FISH4ACP

Developing sustainable value chains for aquatic products

A methodological brief for analysis and design

Draft Document – September 2021

1 Introduction

The Food and Agriculture Organization of the United Nations (FAO) has decades of experience in conducting value chain analysis (VCA), with the primary framework being the Sustainable Food Value Chain (SFVC) Guiding Principles (FAO 2014). The SFVC approach promotes the development of agri-food value chains that are not only economically but also socially and environmentally sustainable, and resilient. Under the EU-funded FISH4ACP project (2020-2024), FAO joined forces with the European Commission (EC) and Agrinatura, to create the value chain (VC) analysis and development approach that is captured in this brief. Based on FAO's SFVC and the EC's Value Chain Analysis for Development (VCA4D) frameworks (EC 2018), as well as FAO´s Value Chain Analysis Tool (VCAT) (see FIGURE 1), the FISH4ACP methodology provides a rigorous standardized approach for VC analysis and development in the capture fisheries and aquaculture sub-sectors. This methodology is field-tested in 12 Africa-Caribbean-Pacific (ACP) countries.

- Value chain analysis is intended to collect and analyse all information needed to make strategic decisions for upgrading a value chain to increase its competitiveness and contribution to achieving the sustainable development goals (SDGs)
- The approach takes a systems perspective, analysing the behaviour and performance of value chain actors influenced by a complex environment. Value chain upgrading is based on the identification of systemic causes of value chain bottlenecks and centres on the development of systems-based solutions.
- Sustainability relates to the triple-bottom line, requiring an analysis of the economic, social and environmental impacts. Sustainability also relates to the value chain's resilience to shocks.
- The main goal is to develop a concrete action plan for sustainable value chain development.

FIGURE 1: FAO´S SFVC FRAMEWORK, FAO´S VCA TOOL AND THE EC´S VCA4D FRAMEWORK

A fisheries/aquaculture VC consists of the full range of actors from capture/production to consumption and their coordinated value adding activities that transform raw materials into food products. A VC development approach is a holistic method, which examines all the elements: actors, support providers, the environment in which they operate, their complex interlinked behaviour, and their technical, economic, social and environmental performance in order to devise an upgrading strategy that will improve the sustainability impact of the chain.

While the FISH4ACP methodology is elaborate and detailed, it remains in essence a scanning tool, i.e., it is broad rather than deep. Throughout, references are made to various in-depth analytical tools that can be applied to explore a key issue in greater depth.

The FISH4ACP approach is highly participatory in nature and stakeholder driven. To promote engagement, three multi-stakeholder workshops are included: (1) inception of the work; (2) analysis validation and vision development; and (3) VC development plan validation. The overall goal is to deliver a VC development plan that all relevant stakeholders agree on.

The end product of the methodology is a VC report with four components. The first two components, a functional analysis and a sustainability assessment, make up the VC analysis (VCA). The last two components, an upgrading strategy and a development plan, make up the VC design (VCD).

The methodology is based on extensive secondary and primary data collection. The latter includes (depending on context and available resources): observational visits, expert groups, focus groups, actor interviews, key informants interviews and surveys.

The process of implementing the methodology starts from a selected VC. The FISH4ACP project selected 12 VCs in 12 different ACP countries through a competitive process. For each VC, the project then established a core VCA team and trained them in the FISH4ACP methodology. From this point forward, the overall process goes through seven steps (FIGURE 2). Critical progress checkpoints are bolded in the figure. The VCA team develops the different components of the VC report in parallel, continuously deepening and refining the analysis and sharpening the strategy and development plan.

FIGURE 2: THE SEVEN STEPS OF THE VC REPORT DEVELOPMENT

1	**Desk review** ▪ Work distribution and data collection plan ▪ Secondary data collection and analysis ▪ Preparation of a **1st draft VC report** based on secondary data	Month 1
2	**Field work inception mission** ▪ Rapid appraisal through visits to local markets and key or typical VC actors ▪ Multi-stakeholder **inception workshop** ▪ Preparations for field research phase	Month 2
3	**Field research** ▪ Data collection (key informant interviews, surveys, direct measurements) ▪ Data analysis ▪ Functional analysis and sustainability assessment (**2nd draft VC report**)	Months 2-6
4	**Validation mission** ▪ Participatory **validation workshop** to present/discuss main VCA findings ▪ Formulation and discussion of first version of vision and core strategy ▪ Finalization of the VCA part of the report (**3rd draft VC report**)	Month 6
5	**Upgrading and planning** ▪ Finalization of the vision and core upgrading strategy ▪ Development of upgraded business models and development plan ▪ Develop the first complete VC report (**4th draft VC report**)	Months 7-8
6	**Planning mission** ▪ **Planning workshop** to present, discuss and finalize the upgrading strategy ▪ Discussions with potential financial partners (financing mechanism) ▪ Stakeholder meetings to discuss roles in implementation phase	Month 8
7	**Report finalization** ▪ Finalization of the VCD part of the report ▪ Final editing and formatting of the report (**final VC report)** ▪ Distribution of VC report and hand-over to implementation phase	Month 9

2 Functional Analysis

The functional analysis is about describing and understanding the structure and dynamics of the value chain. This includes three key aspects: (1) the discovery of the elements (actors, input and service providers, enabling environment, natural environment); (2) for all stakeholders, their behavior, their interactions, and their dimensions (numbers, volumes, values); and (3) identifying root causes for observed underperformances. The analysis focuses on understanding VC actors´ behaviour, i.e. why actors choose particular markets, technologies or governance mechanisms over others that may seem more rewarding or efficient (e.g. using older boat types, not using ice, not recycling fish waste …).

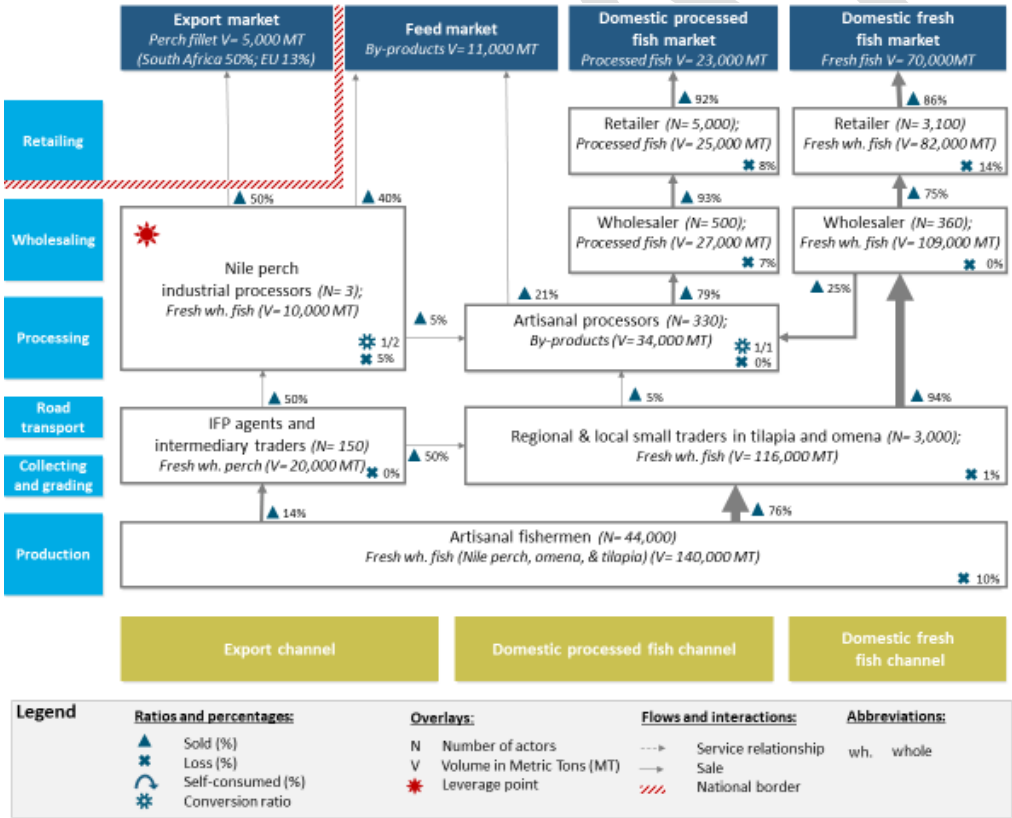
To assure a holistic and in-depth understanding of the VC, the functional analysis works systematically through four steps. Each step presents an opportunity to identify options for the upgrading strategy.

① VC mapping → ***② End-market analysis*** → ***③ Analysis of the VC elements*** → ***④ Governance analysis***

2.1 The Value Chain Map

A VC map is a flow chart that provides a general picture of the VC from production to consumption, indicating the functions, the actors, the linkages between them, and the main channels (see example in FIGURE 3). It facilitates an understanding of the structure and dimensions of the VC. The VC map allows for the identification of possible leverage points, i.e. those points in the system where upgrading can have the biggest impact because they impacts large volumes of product or numbers of actors.

FIGURE 3: LAKE VICTORIA CAPTURE FISHERIES VALUE CHAIN MAP



Developing a VC map consists of six steps:

1. Determine the functions
2. Determine the actor types
3. Indicate the product flows
4. Identify the main channels
5. Provide dimension overlays (data layers)
6. Indicate leverage points

SOURCE: ADAPTED FROM USAID (2008)

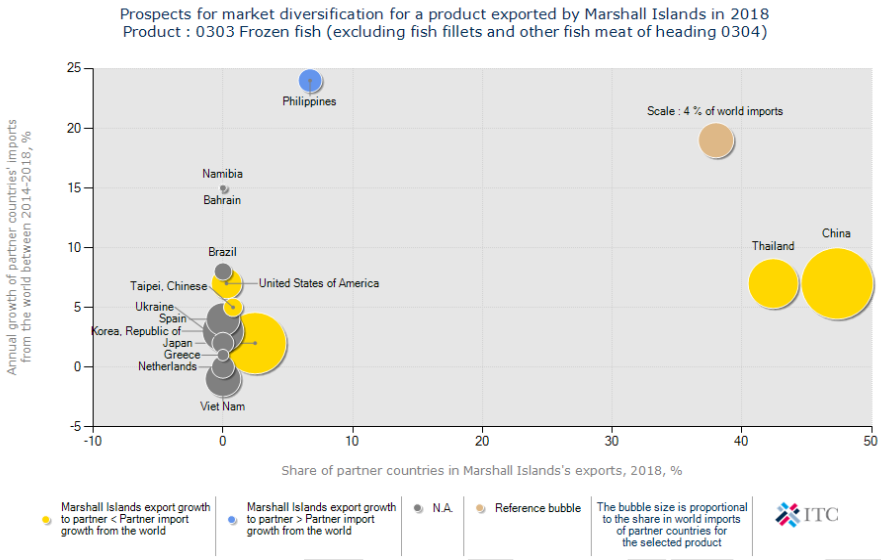
Mapping the VC sets the VC boundaries, a critical first step structuring the rest of the analysis. The VC may be national or sub-national, or may focus on intermediate markets rather than end-markets (e.g., processors rather than households). Sub-value chains for by-products (e.g., fish-bones) may or may not be included.

2.2 End-market Analysis

The next step of the functional analysis is the identification of concrete end-market opportunities, as the (economic) performance of the VC is ultimately determined by its ability to capture value in an end-market, where consumers make their purchase decision from a set of competing alternatives.

Through secondary data, market reports, interviews with local retailers and overseas buyers, and a (domestic) consumer survey, and other means, a detailed understanding of existing and potential end-markets is established. This includes market sizes and growth rates, trade flows, prices and price trends, market drivers, market segments, order specifications, critical success factors, unique selling propositions and consumer perceptions and behavior.

FIGURE 4: EXAMPLE OF TRADEMAP BUBBLE CHART



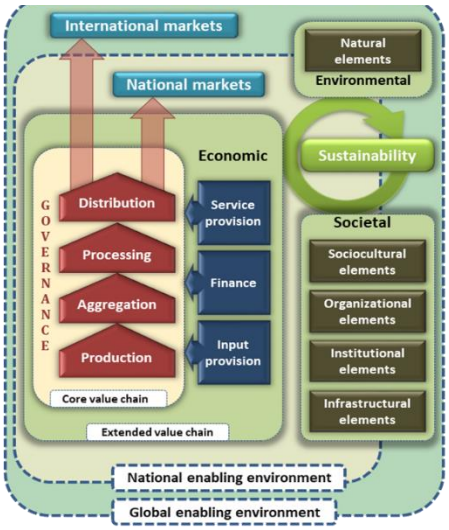
Bubble charts as derived from ITC's TradeMap such as shown in FIGURE 4 depicting frozen fish exports from the Marshall Islands are one of the tools to help assess a competitive position or promising market opportunities.

When analyzing end-markets, key points that need to be considered include:

- Growing segments of the domestic market, import substitution and export markets are the main categories of opportunities. Globalization simultaneously increases competitive threats in domestic markets (imports) and opportunities in overseas markets (exports).
- Market opportunities should include not only those for the currently marketed product (e.g., undifferentiated whole fish) but also for potential value-added products that may not yet exist in the VC (e.g., branded MSC-certified fish filets).
- Upgrading strategies for VCs often assume increased sales. It needs to be clear in which markets these can be realized and what needs to happen throughout the VC working back from (detailed specifications of) the market to the fishers, in order to capture market share.
- As fishery and aquaculture VCs often cover a range of species, the analysis may need to cover markets for multiple species.
- End-markets include not just retail sales of aquatic products to households, but also sales to restaurants, street food vendors and other industries such as feed manufacturers, where the aquatic products will typically be mixed with other inputs.
- The behaviour of end-consumers in the domestic market has to be analyzed: what, where and how do they buy and how do they prepare and consume the aquatic products and why? What opportunities exist to sell more (or greater value) to domestic consumers?

2.3 Analyses of the VC Elements

FIGURE 5: THE SUSTAINABLE FOOD VALUE CHAIN FRAMEWORK



SOURCE: FAO 2014.

The objective of this part of the analysis is to identify concrete and feasible opportunities to reduce or remove operational inefficiencies (bottlenecks), social costs, the ecological footprint and/or to increase economic, social or environmental benefits.

To do so**,** the VC elements are analyzed across four layers (see FIGURE 5):

- **Actors in the core VC;**
- **Input suppliers & service providers in the extended VC;**
- **The societal enabling environment;**
- **The natural environment.**

The analysis of the first two layers, the actors and support providers, focuses on examining their current business models and behaviour in order to determine, amongst others, why they are not already taking advantage of known market or upgrading opportunities (what missing incentives or capacities constrain them). The analysis looks at: (1) the current situation as well as the dynamics (trends and drivers); (2) differences between types of actors within a functional level; (3) the importance of the VC in overall net income; and (4) all information needed to compile operating accounts, which are prepared for all actor types as part of the economic assessment.

The analysis of the third and fourth layers, the societal and natural elements, looks at how the broader enabling environment, comprising of societal and natural elements, influences the performance of value chain actors and support service providers. Many systemic (root) causes of value chain bottlenecks, and thus some of the greatest opportunities for improving value chain performance, lie in this broader environment rather than the chain itself.

Three concepts are at the core of the analytical approach and need to be identified:

- **Root causes**: the ultimate reason for observed underperformances.
- **Binding constraints**: constraints that need to be tackled first in the sequencing of the upgrading activities.
- **Leverage points**: nodes in the VC where many actors or large product volumes come together and where a small change can lead to large impacts.

2.3.1 The Value Chain Actors

Layer 1 focuses on the VC actors, i.e. those who produce or procure from the upstream level, add value to the product and then sell it on to the next level downstream. The analysis is organized by function and describes the current situation, how it is evolving and why.

It includes a **qualitative analysis** covering the following elements:

- Location (to allow for the development of a geographic mapping of the VC);
- Nature of the decision maker (age, education, ethnicity, gender, wealth, household size, …);
- Functions covered by the actor (e.g., aggregation and processing);
- Procurement practices (inputs quality, perceptions of suppliers of inputs, services, finance);
- Operational practices (activities, labor vs capital intensity, quality standards);
- Marketing practices (contracts, markets, prices obtained, transaction mechanism);
- Infrastructure and equipment used (capacity, sophistication, state of repair, energy source);
- Functional performance (volumes, loss rates, conversion rates, labor productivity);
- Competitiveness (compare functional performance to benchmarks);
- General business skills (e.g., accounting, pricing, planning, negotiating);
- Main challenges and (operational, financial and market) risks the actor faces.

Five generic types of actors are distinguished: producers (fishers and aqua-culturists), aggregators, processors, (wholesale and retail) distributors and end-consumers. The end-market analysis covers the end-consumers and the consumption function. In each of these actor categories, there may be distinct subgroups (e.g., modern and artisanal processors), increasing the number of actor types to be depicted in the VC map.

2.3.2 Support Providers and Factor Markets in the Extended Value Chain

Layer 2 looks at the current performance of the extended VC, including the availability, accessibility, effectiveness and quality of inputs and services, the dynamics (what is changing) and drivers (why this status, why these changes). The objective of the analysis is to identify potential gaps in inputs and services provision and in factor markets that represent opportunities for upgrading.

3 main types of support services are assessed:

- The **provision of physical inputs** (such as feed, packaging, ice, equipment);
- The **provision of non-financial services** (such as storage, transport, extension, repairs and market research);
- The **provision of financial services** (including insurance products).

Furthermore, **four factor markets** are analysed: **labor, energy, land and water.**

2.3.3 The Societal Environment

This section provides an analysis of the current social business enabling environment (BEE) that affects the performance of the value chain, how this environment is changing and how it can be upgraded to improve sustainability impacts.

Societal elements are divided into four categories:

- **Formal institutional elements** (such as national policies, regulations, laws and standards);
- **Informal socio-cultural elements** (such as norms, unwritten codes of conduct, cultural preferences, levels of corruption and crime, and social habits);
- **Infrastructural elements** (such as electricity grids, roads, ports, agro-processing parks, and ICT networks);
- **Organizational elements** (such as ministries, public agencies, inter-professional associations, research and development facilities, and any relevant ongoing projects and programs).

2.3.4 The Natural Environment

This section analyses how the natural environment is favourable (or not) for the analysed value chain. It **describes how the natural environment** in the areas of fishing/fish farming **impacts the competitiveness of the value chain.** It identifies the key strengths, weaknesses, opportunities and threats that derive from the natural environment and that need to be taken into account when developing the upgrading strategy.

The natural environment includes elements such as: climate and climate change; quality and quantity of water available for aquaculture (rivers, lakes, coastal waters); aquatic genetic resources; qualities and quantities of fish available for capture (current stock rates); geography (ease with which inputs and outputs can physically move to, from and within the country based on topography and global location); and the absence or prevalence of diseases and other natural disasters (e.g., floods).

2.4 Governance Analysis

Value chain governance refers to the coordination of value chain stages and the relationships and decision-making between value chain actors, making it possible to bring a commodity from primary production to end use.

In this section, the focus of the analysis shifts from assessing how well the individual elements function to assessing how well the VC functions as a whole, i.e., how well the elements are linked and if all necessary elements are present. It analyses the dynamic nature of the formal and informal relationships between actors, and the factors that influence these relationships. It describes the nature of linkages, why they are what they are, how they have been changing over time and how well they are functioning in terms of their core function: delivering food to the population.

This section is organized by VC channel and includes the identification of upgrading opportunities to improve the governance structure (through new or upgraded linkages). The components to be systematically analysed are listed in TABLE 1.

TABLE 1: MAIN COMPONENTS OF THE GOVERNANCE ANALYSIS

Components	Examples of practices and factors to be considered
Vertical linkages	• Price discovery and price setting • Standards applied • Presence or absence of quality premiums • Dependencies (e.g., credit lock-ins) • Levels of coordination and information exchange • Nature of the dominant coordination and transaction arrangements (e.g., contracts) • Impact of possible volatile supplies throughout the year • Transaction costs and benefits (e.g., contract farming to access inputs) • Capacity-building through transactional relationships (e.g., embedded training)
Horizontal linkages	• Levels of competition vs collaboration between actors at the same functional level • Collective action such as joint input purchasing, value addition, or marketing • Associated economies of scale or scope • Associations, cooperatives, etc, and barriers to entry into such organizations • Presence of leaders for the various VC actor types
Market power	• Business strategies and practices of large/influential actors (e.g., an industrial fish processors) or collectives (e.g., a prominent cooperative or association) which functions as channel captains • Vertical power imbalances that can lead to exploitation (e.g., fish-for-sex) • Asymmetries in size, knowledge, or financial means • Dependencies on certain actors for critical inputs, finance or market access • Role of asset specificity (i.e., having assets that lock the actor in to a limited set of buyers) • Isolation of actors • Relative importance of the fish VC related activities to the actors • Political power and the intertwining of business and political interests
Trust	• Length of relationships • Incidence of cheating, corruption, non-payment • Levels of transparency • Cultural factors • Presence of enforced formal dispute resolution mechanisms
Social capital	Social capital refers to ability to access resources through social networks based on family, community or other ties, or in reverse, it refers to the social obligations to work in groups or share benefits with group members,
Formal and informal rules	These are cross-cutting the previous components: the influence of (institutional and socio-cultural) rules on the governance structure.

3 Sustainability Assessment

The objective of the sustainability assessment is to analyze the VC performance in terms of its economic, social and environmental impacts, and to identify critical sustainability issues (hotspots). For this assessment, **the focus of the analysis shifts from how the environment impacts the VC (functional analysis) to how the VC impacts the environment.** The sustainability analysis is comprised of five parts. The first three parts delve into the economic, social and environmental impacts specifically. Throughout these three sections, the analysis assesses not only direct impacts on the actors, support providers and workers in the VC, but also the externalities (unintended impacts) it generates beyond. Part four looks at resilience as a meta-dimension of sustainability: how vulnerable is the VC to external shocks such as an economic crisis, social unrest or a natural disaster? The fifth and final part of this section presents a heat map reflecting the overall sustainability performance of the VC. This heat map then feeds into the strategy development (FIGURE 6). Based on expert assessments, three sustainability levels are distinguished in the heatmap: red indicates a high concern area, or a highly unsustainable situation that requires attention in the immediate term; yellow indicates there is a concern in terms of sustainability that needs to be addressed in the medium-term; green indicates that there are no significant sustainability concerns.

FIGURE 6: EXAMPLE OF AN AQUATIC PRODUCT VALUE CHAIN SUSTAINABILITY HEAT MAP

Economic Sustainability	Social Sustainability	Environmental sustainability
Net income	Wages and employment distribution	Electricity use
Trend in net income	VA distribution	Fuel consumption
Return on sales	Poverty and vulnerability	Carbon footprint
Return on investment	Discrimination	Renewable clean energy use
No. of jobs in FTE	Women's economic involvement	Water and ice consumption
No. of FT jobs	Gendered division of labor	Water pollution
No. wage labour jobs	Gendered access to productive resources	Stock status and dynamics
No. of family/self-employed jobs	Women's decision-making & leadership	Fishing pressure
Average wage for hired workers	Availability of food	Associated species
Average wage proxy family labor	Accessibility of food	Vulnerable ecosystems
Total value of net wages	Utilization of food	ETP species
Direct VA at VC level	Stability of food	Aquatic genetic resources
Indirect VA at VC level	Respect for labour rights	Biosecurity measures
Total VA	Child and forced labor	Animal husbandry
Contribution to trade balance	Job safety and security	Feed use
Rate of integration	Job attractiveness	Drugs and chemicals use
Public finances impact	Collective action	Air pollution
Private investment	Coordination of transactions	Inorganic waste pollution
Investment borrowing	Social cohesion	Organic waste pollution
Formal borrowing	Cultural traditions	Food loss
Nominal protection coefficient	Policy, regulations and standards	Food waste
Direct resource cost ratio	Access to finance	
Consumer surplus	Access to natural resources	
Food safety	Access to information	
Consumer evaluation		
Consumer preference		
Price relative to substitutes		

Resilience		
Redundancy	Diversity	Connectivity
Collaboration	Learning and adaptation	Participation and inclusion

Key:

Not concerning	Concerning	Highly concerning

3.1 Economic Assessment

The economic analysis focuses on the actor-level and value chain-level contributions to economic growth. It contains six domains:

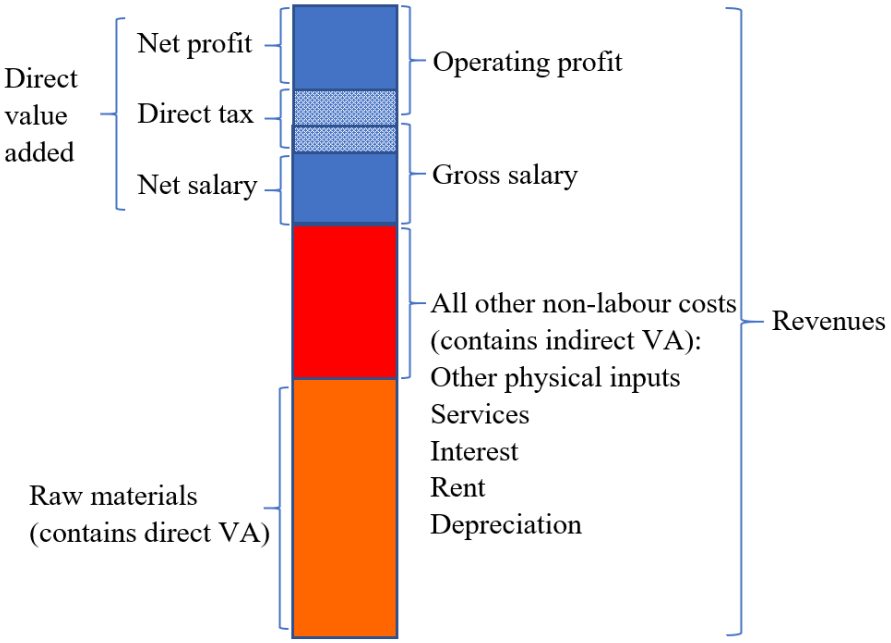
- Profitability (financial analysis)
- Employment (see FIGURE 8)
- Value added
- Effects in the national economy
- International competitiveness
- Value for end-consumers

Each domain includes a number of sustainability impact indicators, with 'value added' (VA) being the central concept. VA is the difference between the revenue from goods sold and the total cost of goods and services purchased from other firms (see FIGURE 7).

FAO's VCA-Tool (VCAT)

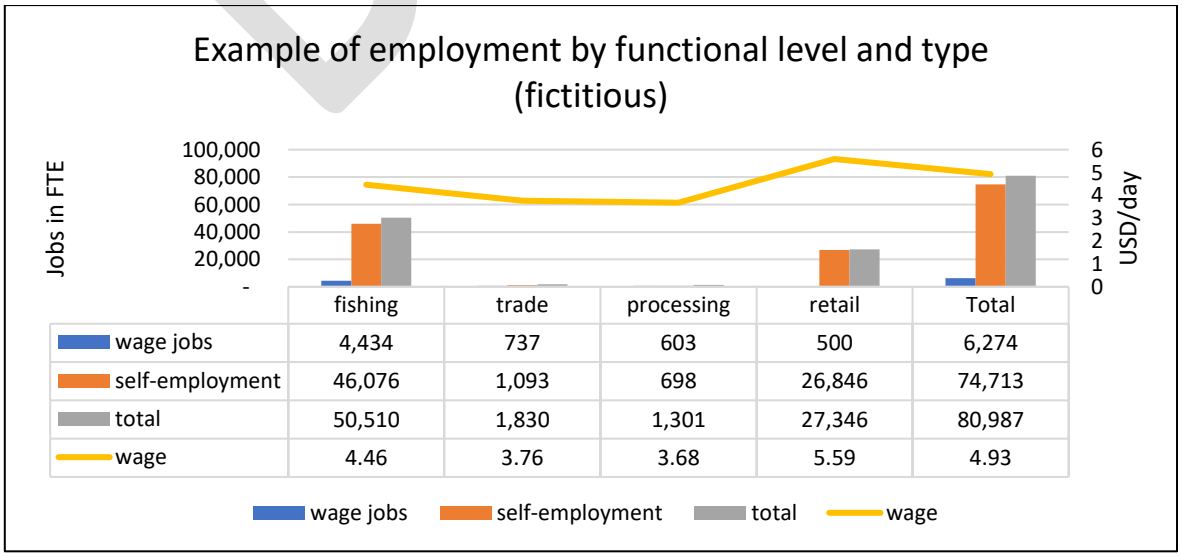
VCAT is a flexible software package that allows the VCA team to systematically organize and integrate the collected physical quantity and financial data into a combination of products, activities, actors and aggregated levels. The software allows to clearly map the baseline scenario (current situation) at both market prices and reference prices from which all economic sustainability indicators are calculated. The tool also feeds into the development of an upgrading strategy for the VC as it allows for an ex-ante analysis of the socio-economic effects of different upgrading options.

FIGURE 7: THE VALUE ADDED CONCEPT (AT ACTOR LEVEL)



The concept distinguishes between raw materials bought from the preceding actor in the VC and other costs. Essentially, value added consists of wages, profits, taxes, interest, depreciation, and rent. As the assessment's main focus lies on the value added captured by employees, asset owners and the government, rents, interest and annual depreciation are included under other costs. The economic analysis uses FAO's VCA Tool (see box) and an associated excel based spreadsheet (Economic Picture Tool).

FIGURE 8: NUMBER OF JOBS AND TYPE OF EMPLOYMENT ALONG THE VALUE CHAIN



	fishing	trade	processing	retail	Total
wage jobs	4,434	737	603	500	6,274
self-employment	46,076	1,093	698	26,846	74,713
total	50,510	1,830	1,301	27,346	80,987
wage	4.46	3.76	3.68	5.59	4.93

3.2 Social Assessment

The objective of the social sustainability assessment is to measure the social impacts of the value chain activities (positive and negative) across six core social domains. Each of these six domains starts from a framing question. Each domain is broken down into four sub-domains (see TABLE 2), with three key questions per sub-domain. The social expert in the VCA team answers these questions and gives a rating (1-to-5 scores). The analysis culminates in a hotspot map (showing social sustainability at subdomain level), and a spider diagram (visualizing social sustainability at domain level).

Social Profile Tool

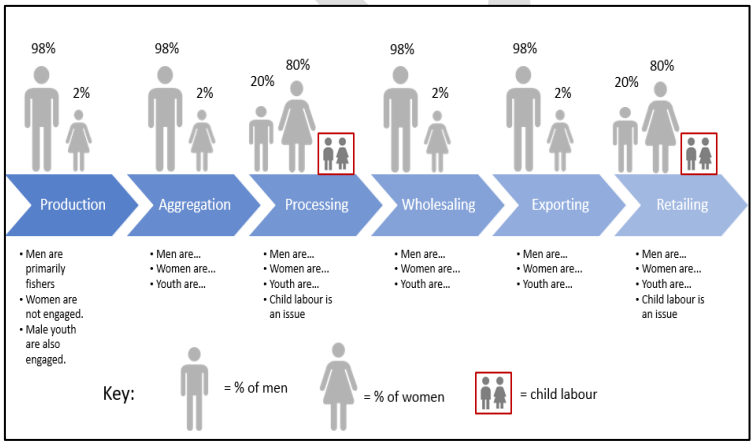
The social sustainability analysis uses the Social Profile Tool, an excel based spreadsheet inspired by the VCA4D approach. The tool involves expert-scoring based on a combination of qualitative and quantitative data organized around a set of 72 questions and 25 quantitative indicators. As such it is a strategic device to help highlight potential areas to address through value chain upgrading.

TABLE 2: SOCIAL DOMAINS AND SUBDOMAINS

1. Inclusiveness	**4. Decent employment**
1.1. Wages and employment distribution	4.1. Respect of labour rights
1.2. Value added distribution	4.2. Child and forced labour
1.3. Poverty and vulnerability	4.3. Job safety and security
1.4. Discrimination	4.4. Attractiveness
2. Gender equality	**5. Social and cultural capital**
2.1. Women's economic involvement	5.1. Collective action
2.2. Gendered division of labour	5.2. Coordination of transactions
2.3. Gendered access to productive resources	5.3. Social cohesion
2.4. Women's decision-making and leadership	5.4. Cultural traditions
3. Food security, safety and nutrition	**6. Institutional strength**
3.1. Availability of food	6.1. Policy, regulations and standards
3.2. Accessibility of food	6.2. Access to finance
3.3. Utilisation of food (nutrition, safety)	6.3. Access to natural resources
3.4. Stability of food (trends)	6.4. Access to information

The social heat map (FIGURE 6) and the social sustainability spider diagram (similar to FIGURE 10) can also be used for monitoring purposes, i.e., to track changes over time, and for identifying issues that require more in-depth analysis by short-term experts (such as gender or decent employment experts) at a later stage.

FIGURE 9: EXAMPLE OF A VALUE CHAIN GENDER MAPPING



The social sustainability assessment uses a range of tools (for example gender mapping, see FIGURE 9) to determine the inclusiveness of the value chain. It also involves a closer examination of the distribution of economic benefits, such as the components of value added (e.g., operating profits of women vs. men-led enterprises).

3.3 Environmental Assessment

The environmental sustainability analysis assesses the value chain's impacts on the natural environment by categorizing these impacts according to severity. The analysis identifies critical areas (hotspots) that may require more in-depth measurement and analysis at a later stage. Seven environmental domains are examined in detail. Each domain comprises several subdomains (see TABLE 3) and for each subdomain, a number of indicators needs to be measured and discussed in order to assess the environmental sustainability at sub-domain level.

Environmental Footprint Tool

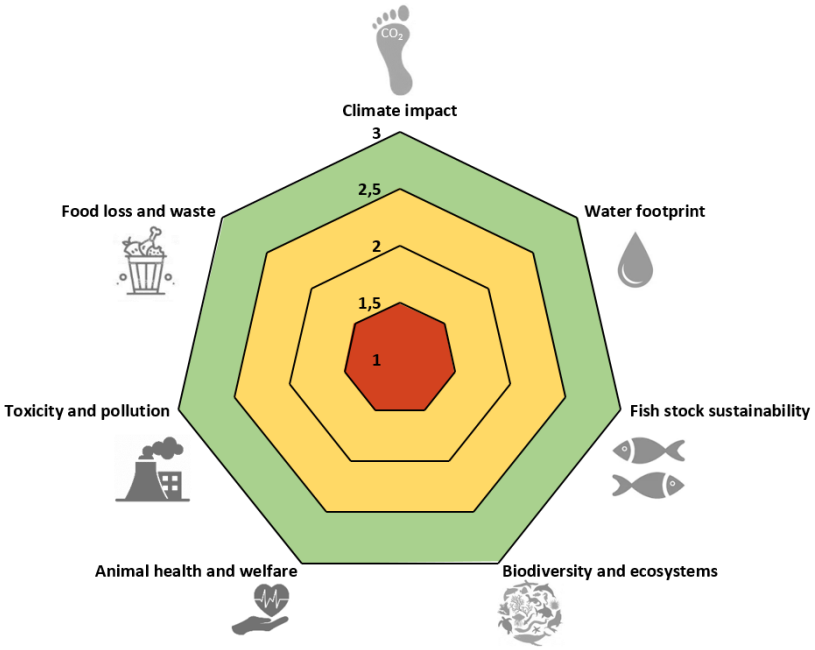
The environmental analysis uses an excel-based tool that provides a framework for organizing the results of the analysis and has a sustainability scoring function that feeds directly into the development of the heat map. The tool helps experts in identifying the main areas of environmental concern that, if prioritized by the VC stakeholders, could be tackled through the VC upgrading strategy.

TABLE 3: ENVIRONMENTAL DOMAINS

1. Climate impact
1.1 Electricity use
1.2 Fuel consumption
1.3 Carbon footprint
1.3 Renewable clean energy use
2. Water foot print
2.1 Water and ice consumption
2.2 Water pollution & treatment
3. Fish stock sustainability
3.1 Stock status and stock dynamics
3.2 Fishing pressure
4. Biodiversity and eco-systems
4.1 Impacts on associated species
4.2 Status of vulnerable ecosystems
4.3 Status of ETP species
4.4 Responsible use of aquatic resources
5. Animal health and welfare
5.1 Application of biosecurity measures
5.2 Appropriate animal husbandry
6. Toxicity
6.1 Responsible use of feed
6.2 Responsible use of drugs & chemicals
6.3 Air pollution
6.4 Inorganic solid waste pollution
6.5 Organic solid waste pollution
7. Food loss and waste
7.1 Food loss
7.2 Food waste

The outcomes of the environmental sustainability analysis are an environmental sustainability heat map (visualizing environmental sustainability at subdomain level) and an ecological footprint of the VC in the form of a spider diagram (FIGURE 10). The information needed for the environmental analysis is collected based on secondary data, key informant interviews and firm and consumer level interviews and surveys. The analysis examines environmental impacts across the different stages of the value chain, from primary production to consumption, making a distinction between different groups of actors in order to get an overview of what specific parts of the value chain have the smallest or the largest impact on the natural environment.

FIGURE 10: EXAMPLE OF AN ENVIRONMENTAL SUSTAINABILITY SPIDER DIAGRAM



3.4 Resilience Assessment

Resilience is part of the analytical approach, whether or not a shock has recently happened or is still ongoing. It is a meta-dimension of sustainability: how are economic, social and environmental sustainability, which relate to performance under normal circumstances, affected by shocks?

The framing question for this section is the following: is the VC resilient (or rather vulnerable) to shocks? I.e., does it maintain its ability to generate and deliver value? The answer to this question relies on the functional analysis and feeds into the vision, strategy and VC development plan. Unlike for the core dimensions of sustainability, there is no excel based tool, but rather a rapid qualitative assessment, based on six domains (TABLE 4) that are reflected in the sustainability heat map.

Resilience defined

Resilience is the capacity of an agri- food value chain to continue generating and delivering value (food products and services) in the face of abrupt more gradual disturbances in supply or demand through the recovery from unexpected shocks, the avoidance of tipping points, and adaptation to ongoing change. This includes anticipation, mitigation, preparation, absorption, adaptation and recovery. When resilience declines, a system moves closer to its critical thresholds and, consequently, disturbances have larger effects on the system (Vroegindewey and Hodbod 2018, IPCC 2012).

TABLE 4: RESILIENCE DOMAINS

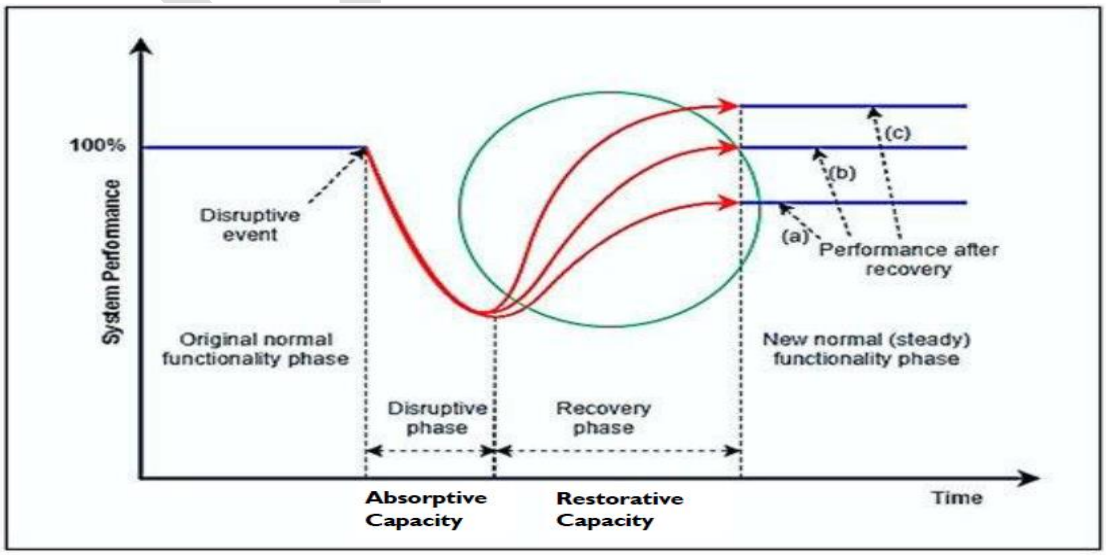
Structural resilience domains	Behavioural resilience domains
Redundancy	Collaboration and governance
Diversity	Learning and adaptation
Connectivity	Participation and inclusion

The analytical process for this section consists of three steps:

- Step 1 – list the most relevant shocks.
- Step 2 – assess how resilient the VC is to such (potential) shocks
- Step 3 – assess the sustainability impact pathways of such (potential) shocks

When assessing the impact of a shock, three phases can be distinguished (see FIGURE 11): the disruptive phase, the recovery phase and the new normal phase. While the disruptive phase is important in terms of minimizing the short-term impact on vulnerable groups, it is especially the recovery phase that is critical for long-term impact. The new normal for the VC can be associated with a worse, similar or better sustainability performance, depending on the nature of the recovery process. It is therefore important to evaluate how the shock can be used for positive transformational change.

FIGURE 11: POST-SHOCK RECOVERY PROCESS FOR MARKET SYSTEMS

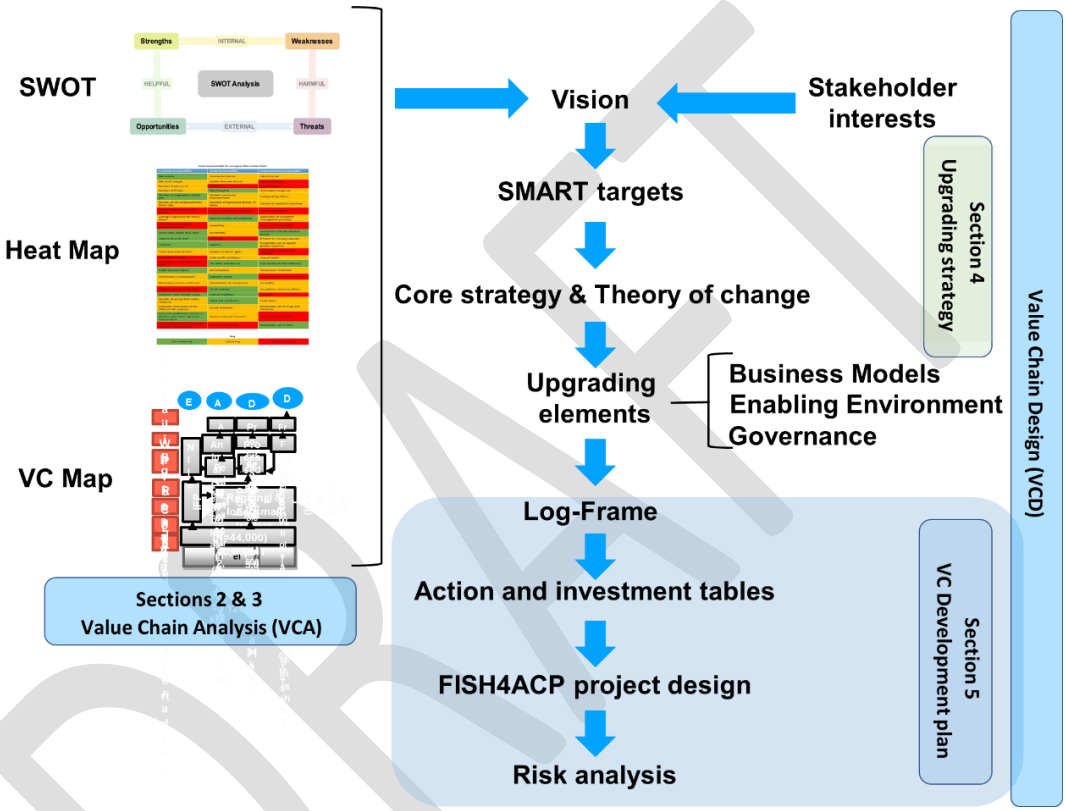


SOURCE: SARKER AND LESTER 2019.

4 Vision and Upgrading Strategy

In section 4 (vision and strategy) and section 5 (VC development plan), the process transitions from analysis to design (Figure 12). Informed by a strengths-weaknesses-opportunities-threats (SWOT) analysis, the sustainability heat map, and the VC map, and driven by the varied interests of the VC stakeholders, a vision, set of concrete targets, a core upgrading strategy and associated theory of change (ToC) for the VC are developed through a participatory process facilitated by the VCA team**.** Based on the core strategy, the VCA team then works out detailed upgrading elements (related to business models, the BEE, governance) and assesses them in terms of their expected sustainability impact**.** From there, the VCA team translates the strategy into a VC development plan, which consists of a log-frame, an action table, an investment (and financing) table, a project design, and a risk assessment.

FIGURE 12: THE STEPS FROM ANALYSIS TO DESIGN



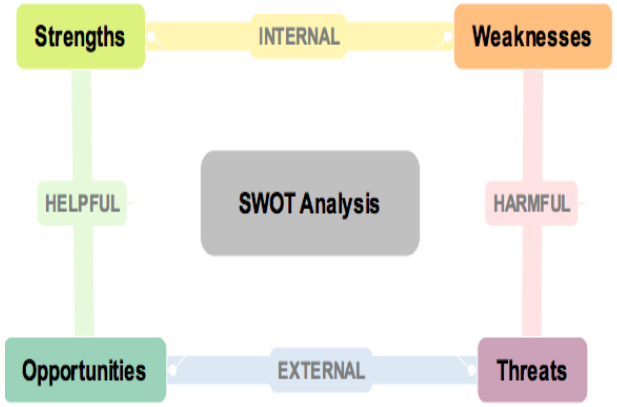
4.1 SWOT Analysis

The SWOT analysis is a tool that facilitates a shift from analytical complexity to strategic simplicity. Four sets of factors (strengths, weaknesses, opportunities and threats) that can foster or hinder the development of the VC are extracted from the functional and sustainability analyses (FIGURE 13: SWOT ANALYSIS).

Several core strategic options emerge from the four factors:

- For each opportunity, what strengths can be leveraged and what weaknesses can be addressed, in order to take advantage of them?
- For each threat, what strengths can be leveraged and what weaknesses need to be addressed, in order to take action to mitigate them?

FIGURE 13: SWOT ANALYSIS



Typically, different strategic options are on the table and not all of them are equally relevant or feasible. Which strategic options to choose depends on the vision for the VC.

4.2 Vision, Upgrading Strategy and Theory of Change

A **vision** for the VC consists of a short vision statement that is linked to an interrelated set of concrete goals. The vision needs to reflect what the stakeholders can and want to achieve within a certain time period (e.g., 10 years). The vision is presented followed by a short narrative on the process (why) this vision emerged, which will emphasize some aspects and ignore others, and which will imply a small or big impacts.

A good vision statement:

- inspires;
- is shared
- promotes the SDGs;
- is realistic;
- aligns with national development plans;
- deals with potential trade-offs

The concrete goals have to be:

- **S**pecific
- **M**easurable
- **A**chievable
- **R**elevant
- **T**ime-based

Realizing a vision and achieving goals requires a core **upgrading strategy**, which is generally defined as "a method or plan chosen to bring about a desired future". This strategy indicates the main strategic thrust, i.e. "a compelling theme that knits together otherwise independent activities and focuses the energies of the various stakeholders on the complementary strategic actions needed to realize a shared vision" (FAO 2014).

Developing a core strategy that maximizes impact is about targeting all critical constraints simultaneously or in the right sequence. The integrated strategy should target:

- the vision that was agreed upon;
- the most promising market opportunities;
- the actors and stakeholders that are most likely to implement the strategy;
- the upgrading opportunities across the four layers of the VC where upgrading will have the biggest impact relative to the vision (i.e., the leverage points, root causes of bottlenecks).

In practice, complexity can hinder success. Therefore, the chosen strategy and associated VC development plan should be as clear and simple as possible. The question that needs to be asked to identify the best strategy is: of all the identified strengths, weaknesses, opportunities and threats (covering all the bottlenecks, leverage points & upgrading options), which are the most important to realize the vision?

In the context of value chain development **an upgrading strategy** is the chosen integrated approach to simultaneously tackle all binding constraints through system-based solutions in order to realise the vision. System-based solutions are solutions that bring about self-sustained mechanisms through catalytic interventions (i.e. the solution is found within the system and does not depend on sustained (project-based) support.

The **theory of change** links to the structure-conduct-performance (SCP) paradigm where structure, conduct (or behavior) and performance are dynamically connected (Figure 14). The upgrading strategy includes catalytic activities by the project that lead to changes in the structure (outputs), that are assumed to resolve bottlenecks and change the incentives for, and capacities of, both private and public VC stakeholders, resulting in changed behaviors (outcomes). The changed behavior taking place in the changed structure will impact the sustainability performance (impact) of the VC (assumed to realize the vision). The changed performance then feeds back into the changing structure of the VC.

The theory of change (Figure 15) focuses on the strategic outputs (mainly new structural elements that changes incentives and/or capacities) and the strategic outcomes (upgraded business models, governance structures or enabling environment elements).

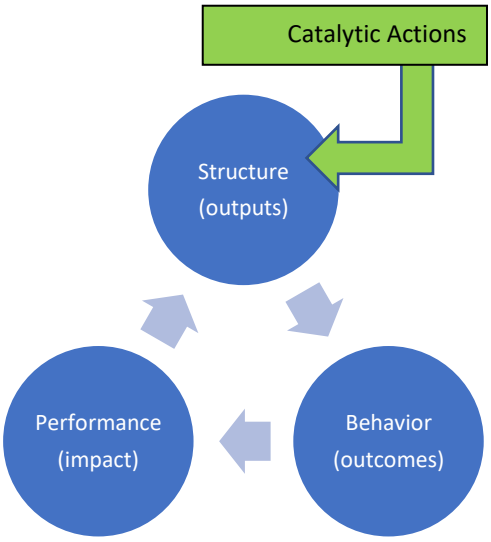
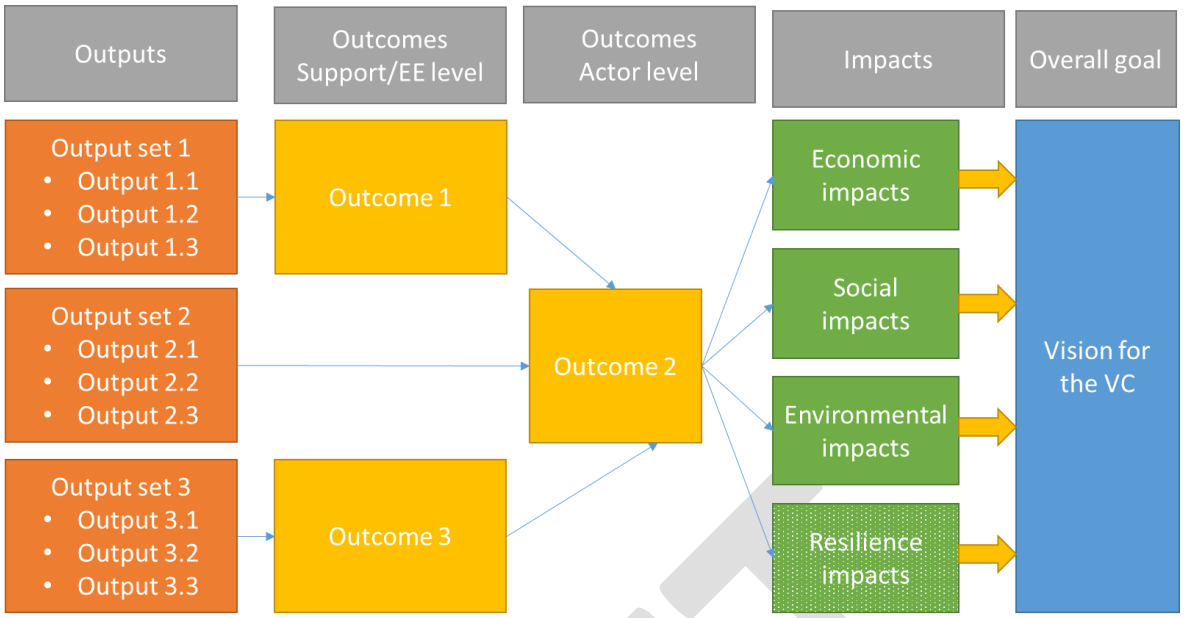


FIGURE 14: STRUCTURE-CONDUCT-PERFORMANCE PARADIGM

FIGURE 15: THEORY OF CHANGE FOR THE OVERALL VC UPGRADING STRATEGY



4.3 Upgrading Actions

After the vision, goals and core strategy are agreed upon, detailed upgrading actions are developed, comprising of three types of upgrading:

- **Upgraded business models** (at individual firm level) compare the current business models with new proposed ones for core actor types and/or for support providers (e.g. different scales or technologies of production or processing, different standards, different markets).
- **Upgraded enabling environment elements** (e.g., policy, legal or regulatory change, public investment, government capacity building) propose improvements that strategically address critical weaknesses (bottlenecks) in the enabling environment.
- **Upgraded governance** (at system level) strives to improve the relationships (linkages) between value chain stakeholders.

4.4 Anticipated Sustainability Impact

To complete the upgrading strategy development, the upgrading strategy is linked back to the sustainability impact it is expected to have. Three questions lead the development of this section:

1. **Will the strategy lead to the realization of the vision and deliver impact at scale?** A rough calculation of how the SMART targets will be achieved based on the level and impact of all upgrading elements combined.
2. **Will the strategy generate important positive or negative economic, social or environmental externalities?** A mostly qualitative discussion with some quantification where possible based on a zooming out to place the VC in the broader national context (links back to heat-map hotspots).
3. **Will the strategy increase the resilience of the VC?** A mostly qualitative discussion based on the framework presented in sub-section 3.4.

In terms of VC report development, this section will reflect the outcome of an iterative process. In finalizing the vision and core upgrading strategy, the three dimensions above – vision/strategy alignment, externalities, resilience impact – need to be taken into account by the VC stakeholders who will make the decision in a discussion facilitated by the VCA team.

5 Value Chain Development Plan

The last step in the process is to translate the core strategy **into a concrete VC development plan for implementation.** The recommended actions are not independent solutions to individual problems but constitute together an integrated implementation plan of interdependent outputs and outcomes to simultaneously tackle all binding constraints standing in the way of achieving the established vision and goals.

The VC development plan presents how the agreed upon individual stakeholder contributions will lead to the realization of the vision and has four main components:

1. **Overall log-frame for VC upgrading**
2. **Action and investment tables, with financing mechanism**
3. **A FISH4ACP project design**
4. **A risk analysis, with mitigation strategy**

To seek the buy-in of a critical mass of VC stakeholders and to develop an initial plan on how investments will be financed (implying the participation of financial services providers and investors), the implementation plan is presented and discussed in the planning workshop, i.e., the final stakeholder workshop of the VCA process.

The overall VC development plan includes the set of strategic actions all VC stakeholders have to engage in together and indicates who will implement them, when and at what cost.

5.1 Overall log-frame for VC upgrading

Building on the ToC (section 4.2), a log-frame is put together for the overall VC upgrading strategy, i.e., what needs to happen to realize the vision. It links outputs to outcomes to impacts, and for each outcome and output, there are assumptions on what needs to be in place beyond the actions (detailed in section 5.2) for the outputs to occur, and beyond the outputs for the outcomes to occur. Table 5 provides a template.

TABLE 5: EXAMPLE OF A VC DEVELOPMENT LOG-FRAME

Impact	**Impact indicators**	**Baseline**	**End-of-project year target**	**Vision year target**	**Assumptions**
Vision statement	SMART target 1				Description of the external factors necessary to achieve and sustain the impact, apart from outcomes
		Means of verification			
	…				
		Means of verification			
Outcome 1	**Outcome 1 indicator(s)**	**Baseline**	**End-of-project year target**	**Vision year target**	**Assumptions**
E.g., adoption of improved BM for capture fisheries	Indicator 1 (a) Share of fishers using BM	10%	25%	80%	Description of the factors and conditions necessary for the technology adoption, apart from outputs
		Based on actor survey			
	…				
		Means of verification			
Output 1.1	**Output 1.1 indicator(s)**	**Baseline**	**End-of-project year target**	**Vision year target**	**Assumptions**
E.g., new loan product in place	Indicator 1.1 (a) Presence of loan product	Not present	present	Present	Description of the conditions necessary to get the loan product in place on time, apart from actions
		Based on bank survey			
	…				
		Means of verification			

5.2 Action and Investment Tables

The VC development action table (TABLE 6) lists all the actions that need to be implemented by the VC stakeholders (both public and private) and by the FISH4ACP project (and possibly other development partners), to generate the outputs and outcomes that are needed to realize the vision. The table thus depicts the critical interplay between the project and the VC stakeholders and should highlight the roles played by "change champions", which may be a lead ministry or a lead firm in the VC. Based on table 6, a Gantt chart-type time-line can be put together on what needs to happen when, taking causal dependencies into account. Finally, low-hanging fruits (easy to achieve outputs) should be identified.

TABLE 6: FORMAT FOR THE ACTION TABLE

Outcome 1: …					
Outputs	**Actions**	**Stakeholders involved**	**Costs (USD)**	**Type of cost**	**Timing**
Output 1.1 E.g., financial feasibility of investment in stuffing machines known to actors	Action 1.1.1 Expert contracted to conduct feasibility	FISH4ACP, actor	10,000	Catalytic (one-off)	1/2022
	Action 1.1.2 Workshop on feasibility study organized	FISH4ACP, actor	5,000	Catalytic (one-off)	3/2022
	…	…	…	…	…
Output 1.2	Action 1.2.1	…	…	…	…
…	…	…	…	…	…
Outcome 2: ….					
Outputs	**Actions**	**Stakeholders involved**	**Costs (USD)**	**Type of cost**	**Timing**
Output 2.1	Action 2.1.1	…	…	…	…
	Action 2.1.2	…	…	…	…
	…	…	…	…	…
Output 2.2	Action 2.2.1				
…	…	…	…	…	…

The investment table (Table 7) provides an overview of the investments needed to realize the vision and how these investments are expected to be financed. This links directly to the information presented in section 4.4, first part and the costs listed in table 6 above. The table also illustrates how blended finance strategies can be applied to fund investment in the upgraded business models identified in the VC strategy. This section of the VC report also presents and discusses the financing mechanism in some detail, which can include for example, loan products, matching grants, equity stakes, de-risking tools, and so on.

TABLE 7: FORMAT FOR THE INVESTMENT NEEDS AND FINANCING TABLE

(in USD)	**Financing Sources**				
Investment Activities	Private investment (equity)	Public investment	FISH4ACP Project (and others)	Financing institutions (loans)	**Totals by activity**
Small-scale fish processing units	500,000	200,000	500,000	800,000	2,000,000
Modern fishing unit BM		100,000		300,000	400,000
Improved inputs supply BM		100,000			100,000
Infrastructure		1,000,000			1,000,000
Facilitation, technical assistance		50,000	2,000,000		2,050,000
…	…	…	…	…	…
Totals by financing source	500,000	1,450,000	2,500,000	1,100,000	**5,550,000**

5.3 The FISH4ACP Project Design

The FISH4ACP. project design (TABLE 8) describes the role of the project in the VC development plan and fleshes it out in greater detail. For each of the actions, the design needs to briefly describe the action and indicate the required resources, partners and pre-conditions (links to the sequencing of actions).

Implementation in VC development projects takes on a continuous **"collaborate, learn and adapt" (CLA) approach**, where small-scale introductions of a change are tried out (e.g. a training) and impacts (such as the adoption of a new practice by actors) are observed shortly thereafter (lessons learned). If impacts are as expected, the change-action is scaled up. If the support action is not having the desired impact, it is investigated why, and the action (or set of actions) is redesigned. The CLA approach naturally feeds into the broader project M&E effort.

Likely activities to be included:

- Creating or strengthening a commodity stakeholder platform;
- Communicating lessons learned and success stories;
- Building capacity through demos and study tours;
- Conducting further analytical work (e.g. detailed feasibility studies, in-depth analysis of certain system components);
- Measuring outcomes and impacts (e.g. technology adoption rate, women inclusion);
- Providing financial support mechanisms (e.g. matching grants, vouchers or loan guarantees);
- Facilitating bi-lateral linkages (e.g., mentorships, coaching, partnerships, commercial links).

TABLE 8: EXAMPLE OF A FISH4ACP PROJECT ACTION PLAN

Outputs and actions	Action description	Resources required (non-financial)	(potential) Partners	Pre-conditions
Output 1.1 – New regulation X is in place				
Action 1.1.1	Design new regulation	Policy expert	Ministry of Fisheries	Confirmed interest from MoF; data collected
Action 1.1.2	Hold a workshop to discuss the new regulation	Venue location	Ministry of Fisheries	Confirmed interest from MoF, design study drafted
Output 1.2 –New loan product is in place				
Action 1.2.1	Design new loan product	Finance expert	Commercial banks	Business model linked to loan completed; VC actor needs & wants assessed; confirmed interest from xx commercial banks
…	…	…	…	…

5.4 Risk Analysis

The risk analysis (TABLE 9) reflects on the risks that can prevent the achievement of the envisioned impact and develops associated mitigation strategies affecting both the overall and project-specific action plans.

The risks need to be described in terms of nature (e.g. economic, societal, environmental) and assessed in terms of level (how likely the risk is to occur and how significant the impact will be on the VC if it occurs). They can be associated with possible external shocks; weaknesses in the VC; or wrong assumptions made in association with the actions, outputs and outcomes. Table to be sorted from highest to lowest overall risk level.

TABLE 9: RISK ANALYSIS TABLE

Risk name	Risk nature	Risk likelihood (1-5)	Risk impact (1-5)	Overall risk level (1-25)	Mitigation options
Name of the risk	Concrete description of the risk				Proposed mitigation measures

Note: overall risk calculated by multiplying risk likelihood with risk impact

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This brief is part of the FISH4ACP methodology package that further includes the full FISH4ACP Methodology Guide, a report outline, analytical tools, training materials, terms of reference, example reports, and more. These resources are listed and described in the full guide and can be accessed from the FAO website

[http://www.fao.org/in-action/fish-4-acp].