European Commission

VCA4D
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

N°64
JULY 2026

Analysis of the shrimps value chain in Madagascar

Value chain analyses assist in informing policy dialogue and investment operations. They help the understanding of how agricultural development fits within market dynamics. They permit an assessment of the value chains' impact on smallholders, businesses, society and environment.

The European Commission has developed a standardised methodological framework for analysis (https://europa.eu/capacity4dev/valuechain-analysis-for-development-vca4d-/documents/methodological-brief-eng). It aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

The value chain context

The Madagascan prawn value chain (VC) plays a strategic role, contributing 6.6% to the fisheries GDP and generating approximately 95.2 million euros in exports in 2023. It is vital for coastal employment and domestic food security. Its structure is highly dualistic: it contrasts highly capital-intensive, export-oriented industrial fishing and aquaculture with small-scale, informal artisanal fishing operating under open-access conditions and geared primarily towards the domestic market. Structurally, the fisheries sector is highly asymmetrical, with value creation concentrated in the formalised upstream segments. Its main constraints include infrastructure deficits (transport, cold chain), heavy reliance on imported inputs (fuel, aquaculture feed) and high logistics costs. The fisheries value chain is also under significant climate-related (rising temperatures, cyclones) and environmental pressure, marked by the collapse of industrial catches, which have fallen from 6,000–10,000 t in the 1990s to 2,000–4,000 t in recent years.

European Union Intervention

The European Union's (EU) intervention forms part of a long-standing political and trade partnership with Madagascar, focused on governance, environmental protection and sustainable development. Within this framework, prawns play a major economic role: they are the most lucrative product for Madagascar on the European market. Malagasy exports benefit from preferential access to the European market, subject to strict compliance with health, veterinary and traceability requirements. Financially, the EU supports the fisheries sector and the blue economy through a range of instruments, including the Sustainable Fisheries Partnership Agreement. It also finances analytical work and sector development initiatives, such as this study, to inform policy dialogue, strengthen evidence-based decision-making, and guide future investments. In terms of institutional strengthening, EU support (alongside other technical partners) aims to modernise fisheries governance.

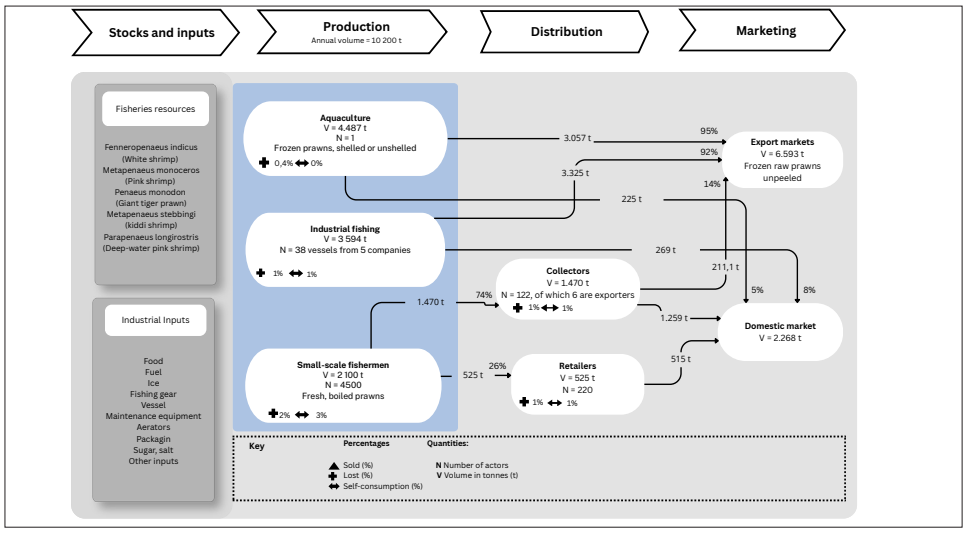

Figure 1: Diagram of the prawn value chain in Madagascar

Functional analysis

Production

Total production is estimated at around 10,200 t in 2024, representing a slight decline compared with the levels recorded between 2020 and 2023 (10,280 to 11,467 t), whilst remaining higher than that observed in 2019 (9,255 t). Production structures are divided into three segments: semi-intensive aquaculture (ponds on rafts, yield of 1 to 2 t/ha/cycle), industrial fishing (a fleet of 38 bottom trawlers using turtle exclusion devices (TEDs) and by-catch reduction devices (BRDs)), and small-scale fishing (dugout canoes and shore fishing) (Figure 1). Production is heavily concentrated along the west and north-west coasts of Madagascar. Yields show alarming variability: catches per unit of effort in industrial fishing have fallen by 40–60 % in recent years, whilst artisanal catches have dropped drastically, falling to between 3 and 8 kg per trip. Climatic pressures are exacerbating this situation: rising ocean temperatures, changes in estuarine salinity, siltation and more frequent cyclones are disrupting the biological recruitment of fish stocks and threatening physical infrastructure.

Processing and marketing

The processing sector is characterised by a marked structural duality: an export-oriented industrial sector (processing and freezing on board vessels or in approved plants), and a small-scale sector specialising in drying and salting for the domestic market. Trade flows are highly polarised: aquaculture and industrial fishing export over 95% of their output (6,457 t in 2024), whilst small-scale fishing supplies 80% of its output to the domestic market. Exports are heavily concentrated in France (73%), followed by China (17%) and Spain (5%). However, logistics suffer from a lack of infrastructure and cold-chain facilities, resulting in post-harvest losses of between 8% and 12% and hampering the artisanal sector.

Sub-chains

The Madagascan shrimp supply chain is structured around three sub-chains. The first, industrial fishing, comprises around 38 trawlers, operated by a limited number of companies with a strong focus on exports. It accounts for 35% of production (3,570 t). The second, small-scale coastal and estuarine fishing, forms the social backbone of the shrimp sector, with around 20,000 fishermen working from canoes or on foot, mainly supplying the domestic market and local subsistence networks. It accounts for 21% of volumes (2,142 t). Finally, shrimp aquaculture, dominated by integrated farms targeting high value-added international markets, accounts for 44% of production (4,488 t). Within these sub-chains, collection, processing and distribution form the main link coordinating production and market outlets. They involve collectors-exporters, wholesalers, fishmongers, retailers, as well as small-scale and industrial processing units. Taken as a whole, the sector exhibits a dual value chain, combining a formal export-oriented system with an informal small-scale system, which is essential for coastal employment and food security.

Governance

Governance of the prawn value chain in Madagascar rests primarily with the Ministry of Fisheries and the Blue Economy (MPEB), with support from the Fisheries Health Authority (ASH), the Fisheries Monitoring Centre (CSP) and the National Centre for Oceanographic Research (CNRO), which operates under the supervision of the Ministry of Higher Education and Scientific Research. The regulatory framework, reinforced by the Fisheries and Aquaculture Code and Decree No. 2021-361 on shrimp fishery, is based on licences, quotas, fees, fishing effort limits, as well as technical and environmental obligations. Financial governance remains highly asymmetrical, with industrial fishing generating the bulk of the sector's public revenue through fees and export duties. However, the mobilisation of tax revenue remains limited by the informal nature of a significant proportion of activities and transactions, particularly in small-scale shrimp fishing, as well as by difficulties in monitoring landings, licences and trade flows. This situation reduces the transparency of economic flows, limits the broadening of the tax base and exacerbates disparities between the various segments of the shrimp industry. Local co-management arrangements, such as locally managed marine areas (LMMA), transfers of management of natural and fisheries resources (TGRN and TGRH) and customary law (Dina), complement the national framework.

However, the effectiveness of this institutional framework remains constrained by unrestricted access to fisheries resources, the high mobility of fishers, weak enforcement mechanisms, and limited institutional capacity. Governance is further undermined by weak data and statistical systems, insufficient monitoring and surveillance capacity, inadequate funding for technical institutions, and fragile inter-institutional coordination. These challenges are particularly acute in the small-scale fisheries sector, which remains largely informal and poorly integrated into monitoring and management systems. Strengthening scientific, statistical, institutional, fiscal, and participatory capacities is therefore essential to ensure the long-term economic, social, and environmental sustainability of the value chain.

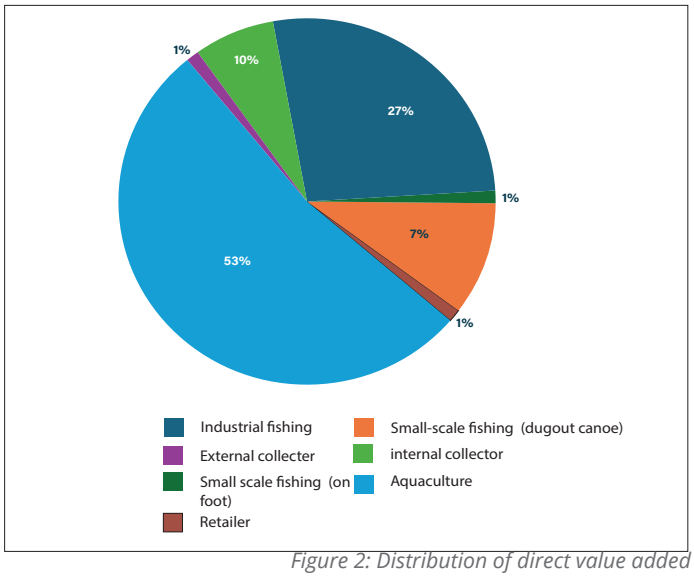

Figure 2: Distribution of direct value added

What is the contribution of the value chain to economic growth?

Sustainability for stakeholders

For the reference year 2024, aquaculture is the most profitable segment, with a return on turnover (ROT) of 20%, net operating profit (NOP) of 38,705,046,000 MGA (€8.5 million) and the highest direct value added (direct VA), at 24,940 MGA/kg (5.5 €/kg). Industrial fishing recorded an operating profit of 1,499,800,352 MGA (€333,000), but its viability remains fragile. Indeed, its profit margin is only 6.2% and its direct VA stands at 12,985 MGA/kg (€2.8/kg), heavily impacted by the burden of energy costs (particularly fuel) and taxation.

For small-scale fishing (using canoes and on foot), profitability ranges from 10.8% to 25.9%. However, absolute incomes remain extremely low, with a net operating profit of around 1,200,000 MGA (€266) and direct value added ranging from 3,444 to 6,095 MGA/kg (0.76 to € 1.3/kg), reflecting a high degree of economic insecurity. These fishermen face liquidity constraints and a structural dependence on informal financing provided by collectors.

Finally, commercial intermediaries (export and domestic collectors) enjoy high profitability, with net profit margins ranging from 22.6% to 37.3%, thanks to their control over logistics, the cold chain and access to urban and international markets.

Contribution to the national economy

For the reference year 2024, the VC generates a total value added (total VA) of 177.9 billion MGA (€39 million), contributing nearly 1% to national GDP and approximately 3.2% to the GDP of the primary sector. It is a major source of foreign exchange, with 6,457 t exported in 2024 (52% from industrial fishing, 47% from aquaculture), worth approximately 306.6 billion MGA (€68 million). Europe is the main destination for exports, with France accounting for 73%.

The fiscal impact is highly concentrated: the VC generates around 24 billion MGA (€5.3 million) in public revenue, of which over 95% comes from industrial fishing (licence fees and export duties). However, its integration into the national economy remains limited: imports of inputs (diesel, aquaculture feed, equipment) amount to 176.2 billion MGA (€39 million), representing nearly 46% of consolidated turnover, which leads to massive capital outflows and reduces domestic multiplier effects.

Sustainability in the international economy

The Madagascan prawn industry, centred on the premium species Penaeus monodon, is highly competitive on international markets. The Nominal Protection Coefficient (NPC) of 0.55 indicates that the domestic price is almost half that of its parity price on the French market (estimated at 130,500 MGA/kg, or €28.9/kg), demonstrating excellent price competitiveness. The Domestic Resource Cost Ratio (DRC) of 0.31 also attests to a very strong comparative advantage and an efficient allocation of local resources.

However, structural disadvantages are hampering this competitiveness, notably critical energy costs (dependence on diesel), significant logistics costs and the near-total reliance on imported aquaculture feed. These macroeconomic distortions are also reflected in a significant tax asymmetry, which places a disproportionate burden on the industrial fishing sector.

Contribution to the national economy

Direct VA is heavily concentrated in the most structured segments of the VC (Figure 2). Aquaculture accounts for the largest share, at 53% of the total, followed by industrial fishing, which contributes 27%. Conversely, small-scale fishing, despite its social importance and the large number of stakeholders involved, captures only a limited share of the VA: 7% for canoe fishing and 1% for shore fishing. Collectors, particularly those focused on the domestic market, play a significant role in value capture, accounting for 12% of the total.

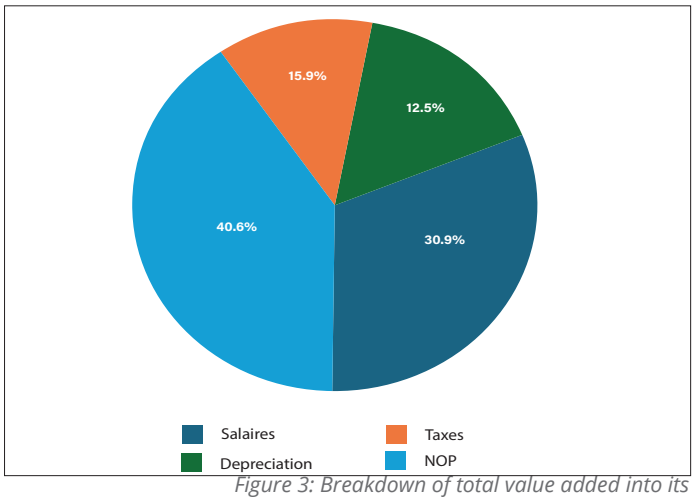

Figure 3: Breakdown of total value added into its components

The value chain is highly dualistic: integrated, capital-intensive aquaculture and industrial clusters dominate international exports, whilst precarious and informal small-scale fisheries supply the domestic market. Value creation is concentrated in the export segments and amongst intermediaries who control the logistics and financial chain.

Is the economic growth inclusive?

Income distribution and governance

For the reference year 2024, the distribution of direct value added (151.4 billion MGA, or €33 million) is highly concentrated (Figure 2). Aquaculture and industrial fishing account for the bulk of this, whilst small-scale artisanal fishing receives only a limited share. Intermediaries (collectors and retailers) capture more value than the fishermen themselves.

The breakdown of total value added shows that 12.5% is allocated to labour costs, whilst taxes and levies account for around 16% (Figure 3). The proportion accounted for by depreciation reflects the significance of productive investment. Net operating income accounts for around 41% of total value added, indicating high profitability in certain segments of the fisheries sector. However, the distribution remains uneven: aquaculture and commercial intermediaries capture the lion's share (79%), whilst fishermen remain marginalised, often caught in debt relationships with collectors that limit their bargaining power and their access to the most lucrative markets.

Employment

In 2024, the fishing industry generated between 8,200 and 13,400 direct and indirect jobs. Small-scale coastal and estuarine fishing is the main source of employment (4,000 to 8,000 fishermen), ahead of industrial fishing (2,000 to 2,400 jobs), aquaculture (1,400 employees) and marketing (600 to 1,100 jobs, mainly held by women). Women play a vital role in post-harvest activities, particularly marketing and small-scale processing, although they remain concentrated in the most precarious sectors, whilst many young people, sometimes as young as 11, are involved in shore fishing and marketing activities. Overall, employment remains characterised by a high degree of precariousness in small-scale fisheries, where unrestricted access encourages migration from southern regions driven by poverty and climatic hazards, thereby increasing pressure on resources, as well as by difficulties in recruiting and retaining skilled labour within the industry.

The growth generated by the value chain is not very inclusive. Income, profitability and formal wages are monopolised by aquaculture and intermediary collectors. Small-scale coastal fishing, whilst providing the bulk of employment for vulnerable and migrant populations, traps these workers in informality, debt and structural precariousness.

Is the value chain socially sustainable?

The following graph and table provide an image of the main social consequences of the VC activities in six strategic domains.

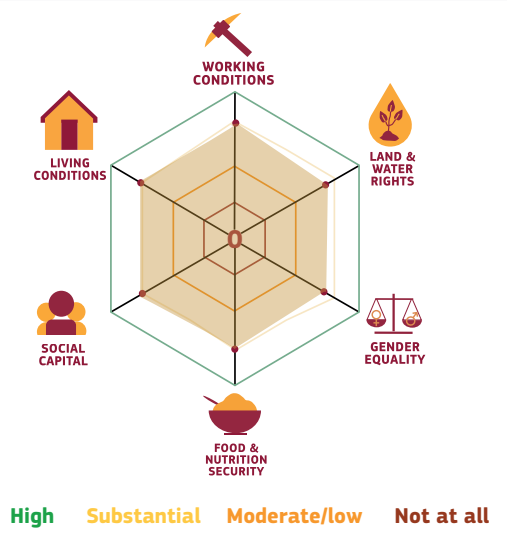

Figure 4: Social profile

The social sustainability of the Madagascan shrimp value chain is mixed: it is generally high in aquaculture and industrial fishing, characterised by formal and relatively secure jobs, but remains fragile in small-scale fishing, marked by the economic and social vulnerability of households, social and gender inequalities, and structural precariousness.

Working conditions	▪ Contrasting working conditions, with compliance with ILO/IMO standards in the industrial and aquaculture sectors (contracts, social security), compared with small-scale fishing, which is largely informal, exposed to high risks, lacking social protection and characterised by child labour.
Land and water rights	▪ Differentiated access regimes to resources, based on five-year licences in industrial fishing, land leases in aquaculture and free access in small-scale fishing. ▪ Recurring territorial conflicts between migrant fishermen, indigenous communities and industrial trawlers, linked to free access to resources. ▪ The Dina play a central role in regulating resource use and resolving conflicts, despite having limited influence over stakeholders outside the communities. ▪ An advanced framework for community-based governance of fishery resources, based on management transfers and Locally Managed Fishing Areas (APGL).
Gender equality	▪ Exclusion of women from offshore fishing and low participation in decision-making. ▪ Women predominate in the wholesale trade and drying of prawns. ▪ Decline in female employment in the industry linked to the closure of aquaculture sites and the processing of the catch on board vessels.
Food and nutrition security	▪ Small-scale fishing makes a vital contribution to household incomes, whilst industrial by-catch provides a significant source of protein. ▪ High risk of food insecurity linked to logistical isolation and climatic seasonality.
Social capital	▪ Fishermen's organisations are poorly structured and not very inclusive, with limited representation of vulnerable groups. ▪ Predominance of individual activities, heavy reliance on middlemen, information asymmetry and weak bargaining power
Living conditions	• Limited access to health services for coastal communities, due to isolation, a lack of infrastructure and financial barriers. • Precarious housing conditions, with insufficient access to water, electricity and sanitation. • Restricted access to education, leading to early school leaving.

Is the value chain environmentally sustainable?

Impacts on protected areas

The value chain compromises the quality of ecosystems and drastically accelerates the depletion of shrimp stocks. Industrial catches have fallen by 60% (from nearly 10,000t in the 1990s to just 2,000–4,000t today), reflecting a trajectory of overfishing. This trend is exacerbated by the rapid and largely unregulated expansion of small-scale fishing, characterised by the use of non-selective gear (gillnets, small-mesh nets, Valakira), leading to the mass capture of juveniles and a breakdown in recruitment. At the same time, habitat quality is deteriorating rapidly due to the deforestation of coastal mangroves and the physical destruction of benthic habitats and seagrass beds by industrial trawl nets. The impact on human health is intensifying at an alarming rate due to the misuse of insecticide-treated mosquito nets as fishing nets, which releases toxic pyrethroids into estuaries and potentially into the food chain. In terms of climate change, the VC is a major emitter: it directly generates 103,000 t of CO_2 equivalent per year (38,181 t from industrial fishing, 64,889t from aquaculture) due to its exclusive reliance on fossil fuel (diesel) for trawls and pumps.

Impacts on protected areas

- Production: In aquaculture, the heavy reliance on diesel-powered generators for water pumping and aeration results in a relatively high carbon footprint. The activity also poses risks to estuarine ecosystems through nutrient-rich effluents that may contribute to eutrophication, although these impacts are partly mitigated by the low density of ponds. Additional concerns include the potential introduction of viral pathogens, such as White Spot Syndrome Virus (WSSV), and dependence on fishmeal derived from wild fisheries.
- Industrial fishing is similarly characterised by high diesel consumption, while bottom trawling disturbs benthic habitats and by-catch increases pressure on non-target species. Small-scale fisheries also generate significant environmental pressures through the widespread use of non-selective fishing gear, non-compliance with biological closure periods, and the degradation of mangrove habitats. Together, these practices undermine ecosystem integrity and reduce the capacity of shrimp stocks to replenish, including in and around protected coastal areas.
- Processing & Transport: Indirect greenhouse gas (GHG) emissions linked to refrigeration (generators for freezing) and the lack of an electricity grid are massive. Small-scale fisheries suffer enormous post-catch losses due to the lack of a cold chain.
- Harvesting (Coastal and Industrial Fishing): This is the environmental weak point. Industrial trawling significantly alters benthic habitats and generates considerable non-selective by-catch (ratio of 1:3 to 1:10, i.e. up to 10 kg of non-target species for every 1 kg of target species). Coastal communities contribute to the degradation of mangrove nurseries through the harvesting of timber and charcoal, and, through the use of prohibited filtering fishing gear (gillnets, weirs, small-mesh nets, beach seines), catch 48% of juveniles, negatively affecting biological recruitment.
- Export: The impact stems from the high emissions associated with refrigerated sea freight to Europe and Asia.

Biodiversity

Biodiversity loss is accelerating under dual pressure: the mass capture of numerous species through by-catch (demersal fish, crabs, juvenile sharks, turtles) and habitat fragmentation linked to the deforestation of mangroves for timber and firewood. Conservation frameworks are based on community co-management across 22 Marine Protected Areas (MPAs), 280 locally managed marine areas (LMMA – MIHARI network), the transfer of natural and fisheries resource management (TGRN and TGRH) and customary law (Dina). Mitigation strategies include the installation of sea turtle exclusion devices and by-catch reduction devices (TEDs, BRDs) on industrial trawlers, adherence to biological rest periods (applicable only to industrial fishing), and corporate social responsibility (CSR) programmes for mangrove reforestation. However, these measures are structurally undermined by a lack of scientific data and regular stock assessments (following the closure of the National Shrimp Research Programme) and a lack of state enforcement capacity.

The environmental footprint of the value chain is unsustainable. Shrimp stock recruitment is jeopardised by non-selective fishing gear (small-mesh nets, mosquito nets, barrier nets and beach seines) used in small-scale artisanal fishing, whilst industrial trawling degrades the seabed. Furthermore, dependence on diesel and the diversion of toxic gear (impregnated gillnets) for other purposes, such as use in small-scale fishing, severely limits the capacity for sustainable management of the resource. This requires urgent ecological governance and scientific monitoring.

Main findings and recommendations

The shrimp industry remains strategic for Madagascar, given its contribution to exports, public revenue, added value and coastal employment. However, its sustainability remains undermined by pressure on resources, the decline in small-scale fishing yields, mangrove degradation, informality, dependence on imported inputs, health risks in aquaculture and the social vulnerabilities of coastal communities.

To strengthen the sustainability of the fisheries sector, several areas warrant priority attention: food security and the consumption of fishery products; an integrated data system and economic dashboard; a national fisheries sector observatory; fiscal transparency, licensing and revenue governance; the vulnerability of fishing households; the territorial feasibility of alternative activities; the impacts of trawling on benthic habitats; sustainable aquaculture; access to economic information; and a national fisheries and aquaculture development fund.

In conclusion, the central challenge is not merely to produce more, but to build a better-governed, more transparent, fairer and more resilient fisheries sector, one that is more fully integrated into the national economy and compatible with the preservation of the natural capital that underpins its sustainability.

Recommendations

The recommendations are structured around three complementary scenarios, presented in order of priority (short, medium and long term).

Scenario 1 – Sustainable stabilisation of the resource and strengthening of fisheries governance: This is based on strengthening the enforcement of existing rules, controlling the use of prohibited gear, ensuring compliance with biological rest periods, restoring mangroves, and developing scientific monitoring, licence monitoring, catch surveys and the monitoring of trade flows. It also requires better coordination between formal and informal stakeholders, as well as clarification of the legal scope of the Dina and their integration into local and national governance. This approach prioritises ecological resilience and the safeguarding of coastal communities' livelihoods, whilst gradually improving artisanal infrastructure and institutional capacities for monitoring and management. Implementation of this scenario is primarily the responsibility of the MPEB, the CSP, the ASH and regional administrations, in collaboration with local authorities, fishing communities and local co-management bodies.

Scenario 2 – Resilience of coastal communities and the consolidation of co-management: This scenario emphasises the strengthening of LMMA, TGRH, TGRN, MPAs, Dina and other existing community-based mechanisms, with increased participation by women and young people. With a view to reducing the economic vulnerability of households, it is necessary to i) strengthen Community Savings Groups, ii) promote access to appropriate microfinance, iii) step up financial education; and iv) develop complementary alternative activities based on real opportunities: seaweed farming, fish farming, crab farming, community-based ecotourism, beekeeping, small-scale processing, by-catch utilisation and post-harvest activities. The implementation of this scenario relies on local authorities and community organisations, with the support of NGOs, microfinance institutions and technical and financial partners.

Scenario 3 – Sustainable processing, national value addition and economic integration: This involves the development of local processing, the cold chain, logistics infrastructure, cold storage facilities, landing sites, storage and processing centres, as well as hybrid energy solutions. It aims to improve market transparency, price information systems and accessible digital tools, as well as enhanced traceability and a more resilient aquaculture sector based on biosecurity, health monitoring, effluent management and reduced dependence on diesel. The implementation of this scenario relies on coordination between the government, the private sector, trade organisations, research institutions, and technical and financial partners.

Value Chain Analysis for Development (VCA4D) is a tool funded by the European Commission / INTPA and is implemented in partnership with Agrinatura. Agrinatura (http://agrinatura-eu.eu) is the European Alliance of Universities and Research Centers involved in agricultural research and capacity building for development. The information and knowledge produced through the value chain studies are intended to support the Delegations of the European Union and their partners in improving policy dialogue, investing in value chains and better understanding the changes linked to their actions. VCA4D uses a systematic methodological framework for analysing value chains in agriculture, livestock, fishery, aquaculture and agroforestry. More information including reports and communication material can be found at: https://europa.eu/capacity4dev/value-chain-analysis-for-development-vca4d-

This document is based on the report Value Chain Analysis of shrimp in Madagascar by Fontenele, E., Thoreux, M., Rouillard, A., Airaud, F., Andriantsoa, M., Andres, L., 2026 for the European Union, DG-INTPA Value Chain Analysis for Development Project (VCA4D CTR 2018/392-416), 162 p + annexes. Only the original report binds the authors.