

3.2 Benefit sharing among actors in the culture-based fisheries sector in Sri Lanka: an analysis of giant freshwater prawn and finfish value chains

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Abstract

Establishing an efficient market mechanism is important to empower the rural fishery community economically. It is fundamental for the reduction of the inequality gaps among actors within fisheries value chains. Rural fishing communities are centred around reservoirs, and they engage in CBF activities in addition to farming. This industry has received less government attention than marine fisheries, but it is highly significant in improving the livelihoods of rural communities. Therefore, understanding the characteristics of value chains in the CBF sector is important. This study was carried out in 5 locations in 3 districts in Sri Lanka via 5 case studies within the CBF sector. The objectives of this study were to identify existing value chains in the CBF sector and how its benefits are shared among the value-chain actors. Data were collected through field surveys. This study found that there are 2 main products in CBF: GFP and finfish. The main destination for GFP is the export market, while the finfish is mainly a target for the local market, especially within and outside village boundaries. Several value-chain nodes function in markets such as fishing, primary collecting, secondary collecting, wholesaling, retailing and consuming. In the fishery value chain, fishers received the highest price percentage when selling finfish as fresh. When finfish go to the dry fish market, fish receive the lowest price percentage. Within the GFP value chain, fishers who handle larger-sized prawns tend to capture lower value shares, whereas secondary collectors obtain the highest proportion of the end-market price. Upstream actors of value chains received lower benefits among the value-chain nodes. Thus, ensuring fair pricing methods and improving fishers' bargaining power through strategically managing harvest is recommended in this study.

Keywords: *culture-based fisheries, finfish, giant freshwater prawns, value chain*

Introduction

Equitable benefit sharing is one of the sustainable development goals in any country. When considering the term 'benefits', it is known as gain from a particular thing. It can be a kind of product, economic activity or financial return. The benefit from fishery products to the human is diverse and may be computed differently. In general, benefits are calculated as the output of the commodity based on their weight and quantity. Hence, fishery output can be divided further into capture and culture fisheries (Lackey 2005). Capture fisheries are conducted on a large scale and mainly target profitability. Additionally, capture fisheries have a longer value chain, creating more business and employment opportunities than culture fisheries (Martinez 1997). Although, culture fisheries have low input and output relationships (Martinez 1997; Edwards 1999). Culture fisheries significantly contribute to ensuring food security, generating income, strengthening livelihood patterns and alleviating poverty. However, its value creation process is shorter than capture fisheries (Martinez, 1997).

Benefit sharing among fishery activities is commonly measured based on the economic value of the commodity output through the wholesaler or retailer (Lackey 2005). Calculating benefits is easy for commercial or capture fisheries as the fishery products are mainly market oriented. But in culture fisheries or small-scale fisheries, product quality is very important. The measurement carries out the weight of the fish or fish quantity. Here, the economic value measures the benefits provided to fishers or society. Even in commercial or CBF, substantial benefits may be associated with cultural or religious aspects beyond the national

boundaries (De Silva 2011). Although some researchers pointed out that small-scale fisheries are crucial for rural development, some researchers found that small-scale fishers and fish farmers receive minimal economic benefits for their products, while processors and retail markets receive a larger share of the value chain's benefits (Bjorndal et al. 2014). Consequently, it is essential to examine how benefit sharing works among the value-chain actors in the CBF sector in Sri Lanka.

Although measuring values and benefits is difficult in CBF (De Silva 2011), it is essential to assess the need for this sector to be enhanced sustainably. Therefore, this study aims to identify the existing value chains in the CBF sector, types of benefits from value-chain participation, and how benefits might be shared among actors in both GFP and finfish value chains.

Methodology

The case study research method was used for this study. The case study approach to research provides in-depth, multidimensional knowledge about complex issues in reality. It includes a wide range of disciplines, especially social science (Crowe et al. 2011). The case study method is appropriate for capturing explanatory information for the research questions 'how', 'what' and 'why'. In addition, it is useful to understand casual links and patterns. Thus, this method helps to find the existing flow of the value chains and gaps in existing mechanisms (Yin 2009). Five reservoirs in 3 districts were examined for the value-chain analysis in this study. Value-chain mapping, as well as estimating revenue, cost and marketing margins along these chains were used to identify benefit sharing among the chain actors. Data were collected from individual, semi-structured interviews with value chain actors and

secondary sources such as fisheries society records books. Data were gathered from June to December 2023. This paper summarises the findings of the study on value chains, as a component of the comprehensive studies conducted under the ACIAR project.

Reservoirs selected for the present study are indicated in Figure 3.2.2. Case A: Urusita wewa (Mo5) in Monaragala district; Case B: Vijayakadupotha wewa (P5) and Case C: Tabbowa wewa (P4) in Puttalam district; Case D: Iranamadu wewa (Ki2) and Case E: Pudumurippu wewa (Ki3) in Kilinochchi district. The criteria for selection of reservoirs were based on geographical location.

Results and discussion

Four sub-themes were identified for analysis under the main theme of assessing existing supply chains in the CBF sector: the number of value chains, chain nodes and their relationship; market proportion; nature of the price determination; and operating cost, profit and market margins of the industry.

Market proportions – controls by the value chain actors

Market destination is an important component of the value-chain analysis. Three major market destinations were identified: local/village, national/urban and foreign/export markets. The village/local demand for GFP is a relatively low proportion of the value chains. Fishers bring GFP home for consumption when the harvested GFP does not reach export quality or when there is small physical damage due to predator attacks, or damage to the head or malting. In such cases, GFP are rejected and used for subsistence. The percentage of rejection due to damage is close to around 3%. The proportion

distributed for local sales, especially in restaurant 5-star hotels as well as other local hotels is around 23%. Occasionally, villagers came to the landing site to purchase GFP on special occasions or due to personal interest. The largest proportion of the GFP harvest – around 74% – is exported (Figure 3.2.1).

There are 3 major markets for fresh and dried finfish as well: local/village, surrounding small town and national/urban markets. Urban wholesalers hold the largest share (35%) of the finfish market. This could mean wholesalers play a crucial role in bulk distribution before products reach retailers (especially in Case D). Therefore, urban wholesalers might play a dominant role in the finfish market. Local retailers (30%) also have a substantial share, indicating a strong demand for direct-to-consumer sales (Case E) (Figure 3.2.3). It appears that many customers prefer buying from local/village retailers rather than the urban market as the fish sold by local retailers is fresher than that sold by urban retailers, who generally sell frozen

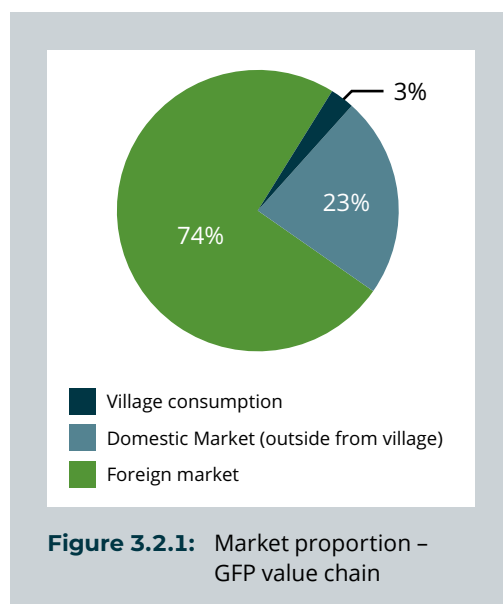


Figure 3.2.1: Market proportion – GFP value chain

fish. Urban retailers have a lower market share than local retailers and wholesalers. This might imply that urban markets are more competitive or consumers prefer local markets over urban ones when purchasing inland finfish. The lower percentages used for processing finfish suggest that dried finfish has less market demand compared to other categories. This could indicate seasonal demand. However, finfish has no export market contribution with all of the catch reaching rural and urban consumers in Sri Lanka.

Types of value chain actors and relationship

Five channels were identified within the GFP value chain (Figure 3.2.4) based on the product movement of GFPs from fishers through different intermediaries before reaching the end market. Chain 1 represents the movement from fishers, followed by the primary handlers, secondary handlers, company handlers and export companies (Case A, D, and E). Chain 2 represents the direct movement of fishers and primary collectors to the secondary

handler and from there to the export market (Case C and some chain from Case B). Chain 3 moves from the fisher, primary handler and company handler to the export company. Chain 4 contacts the primary handler directly to access the domestic market. Finally, Chain 5 consists of direct sales from fishers to local consumers.

When assessing the finfish market, 6 value chains were identified (Figure 3.2.5). The supply in Chain 1 flows is from fishers to the fisheries society, which manages the catch and distributes it. The society sells part of the catch to urban wholesalers (Case D) from whom it reaches urban retailers, followed by village retailers and urban consumers. Chain 2 is determined by the value added from fishers to the fisheries society and directly links with the wholesaler, who meets with village retailers. Chain 3 moves from the fisheries society to the urban retailer, who purchases fresh fish from the society for sale to the urban consumer through village retailers. In Chain 4, village retailers meet directly with the fisheries society to purchase finfish, and this is then sold to village consumers. Chain 5 constitutes village consumers purchasing fresh fish directly from the fishery society, identified as Chain 6.

When examining the gender division of labour within the value chains of both the GFP and the finfish market, it is evident that men dominate most sectors. In the GFP chain, approximately 45% of primary handling is performed by women. In contrast, in the dried finfish value chain, women account for 77% of processing activities and 47% of local retailing.

The nature of price determination and quantity

There was price variation in GFP trading across different locations. In Cases D and E, fishers received a lower price

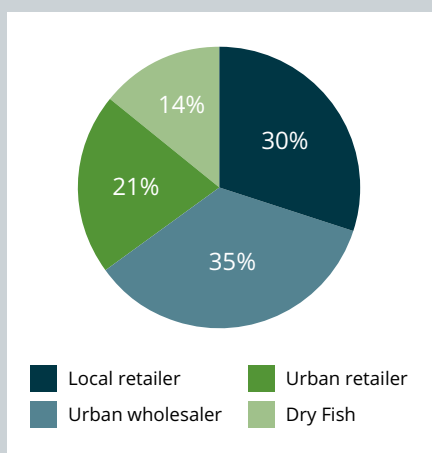


Figure 3.2.3: Market proportion - finfish value chain

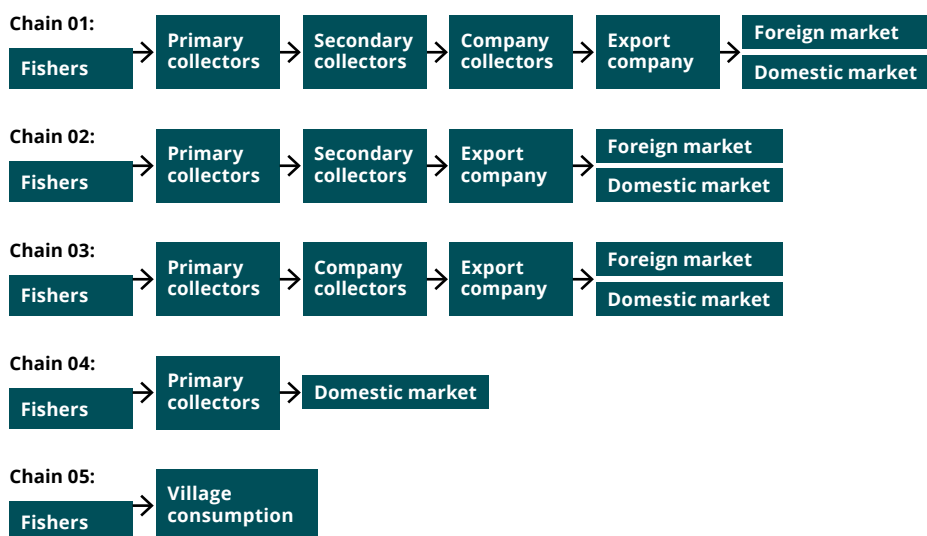


Figure 3.2.4: Types of value chain – GFP

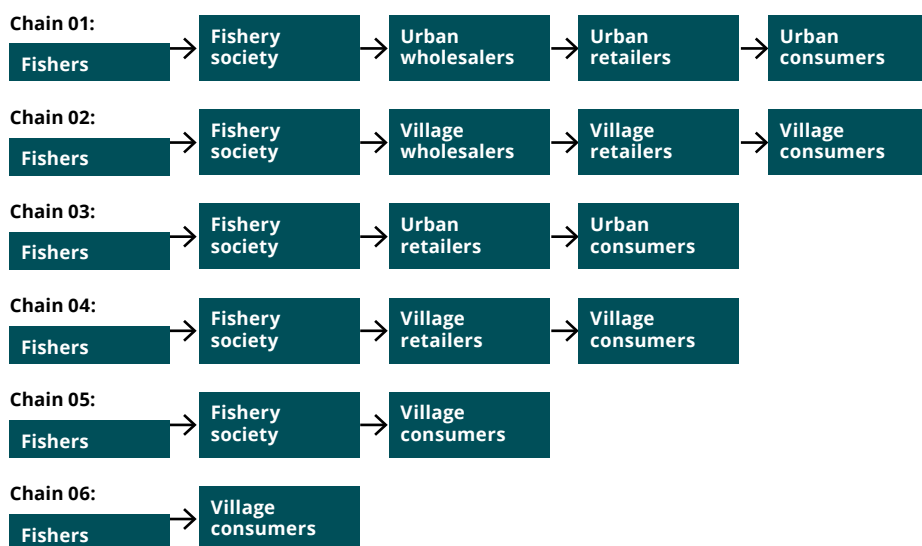


Figure 3.2.5: Types of value chain – finfish



(LKR900–1,500/kg), whereas in Cases A, B and C, prices were determined at a higher level (LKR1,500–2,000/kg). In this value chain, primary GFP handlers categorise the prawns based on physical appearance based on overall size, leg size, damage to carapace or other parts of the body (Case B, C, D and E). The primary collector decides the price based on the quality. In some cases, as in A, there is no price variance, and any type of GFP is bought at the same price. Therefore, it is clear that price is determined by the collector according to their criteria. There is no common pricing method at the landing site.

When the GFP harvest reaches the export company, it is categorised according to the weight of individual GFP. Exporters export GFP according to a weight categorisation above 500 g, 400–500 g, 300–400 g, 250–300 g, 200–250 g and 150–200 g. Fishers received the highest proportion of the total price when GFP are sold for village consumption. As the GFP increase in size from 150–200 g to above 500 g, the proportionate share received by fishers decreases to less than 60% to 40% of the total price across all nodes of the supply chain. Thus, as the weight of the GFP increases, the percentage of the price that fishers receive decreases. This pattern is also apparent for primary collectors, who receive the least proportion of the overall price. However, as the GFP weight increases gradually, the percentage of the price accruing to secondary collectors increases markedly from 30% to 60%, thus providing them with greater benefits when GFP reach a larger size.

Local retailers and village consumers pay the highest price range (LKR500–575/kg) for all categories of finfish. Local retailers sell fish directly to village consumers, often in smaller quantities. The higher price reflects smaller-scale distribution costs,

transportation expenses and margins compared to bulk purchases. Consumers in villages may have limited access to alternative fresh finfish sources, leading to slightly higher prices. Wholesalers purchase fish in bulk, leading to a lower price compared to that paid by retailers. The price variation (LKR440–500/kg) could be due to seasonal availability, quality differences (different species) or supplier negotiations. Wholesalers serve as intermediaries, distributing fish to urban retailers or local markets.

Urban retailers buy from wholesalers and sell with a mark-up to urban consumers. The price range for finfish sold by urban retailers is slightly lower than that of local retailers, possibly because of higher competition in urban markets with marine fish. Transportation costs influence the pricing. The significantly lower price for fish sold to make dried fish (LKR125/kg) suggests that lower-quality or excess fish are used for this process. Fresh fish fetches higher prices, while fish used for drying is often cheaper. Dry fish processing adds value but reduces weight, leading to different pricing structures in the market.

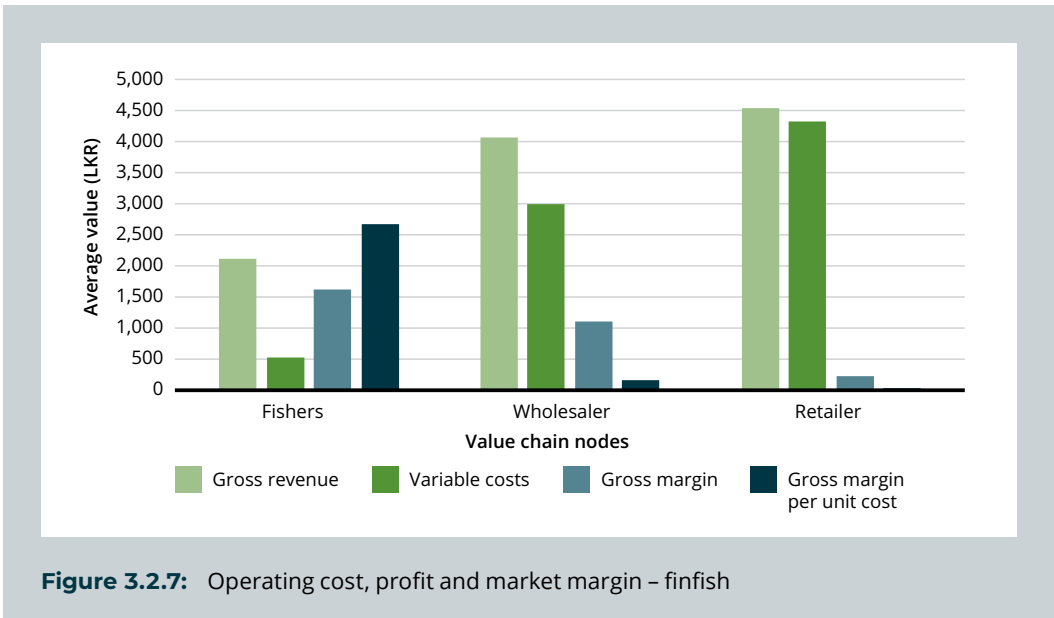
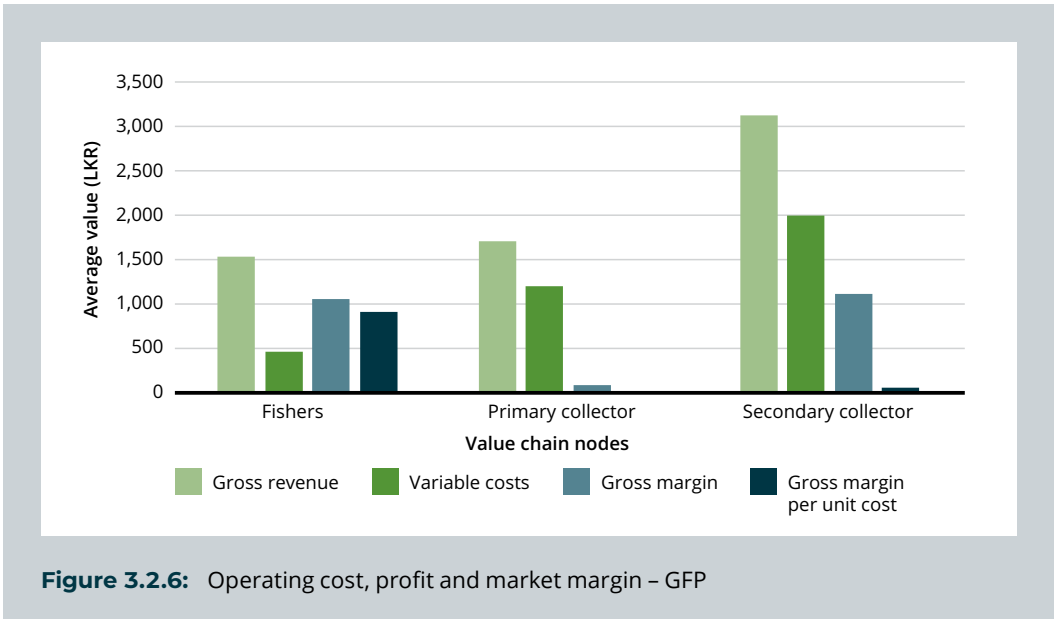
Retail prices are the highest within value chains, with local retailers having the highest range. Wholesalers get the lowest rates, benefiting from bulk purchases. Urban retailers fall between wholesalers and local retailers, reflecting a competitive urban market. Dry fish is the least expensive raw material as it is often made from lower-grade or excess fish.

Operating cost, profit and market margin

Gross revenue is lowest for fishers, followed by primary handlers in the GFP market. In contrast, the highest gross revenue is received by secondary collectors – nearly twice as high as fishers. Considering

variable costs, fishers have the lowest costs, while the secondary collector has the highest variable costs with the primary collector bearing moderate variable cost (Figure 3.2.6).

Fishers incur several types of costs when producing GFP. In some cases (such as Case A) fishers experience the highest cost for PL stocking for the next production cycle, accounting for 23% of their total costs. This is because fishers invest their





money in re-stocking. In addition to PL stocking, the other significant costs include labour, boat and fish net repair. Labour costs are primarily incurred to maintain the fisheries society premises and clean the reservoir area by removing aquatic plants from the water's surface. Due to GFP fisheries, damage to fish nets has increased, resulting in additional costs for net replacement or repair, which represents 15% of their total expenses.

To understand the distribution of costs and value captured along the GFP value chain, it is essential to examine the roles and responsibilities of key intermediaries involved in post-harvest handling. Among these actors, the primary and secondary GFP handlers play a critical role in aggregating, transporting and preparing the product for subsequent market channels.

Primary GFP handler (primary collector):

This individual is responsible for handling GFP and bears the costs related to purchasing inputs and fuel. The input purchasing cost is the payment made to the fisher for their GFP harvest, which accounts for 99% of the total expenses.

Secondary GFP handler (secondary collector): The individual who purchases GFP from the primary handler is known as the secondary collector. This person typically covers 98% of the total cost associated with acquiring GFP. This total includes expenses related to fuel, transport vehicle repairs and maintenance, labour and ice. However, these additional costs are relatively insignificant compared to the high cost of purchasing GFP. Therefore, the input buying cost is also considerable for the secondary GFP handler.

In terms of gross margins in GFP value chains, primary collectors have the lowest

margins (LKR9.72/kg), followed by fishers. The highest gross margin is accrued by secondary GFP collectors (LKR38/kg). Additionally, the gross margin per unit of variable cost is highest for fishers followed by secondary collectors. Primary collectors have the least gross margin per unit of variable cost.

Variable costs serve as an indicator of the risk taken by each agent in the value chain. The primary collector receives the lowest gross revenue among all agents in the chain. In comparison to other supply chain actors, secondary collectors receive the second-highest gross revenue, but they also bear the highest risk. On the other hand, fishers enjoy the least gross revenue while facing the lowest risk. Primary collectors received the lowest market margin (14%), while the secondary collectors received the highest market margin (37%) among the value-chain nodes. The secondary collectors' market margin is approximately 3 times higher than the primary collectors'.

In the finfish market, retailers received the highest gross revenue, followed by wholesalers and fishers (Figure 3.2.7). Retailers faced the highest variable costs and therefore assumed the greatest risk. Wholesalers incurred the second largest variable costs, while fishers had the lowest variable costs. This indicates that wholesalers experienced moderate risk, while fishers encountered the least level of risk.

Additionally, fishers achieved the highest gross margin among the finfish value chain nodes, whereas retailers had the lowest gross margin. This difference is primarily because retailers face intense market competition from substitute products.

Market margin distribution shows that wholesalers receive a higher market margin (LKR180.1/kg) than retailers (LKR86.1/kg)

and fishers. Wholesalers purchase a large quantity of finfish and sell to retailers while covering their transportation costs. In contrast, retailers purchase smaller quantities of finfish, which prevents them from achieving the same level of market margin as wholesalers.

In terms of gendered benefits from value chains, women are located in nodes that accrue the lowest returns. In the GFP value chains, they are engaged in the primary handler node. Within the finfish value chains, they are mostly confined to the dried finfish chain, where their main participation is in the processing and local retailing nodes. Thus, while their variable costs are low, so are their gross margins.

Discussion

Fishing, fish farming, wholesaling, retailing and processing are the main nodes in GFP and finfish value chains. Several marketing nodes are evident, along with unequal benefit sharing among the value-chain actors, which were investigated in this study (Sinh et al. 2014).

The GFP value chain is different from the finfish value chain as the finfish market chain is mainly targeted at considering fulfilling village/local fish consumption requirements. In contrast, the GFP value chain is mainly focused on the export market targeted at foreign consumers (Abeyrathne et. al. 2020; Jones et.al 2021). Therefore, the largest proportion of the GFP harvest is delivered out of the village.

The gendered value chain in the fishing industry reveals that fishing, primary handling, wholesaling and retail selling are predominantly male-dominated activities. In contrast, the production of dried fish is primarily a female-dominated task. Although women participate in retail selling, they do not typically engage in wholesale

selling. In the aquaculture sector, women represent a significant portion of the labour supply (Song 1997). Their contributions are particularly notable in fish processing, marketing, fry collection, fish feeding and net mending, as evidenced by cases in other developing countries (Bueno 1997; Locicero 1997; Virulhakul 1997; Murray et al. 1998; Kusakabe 2003; Paranamana et al. 2024).

Fishers received the lowest percentage of the final price while the secondary collectors received the highest percentage within this value chain. As the weight of GFP increases, the percentage of the price received by fishers becomes a lower price percentage. A considerable proportion of the market margin centres around the secondary collectors (for GFPs) and wholesalers (for finfish).

Conclusion and recommendation

Both GFP and finfish are important for CBF communities and the rural economy. While finfish is essential for food security, GFP offers a high earning potential for households engaged in culture-based fishing. Therefore, the value chains for both products need to be improved.

To maximise benefit-sharing among value-chain actors, the information asymmetry regarding price determination must be minimised. The pricing methods used at the farm-gate and by exporting companies should be aligned. Currently, fishers are unaware of the premium value associated with GFP due to hidden information within the value chain. If collectors pay fishers based on the weight of the GFP, the fishers will be incentivised to harvest larger, premium-sized GFP instead of smaller ones.

Additionally, market access must be improved for upstream value-chain actors, including fishers, processors and primary handlers/collectors, to reduce existing

benefit-sharing gaps. It is also crucial to strengthen the bargaining power of these upstream actors by increasing their market nodes, production volumes and/or the quality of their products.

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