

Disentangling seafood value chains: Tourism and the local market driving small-scale fisheries



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ABSTRACT

Identifying socio-economic drivers of small-scale fisheries is a fundamental step to understand impacts and pressures on fishery resources, and the behaviour of seafood trade actors. It is especially relevant for developing countries where such information is usually lacking and fisheries management is greatly needed. To address this gap, this study maps the structure of value chains of fish and marine invertebrates caught by small-scale fisheries from São Vicente, Cape Verde (West Africa), and examines the main socio-economic drivers behind the seafood trade on the island. Specifically, it shows how drivers, such as tourism and the local market, shape the preferences for certain species and how they affect the distribution of income among actors involved in the seafood trade. To collect this information, interviews were done with fishers, small-scale traders, market vendors, and restaurant owners, in all fishing communities of the island of São Vicente, in 2015. Tourism and the local market drive the exploitation of a wide variety of marine species, from small demersal low trophic level fish and marine invertebrates, to large pelagic high trophic level fish species. Moreover, the local seafood market, and especially tourism dynamics, contribute to the unequal distribution of income among actor groups, benefiting mostly restaurant owners due to their direct access to tourist consumers. Such findings have implications for local fishery resources management, food security, and fishing communities' livelihoods.

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1. Introduction

Coastal populations rely on seafood such as fish and marine invertebrates as a source of protein and income [1,2]. This is especially prevalent among rural coastal populations from small island developing states such as Cape Verde, where small-scale fisheries are widespread. The conditions that determine the access of rural coastal populations to fishery resources are the state of the ecosystem [3] and the institutional context [4] that governs the economic opportunities arising both from fisheries and seafood trade [5]. Therefore, on the one hand, it is of paramount importance to understand the key ecosystem processes and functions that contribute to a sustained provisioning of marine ecosystem services to coastal populations [6–8]. On the other hand, understanding the drivers behind global and local seafood trade [9–11], the behaviour of fishers [12,13] and seafood trade actors [14], and the distribution of actors' income [15] is vital to devise suitable strategies to improve the wellbeing of populations that rely on

fisheries.

Small-scale fisheries are embedded in complex, dynamic and multiple networks, or value chains, of supply and trade that link production to consumption, involving value-adding processes and employment creation along the way [16]. Unlike the traditional economic analysis of individual species or economic fishing actors, the analysis of value chains focuses on the relations between actors, their activities, behaviours, social ties and norms [17]. Methods derived from value chain analysis are, therefore, able to unveil previously hidden links within social-ecological systems. Yet, the analysis of value chains in fisheries science is rather scarce, particularly in small-scale fisheries from developing countries [18]. Nonetheless, existing empirical evidence indicates that tracing value chains enhances transparency from production to consumption, providing key insights for policy makers about the economic flows between producers, middlemen, and final consumers [14]. Moreover, value chain analysis can reveal the effects of trade on fish stocks [19], and on particular functional groups and fish maturity stages [11]. It can expose differences in income and inequalities among trade actors, arising from global market integration [15,20]. Revealing changes in seafood prices along the value chain, and the factors that determine them, have been useful approaches to unveil socio-economic drivers of small-scale

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fisheries [9].

Socio-economic drivers, such as high human population density, demographic growth and lack of income alternatives for fishers, often have a negative effect on the abundance and diversity of fish and marine invertebrates in coastal social-ecological systems [21–24]. Likewise, local markets can drive fish and invertebrates abundance and diversity decline, especially with increasing proximity of markets to fishery resources [21–23] and increased market access [25]. Tourism can also be a powerful driver of fishery resources exploitation in developing nations [26]. Its demand can greatly surpass local population demand for fish and invertebrate species [27], namely expensive seafood such as crustaceans, molluscs and large high trophic level fish [14].

In Cape Verde, both the tourism sector and the local seafood market have been changing. The number of boats, fishers, and traders involved in the domestic seafood market is steadily increasing [28], possibly due to rising demand for seafood as a consequence of an increasing country's population [29]. Moreover, the number of tourists has been growing, at a rate of 13% annually since 2002 [30]. The travel and tourism sector is now fundamental for the economic development of Cape Verde, with a total contribution of 40% to the country's gross domestic product [31]. Tourism development has resulted in a substantial increase of recreational catches, which are hardly monitored and reported [32]. A great proportion of commercial and subsistence catches in Cape Verde are also under-reported [32], and there are local reports [33] indicating that certain fish and invertebrate stocks are overexploited.

Identifying and understanding the dynamics of socio-economic drivers is crucial to better manage fishery resources and develop strategies able to ensure food security and improve fishing communities' livelihoods, especially in developing countries. To address this issue, this paper aims at unveiling the main socio-economic drivers behind small-scale fisheries and seafood trade, and understand how such drivers shape the preferences for fish and invertebrate species, and the distribution of income among actor groups. To achieve the proposed aim, this paper maps the structure of the fish and marine invertebrate value chains of the island of São Vicente, Cape Verde, by examining the flow of seafood from fishers to final consumers.

1.1. Study site

Cape Verde is an archipelago located in the central eastern Atlantic Ocean, about 500 km west off Senegal. The archipelago has ten semi-arid small islands and numerous islets, totalling a land area of 4033 km², and an exclusive economic zone of 790,000 km². Cape Verde is considered a medium human development country by the United Nations [34], with a total population of 491,683 people, of which 76,107 live on the island of São Vicente [29]. This island was chosen as a case study due to the great importance of small-scale fisheries for local livelihoods, and due to the rising predominance of tourism in the island's and country's economy.

This study covers all fishing communities of the island of São Vicente, i.e., Mindelo, Salamansa, São Pedro, and Calhau (Fig. 1). In 2011, there were 279 fishers involved in small-scale fisheries, belonging mostly to low-income households [28]. Small-scale fisheries in São Vicente are multispecies, targeting mainly low trophic level demersal fish and, seasonally, larger higher trophic level pelagic fish. The fleet is composed of about one hundred 6 m vessels, typically operated by a crew of 3–4 fishers. Most of the vessels are propelled by small outboard motors with ca. 15 HP, although sometimes to save fuel and reduce costs, fishers set sails and take advantage of the wind. Gears used are typically artisanal, mostly handlines. Nevertheless, diving gear is increasingly being adopted to catch invertebrates such as lobsters and marine gastropods, and spearguns to catch reef-related fish species. Catches are usually landed either on the beaches adjacent to the fishing villages – São Pedro, Salamansa, and Calhau – or in a small harbour next to the fish market of the city of Mindelo. Fresh fish from the villages are usually transported on the same day of capture to the city's fish market.

The main actors involved in the seafood trade of the island are fishers, small-scale traders, market vendors and restaurant owners. Fishers and small-scale traders operate from the fishing communities where they live while market vendors are found in the city of Mindelo where they rent stands at the city's fish market. Restaurants are mostly located in Mindelo, although a few are placed in remote parts of the island. In some cases, small-scale traders and market vendors belong to a fishing household, owning the catch together with the fisher. In other cases, small-scale

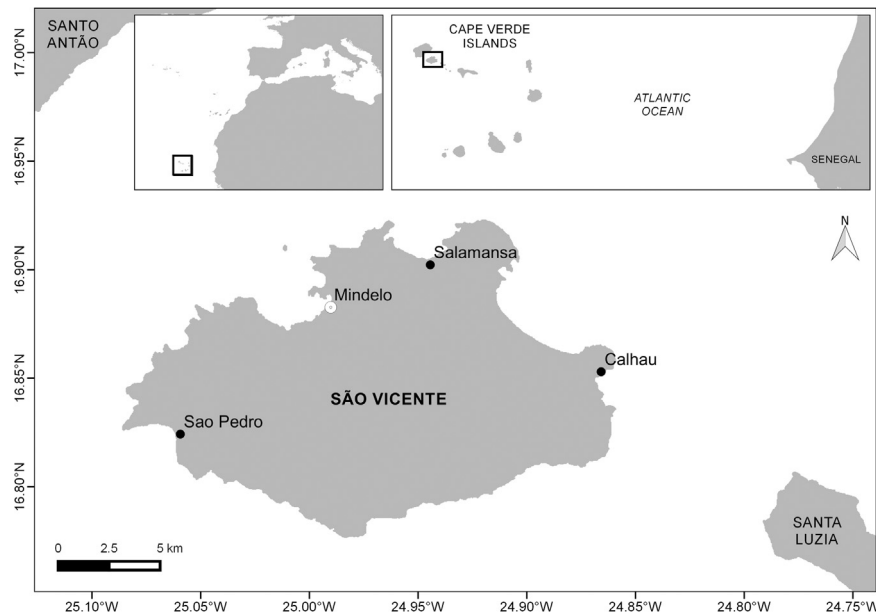


Fig. 1. Map of the island of São Vicente, Cape Verde, where are located the fishing communities of São Pedro, Salamansa, Calhau, and the city of Mindelo.

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