the country (DENR-FMB, 2020), which retains the title for the Caraga Region as the country's Timber Corridor (Peras et al., 2020). On average, around 65% of the country's timber supply is procured from the region annually (DENR-FMB, 2014, 2015, 2016, 2017, 2018). In 2011, by virtue of Executive Order (EO) 23 that promulgated the prohibition of the cutting of trees from the natural and the residual forests in the country, the timber industry in the region underwent a major change due to the consequent rigid regulatory schemes. The region's timber industry performance plummeted drastically following the enforcement of EO 23, but bounced back with the flourish of the planted forests and the cohesive adaptation of stakeholders, especially the timber trade middlemen (Peras et al., 2020). However, these middlemen, except for the wood processors, have been unrecognized for years, because there is yet no accreditation system to enroll them for proper recognition in the wood/timber industry in the region. Particularly, these middlemen have been assisting the industry to ensure continuous log supply for the wood processors and to ensure accessible log buyers for the tree farmers. Yet, there is scarcity of information regarding their functions, specializations, and issues in the timber supply chain, which can potentially impede welfare improvement along the chain.

The region is also the highest in log consumption in the country with the huge volume required for its wood processing plants (DENR-Forest Management Bureau, 2018; Peras et al., 2020). In 2018, it posted a total log requirement for wood processing at around 719,000 cubic meters, to which it could only provide 72% of the volume required (DENR-FMB, 2018). Log importation and procurement from other regions help fill the gap nonetheless (DENR-FMB, 2018; Peras et al., 2020). The unrecognized middlemen as go-between and intermediaries organize the activities necessary for the smooth flow of log and financial resources from the tree farmers and the wood processing plants and vice versa. These individuals have learned to handle the craft smartly for the daily operations of the wood processing plants and the timber industry in the Caraga Region and also overseas with log exports being made. Thus, this work advocates for the research on the middlemen and their specific functions in the timber supply chain to address information scarcity on this aspect and to understand these individuals in the timber trade in Caraga Region. Generally, these middlemen have been perceived sullenly as necessary evils in log/timber marketing.

As this work addresses the information gap about the middlemen in the timber trade, it is driven to produce insights for these middlemen to be properly recognized. These middlemen are widely perceived to be manipulating prices and business transactions to their advantage (Bertomeu, 2008; Dong and He, 2017). Such perception is checked and tried to be explained based on factual observations, particularly on the conditions/opportunities that could have allowed such manipulative behavior among the timber trade middlemen. This work presents the baseline specifically about the types of middlemen in the timber trade apart from the wood processors, their personal background, their specific activities, and their economic shares in the trade. The issues and constraints in the performance of their activities are tackled also to present the limiting conditions they have to surmount to facilitate the regular operations of the timber industry for local and international markets. Caraga Region as the Timber Corridor of the Philippines has a pivotal role in the upgrading of the timber industry with relevant policies that would look into the

welfare of its key stakeholders, including the middlemen. To the best of the authors' knowledge, this work has pioneered in the study of the timber trade middlemen in Caraga Region to discuss the policy implications for the proper recognition and mainstreaming of these middlemen in the region's timber industry development.

Review of literature

Timber trade in Caraga Region has already existed even before the 1970s. In the region's glorious past, it hosted the Timber City of Southern Philippines known today as Butuan City. At present, the forest base is dwindling, but the entire region remains among the last frontiers of Philippine forestry as the Timber Corridor of the country (Peras et al., 2020). The tree farmers' participation in the upstream of the timber supply chain is credited hugely for that, and so is the participation of the timber trade middlemen. In the region, the regular operations of the timber industry are made possible largely with the middlemen who are responsible for the smooth flow of timber products and payments daily. These middlemen operate in an indistinguishable way to the public; yet can still exert impact on timber trade (Kuempel, 2016). The region is credited for the daily count of over a hundred trips of timber delivery from Agusan del Sur, Agusan del Norte and Surigao del Sur to Cagayan de Oro City in Northern Mindanao and Davao City in Davao Region for bulk log consumption either in processing or in overseas shipping (Laureto et al., 2015). In this work, the middlemen's activities and role in the timber trade are discussed for the welfare concerns and interests of these critical players in the timber supply chain.

The timber trade middlemen: critical role and activities

The recent published works pertaining to the timber trade middlemen are scant (Tham et al., 2020). Many of those related to them are nested in studies addressing different issues where they can be part of the key data/information sources, as in the works of Arvola et al. (2020), Santos et al. (2019), and Lusasi et al. (2020), among others. In Caraga Region, the middlemen are the least understood in the timber supply chain. Interestingly, they get involved in the chain activities indistinguishably but can still influence the chain/industry balance (Peras et al., 2020). There are no public records about the identities and functions of these middlemen in the timber supply chain, unlike the tree farmers and the wood processing companies (Peras et al., 2020). Over the years, most studies have focused on the tree farmers who are generally poor in the Philippines (Peras et al., 2020).

On the other hand, studies depicting the middlemen in the timber industry highlight the disreputable exploitative behavior of these middlemen. The timber trade middlemen are viewed as capable of controlling trade negotiations to their advantage, particularly in the matter of prices (Tham et al., 2020; Pulhin and Ramirez, 2016). They are noted to be involved in illicit activities such as illegal timber trade with timber production practices inconsistent with the global sustainable forestry standards (Maria-Sube and Woodgate, 2019; Phan, 2017; Pulhin and Ramirez, 2016; Anttila, 2016; Woods, 2011). With their engagement in illegal timber trade, corrupt practices are inevitably associated with them as found in the work of Mahanty (2018). These middlemen have the tendencies to bribe for favors (e.g. for the smooth passage of illegal logs or timber laundering according to Andrighetto (2018)) and also have rent-seeking tendencies (Anttila, 2016).

Thus, the middlemen are commonly known to influence shrewdly the distribution of timber trade benefits, which result in much higher benefits for them than for the tree farmers

Table 1 Middlemen’s services in the timber supply chain.

Service/Activity	Source
Purchase timber directly from the farmers or collect timber for the wood processors.	Purwanti (2016)
Act as bridge between the customers and suppliers	Susilowati and Akbar (2018)
Sell timber to the wood processing industry in the form of logs.	Purwanti (2016), Muin (2016)
Do the felling and transport of timber	Muin (2016)
Make themselves accessible or easy to contact by tree growers/farmers/cultivators for the buying of selected logs.	Arvola et al. (2019), Ghosh and Sinha (2018)
Take responsibility of time-consuming activities with the bureaucratic process in the sale of logs and carry the administrative burdens	Arvola et al. (2019), Ghosh and Sinha (2018), Wells et al. (2007), Anttila (2016), Bisjoe (2016), Purwanti (2016), Muin (2016), Lusasi et al. (2020), Dong and He (2017)
Provide information on prices.	Erbaugh et al. (2016)
Act as representatives of wood-based industries	Purwanti (2016)
Make cash payments for purchased timber and advance money for use by the tree growers/farmers/cultivators.	Arvola et al. (2019), Erbaugh et al. (2016), Wells et al. (2007), Purwanti (2016), Susilowati and Akbar (2018)
Absorb the stresses associated with timber/log sale and supply	Arvola et al. (2019), Ghosh and Sinha (2018), Wells et al. (2007), Anttila (2016)
Bear the possible risks in the trade on behalf of the tree farmers and the manufacturers	Arvola et al. (2019), Ghosh and Sinha (2018), Wells et al. (2007), Anttila (2016), Bisjoe (2016), Muin (2016), Susilowati and Akbar (2018)
Reach remote regions of production and conduct inter-island commercial trade	Susilowati and Akbar (2018)

(Tham et al., 2020; Susilowati and Akbar, 2018). That observation has become a cliché that has not been explained with depth as to why these middlemen can behave exploitatively (Tham et al., 2020; Susilowati and Akbar, 2018; Peras et al., 2020; Lusambo et al., 2021). This work has considered the conditions under which the middlemen can potentially exert influence to their advantage. As widely observed, the timber trade or supply chain is noted to have arduous and ambiguous processes and policies (Vasile, 2020; Tham et al., 2020; du Preez and Chevallier, 2012; Race et al., 2019). Such condition provides opportunities for middlemen to offer assistance at a much profitable rate especially in areas with high timber demand (Race et al., 2019). As intermediaries, the middlemen perform a number of functions that ease the tree farmers (of red tape particularly) and the wood processing companies of burdens associated with the exchange and flow of timber products and product payments (Arvola et al., 2019). Table 1 shows some of the critical tasks undertaken by the middlemen in the timber supply chain, which also explain the preference of the tree farmers and the wood processors for the middlemen’s services.

Facilitation services are the apparent reasons for the preference of the tree farmers for the middlemen’s services, especially in the sale and transport of logs. The middlemen are clearly specialized in intermediary functions to act as bridges between log producers and consumers and provide gratifying results to their clients even if forestry regulations are violated sometimes (Phan, 2017; Dong and He, 2017). As individuals engaged in facilitation/intermediary business, they have to set prices for their services considering the burdens and risks that have to be borne in the accomplishment of their intermediary tasks. Indeed, one of which is to master with bureaucracy in the timber industry to accomplish intermediary tasks with success (Arvola et al., 2019; Ghosh and Sinha, 2018; Anttila, 2016; Bisjoe, 2016; Lusasi et al., 2020). The timber industry is a highly-regulated sector because of the issues in forest rehabilitation and sustainability as well as environmental impacts (Dong and He, 2017; Pontecorvo, 2018). The middlemen bear risks that may cost them to lose so much of their expected profits. These risks may include personal safety/security (at border patrols and checkpoints), price fluctuations at market destinations, political conflicts, exorbitant interest rates at lending, timber order cancellation, product delays, transaction cost increase, uncertain policies, and many others (Dong and He,

2017; Phan, 2017). The uncertainty and costs of confronting these risks have made the middlemen quite wary of their profits from trade, according to Tham et al. (2020).

On the welfare of the timber trade middlemen

The studies reviewed in the earlier section have established the essential role of the middlemen in timber trade. The importance of the middlemen is justified by their services despite the drawback of exploitative behavior. Underlying reasons of information gaps and transparency issues are believed to have contributed to the opportunities of these middlemen to be exploitative/manipulative. The timber trade sector or supply chain has some issues that hinder the understanding of the factors leading to the said middlemen’s behavior. It has been complex and problematic not only across the Philippines but across the globe as well. Tham et al. (2020) have pointed out numerous elements that have contributed to the sector’s chronic problems/issues. Poorly behaving regulation and institutional arrangements as well as increasing transaction costs are among these elements, specifically in the Southeast Asian countries like Cambodia, Philippines, Lao PDR, Vietnam, and Indonesia (Tham et al., 2020). The timber trade sector needs to catch up with the improvement of governance and coordination in the timber supply chain. Less empowered trade participants and cutthroat competition can complicate the existing governance and coordination issues in the timber supply chain (Tham et al., 2020). Additionally, lack of market information, technology upgrading, sound business strategies, and research and development support are the other lingering issues (Tham et al., 2020).

Meanwhile, high transaction costs present a reasonable gap and favorable opportunity for the middlemen to get involved in timber supply chain activities as intermediaries and facilitators ((Anttila, 2016), The chain participants (e.g. tree farmers/growers/cultivators and wood processors) usually lack time and resources to undergo the hassles/tediousness and unprogrammed expenditures associated with forestry/timber industry regulations (Anttila, 2016). This has been observed in the reviewed works of Phan (2017) and Pontecorvo (2018) where the timber exports are challenged with the cross-country timber trade policies (e.g. Forest Laws Enforcement Governance and Trade) as well as of Dong and He (2017) where timber importation of China has increased after tightening of the country’s timber policies.

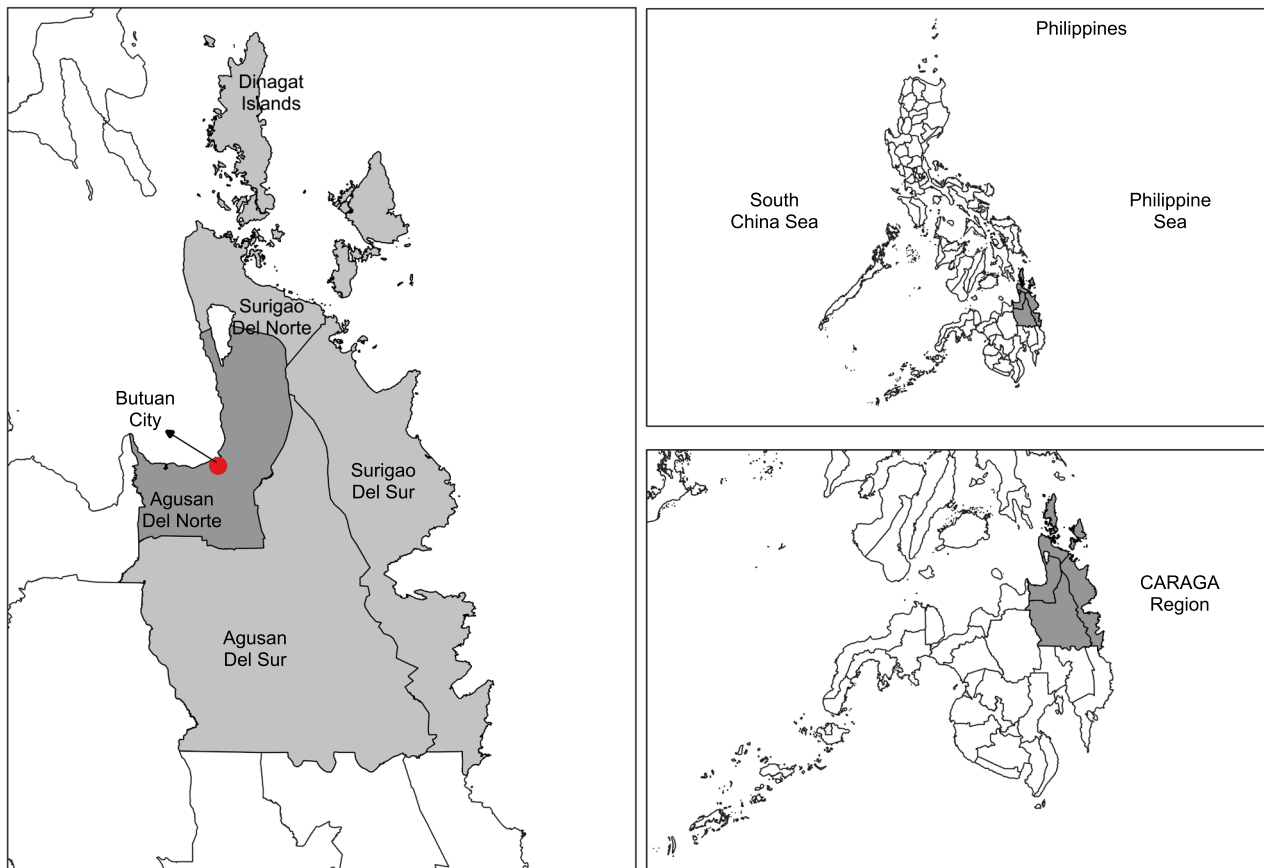


Fig. 1 Map of Caraga Region.

However, almost none of these works have attempted to understand the middlemen's practices and their welfare issues. Among the works reviewed herein, Anttila (2016) had gotten close to investigating the importance of the services of the middlemen in timber trade. However, the said study had delved only a little to discuss about the work conditions and other welfare issues that could clarify the actions of these middlemen. This work has aimed to produce the baseline to draw insights from synthesized information about these middlemen. For the case of Caraga Region, the tasks and the risks of these middlemen are vital information to be accounted for in the ways forward to accelerate timber industry development.

Methodology

Area of the study. This study was conducted in the three provinces of Caraga Region that is dubbed as the Philippine Timber Corridor. The region is situated in the northeastern part of Mindanao Island (the second largest island in the country) with a total land area of 18,847 sq. km (National Nutrition Council, 2021). Forestland comprises 71% of the said land area in which most of it is located in the province of Agusan del Sur (DENR-FMB, 2019). Besides Agusan del Sur, Agusan del Norte and Surigao del Sur are the other two provinces where the field activities of this study were conducted. These three provinces were selected based on the forestry statistics published by the Department of Environment and Natural Resources-Forest Management Bureau (DENR-FMB). Particularly, the said provinces were selected based on the monthly log production volume and the tenurial instruments for forest resource allocation by province. Butuan City, the former Timber City of Southern Philippines, is the administrative capital of Caraga Region and is

the home of most of the region's wood processing companies. Figure 1 shows the geographical map of the Caraga Region.

Selection of respondents and data collection. The main respondents of this study are the middlemen in the timber trade who have been unrecognized with the absence of public records about their characteristics and involvement in the said trade. Peras et al. (2020) have considered these middlemen the "phantoms" in the timber trade because they have been unregistered unlike the wood processors. Snowball sampling approach was used in identifying the respondents because of the absence of a sampling frame or a reference list of these middlemen to serve as basis for the random selection of respondents. To locate them, information and assistance from key informants were essentially utilized. The key informants had linked the interviewers of this study to the middlemen for the consented personal interviews. These key informants were fellow workers of the middlemen who were intended as the main respondents of this study. Suggestions from the interviewed respondents were then followed to locate the rest of the respondents. The tracing method of this study was aided by the information given by the key informants and the interviewed middlemen. The key informants who were also middlemen were selected based on their lengths of experience, engagement in, and knowledge about timber trade across the region. In addition to the middlemen-key informants, this study also selected some local people who lived near the hot decks, tree farmers, barangay officials, and personnel from the Department of Environment and Natural Resources (DENR) as other key informants. They were asked with consent about their knowledge as to the identities, the activities, practices, and behavior of the middlemen as well as their perspectives about these middlemen. The tracing and the interviews of the respondents were

undertaken for four months (January–April 2020) with the purchase order holders as the last interviewees. Knowledge about these purchase order holders in Caraga Region was obtained from the work of Peras et al. (2020).

Four hundred four (404) respondents were interviewed with the use of a structured questionnaire. Their backgrounds, timber trade activities/practices/functions and specialization (on which the middlemen classification is based), costs and incomes, perceptions about the timber trade operations, risks, problems, and constraints were among the information gathered. They were interviewed by eight (8) trained enumerators who were college graduates with agriculture and forestry backgrounds and who had lived for more than 1 year in the province of Agusan del Sur. Prior to the deployment of the enumerators, they underwent a weeklong orientation and training to do the interviews properly. The work of Kohls and Uhl (2002) and the online material from the e-Learning Portal on Agricultural Education of the Indian Council of Agricultural Research (ICAR) (e-Learning Portal on Agricultural Education, undated) were used as guides in the classification of the middlemen. The middlemen are the business individuals and groups specialized in performing the marketing tasks and are between the producers and the consumers of a product/commodity (e.g. logs and timber) (Kohls and Uhl, 2002). In this study, the timber trade middlemen are classified into merchant middlemen, agent middlemen, and service providers. In the timber trade of the Philippines, only the wood processors have been recognized and registered properly; the rest had to be traced and registered for welfare improvement in the timber supply chain. Also, in this work, investigative practice and comparative observation were undertaken. The investigative practice has been applied in various research topics in the medical and the cultural fields as well as in police investigation and program assessment. The works of Kinney et al. (2019) on sudden death in epilepsy, Smith et al. (2017) on improvement in the use of DNA in crime investigation, Bhardwaj (2019) on dance teaching in a contemporary Indian context, and Abderrahim and Merabet (2021) on new program assessment in France exhibit the empirical use of investigative practice particularly.

The use of the investigative practice in this study is for the baseline information about the unrecognized middlemen to be established. These middlemen are believed to be many in Caraga Region who may have done critical roles, functions, and services, facing risks and problems, and working with profit motives in the timber supply chain. Comparative observation is the supplemental approach for the synthesis and analysis of data for this study. Similar to investigative practice, it has been used in various research works such as configuration of human teeth during the middle Pleistocene Age in China by Pan and Zanolli (2019), legal issues in global supply chain liability by Reinke and Zumbansen (2019), and cleaner shrimp production concerns by Titus et al. (2017). Comparative observation is useful in distinguishing the interesting differences and areas for improvement in certain cases. In this study, the unrecognized middlemen's background, work conditions, problems, and risks are discussed to suggest strategic actions. Moreover, the study used primary and secondary data/information to provide an adequate basis for strategic development actions. As mentioned, the primary data/information was obtained through questionnaire-guided interviews of the purposively selected middlemen and the interviews of the key informants. Field observations also provide further information to the collected and analyzed responses and data. Observation activities were done with approval from the middlemen during the performance of some timber trade activities from farm sites to hot decks or assembly or pick-up areas where logs were deposited for loading into the trucks. These were done to gather information on the work condition and the

occupational safety concern during the performance of the timber trade activities (e.g. hauling, transport, and loading of logs). The secondary data/information was collected through desk research with online search and downloading of published works.

Method of data analysis. The classification of the middlemen was outlined through the information from the key informants. The information from the questionnaire-guided interviews substantiated this classification. In determining the specific middlemen types, the work of Kohls and Uhl (2002) was referred to with the online lecture material on marketing at the e-Learning Portal of Agricultural Education. The analyzed responses about the specialization or tasks of the respondents reveal that the unrecognized middlemen in the timber trade in Caraga Region are of three types: service providers, agent, and merchant middlemen. Descriptive statistics using Excel was used in the analysis of the data/information gathered through the key informant interviews, the questionnaire-guided interviews, and the desk research. Nonetheless, the contextual analysis provided the guide in the sorting and synthesis of information from the secondary sources through the desk research and from the primary sources through the consented interviews to establish the major findings of this study.

Results

The middlemen of timber trade in Caraga Region. With the absence of statistical and registry documents about the timber trade middlemen in the Caraga Region, these unrecognized middlemen are estimated to be at least a thousand in number. This is due to the fact that over a hundred truckloads of logs per day (or at least 125 truckloads daily on average) are transported within and out of Caraga Region (Laureto et al., 2015). The middlemen-key informants of this study estimated the loading of logs to a truck to take around 2 hours for the pulpwood type and 6–8 hours for the peelable type, but longer for logs bound to Cagayan de Oro City (175 km away from Butuan City) due to the tediousness of log piling to maximize the truck's cargo space. On average, 10–20 persons are involved in the loading process at the hot deck. For other activities like timber harvesting and hauling, around the same number of people are involved estimably. All of the timber trade activities (e.g. log cutting, hauling, loading and transport) can occur at the same time. This study interviewed 404 of the timber trade middlemen distributed across the three provinces (Agusan del Sur, Agusan del Norte, and Surigao del Sur) unevenly by middlemen type. The presence of these many middlemen in the region conveys the evidence of beneficial spillover impacts of timber trade to the local economy of the Caraga Region. Timber trade employment opportunities have been apparently created with these middlemen. In the prior years, these opportunities and beneficial impacts had not been discussed and accounted for because these middlemen had been indistinguishable or incognito in the timber supply chain (Peras et al., 2020).

Table 2 presents the distribution of the said middlemen across the region. Agusan del Sur is shown as the epicenter of timber trade activities with the largest number of middlemen in the timber trade. The aforementioned middlemen are of three types in each province: merchant and agent middlemen and service providers. The merchant middlemen are the ones who procure the logs for their wood processing clients. Depending on their strategies to meet the wood requirements of their clients, they arrange for the terms of sale with their fellow middlemen. They also do the same with the tree farmers in the area. Sometimes, the merchant middlemen seek help from the agent middlemen to find the sources of log supply for consequent purchase. A key

Table 2 Distribution of timber trade middlemen by type across caraga region, 2019.

Particulars	Number	Percentage
Agusan Del Norte	133	100
Merchant Middlemen	29	21.8
Agent Middlemen	14	10.5
Service Provider	90	67.7
Agusan Del Sur	210	100
Merchant Middlemen	17	8.1
Agent Middlemen	7	3.3
Service Provider	186	88.6
Surigao Del Sur	61	100
Merchant Middlemen	5	8.2
Agent Middlemen	2	3.3
Service Provider	54	88.5
Total number of respondents	404	100

informant from the DENR also called this middleman as a spotter to mean that this middleman helps the merchant middlemen in identifying the tree farmers interested in selling their logs. The agent middlemen assist the merchant middlemen in log procurement and can help arrange for timber harvest and transport operations as well. The service providers cater to the need for substantial manpower for the accomplishment of the tasks involved in the availability of logs for delivery to the wood processing plants. In the table, although Agusan del Sur has the largest number of middlemen, it is specifically largest in the number of service providers. Agusan del Norte, which is next to Agusan del Sur in the total number of middlemen, is largest in the number of merchant and agent middlemen. Across the region, Agusan del Sur is widely known for timber production while Agusan del Norte is known for wood/log consumption since most of the wood processors are located in it.

In Table 3, the background of these middlemen shows that the middlemen are local people who work in timber trade operations for gainful employment. Interestingly, they are ordinary persons who have mastered the trade of addressing facilitation needs for a living. The regularity of timber trade operations in the Caraga Region is owed to them. Reciprocally, it helps them establish connections and make regular earnings. The merchant and the agent middlemen are older in age than the service providers. The younger age composition is suitable for the service providers due to the substantial brawn power required for their jobs. Across the three types, these middlemen have low education with secondary level as their highest level of educational attainment. Although males are dominant, there are a few women in merchant middlemen and service providers. Most of the middlemen are married and have small- to medium-sized households. They have lived in their current areas of residence for more than 20 years, especially the merchant and the agent middlemen. Prior to settling in their current locations, they have mostly lived in Butuan City, which is the Timber City of the South of the country. These people mostly have no affiliation with any organizations that might help them advance their engagement in the timber supply chain as essential intermediaries.

Based on the estimated values of their assets, the merchant middlemen are the relatively well-off individuals compared to the agent middlemen and the service providers. The latter two types of middlemen appear to be of modest living standard. Based on income, the merchant middlemen earn the most substantial amount from at least Php 20,000 (\$395.5) to around Php100,000 (almost \$2000) per month due to their timber trade activities. Among the merchant middlemen, the purchase-order holders earn five times higher compared to those without purchase

orders. They also earn income much higher than most of the service providers. The agent middlemen earn around Php 1760 (\$35) per truck on estimate, in which the number of trucks is highly variable and is believed to be at least three trucks per month. However, in terms of their other income sources, the agent middlemen were not forthcoming such that no reliable estimate can be given for their other income sources. Both merchant middlemen and service providers have alternative income sources that include coconut farming, swine raising, vegetable production, and small-scale vending (sari-sari store in local term).

Critical functions and network of the middlemen in timber trade. Tables 4 and 5 introduce the classification of the timber trade middlemen operating in the Caraga Region. The classification is based on the specialized functions of the middlemen (which job they are most associated with) and the size or scale of operations specifically for the merchant middlemen. This work has noted the practice of multi-tasking among the middlemen especially the service providers for some economic reasons such as additional income and work efficiency (to accomplish the marketing task on time/schedule). The common multiple tasks performed by each type of middleman are also described in the aforementioned tables. The agent middlemen are classified into commission men and brokers following the reference materials mentioned earlier. The services of the commission men are found to be employed by the brokers, the fact that most of the negotiations with the tree farmers are done by the commission men and that payments for the services of the commission men are charged to the brokers. The brokers deal more with the log buyers who are the merchant middlemen than with the log producers who are the tree farmers. The merchant middlemen are of three types based on the scale of operations: strikers, non-purchase-order (non-PO) holders, and purchase order (PO) holders. The strikers have the smallest and the most irregular scale of operations, dealing with the buying of some log pieces (very much less than a truckload) to be consolidated with the logs bought from other sources for next sale or delivery. They negotiate with the tree farmers directly for the procurement of logs that they sell consequently to either the non-PO or the PO holders. The non-PO holders employ the services of the agent middlemen for the buying of logs from the tree farmers, which is the same with the PO holders in practice.

All merchant middlemen employ the services of the various service providers for the cutting of trees and the delivery of logs to their wood processing clients. They also process for the release of the necessary certifications/permits for the cutting and transport of logs to the wood processing companies in the proper Community Environment and Natural Resources Offices (CENROs) that are attached agencies of the Department of Environment and Natural Resources (DENR). The non-PO holders assemble bigger log volumes (in truckloads with an average of 30 cu.m. per truck) for potential sale to the PO holders or to the wood processing companies after days to months of waiting. The waiting time/period at the wood processing plants depends on the log needs of the wood processing companies or whether or not additional log delivery is needed. The PO holders are the merchant middlemen who are awarded with the purchase orders from the wood processing companies. The possession of purchase orders indicates the authority of the PO holders to purchase logs on behalf of the companies and thus the priority rights to be served with the proper entry for log delivery at the plant gates of the wood processing companies. Without the purchase orders, the merchant middlemen who wish to deliver their logs to the said companies have to wait outside the plant gates until all deliveries

Table 3 The general characteristics of the timber trade middlemen in Caraga region.

Particulars	Merchant middlemen	Agent middlemen	Service providers
Age composition (years)	36-50 (67%)	31-45 (50%)	30 and below (44%)
Educational attainment (level)	Elementary-secondary (84%)	Elementary-secondary (100%)	Elementary-secondary (74%)
Gender composition	Male (98%)	Male (100%)	Male (99%)
Civil status	Married (96%)	Married (88%)	Married (67%)
Household size (number)	3-6 members (63%)	3-6 members (71%)	1-4 members (68%)
Years in the community	31-50 (55%)	31-50 (58%)	21-40 (62%)
Area lived in prior to current residence	Butuan City (47%)	Butuan City (52%)	Not lived anywhere (current residence) (75%)
Membership in organization	None (78%)	None (79%)	None (94%)
Household assets (estimated value in Php and USD)			
House	393,333.33 (\$7777.92)	90,227.27 (\$1784.19)	58,304.88 (\$1152.94)
Residential Lot	200,000.00 (\$3954.87)	No response	150,000.00 (\$2966.16)
Farm land	675,285.71 (\$13353.35)	157,777.78 (\$3119.96)	228,621.43 (\$4520.85)
Four-wheeled vehicle	734,142.86 (\$14517.22)	348,000.00 (\$6881.48)	259,045.45 (\$5122.46)
Two-wheeled motor vehicle	108,322.58 (\$2142.01)	55,666.67 (\$1100.77)	36,760.56 (\$726.92)
Income sources and estimated amounts (in Php and USD)	Purchase order holders: log buying and selling and use of purchase orders by other merchant middlemen (estimated Php100,000 (\$1977.5) per month) beside the piggery/swine raising business, coconut farming and small-scale vending Non-Purchase Order Holders and Strikers: Log buying and selling (at least Php20,000 (\$395.5) per month) beside vegetable production (Php2000 (\$39.55) per month), small scale vending (Php2000 (\$39.55) per month), coconut farming (Php3000 (\$59.3) per month), and backyard swine raising	Estimated at Php1764 (\$35) per truck for at least three trucks per month Alternative income sources: no response	Service providers excluding the truck driver and truck assistants: labor services (around Php8000 (\$158.2) per month) beside vegetable production, backyard swine raising, small-scale vending and coconut farming Truck driver: transportation service (around Php24,000 (\$474.6) per month) beside vegetable production and small-scale vending Truck driver assistant: labor service (around Php12,000 (\$237.3) per month) beside vegetable production and small-scale vending

Numbers/figures in parentheses for all items before the household assets refer to the percentage of the respondents comprising the majority. All numbers inside the parentheses for all asset items or under the household assets as well as the incomes refer to the dollar equivalents of the estimated values above in Philippine peso. The exchange rate is US\$1 = Php50.57.

Table 4 The functions of the agent and the merchant middlemen in the caraga region.

Types of middlemen	Functions
<i>Agent middlemen</i>	
Commission men	- Locate the log sources - Negotiate with the tree farmers for a favorable price - Receive commissions from the broker-clients
Brokers	- Commonly contacted by log buyers for their log needs - Look for log supply sources - Employ commission men to look for supply sources and give commission to them - Collect payment for the service from the log-buyer clients - Does log marking sometimes
<i>Merchant middlemen</i>	
Non-purchase-order (non-PO) holders	- Engage the services of the agent middlemen - Buy logs and sometimes sell logs to companies only not on a prioritized basis - Work out for the necessary permits
Strikers	- Look for supply sources, buy logs in minimal volumes and sell to Non-PO holders and sometimes to PO holders - Work out for the necessary permits
Purchase-order (PO) holders	- Engage the services of the agent middlemen - Hold the purchase orders of the wood-processing company clients - Arrange with their company clients the schedules of log delivery - Buy logs from non-PO holders and strikers - Work out for the necessary permits

Table 5 The function of the service providers in the caraga region.

Type of middlemen	Functions
Surveyor	- Survey the areas to be harvested to determine the profitability of buying the logs from those areas - Has sidelines in the loading and unloading of logs and in transporting logs from farm site to hot deck
Scaler	- Scale logs sometimes - Load and unload logs - Measure the logs for the determination of diameter at breast height following the prescribed log measurements of their company clients - Determine the volume of logs per truck for transport decisions - Classify the quality of harvested logs based on company's log requirements (e.g. logs with cracks classified into either peel-able or pulp) - Do the surveyor's functions sometimes - Influence the sorting process of logs by evaluating the log sizes and volumes loaded into the trucks
Hauler	- Transport logs from farm site to hot deck
Loader	- Load and unload logs (from hot deck to truck and vice versa)
Log cutter/chainsaw operator	- Fell the timber and cut the logs based on the required sizes of the wood processing clients
Transporter	- Transport logs from hot deck to the company - Can receive payments from buyer on behalf of the PO holder

of the PO holders are completed properly. This usually results in temporary campouts and long queues of trucks and transporters outside the plant gates of the wood processors. The PO holders can help their fellow merchant middlemen by assembling the log volume required in the purchase orders through buying logs from the strikers and the non-PO holders. To avoid the costs associated with extended campouts and queues, the non-PO holders and the strikers may choose to sell their logs at reduced rates to the PO holders who are also concerned about meeting their obligations of regular log delivery to the wood processing companies.

The service providers are middlemen of varied types who belong to the facilitative middlemen because they offer their services to accomplish the marketing tasks in time without hassles on the part of the merchant and the agent middlemen. They are highly skilled individuals who engage in multiple jobs during field operations for additional income. Their job identification in the timber trade is based on the activity where they are most involved in spite of multitasking. The specific tasks handled by the service providers are identified based on the tasks in timber trade where they have gained the most experience. This is because the performance of the timber trade activities, particularly in hauling and loading, requires substantial coordination and non-verbal communication. Accidents and losses/income reduction (e.g. from cracks) can be avoided in the process through well-coordinated activities handled by experienced individuals. The skills competency among these middlemen is developed through experience from frequent engagement in timber trade activities, as there are no formal training programs designed specifically for them. The service providers refer to the surveyors, scalers, haulers, loaders, log cutters (chainsaw operators), and transporters. The surveyors, scalers, and log cutters are much involved in activities done at the tree farm site such as determining the trees to be felled, felling the trees, marking logs with cracks or damages, determining the small end and volume, and making the logs ready for hauling and transport to the hot deck. The hot deck is the term for the accessible spots or areas in which the logs for delivery are assembled for consequent loading into the trucks' cargo spaces. It is oftentimes close to where the truck is parked or stationed in preparation for the long hours of loading. The loaders take charge of loading the logs into the truck bed or cargo space. Their task is important for the efficiency of transport because they are the ones who pile the logs on the truck bed. They are responsible for ensuring that the piling is secured properly to avoid logs from rolling over and to avoid physical hazards and accidents for the safety of the rest of the service providers during the loading activity.

In Agusan del Sur, loading, an activity performed from the hot deck to the truck, consists of several (10–20) experienced people to be efficient or to do the task fast and free from hazards. It is done by some people hoisting the logs while others pull the logs from the cargo space with bolos having pointed hooks to clinch the log being tossed up for ease of pulling and piling the logs on top of one another. The higher the pile of logs on the truck bed, the riskier it goes because logs have to be stepped on to continue the piling up to the target height. The height of the pile stops at the level of the truck's roof about two meters high from the truck bed. The transporters take over by the time the loading activity is done. Prior to starting the long trip ahead, they have to check if the pertinent documents are intact, especially the necessary permits and some other provisions such as money, cooking utensils, food, and extra clothes for transport. Cooking utensils and food are important provisions, particularly during extended parking times/schedules and campouts. All of the activities done by the service providers are carried out in all weather conditions, except for the times when there are critical announcements received that threaten personal safety such as that of the National Disaster Risk Reduction and Management Council (NDRRMC) and from the advice of military personnel. Ordinary rains can hardly stop the timber trade activities (e.g. log cutting, hauling, loading, and transporting) from moving on because of delivery schedules at the plant gates and sometimes at piers for national and international deliveries. However, rains can add to the hazards faced by the service providers especially during the hauling and loading activities due to slippery surfaces. But it is during that time that experienced haulers and loaders can save the entire operation. Caraga Region has some of its logs being exported, particularly to China. The activities of the service providers are done manually, which means brawn power is essential along with some tools and implements such as chainsaws, saws, and bolos with pointed hooks.

The network of the timber trade middlemen in Caraga Region.

The middlemen in Caraga Region's timber trade are perceived as manipulative and highly profit-driven. This is linked to their rent-seeking behavior as pointed out in the reviewed articles of this work. The key informants from the Department of Environment and Natural Resources, the selected tree farmers and the local people in Agusan del Sur have such perception particularly. Additionally, these informants view the middlemen as taking advantage of the incapacity of the tree farmers to sell their logs directly to the wood processing companies. Indeed, the tree

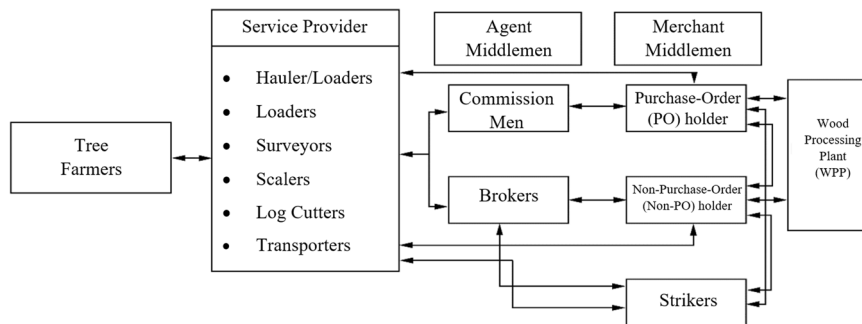


Fig. 2 The Timber Trade Middlemen in Caraga Region. The general arrangement of the timber trade middlemen in Caraga Region (between the tree farmers as log source and the wood processing plants as log destination prior to formal market release).

farmers cannot sell their logs easily to the said companies because these companies have to prioritize the delivery of logs from the purchase-order holders. For efficiency reasons, the companies prefer to entertain bulk log deliveries, which the tree farmers can hardly do. This forms the reason for the merchant middlemen’s deliveries to be always prioritized or accepted by the companies. The companies use their daily rated capacity of more than a thousand cubic meters (1164–1514 cubic meters) in aggregate across Caraga Region in obtaining logs and in scheduling log deliveries (DENR-FMB, 2018, 2019, 2020). However, all of the key informants have associated timber trade middlemen as only composed of merchant middlemen. Their perceptions of manipulative middlemen are directed to the merchant middlemen and not to any other middlemen types. This implies the limited understanding of the key informants and perhaps of the other timber industry stakeholders who mean timber trade middlemen as merchant middlemen. Since diverse people have worked to ensure the regular operations of the timber industry, the other types of middlemen are important to be examined for the acknowledgment of their critical contributions.

Furthermore, the key informants have thought of these middlemen as with shady characters. Yet, they acknowledge the importance of the middlemen in the timber industry. The tree farmers prefer to sell their logs to the middlemen because they pay in cash at the accomplishment of log sale. The DENR key informants have thought the same, as according to them, the timber industry could not do anything without the middlemen’s help. The local people have the same perception on the importance of the middlemen since the middlemen can free the tree farmers from the hassles and additional costs in delivering logs to the companies. The tree farmer-key informants have admitted their lack of skills for the log cutting and transport jobs. They have considered such jobs as extremely risky. The regular operations of the timber trade in the Caraga Region are owed to these middlemen who handle the trading activities well for the timber industry. The middlemen’s activities can be observed in accessible areas, where clusters of logs can be seen at the roadsides. This is a common sight in Agusan del Sur as the epicenter of timber trade. Meanwhile, Fig. 2 shows the arrangement of these middlemen between the tree farmers and the wood processors. It also shows the interactions among these middlemen as they avail of the services of each other. Among the middlemen in Fig. 2, the service providers are the ones who work closely with the tree farmers who also monitor them. The agent middlemen approach the tree farmers for sale negotiation purposes; but negotiations between them are brief relative to the job performance of the service providers in the tree farm site. The tree farmers have to lead the service providers to their tree farms to point the trees to be felled, monitor the service providers in their manual field activities, and have to be present during the

log volume computation for transparency. The tree farmers can ask the service providers for clarifications should they have doubts in the log volume computation. The result of the log volume computation determines the consequent income of the tree farmers.

After reaching an agreement with the tree farmers regarding the manner of log sale, the agent middlemen turn over the transaction to the service providers for the rest of the manual and laborious activities. The strikers also deal with the tree farmers when they want to buy some logs from them. On the other hand, the merchant middlemen are close to their wood processing clients who issue purchase orders specifying the volume, the price, and the date of delivery to the companies. The purchase orders are awarded to the PO holders to comply. Although the non-PO holders and the strikers are merchant middlemen, they are not issued with the purchase orders. Yet, they can still sell directly to the wood processing companies but not on a prioritized basis unlike the PO holders. Sale of logs to the companies by the non-PO holders and the strikers’ results to long waiting and queuing periods until the plant gates open for their deliveries. It is believed that the PO holders have the privilege of special rates with the award of the purchase orders. There is a transparency issue with these rates as these are not freely shared in the timber trade system in the Caraga Region. To meet their required log volume within the scheduled date, the PO holders purchase the logs bought by the non-PO holders and the strikers from the tree farmers. With that, the non-PO holders and the strikers can act as log assemblers/consolidators for the PO holders. The PO holders are the expected merchant middlemen to deliver logs to the wood processors under the terms specified in their purchase orders.

Conditions with which the timber trade middlemen operate.

The timber trade middlemen in Caraga Region operate simply to keep costs down as much as possible. Table 6 describes how they perform their intermediary tasks for a living in the region. The merchant and the agent middlemen use handy materials to accomplish their transactions such as mobile phones, calculators, pens, and notebooks. Their functions/jobs involve only light activities such as discussion, negotiation, linkage development and maintenance, computation, and recordkeeping. The service providers have to carry ropes, chain saws, panel saws, calculators, axes, and bolos with pointed hook ends (locally known as “pantok”) in anticipation of their laborious work of felling trees and cutting, hauling, loading, and transporting logs. They get information from their friends and fellow middlemen about the location of their potential clients/customers. These potential clients are the tree farmers who are the log supply sources looking out for log buyers in the vicinity. Transactions among these middlemen are held

Table 6 The manner with which the timber trade middlemen operate.

Actors	Materials and tools used	Source of information about supply sources	Place of transaction	Mode of payment	Medium of communication	Mode of transportation (going to the transaction area)	Type of wood-processing company served	Perception of Intermediaries
Merchant middlemen	- Notebook - Ballpen - Calculator - Mobile Phones	- Fellow Middlemen - Friends	- Company - Farm site - Home	- Cash	- Face to face - Call - Text	- Single motor vehicle	- veneer and plywood	- Should have license/ permit
Agent middlemen	- Scale tape - Mobile Phones	- Friends	- At home (sometimes) - Roadside	- Cash	- Face to face - Call - Text	- Single motor vehicle	- veneer and plywood	- Should have license/ permit
Service provider	- Rope - Chainsaw - Panel saw - Calculator - Axe - Pantok (bolo with a pointed hook)	- Friends	- Farm site - Roadside	- Cash	- Face to face	- Single Motor vehicle	- veneer and plywood	- Need skills upgrading - Provide value-adding activities for buyers and sellers (e.g. arrangement of logs in transit can influence payment computation)

informally in company locations (particularly among the PO holders), at farm sites, and at home for the merchant middlemen. Although the agent middlemen and the service providers conduct their transactions at home and at farm sites, they entertain transactions along roadsides, so that they would not incur any cost for holding discussions and finalizing agreements and arrangements (e.g. work schedules and payment turnovers). By holding such activities along the road, they can easily/conveniently depart from the place at the conclusion of their meetings.

All middlemen prefer face-to-face communication; but should that communication be impossible, call and text may do. Payment should be made in cash among these middlemen. For their mobility, single motor vehicles are used for economic reasons (fuel efficiency for less fuel consumption) and for ease in maneuvering heavy traffics in the cities/town centers and any topography in the timber areas. All of the middlemen serve the log needs of the veneer and plywood companies in Butuan City. Possession of proper licenses and permits is perceived as an important opportunity among these middlemen. They can avoid trouble/run-ins with the regulatory authorities when they have the proper regulatory documents. (Table 7). The middlemen perceive their functions as essential because value addition will result from their activities. For instance, the middlemen’s services increase the value of logs when cut in required lengths (2.8 m usually) and moved to accessible locations for loading. Log buying and selling values increase with the care from the middlemen’s services (e.g. cutting the logs without cracks, making the logs available close to the hot decks for pick up, and transporting the logs to the plant gates). On this aspect, they consider skills upgrading and attendance to trainings and seminars as necessary. Making themselves a part of the government-accredited organizations is helpful among them as well (Table 7). With the licenses and permits of these middlemen as well as their affiliation to government-accredited organizations, their involvement in timber trade is likely to be mainstreamed properly. The necessary interventions for their welfare and efficiency in their activities are likely to be addressed properly as well. On the other hand, the agent middlemen’s and the service providers’ skills can be improved with their exposure to appropriate R&D on technological innovations. The service providers consider skills upgrading particularly important to their crafts. They can have better incomes with their improved skills and value-adding contributions such as reduction of cracks in logs and higher transport efficiency, among others.

Table 8 shows further descriptions on the manner of operations among the same middlemen. It is apparent that their operations are not mechanized and aided with high technology levels. Every essential work is done manually. The reason for this has to do with costs and the availability of skilled service providers in the timber areas. Draft animals (carabaos) and single motor vehicles are used in the transport of logs from the farm site to the hot deck for the loading at the truck to follow. The middlemen in the performance of their tasks are cognizant of the risks around them. The merchant and the agent middlemen have similar risks that are associated with personal safety and price fluctuation. The service providers have occupational safety to face in addition to the other risks on personal safety/security and unexpected changes in service payments. The source of personal safety/security issues in the areas where these middlemen work is the problem of insurgency in the forested parts aside from the hostile business competition. The economic risk of price fluctuation is due to the unexpected changes in the buying price of the wood processing companies due to log cracks. Logs of peelable type can be valued low based on the pulpwood rates when cracks can allow pens to get through. This is cascaded to the agent middlemen and the service providers to avoid income

Table 7 The perception of middlemen on their involvement in the wood industry in caraga region.

Particulars	Merchant middlemen			Agent middlemen			Service provider		
	Positive	Negative	Undecided	Positive	Negative	Undecided	Positive	Negative	Undecided
Middlemen provide value adding activities for buyer and seller.	50 (98%)	0	1 (2%)	22 (96%)	1 (4%)	0	298 (90%)	4 (1%)	28 (8%)
Middlemen should have licenses/permits.	44 (86%)	4 (8%)	3 (6%)	13 (57%)	8 (35%)	2 (9%)	166 (50%)	138 (42%)	26 (8%)
Middlemen need skills upgrading.	48 (94%)	3 (6%)	0	14 (61%)	9 (39%)	0	262 (79%)	41 (12%)	27 (8%)
Middlemen must attend training/seminars organized by both public and private agencies.	43 (84%)	7 (14%)	1 (2%)	14 (61%)	7 (30%)	2 (9%)	255 (77%)	48 (15%)	27 (8%)
Middlemen should belong to organizations accredited by government organizations (ex. DENR, DTI, etc.)	42 (82%)	7 (14%)	2 (4%)	17 (74%)	4 (17%)	2 (9%)	255 (77%)	48 (14%)	27 (8%)

DENR means Department of Environment and Natural Resources, DTI means Department of Trade and Industry.

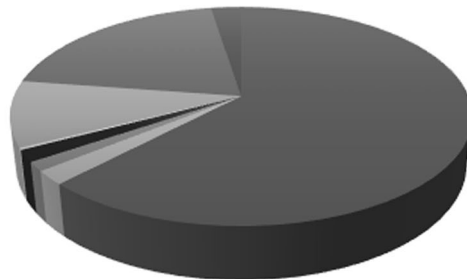
reduction. The service providers have occupational safety issues due to the possibility of deadly insect and snake bites and the manual operations that they have to do with great caution.

The merchant middlemen who provide the logs to the wood processing companies incur costs that are received as incomes by the tree farmers, the agent middlemen, the service providers, and the regulatory entities. They incur payments involved in the buying and transport of logs from the tree farm sites to the hot decks and then to the plant gates of the wood processors in the timber trade. From the cost data provided by the merchant middlemen for logs of peelable type, the shares of the tree farmers, the agent middlemen, the service providers, and the regulatory agencies to the per cubic meter log price are estimated (Fig. 3). The highest proportion is the share of the tree farmers at 62%, which is the cost of log paid by the merchant middlemen. The second highest is the share of the service providers at 33%, which refers to the accumulated cost of the services rendered by the said middlemen. The lowest proportion is that of the agent middlemen at 2%. The share of the regulatory agencies is around 3%. These shares are changed in the pulpwood log type, because of the reduced log cost received as income by the tree farmers as shown in Fig. 4. Table 9 also provides data that suggest the shares of the tree farmers, the agent, and the merchant middlemen, the service providers, and the regulatory agencies to the unit prices of the peelable logs and the pulpwood type of logs. For logs sold to the wood processing companies, the non-PO holders and the strikers receive a higher share of around 36% based on their net profit of 1640.02 for the peelable type and 7% based on their net profit of 158 per cubic meter for the pulpwood type. With respect to the unit price of the peelable type, the shares of the tree farmers, the agent middlemen, the service providers, and the regulatory agencies are 39.7%, 1.3%, 21.4%, and 1.5%, respectively. These shares have increased to 41.8%, 2.7%, 45%, and 3.1% in the same order for the pulpwood type. Among the merchant middlemen, the PO holders earn the highest estimated profits of 51.5% and 21% of the unit prices of the peelable and the pulpwood types, respectively. The tree farmers have the least profit of all the industry players here, considering the growing time of trees for logs of about 5–7 years. The rest of the timber industry players who are the middlemen earn their incomes in just a matter of days.

However, the price data at plant gates are not willingly shared across the timber supply chain in Caraga Region. The PO holders who know about these prices are silent while the agent middlemen and the service providers know only that these prices are large without the specific amounts. This information indicates an underlying trust and transparency issue in the timber supply chain. In the estimation of merchant middlemen's profits earlier, the conservative 3-year average prices published by the DENR-FMB were used for the peelable and the pulpwood types to approximate the prices at plant gates for the logs sold directly to the wood-processing companies. Based on that approximation in the sales part of Table 9, the PO and the non-PO holders including the strikers can get a profit of around 50% and 36% of the gross income per cubic meter for the peelable type, and 21% and 7% of the gross income per cubic meter for the pulpwood type, respectively. These can be earned if the logs are sold directly to the wood processing companies. If the non-PO holders and the strikers opt to sell their logs to the PO holders, they would not incur positive net incomes as shown in Table 9. For this part, the PO holders value the unit prices of logs at around 49% and 79% of the DENR-FMB's log prices for the peelable and the pulpwood type, respectively. Costs and payments for the services of the middlemen in the timber supply chain as well as the required fees do not vary by log type. However, the log diameter can make price differences since the

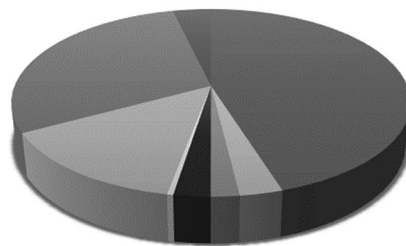
Table 8 The manner of performing their functions and the risks the timber trade middlemen face.

Type of middlemen	Manner of performing their functions	Risks faced by intermediaries	General level of risks
Merchant middlemen	- Manual	- Security/safety: encountered high-tempered people that led to violence; waylaying and impudent behavior of revolutionary groups in the areas of timber trade operations; sometimes death threats from competitors Economic: unexpected buying price changes at company plant gates (sometimes led to bankruptcy)	- Medium to high risk
Agent middlemen	- Manual	- Security/safety: traveling in remote areas with large sums of money; waylaying and impudent behavior of revolutionary groups; not speaking the native language of a specific place Economic: unexpected price adjustments by clients (merchant middlemen)	- Medium to high risk
Service provider	- Manual; with implements (e.g."pantok" and saws), single-motor vehicles, and draft animals for log transport	- Physical and safety: risk in the loading and unloading logs; prone to accidents such as bitten by deadly snakes and insects, hurt by fallen debris, and accidental fall/run over by logs - Physical and safety: risk in the scaling, cutting, and transporting of logs - Security/safety: threats from revolutionary groups Economic: earnings are reduced due to slippage (from cracks in logs or no proper arrangement of logs)	- High risk



- Tree farmers' share (62%)
- Surveyors' share (1%)
- Scaler's share (0.3%)
- Transporter's share (20%)
- Agent middlemen's share (2%)
- Log cutter's share (2%)
- Hauler and loader's share (10%)
- Share of other fees (3%)

Fig. 3 Share of the Tree Farmers, Agent Middlemen, Service Providers and Other Expenses to the Total Cost Incurred by the Merchant Middlemen on a Per Cubic Meter of Log (Peelable Log Type).



- Tree farmers' share (45%)
- Log cutter's share (3%)
- Transporter's share (29%)
- Agent middlemen's share (3%)
- Scaler's share (0.4%)
- Share of other fees (4%)
- Surveyors' share (2%)
- Hauler and loader's share (14%)

Fig. 4 Share of the Tree Farmers, Agent Middlemen, Service Providers and Other Expenses to the Total Cost Incurred by the Middlemen on a Per Cubic Meter of Log (Pulpwood Log Type).

Table 9 Cost and returns of the merchant middlemen based on manner of sale.

Particulars	Non-PO holder & striker (selling directly wood processing companies)		Non-PO holder & striker (selling to PO holders)		PO holder (selling to wood processing companies)	
	Peelable Amount (Php)	Pulpwood Amount (Php)	Peelable Amount (Php)	Pulpwood Amount (Php)	Peelable Amount (Php)	Pulpwood Amount (Php)
Sales per cu.m.	4534.59	2152.99	2220	1700	4534.59	2152.99
Less: Cost of log per cu.m.	1800	900	1800	900	2200	1700
<i>Pre-transport cost (per cu.m.)</i>						
Agent's fee	58.81	58.81	58.81	58.81		
Surveying	38.88	38.88	38.88	38.88		
Cutting of logs	50.6	50.6	50.6	50.6		
Scaling	8.33	8.33	8.33	8.33		
Hauling and loading (including transporting from farm to hot deck)	282.09	282.09	282.09	282.09		
<i>Transport cost (per cu.m.)</i>						
Transportation	583.1	583.1	583.1	583.1		
Parking fee	6.66	6.66	6.66	6.66		
<i>Others (per cu.m.)</i>						
Processing fee	63.31	63.31	63.31	63.31		
Toll fee	3.33	3.33	3.33	3.33		
Total cost	2894.57	1995	2894.57	1995	2200	1700
Net profit (per cu.m.)	1640.02 (\$32.43)	158 (\$3.12)	-694.57 (-\$13.73)	-295 (-\$5.83)	2334.59 (\$46.16)	453 (\$8.95)

The exchange rate is US\$1 = Php50.57. Figures in parentheses are in USD.

Table 10 Issues and concerns in the timber supply chain of caraga region.

Relevant Actors	Problems Encountered	No.	%
Merchant middlemen	- Threats from armed groups	*	*
	- Unexpected price changes	36	70.59
	- Security issues in areas where they conduct business transactions	12	23.53
Agent middlemen	- Threat from armed groups	*	*
	- Unexpected price changes	23	65.22
	- Security issues in areas where they conduct business transactions	3	13.04
Service Provider	- Occupational safety issues (no insurance protection from any untoward incidents)	*	*
	- Manually done activities that result in slippage if logs have cracks or pile not done properly	*	*
	- Security issues in areas where they work	56	17.07

Asterisks mean based on key informant responses.

price of the peelable type (large diameter size: above 30 cm) is much higher than that of the pulpwood type (small diameter size: below 30 cm). Among the wood processing companies, the peelable type is preferred to be without cracks to produce quality veneer and plywood products. The tree farmers hope to produce and sell peelable logs without cracks for good income. The pulpwood type may be comprised of large branches and other useful parts of the felled tree, which are utilized for other wood-based products such as particle boards, matchsticks, toothpicks, pallets, and boxes. Table 9 also shows the estimated payments for the middlemen's services based on the log types and the mode of selling (e.g. selling to the PO holders and selling to the wood processing companies). The said payments for the middlemen's services approximate the incomes of these middlemen.

Issues and concerns affecting the timber trade middlemen.

Table 10 shows the issues and concerns of the timber trade middlemen in Caraga Region, which are closely related to the reported risks among these middlemen in Table 8. Survey data and key informant responses suggest the merchant and the agent middlemen as more concerned on their earnings, while the service providers as more concerned on their security at work than

any other issues/concerns. Unexpected price changes are a challenge for both the merchant and the agent middlemen, because they hope for large profits as final trade outcomes. Price changes along the chain can surprise the middlemen, as these changes happen without prior notice, including the purchase orders issued by the wood processing companies. The possible reasons for these price changes are quality differences from what is expected of the delivered logs, delays in delivery, and reduction in prices at world markets. The security issues faced by the service providers are due to the hazards with the rampant insurgency in the timber areas. Forested areas in the region are known to provide good covers for the whereabouts of the rebel forces. Armed rebel groups ask for revolutionary taxes for the protection of people and businesses in the forested areas. Failure to give in to the tax demands from these groups means potential life threats.

The service providers are generally poor individuals who are dependent on timber trade transactions for continuous support to their households. They are affected easily if armed rebel groups patrol in the areas where they work. Chance encounters between the military and the rebel forces can put the service providers in great danger due to the possibility of crossfires. Security is also an issue among the merchant and the agent middlemen for the same

reason of tax demands from the rebel groups. The other source of security issue among the merchant and the agent middlemen is the threats from hostile competitors. Heated arguments between or among competitors can lead to loss of lives. The service providers are also concerned about occupational safety, because of the nature of their work. Felling trees and hauling and loading logs are manually done regardless of weather conditions. The manual and laborious works with logs are already risky to the service providers. There are no paraphernalia and gears to use for their protection. Risks of being rolled over or fallen by logs are quite possible. Aside from that, bites from deadly insects and snakes cause life threats, since these organisms and animals are rampant in the forested areas where the service providers work. Injuries and casualties from accidents and from those elements mean work stoppage. Thus, the middlemen are challenged with occupational safety issues, especially that they do not have any insurance protection. Also, the manual work among the service providers means prone to slippage due to reduced log quality from unintended cracks. Slippage from the manual activities implies reduced income among the service providers.

Discussion

The timber trade middlemen have been perceived differently. In Caraga Region, they are known for being manipulative/exploitative, highly profit-driven and highly rent-seeking. The tree farmers are often dissatisfied with the outcomes of selling logs to the middlemen. They are disappointed without choice on the low buying prices among these people for the logs produced for more than five years. Nonetheless, this study has provided the baseline information to induce understanding about the background, functions and challenges among the middlemen for the timber industry in Caraga Region. The middlemen aspect is a huge information gap across the region's timber industry. This study has addressed the gap accordingly by examining the middlemen who have been indistinguishable/incognito in the region's timber industry/supply chain. For traceability and ethical standards along the said chain, it is important to examine the middlemen aspect for insights.

The findings show that the timber trade middlemen have an essential role in the timber trade operations of Caraga Region. These middlemen are responsible for the regular operation of the timber industry, involving the daily distribution of more than 100 truckloads of logs to the different log consumers in the region and other places. The various types of middlemen doing various intermediary tasks are a significant force to reckon with in that particular operation. These middlemen are possibly large in number, which also implies the large size and significance of the timber industry in Caraga Region's economy. Facilitation services in the timber industry have made these middlemen gainfully employed in timber trade where multi-tasking and high level of coordination are combined for successful intermediary tasks. Interestingly, the jobs of the middlemen in the timber industry are challenging, which require determined ingenuity and skills sets. The middlemen in the region's timber trade have mastered their jobs through personal experience only. In spite of this, no entity in the region has tried to study on these intermediary tasks for proper R&D, innovation and training opportunities.

Although the middlemen are highly necessary for their intermediary tasks, they are still not guaranteed of profitable/rewarding outcomes. The non-PO holders and the strikers can possibly incur losses if they cannot penetrate easily the wood processing companies with their logs. Yet, the said middlemen have sustained their participation in the timber trade. It indicates that there are available alternatives through which they can recoup their losses, which are interesting to be documented. In the performance of

intermediary tasks, price information is essential. However, an information gap is noted on this aspect, especially that the transmitted price information excludes the log buying prices of the wood processing companies. The said prices of the wood processing companies are not freely shared in the timber supply chain. With this, there is no reference to use in evaluating the appropriateness of the prices set by the merchant middlemen for the logs of the tree farmers. This lack of price information can encourage rent-seeking behaviors among the merchant middlemen particularly. In Caraga Region, the absence of adequate price information also contributes to the transparency issue in the chain, particularly in the aspect of equitable distribution of opportunities and wealth in the timber industry.

Meanwhile, the variety of middlemen in the chain signifies the numerous activities to be done to secure the log supply for wood processing and the availability of cash incomes for the timber trade participants. The middlemen are believed to be many. However, there is no certainty as to their number because they continue to participate in timber trade like phantoms. The reason for this is due to the absence of a registration system for middlemen. For several years, the number of these middlemen in Caraga Region is not approximated. There is a huge information gap on the aspect of middlemen, which can potentially persist the transparency issue along the timber supply chain. There are no existing records in terms of the middlemen's identities, competencies, functions, activities, and issues. Thus, no vital information can be used to chart the future of the timber industry in partnership with the middlemen. They cannot be represented in development discussions in spite of their significance in the timber trade. Holistic development is not also possible for the timber industry, because of the lack of understanding about the middlemen aspect. The disclosure on the part of the middlemen can facilitate in understanding the development directions of the timber industry in the region. It will address the lingering transparency issue, which can improve the functioning of the timber supply chain. The low price issue can also be resolved with the support of the players in the timber supply chain where the middlemen are an important part.

Furthermore, the proper registration of the timber trade middlemen can attract additional beneficial opportunities. Traceability and practices conforming to global sustainable forestry standards can be defined and established for all chain players to observe and follow. Having these properly incorporated in the timber supply chain is a step towards strengthening and redefining the timber industry standards for competitiveness and sustainable development. It is a way to institute ethical standards and address welfare concerns across the timber supply chain. Discussions on welfare can be launched with the high possibility of success due to the increased availability of information for strategic actions. In Caraga Region, policy issues are complicated and have slowed down the activities in the timber supply chain. The regulations have increased the anxiety in the chain because of the introduced processes that have also evolved to get through with the said regulations. The case of Caraga Region's timber industry conforms to the findings of Dong and He (2017) and Pontecorvo (2018) on being highly regulated. The implementation of EO 23 had tightened the regulatory regime in the industry, which was met with drastic decline in log/timber production and social chaos due to the displaced workers. The transition during that time was difficult, but the middlemen had helped somehow the other industry players to get back to do log/timber business again. EO 23 had been successful on the aspect of protecting the natural and protected forest areas, yet it has induced some drawbacks. Product mobility is weighed down by the stringent requirements (e.g. permits) and transparency issue has remained unresolved.

The middlemen's services may have contributed to the comeback of the timber industry after the implementation of EO 23. The additional stringent measures have offered opportunities for the middlemen to take part with facilitation services for the tree farmers and the wood processors. Particularly, the middlemen have mastered the policies before log cutting and in the transport of logs. The tree farmers avail of the middlemen's services because the middlemen know the requirements for the legitimate transactions in the timber supply chain. This is the same reason why wood processing companies call on the middlemen for their log needs. The middlemen have learned to navigate with the forestry/timber regulations and regulatory agencies in Caraga Region in a way that has emphasized the importance of their involvement in the timber industry. However, it is not clear in the timber industry if their rent-seeking behavior is in effect for this matter, especially that their tree-farmer clients have incomplete knowledge about the policies and their associated processes (e.g. permit and environmental tax payments). The government regulatory and monitoring agencies are all subject to the Anti-Red Tape Act (ARTA) of 2007. However, red tapes and grease money are still believed to exist in the timber supply chain particularly among those agencies. Although essential information about the regulatory and monitoring processes is posted in conspicuous places for transparency, it is believed that there are clandestine activities that still violate the ARTA law, which form part of the costs and risks of the daily activities of the timber trade middlemen.

Thus, the existence of the middlemen in the timber supply chain in Caraga Region is induced by the huge need of facilitation to undertake the activities in the chain in appropriate timing. The middlemen also exist to enhance the efficiency in the chain and enable the key players to meet their respective market responsibilities. They have dealt with the widespread imperfections and various transparency gaps in the chain for their clients to continue with their regular operations. They are an essential component of the timber supply chain who need to be considered as equal partners in timber industry development in Caraga Region. Such is a compelling reason for them to be recognized and mainstreamed properly for enhanced industry coordination also. Similar with the other industry players, the middlemen have concerns that could affect the outcomes of their jobs and affect as well the work outcomes of their clients. The essential functions of the middlemen are apparently interconnected with all other industry players. Not paying attention to the welfare concerns of these middlemen would slow down the development of the timber industry. The middlemen's services are carried out under conditions that require a high level of creativity and skills, because of the highly risky situations involved. Strategic solutions for their welfare concerns are necessary to improve their efficiency and eventually the transparency of the timber supply chain. These solutions refer to further R&D and knowledge sharing to configure the improvement of their skills and knowledge as well as their work environment through capability building programs and through technological and logistical innovations to enhance efficiency.

Conclusion and recommendation

The timber trade middlemen have shown a great deal of service to both upstream (tree farmers) and downstream (wood processors and product distributors) parts of the timber supply chain. They perform various functions and assume varied roles to accomplish the necessary activities in proper timing. The study implies that the timber trade middlemen in the region have the ingenuity and skills sets that provide regularity to the timber trade operations in the region. Although these middlemen have been alleged of having rent-seeking behavior, their contribution to the timber

industry is significant. Caraga Region remains the Timber Corridor of the Philippines. Over 100 truckloads of logs are distributed everyday across the region and to other places. The jobs of the middlemen are commendable for ensuring daily that level of accomplishment for the timber industry. With this, the timber industry is shown to be a highly significant component of the Caraga Region's economy. The country may have the largest number of timber trade middlemen in Caraga Region, capable to sustain trade operations for the local, national and international markets. There may be abnormal profits earned and manipulations done by these middlemen, but this study has attributed such practices to the imperfections in the timber industry. There are many transparency issues that can enable them to behave with rent-seeking tendencies. In fact, no records about these middlemen can be referred to for knowledge about their identities, practices and concerns. This study has produced the baseline information to understand them and to induce their proper mainstreaming as equal partners in timber industry development.

The current condition of so much information and transparency gap can allow the middlemen to persist with their manipulative/exploitative behavior. It is difficult to institute responsibility and traceability in the timber supply chain without reliable information and adequate knowledge. This study has focused to address the gaps and issues concerning the middlemen to start the strengthening of the timber supply chain for further development and competitiveness. It is a necessary step to chart the future directions of the industry through comprehensive development platforms and agenda in partnership with the timber trade middlemen. On the other hand, these middlemen are faced with formidable risks that include security threats, occupational safety risks, and price fluctuations. These risks can be addressed by strategic measures such as R&D, proper enrollment system for the middlemen, logistical improvement, continuous capability building programs and innovation platforms. Caraga Region is fortunate to have ingenious industry players who can deal with the difficulties of their work environments to keep the industry afloat. The middlemen are certainly the individuals to reckon with for this aspect. Thus, the following recommendations are laid out for the groundwork of developing the timber industry in Caraga Region with strategic actions:

1. Further studies are recommended to take off from the findings of this study. Although this study has strived to produce the baseline information about the middlemen, there are still important questions left unanswered. This study has not elaborated on the rent-seeking behavior of the middlemen to check for the veracity of it in Caraga Region's timber industry and to document and synthesize the information on the situations and drivers of such behavior. The price information gap between and among the tree farmers and the middlemen including the wood processors is an interesting facet, so that the price setting in the timber industry can be explained. The selling and buying process is even in need of details to enhance understanding on the process. Aside from this, there are other ways of buying and selling trees such as by area/hectare and by stumpage. These are among the important areas to investigate to address the transparency issues along the chain. The dynamics in the timber supply chain has not been also captured for the same purpose. At this point, the leaders and the followers in the chain cannot yet be established. The industry has not properly recognized yet the middlemen between the tree farmers and the wood processors. It is difficult to approximate their number in Caraga Region. This study also recommends on examining further the welfare concerns of these middlemen in the

chain so that short-, medium- and long-term solutions can be identified to address the said concerns. R&D for technological support is also recommended to configure the technologies appropriate for use among the service providers, the agent and the merchant middlemen.

2. This study finds the security and safety issues faced by the middlemen as indeed risky for the performance of their functions. Discussions and platforms for peace programs in the work areas and for occupational safety protocols in the work environments of these middlemen are important to be carried out for them to be assured of their overall safety. Online platforms can be explored for business negotiations, meetings and payment remittances among the middlemen. The current technologies such as apps development in support to the middlemen's transactions can be configured so that they do not have to conduct business activities in a risky work environment.
3. Transparency issues in the timber supply chain need to be addressed with strategic and intelligent measures such as R&D and use of current internet-based systems. The use of websites of organizations and associations can be explored in which the key players such as the tree farmers, the various middlemen, and other entities in the timber supply chain can be gathered to get interconnected. The timber trade middlemen need to catch up on this to fast track the development of the timber industry. For this matter, the Department of Environment and Natural Resources has to be creative with its approach to draw massive support among the industry players for this aspect. Also, the actions to be taken will have to abide by the ethical standards to earn respect and trust among the industry players. The industry players must be considered equal partners for industry development, especially the timber trade middlemen.
4. The application of the Nudge theory by Professor Richard Thaler is important to be explored also to elicit support from the middlemen. Relevant nudges can be determined through social experiments to identify them properly. Nudges are of many forms, which can convey deliberately the important messages of support and benefits among the timber industry players. They can draw willingness to participate and sometimes volunteerism from the target stakeholders, which enable active participation. Also, potential solutions with nudges have high possibilities of success and sustainability. Particularly, studies on potential nudges and their proper administration are important to pursue for the proper mainstreaming of the timber trade middlemen in Caraga Region.
5. Discussions on the relevant policy actions are important to be carried out. Particularly, there is a need to review the current policies to check for their relevance and potential constraints with traceability and transparency along the timber supply chain. Relevant policies such as the proper recognition and mainstreaming of the middlemen in this study need to be carefully planned. For that aspect, transparency in the timber supply chain is resolved step by step. Also, the future agenda towards further development of the timber industry needs special attention to determine the policy support to attain the industry's development goals.

Data availability

The data of this research is available upon request from the first author, due to the shared data ownership with the funding agency.

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Competing interests

The authors declare no competing interests.

Ethical approval

This research was reviewed and approved for conduct by the academic councils and the Research Ethics Committee of the lead implementing agency. The Declaration of Helsinki was adhered to throughout the research process especially in keeping the personal information of the respondents confidential.

Informed consent

Informed consent was also obtained from all respondents and participants in the conduct of this research in the municipalities of Agusan del Sur, Surigao del Sur, and Agusan del Norte, Philippines. The identities of the respondents are strictly kept confidential to ensure anonymity to their participation in the survey and interview activities.

Additional information

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