



Food and Agriculture
Organization of the
United Nations



GCP/INT/745/ITA
Terminal Report

FAO/GOVERNMENT COOPERATIVE PROGRAMME

IMPROVING FISHERIES AND AQUACULTURE VALUE CHAINS IN THE MEDITERRANEAN WITHIN THE BLUE GROWTH INITIATIVE

INTERREGIONAL

PROJECT FINDINGS AND RECOMMENDATIONS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME, 2024

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Report prepared for
the participating governments
by
the Food and Agriculture Organization of the United Nations

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2024

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TABLE OF CONTENTS

	<u>Page</u>
LIST OF ACRONYMS AND ABBREVIATIONS	vii
A OVERVIEW	1
A.1 Project profile	1
A.2 Financial data in USD	2
A.3 Executive summary	2
B RELEVANCE	4
C ACHIEVEMENT OF RESULTS	7
D IMPLEMENTATION OF WORK PLAN AND BUDGET	14
E SUSTAINABILITY	17
F LESSONS LEARNED	19
G FOLLOW-UP ACTIONS FOR GOVERNMENT ATTENTION	22
<u>Appendix 1</u> LOGFRAME MATRIX - ACHIEVEMENT OF INDICATORS	25
<u>Appendix 2</u> DOCUMENTS PRODUCED DURING THE PROJECT	28
<u>Appendix 3</u> PROJECT STAFF	29
<u>Appendix 4</u> TRAINING AND STUDY TOURS	30

LIST OF FIGURES AND TABLES

	<u>Page</u>
<u>Figure 1</u> Workplan and distribution of project over the course of the project	15
<u>Table 1</u> The three main activities implemented in each country	9

LIST OF ACRONYMS AND ABBREVIATIONS

Adriamed	- Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea
FAO	- Food and Agriculture Organization of the United Nations
GFCM	- General Fisheries Commission for the Mediterranean
INSTM	- Institut National des Sciences et Technologies de la Mer
IPC	- Integrated Food Security Phase Classification
LoA	- Letter of agreement
MedSudMed	- Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily
MiPAAF	- Ministry of Agriculture, Food, and Forestry Policies (Italy)
NAOHS	- National Aquatic Organism Health Strategy
NGO	- Non-governmental organization
PMP/AB	- Progressive Management Pathway for Aquaculture Biosecurity
PMU	- Project Management Unit
PTF	- Project Task Force
SDG	- Sustainable Development Goal
SFVC	- Sustainable Food Value Chain
SVC4MED	- Sustainable Fisheries and Aquaculture Value Chains for the Mediterranean's
SWOT	- Strengths, weaknesses, opportunities and threats
UN	- United Nations
VC	- Value Chain
VCA	- VC Analysis
VCA4D	- Value Chain Analysis for Development

A. OVERVIEW

A.1 PROJECT PROFILE

Country	Interregional (Albania, Italy, Lebanon, Tunisia and Türkiye)	
Project symbol	GCP/INT/745/ITA	
Project title	Improving Fisheries and Aquaculture Value Chains in the Mediterranean within the Blue Growth Initiative	
Resource partner	Ministry of Agriculture, Food, and Forestry Policies (MiPAAF), Government of Italy	
Actual EOD	8 June 2021	
Actual NTE	31 July 2024	
Participating organizations (e.g. Ministry of Agriculture, etc.)	Ministry of Agriculture and Rural Development, Albania; Ministry of Agriculture, Lebanon; Ministry of Agriculture and Forestry, Türkiye; Ministry of Foreign Affairs, Tunisia	
Implementing partners (list):		
Name	Type (non-governmental/civil society/community-based organization/Government, etc.)	Total funds transferred (USD)
NISEA Societ� cooperativa	Research Institute	35 468.56
Hydra NGO Fishery and Aquaculture Research Centre	NGO	32 000
Institut National des Sciences et Technologies de la Mer (INSTM)	Non-profit, Research Institute	20 000
S��R-KOOP	Non-profit, Research Institute	20 000
Contribution to Programmatic Framework		
Indicate the title of each higher-level result to which the project contributes		
Sustainable Development Goals (SDGs)	14	
SDG Target(s)	14.b, 14.7	
FAO Programme Priority Area(s) (PPA/s)	BP2	
Regional Priorities/Regional Initiative(s), if applicable	N/A	
UNDAF/UNSDCF Outcome(s) (or those from an equivalent UN common country programme document), if applicable	N/A	
CPF Output(s), if applicable	<u>Albania</u> : CPF 2022-26: Output 1.1: Sustainable and resilient economic growth and green and blue economy transition. <u>Lebanon</u> : CPF 2018-2020: Output 2.4: Value chains developed by FAO to promote inclusive, efficient and sustainable agri-food chains. <u>Tunisia</u> : CPF 2022-2025: Produit 4.1: Les acteurs publics, priv��s et de la soci��t�� civile disposent des outils et des capacit��s	

	en matière de gouvernance durable, équitable et participative des ressources naturelles, des écosystèmes et des services environnementaux. Türkiye: CPF 2016-2020: Output 1.1.2: Capacity of stakeholders strengthened on processing, value addition and efficient utilization of agricultural products.
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A.2 FINANCIAL DATA in USD¹

Latest Approved Budget:	USD 559 790
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A.3 EXECUTIVE SUMMARY

Considering the importance of shrimp fisheries and rainbow trout farming in the Mediterranean, the aim of this project was to map and assess the performance of wild shrimp and farmed rainbow value chains (VCs), in terms of economic, social and environmental sustainability, as well as resilience to shocks.

In this context, the final objective of this project was to develop visions, policies and strategies for upgrading the wild shrimp and farmed trout VCs in the Mediterranean region to improve competitiveness and sustainability performance. As such, the project contributed to the fulfilment of the United Nations' (UN) 2030 Agenda for Sustainable Development, and, in particular, Sustainable Development Goal (SDG) 14 "Life below water", and also contributed to achieving the four betters – better production, better nutrition, a better environment, and a better life within FAO's Strategic Framework, in line with the SDGs.

Five countries were selected for the implementation of project activities, namely Albania (farmed trout), Lebanon (farmed trout), Türkiye (wild shrimp), Tunisia (farmed shrimp) and Italy (farmed trout and wild shrimp). The Sustainable Fisheries and Aquaculture Value Chains for the Mediterranean's (SVC4MED) methodological approach was built on FAO guiding principles on Sustainable Food Value Chain (SFVC) and Value Chain Analysis for Development (VCA4D) of the European Commission. This holistic approach, designed to identify and understand the core factors and interrelated constraints associated with all main components of the system, made it possible to assess the performance of selected VCs and to identify upgrading opportunities.

¹ Data source: FPMIS/Data Warehouse.

During the implementation of the project, the following activities were carried out:

- the recruitment of an international team of core experts;
- coordination with relevant FAO country offices, national authorities and ministries;
- coordination with parallel FAO projects and programmes (Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea [Adriamed], Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily [MedSudMed], and General Fisheries Commission for the Mediterranean [GFCM]);
- the selection of national implementing partners;
- methodological training conducted for service providers and consultants;
- the collection and review of secondary data on wild shrimp and farmed rainbow trout VCs in targeted countries;
- the finalization of a tailored methodology, adapted to local contexts, for the collection of primary data on wild shrimp and farmed rainbow trout VCs;
- the preparation of questionnaires and checklists for semi-structured interviews for primary data collection, and the organization of related meetings with VC stakeholders;
- quantitative and qualitative primary data collection in targeted countries;
- value chain analyses in Albania, Italy, Lebanon, Tunisia, and Türkiye;
- the organization of stakeholder consultations and meetings for data validation, assessment, feedback and the finalization of a shared strategy for upgrading the value chain;
- the preparation, discussion, revision, data validation and finalization of technical (VC) reports;
- the finalization of a website; and
- broader-based results dissemination events.

Finally, preparation for moving beyond the scope of the project, into the implementation of the development recommendations identified in the value analysis was initiated, with a focus on Lebanon, given its priority status among the five project countries, in terms of food insecurity and rising poverty, as well as the potential for addressing the significant sustainability issues facing the value chain.

B. RELEVANCE

The problem

Capture fisheries and aquaculture in the Mediterranean face both sustainability challenges and opportunities for improving competitiveness, which need to be addressed through appropriate policies and strategies for the development of these sectors.

Some of the main challenges currently facing the capture fisheries and aquaculture VCs in the Mediterranean include the globalization and increasing complexity of markets and production; growing international competition; restructuring of VCs; imbalance in bargaining power between actors; tighter standards for production; and increasing consumer demand for quality, convenience and traceability and ecocertification.

On the other hand, Mediterranean fisheries and aquaculture VCs enjoy opportunities for maximizing economic and social benefits from aquatic products. Well-established seafood processing and value addition capacity, innovation, functioning institutions, active producers' organizations, a well-established sector management bodies, and well-developed human capital are some of the key routes to fully utilize the potential of sustainable fisheries and aquaculture VCs.

In this context, in-depth assessments and understanding of Mediterranean seafood value chains enables the identification of concrete challenges and opportunities to upgrade the VCs, and to improve their economic, environmental and social sustainability, contributing to the success of the SDGs and FAO Blue Transformation objectives in the Mediterranean region.

To achieve this, FAO calls for the collection of accurate and up-to-date information on all nodes of the VCs for fisheries and aquaculture products. Indeed, the VC is an important construct and framework for understanding the distribution of returns arising from production, processing and marketing of aquatic products. This helps to identify challenges and key points of interventions and to formulate evidence-based recommendations for improving VCs.

Capture fisheries and wild shrimp

Capture fisheries in the region are characterized by exploitation of a variety of benthic and pelagic stocks of fish, as well as molluscs and crustaceans. Small-scale fisheries play a particularly important role in Mediterranean fisheries, where they represent more than 80 percent of the total vessel fleet.

Deep-water rose shrimp (*Parapenaeus longirostris*), Giant red shrimp (*Aristaeomorpha foliacea*), Blue and red shrimp (*Aristeus antennatus*), and Peregrine shrimp (*Metapenaeus stebbingi*) are the main shrimp species of commercial and conservation interest in the

Mediterranean. Italy has the highest landings of shrimp species, followed by Spain and Tunisia.

A preliminary literature review on the VCs for shrimp species revealed that VCs for shrimps from the Mediterranean region were not studied, which called for an investigation into the current state and potential improvement of these VCs within the FAO Blue Transformation prospective and SDGs.

Aquaculture and Rainbow trout

Mediterranean aquaculture is also a large and dynamic industry, with a significant role in terms of production, creating jobs, trade of seafood, and generating economic growth. Aquaculture is also contributing to meet the rising demand for fish and fishery products in the region. Approximately 70 different species of finfish, molluscs and crustaceans are farmed in freshwater, marine and brackish environments, with molluscs and finfish dominating aquaculture production in the region.

Rainbow trout (*Oncorhynchus mykiss*) is the main Salmonidae species cultured in the Mediterranean, with France, Italy, Spain and Türkiye being the major producers. Across the Mediterranean, the rainbow trout farming sector is dominated by small- and medium-sized enterprises. These farms are mostly land-based and are located in rural areas, contributing to socioeconomic development in terms of income and job generation.

A literature review on the Rainbow VC revealed that such studies were rare, pointing out the need for in-depth analysis of the VC for farmed Rainbow trout in the Mediterranean countries, particularly considering the need for sustainable aquaculture expansion under the FAO Blue Transformation initiative, and the potential of the VCs of this species to contribute to rural development and employment.

The response

Considering the importance of shrimp fisheries and rainbow trout farming in the Mediterranean, the aim of this project was to analyse the performance of wild shrimp and farmed rainbow VCs, in terms of economic, social and environmental aspects, as well as resilience to economic, social and environmental shocks; and on the basis of that, to develop visions (set of goals) for upgrading wild shrimp and farmed trout VCs, including policies and strategies to improve the competitiveness and sustainability of these value chains. By so doing, the project aimed to contribute to national economies by improving the generation of employment and value addition. Additionally, the project aimed to contribute to facilitating

regional cooperation on VCs and capacity building among fishers and aquafarmers, focusing on small-scale fisheries and aquaculture operation and producer organizations.

The five countries selected for the implementation of project activities were Albania, Italy, Lebanon, Türkiye and Tunisia, based on the importance of the species within the national fisheries or aquaculture sectors, and the potential for sustainability improvement. The project activities consisted of a VC analysis, strategy development, and stakeholder consultations, conducted in three phases as follows:

- Activity 1: Measuring performance of Food Value Chains-Sustainability Dimensions.
- Activity 2: Understanding performance and analysing the dynamics of the value chains (i.e. the core drivers of performance/or the root causes of underperformance).
- Activity 3: Finalization of the vision document through stakeholder consultation.

The intended beneficiaries of the project were VC actors and VC support providers, particularly small-scale producers of the following countries/VCs: Albania – rainbow trout; Italy – rainbow trout and wild shrimp; Lebanon – rainbow trout; Tunisia – wild shrimp; Türkiye – wild shrimp.

The project was designed and implemented in synergy with other FAO projects in the same sector and area, namely MedSudMed, which is also interested in the shrimp value chain in Tunisia, and AdriaMed, with a focus on aquaculture value chains in Albania.

Coordination was pursued with MedSurMed throughout the project. The first coordination meeting with MedSudMed for shrimps in Tunisia was held on 4 May 2022 to identify common points and synergies and optimize the use of the available resources. Following this, online follow-up meetings and exchanges were held between the two projects teams, which allowed to share information and methodologies and fine-tune the questionnaires for the collection of primary data in the country.

C. ACHIEVEMENT OF RESULTS

Results achieved²

Activity 1: Measuring performance of Food Value Chains-Sustainability Dimensions

Considering that assessment is the first fundamental step for management, the first phase of the project aimed to develop a good understanding of the wild shrimp and farmed rainbow trout VCs in the target countries and shed light on their sustainability performance. This was achieved through data collection and the use of indicators regarding economic, environmental and social dimensions of sustainability.

Outputs

Maps of wild shrimp species and farmed trout value chains were developed in the target countries, revealing their performance and resilience in terms of economic, environmental and social dimensions of sustainability.

Strategy

The first step in data collection was a literature review for secondary data (e.g. scientific papers, reports, statistics) on wild shrimp and farmed trout VCs in the target countries. Furthermore, primary data for the construction of VC maps were collected through field studies and interviews. Interviews included selected VC actors (production, processing, wholesalers, exporters, retailers), support service providers (e.g. logistics), and broader stakeholder groups (e.g. policymakers, farmers/producers' organizations). Due to travel restrictions imposed in response to the COVID-19 pandemic, field studies were conducted by local consultants in the target countries.

Activity 2: Understanding performance and analysing the dynamics of the value chains

This phase of the project activities included the assessment and analytical phase. Functional analysis and sustainability assessments were conducted, based on FAO Guiding principles for Developing sustainable food value chains, other FAO studies, and relevant sources. Gender and decent rural employment analyses were also carried out and incorporated.

² The final report on the main activities and key achievements at country level is provided in Annex 1 - Main Activities and key achievements at country level.

Outputs

Clear understanding of structure, dynamics, enabling environment, end markets and core drivers of performance/underperformance for wild shrimp species and farmed trout value chains was achieved in the target countries. This was followed by developing appropriate and realistic visions (goals) for improving VCs.

Strategy

Based on the data collected and VC analysis and sustainability assessments, a strengths, weaknesses, opportunities and threats (SWOT) analysis was used to obtain a simplified strategic understanding of wild shrimp and farmed rainbow trout VCs, based on strength and weaknesses of the chains as well as opportunities and threats. Initial vision and core strategies were drafted for improving the economic performance and social outcomes, and to reduce their environmental footprint. These were species and country-specific due to the nature of each VC. Visions explicitly addressed gender and decent rural employment dimensions, expressed in line with national policies, FAO's gender policy, FAO Guidance on Social Responsibility in Fisheries and Aquaculture Value Chains, and other relevant international agreements, as appropriate.

Activity 3: Finalization of the vision document through stakeholder consultation

The final stage of the project was related to the organization of workshops to share and elaborate the drafted vision, supporting strategies and action plans for upgrading the VCs for: i) increased economic performance; ii) enhanced environmental sustainability; iii) improved social sustainability and inclusiveness (including decent rural employment); and iv) enhanced enabling environment and governance. Gender balance in the stakeholder representation was ensured.

Outputs

A realistic set of goals and implementation plans was developed for improving/upgrading the competitiveness and sustainability of wild shrimp species and farmed rainbow trout VCs in the target countries. The vision document included upgraded business models, enhanced enabling environment and governance. Enhancing the resilience capabilities of VCs to environmental, economic and social shocks (e.g. COVID-19 pandemic) was also part of the upgrading strategies.

Strategy

The drafted vision documents (core strategies and action plans) were shared and discussed with relevant stakeholders (e.g. fishers, fish farmers, processors, exporters, retailers, producers' organizations, policy and decision makers, researchers/academicians) in the target countries for co-construction, validation and finalization of vision documents, including upgraded business models, enhanced enabling environment and governance. These workshops were organized as hybrid meetings, to allow all relevant stakeholders and the entire FAO project team to attend.

The three main activities identified in the Project Document, summarized above, were implemented in each country, in line with the table below.

Table 1: The three main activities implemented in each country

Country	1st reporting period	2nd reporting period	3rd reporting period	4th reporting period
Albania	Preparation Activity 1	Activity 1 Activity 2	Activity 2 Activity 3	
Italy	Preparation Activity 1	Activity 1 Activity 2	Activity 2	Activity 3
Lebanon	Preparation Activity 1	Activity 1	Activity 1 Activity 2 Activity 3	Follow-up activity*
Tunisia	Preparation Activity 1	Preparation Activity 1	Activity 1 Activity 2	Activity 2 Activity 3
Türkiye	Preparation Activity 1	Activity 1	Activity 2 Activity 3	

**Development of a National Aquatic Health Strategy for Lebanon*

Within these three activities, a set of subactivities and expected outputs were defined and carried out as described below.

Activity 1: Measuring performance of Food Value Chains-Sustainability Dimensions

At the beginning of the project, preparatory activities were carried out, as described below, including the definition of methodological aspects.

Several coordination meetings were held within the FAO Project Management Unit (PMU) to define the strategy for the establishment of the Project Task Force (PTF), and the identification of beneficiary countries and project staff.

To ensure effective coordination at country level and to maximize long-term benefits of the project, a PTF was defined and established, contributing to the smooth implementation of this first phase and supporting the overall orientation of the project. The PTF gathered, in addition to the project core team, FAO officers from relevant countries/regions to provide a

platform for regional cooperation on VCs, to help shape the project's main delivery steps and share information about progress in project implementation, as well as partners' activities and initiatives.

The first PTF meeting was held virtually on 9 March 2022, covering an overview of the project, and an update on technical and financial aspects. Communication aspects were also presented and discussed. The PTF included the PMU; representatives from the GFCM; representatives from FAO Regional Office for Europe and Central Asia, covering Albania and Türkiye; FAO Regional Office for Near East and North Africa, covering Lebanon; and FAO Subregional Office for North Africa, covering Tunisia.

Five beneficiary Mediterranean countries were identified through discussions between the core team, relevant countries and the PTF. For each country a VC of wild shrimp and/or farmed rainbow trout was discussed and assigned for investigation, as follows:

- Albania: rainbow trout;
- Italy: rainbow trout and shrimp;
- Lebanon: rainbow trout;
- Tunisia: wild shrimp; and
- Türkiye: wild shrimp.

Formal discussions with relevant ministries at country level were carried out and formal agreements were signed with them, before starting the work in the countries. Furthermore, at this stage, national and international consultants and implementing partners (through letters of agreement [LoAs]) were identified and contracted to carry out the work within the relevant countries. The process of contracting included the definition of activities, methodologies and an associated workplan to be implemented by the contracted party, followed by negotiations with identified potential partners.

The final selection of national partners and consultants was as follows:

- Albania: an LoA was signed with Hydra NGO Fishery and Aquaculture Research Centre;
- Italy: an LoA was signed with NISEA Società cooperativa;
- Lebanon: two national consultants were identified;
- Tunisia: an LoA was signed with Institut National des Sciences et Technologies de la Mer (INSTM), and one national consultant was identified and recruited; and
- Türkiye: an LoA with SÜR-KOOP was signed and one international consultant was identified and recruited.

The national implementing partners played a key role in supporting the VC Analysis (VCA) within the project by carrying out primary and secondary data collection, performing a VCA and other analyses, and providing overall technical expertise, coordination and experts at national level.

The selection of the implementing partners was based on: i) experience in relevant work; ii) experience of working with other institutions and agencies; iii) previous successful cooperation with FAO; and iv) technical experience in collecting and analysing relevant VC data in the selected countries.

Activity 1.1. Data Collection on Wild Shrimp and Farmed Trout Value Chains in Targeted Countries

Quantitative secondary data were collected on the production and international trade of relevant species at national level. Data were coded using standardized coding systems and organized into a relational database. This allowed the calculation of metrics such as apparent consumption, per capita consumption, growth rates, international trade patterns.

In addition to quantitative data, relevant published papers and reports, project reports and news releases were collected, to identify gaps in the knowledge, in preparation for the forthcoming data collection and analysis by national partners.

Meetings with FAO/GFCM and FAO/MedSudMed were held, which had ongoing project activities in the selected countries, in order to identify synergies and opportunities for building on ongoing efforts and avoid overlap.

Questionnaires and checklists for semi-structured interviews for primary data collection were prepared. In addition, materials were collected to develop training on standard methodology for data collection at national level to be delivered to national partners.

A virtual “Project introduction & methodology training” workshop was developed and delivered on 23 and 24 February 2022, to provide training and capacity building to the national partner institutions and consultants on the methodology for data collection at national level, the VCA approach, and its adaptation to local conditions. The workshop was attended by representatives from the PMU, national partner institutions and national/international consultants. The scope of the training was to provide participants with an overview of the principles of VCA, to guide them in successfully executing related activities. Additional one-to-one meetings, and follow-up discussions were subsequently scheduled, by country, for a more in-depth discussion on developing data collection tools for field work.

A follow-up workshop on the research process and the presentation of a preliminary version of the VC map was organized from 14 to 17 March 2022, to become acquainted with and adopt the project methodology.

Primary data (quantitative and qualitative) were collected by the national partners and consultants through interviews with core VC actors, key informants, group discussions with stakeholders, and field visits to farms and processing facilities. Guidance by the PMU was provided throughout the process.

Activity 1.2. Drafting Value Chains Maps and Validation through Stakeholder Consultations

Based on secondary data available and primary data (quantitative and qualitative) collected through the interviews, VC maps for wild shrimp species and farmed rainbow trout and preliminary reports were drafted. The main output was analyses of wild shrimp species and farmed trout value chains in the target countries, revealing their performance and resilience in terms of economic, environmental and social dimensions of sustainability. Coordination in the collection and analysis of data across the countries with same species was ensured throughout this activity.

An in-person progress meeting was organized and conducted from 28 to 30 September 2022 in Rome (FAO headquarters), which was attended by the PMU and partners from all countries working on the trout VC. The objectives of this meeting were to i) review the progress in primary and secondary data collection on the trout value chains in Albania, Italy and Lebanon, discuss trends and issues emerging from the research, and establish priorities for further work (one working day); and ii) review existing sources of data on the trout VC in Lebanon, finalize the data collection tools, and develop a data collection strategy for the country.



Photo 1: SVC4MED trout VC in-person progress meeting. (Credit: ©FAO).

Activity 2: Understanding performance and analysing the dynamics of the value chains

This phase of the project activities was the main assessment and analytical phase. Functional analysis was conducted. For this purpose, FAO Guiding Principles for Developing Sustainable Food Value Chains, other FAO studies and relevant sources were used.

Activity 2.1. Analysing the Structure, Dynamics and Performance of the Value Chains

Value chain analysis helped to understand the interrelated structure-conduct-performance and identify the structure of the system in every node of the chain, end markets, commercial behaviour of individual stakeholders, as well as core drivers of performance or the root causes of underperformance. Analysing the enabling environment (infrastructure and policies, institutions and processes that shape the market environment) and service providers (the business or extension services that support the VCs' operations) was also the core element of assessments. Price composition and transmission along the nodes of supply chain were used to identify market asymmetries and issues of bargain power.

Activity 2.2. SWOT Analysis & Visions for Upgrading of the Value Chains

A SWOT analysis was used to obtain a summarized and simplified strategic understanding of wild shrimp and farmed rainbow trout VCs, based on strength and weaknesses of the chains as well as opportunities and threats. Based on sustainability assessments, VC maps and SWOT analysis, an initial vision and core strategies were drafted for improving the economic performance, social outcomes and resilience capabilities of the VCs, and to reduce their environmental footprints.

Activity 2.3. Drafting Visions for Upgrading Value Chains for Targeted Species and Countries

Following on from the SWOT analysis carried out under Activity 2.2, a second draft report was developed and reviewed by the PMU. Where necessary, additional data was collected and/or the analysis was expanded.

Activity 3: Finalization of the vision document through stakeholder consultation

The final stage of the project included the organization of workshops to share with stakeholders and elaborate the drafted visions, supporting strategies and action plans for upgrading the value chains for: i) increased economic performance; ii) enhanced environmental sustainability; iii) improved social sustainability and inclusiveness; and iv) enhanced enabling environment and governance.

Activity 3.1. Organization of Workshops and Stakeholder Consultations

The drafted vision documents (core strategies and action plans) were shared and discussed with relevant stakeholders (fishers, fish farmers, processors, exporters, retailers, producers' organizations, policy and decision makers, researchers/academicians) in the target countries for co-construction, validation and finalization of vision documents, including upgraded business models, and enhanced enabling environment and governance. Dissemination of the results was also targeted at this stage, through the organization of a workshop on rainbow trout VCs in the Mediterranean and Black Sea Region, which was held in Italy with representatives from project countries and non-project countries from the region.

In addition to the activities envisaged in the initial project workplan, two more activities, directly resulting from the work already conducted in previous phases, were performed at the end of the project, as follows:

- a VC analytical toolbox was developed, using experience from the project, a methodological approach and public data; and
- a set of activities to strengthen the aquaculture biosecurity framework and manage health risks along the aquatic VC was developed. In particular, based on the results of the VCA conducted within the SVC4Med project in Lebanon, particularly considering the threats to the sustainability of the trout value chain and the critical economic and food security situation in the country, a key study and concept note were formulated for the development and implementation of a crucial National Aquatic Animal Health Strategy for Lebanon. The study proposes the establishment of a National Aquatic Organism Health Strategy (NAOHS) and includes a Progressive Management Pathway for Aquaculture Biosecurity (PMP/AB) in Lebanon.

D. IMPLEMENTATION OF WORK PLAN AND BUDGET

Work plan and budget

Activities were implemented on time and within the project budget, with no major discrepancies in relation to the workplan. Some initial minor delays were encountered for the activities implemented in Lebanon and Tunisia, due to the difficult political context, but all the issues were properly addressed and resolved. A detailed description of issues, challenges and difficulties encountered at country level is described in Annex 1.

Year		2021												2022												2023												2024											
Calendar Month / Project Month		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40								
Phase 0: Preparation																																																	
Activity 1 Data collection and literature review	1.1 Data Collection																																																
	1.2 VCA report first draft																																																
Activity 2 Analysis & Strategy Development	2.1 VCA Structure, Dynamics and Performance analysis																																																
	2.2 Swot Analysis, Visions, Goals & Upgrading strategies																																																
	2.3 VCA report second draft																																																
Activity 3 Validation & stakeholder consultations	3.1 Stakeholder Workshops																																																
	3.2 Final VCA report																																																

Figure 1: Workplan and distribution of project over the course of the project.

Resource partner contribution

The project budget of USD 559 790 was provided by the Ministry of Agriculture, Food, and Forestry Policies (MiPAAF), Government of Italy. Expenditures against this budget were done in line with the payment schedule described in the Contribution Agreement.

Coordination

Coordination within the project team and country-level activities, as well as with other relevant projects, was provided by the PMU. Within each beneficiary country, coordination with value chain stakeholders was implemented through a focal point.

Coordination with the Government of Türkiye was ensured by identifying a governmental focal point for the project in the Ministry of Agriculture and Forestry, which served as a link between the project team and the core value chain actors, particularly the fishers and producers organizations. The focal point also played a key role in establishing trust between the project staff and the stakeholders, facilitating the collection of data and the achievement of project objectives. The Ministry of Agriculture and Forestry provided the facilities for the final stakeholder meeting. Consultation with the MedSudMed team on the development of questionnaires for data collection in Türkiye was one of the outcomes of this scientific collaboration with the project.

Coordination with the Government of Albania was ensured by involving the government officials with responsibility for the aquaculture sector in the country in the initial presentation of the project and training sessions. Their involvement throughout the project was ensured through regular contacts by the national service provider, for the provision of data and information and general guidance and the oversight of the project activities. The government played an active role in the data validation and stakeholder engagement workshop. Furthermore, coordination with the FAO AdriaMed project was established, and the recommended activities of the final stakeholder workshop were noted by the project staff, with the potential for further development through AdriaMed.

In Lebanon, both consultants who formed part of the project team had long-term roles in the Government of Lebanon that were relevant to fisheries and aquaculture. In addition, due to their experience in government and other national and international organizations, they had a wide professional network and strong connections with other institutions in the country, including universities and research centres, NGOs and the private sector, with which they coordinated throughout the project, and they were essential to gathering the necessary data for the project activities and to reaching the relevant stakeholders. The FAO country office also assisted with the communication with stakeholders and coordinated the stakeholder workshop in Lebanon.

In Tunisia, the coordination between the Government of Tunisia and the project team was facilitated by the FAO country office based in Tunis. In addition, the national service provider ensured the coordination between the VC stakeholders and relevant institutions. Coordination of the activities was also achieved with the FAO MedSudMed project by FAO, which had implemented related activities in the fisheries VCs of Tunisia. Coordination, particularly on the development of a questionnaire for data collection which complemented and did not replicate previous work, was essential.

In Italy, the coordination between the VC stakeholders was ensured by the national service provider, which had strong connections with the main producer organizations in the trout and shrimp VCs, as a result of previous work in those contexts. Since the members of the national provider team also served as researchers in some of the main research institutions related to the VCs, facilities were also provided for the stakeholder meeting and good representation of the VC actor groups was ensured.

Risk management

The risk identified in the Project Document was the possibility that the rate of implementation of the project could be affected, because the extent of existing staff, data and supporting facilities in some participating countries was not yet fully clear. This risk was mitigated through effective and close coordination with the countries (relevant ministries, FAO country offices, project staff *in situ*).

Visibility

The SVC4MED website was officially launched on 19 May 2022, and is accessible via the following link: <https://www.fao.org/in-action/sustainable-fisheries-aquaculture-mediterranean/en>. The website includes a general overview of the project and methodological approach and outlines the project objectives as they related to the UN's 2030 Agenda for

Sustainable Development and SDG 14.

The website includes an individual page dedicated to the work carried out in Albania, Italy, Lebanon, Tunisia and Türkiye, a news page, an explanatory page about the project, and a resources page. In addition, information and communication about the project activities were continuously provided during the participation in international meetings and together with the dissemination of results through the stakeholder workshops at national level.

E. SUSTAINABILITY

As highlighted above, capture fisheries and aquaculture in the Mediterranean face challenges that need to be addressed for the sustainable development of these sectors. In this context, the project carried out in-depth assessments and enhanced understanding of selected Mediterranean seafood VCs, to enable the identification of concrete opportunities and strategies to improve their economic, environmental and social sustainability.

Considering that assessment is the first fundamental step for management, the first phase of the project concentrated on the analysis of wild shrimp species and farmed rainbow trout VCs in targeted countries. This was achieved mainly by analysing the performance of the VCs in terms of economic, environmental and social sustainability, *inter alia*:

- Economic: analysis of the profitability of the VCs throughout all their nodes (profits, wages, tax revenues, added value, competitiveness and consumer surplus).
- Environmental: ensuring that the VCs have a neutral or positive impact on the natural environment (environmental monitoring schemes, biodiversity, practices for minimizing carbon and water footprint, waste management schemes, certifications and overfishing);
- Social: verifying whether the VC had broad-based benefits for society inclusiveness (decent rural employment, gender equality, child labour, food security, and working conditions).
- Resilience capabilities against shocks (e.g. COVID-19 pandemic).

a. Capacity development

During the final stage of the project, a series of workshops (please see Annex 1 for details) was organized to share and elaborate the drafted vision and supporting strategies and action plan for upgrading the value chains for: i) increased economic performance; ii) enhanced environmental sustainability; iii) improved social sustainability and inclusiveness

(including decent rural employment); and iv) enhanced enabling environment and governance. Women/women's sector organizations and groups were specifically targeted.

In addition, the diverse set of expertise available at FAO made it possible to cover different aspects associated with VC analysis, including social and environmental dimensions (by analysing the performance of the VCs in terms of environmental and social sustainability).

b. Gender equality

Common roles of women include small-scale production, post-harvest industrial and artisanal processing, value addition, marketing and sales. In order to meaningfully integrate a gender lens into the project (mapping, analyses and development of a gender-sensitive vision), however, it was necessary to go beyond these overarching findings and study specific VCs in participating countries. A rapid desk-based scan identified that while some studies existed, they did not give this level of detail. FAO guidelines on gender-sensitive VCs were followed, and attention was paid to meeting the objectives of the FAO Policy on Gender Equality 2020–2030.

c. Environmental sustainability

In addition to promoting socioeconomic benefits, the project aimed to identify the main negative environmental impacts arising from the VC operations and to develop solutions in the form of strategies and actions. The implementation of these is expected to lead to more sustainable wild shrimp and farmed trout VCs overall, by reducing or eliminating the existing negative environmental impacts and reducing the risk for further ecological and environmental degradation and compromised animal welfare (e.g. preservation of marine biological diversity and stocks, better environmental management, monitoring of aquatic animal health, preparedness for environmental shocks).

d. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

The fisheries and aquaculture sector is characterized by a high prevalence of informal work arrangements, underemployment and seasonal and casual employment. The analyses included assessments of the extent to which national laws related to decent labour existed and to what extent they complied with internationally agreed standards.

The project therefore engaged a legal specialist on decent labour and gender to integrate the existing frameworks and provide an evaluation of the extent to which these frameworks met accepted criteria.

e. Technological sustainability

The intraregional synergies that were activated during the implementation of the project will facilitate intraregional coordination, management of transboundary resources, trade, identification of emerging markets, and transfer of new available technologies. Furthermore, the promotion and use of improved technologies and techniques on farms and in processing facilities aimed to lead to improvements also in terms of environmental and economic sustainability (e.g. through reduced waste, improved productivity and efficiency).

f. Economic sustainability

The VC is an economic system and its continued functioning depends on economic sustainability. One of the main goals of the project was to assess the wild shrimp and farmed rainbow trout VCs in terms of economic performance (profits, wages, tax revenues, added value, competitiveness and consumer surplus), outcomes and profitability throughout all the nodes of the VC, as well as to develop solutions to identified challenges.

F. LESSONS LEARNED

Lessons learned – *Elements of success*

Value chain analysis is a multidisciplinary endeavour, necessarily covering a diverse set of aspects associated with complex economic systems. Market demand, on-farm technical performance and productivity, support services in the enabling environment, power relations between actor and political economy, strategic management, and social and environmental impacts are some of the background disciplines on which VC analysis, as per the FAO guidelines for sustainable food value chains, is based.

Therefore, the composition of a team whose members are knowledgeable in these areas and have experience with qualitative and quantitative data collection and analysis is an important element of the success of any VC project. In this project, the PMU team comprised senior experts with long experience in the fisheries and aquaculture sectors, as well as younger specialists on VCs, and the necessary supporting staff, which was one of the key elements of success. The diverse set of expertise available at FAO made it possible to cover the multiple demands of VC analysis.

In addition, the network of FAO country offices meant that in-country support was available and FAO staff were present to assist, either with directly supporting the national service provider in executing the necessary tasks and delivering project results, or with

coordinating between a variety of stakeholders. This was particularly the case of Tunisia and Lebanon, where the challenging political and economic environment required additional support from the country offices.

In addition, the experience and capacity of FAO staff outside the current project team, through related projects such as AdriaMed, MedSudMed and GFCM, played an important advisory role in identifying the stakeholders in the project countries and the elimination of any potential duplication in the data collection efforts. Thus, the establishment of tailored questionnaires for Albania and Tunisia was done with the help of these external FAO staff.

The country-level activities, and particularly the data collection effort, were aided by active focal points in the beneficiary countries. In Türkiye, for example, the focal point was a government official whose active role allowed access to the fishers and trust with them was easily established. Similarly, the national service provider in the country had close connections with the fishers and downstream VC actors, further facilitating the process of data collection.

Similarly, the well-established networks and strong connections with the private sector of the Albanian, Italian and Lebanese service providers and consultants made possible the collection of data, which would otherwise have been more challenging to collect. This was thanks to their ability to establish trust with the stakeholders and providers of data, leveraging their longstanding professional relationships.

Finally, the involvement in the analysis stage of researchers and academics with extensive experience in report writing and economic analyses made it possible to meet the requirements of VC analysis.

Lessons learned – *Impediments/constraints*

There were some delays in the contracting of national project partners and staff to carry out the planned activities at local level, which can be attributed to general delays in the workflow processes due to COVID-19 pandemic issues.

Additional constraints during the implementation period of the project included some delays of the service providers, particularly in Tunisia, due to the difficult economic and political situation, which were addressed by having regular contact and clear explanation of the requirements, as well as by providing methodological training and assistance. The FAO country offices (especially in Lebanon and Tunisia) were always engaged in the support of the execution of project activities and delivery of project results. A specific mission was also organized to negotiate the terms of the LoA and to resolve identified issues linked to the provision of primary data on the Tunisian shrimp VC.

Technical challenges, related to the collection of firm-level data were also encountered. The first type of challenge was linked to the extreme heat waves in 2022 in Italy, which led to substantial losses of farmed fish in Italy. This prevented the planned on-farm visits by the national service provider, and instead information was gathered by telephone or through key informant interviews.

A second type of challenge was related to the lack of knowledge on behalf of the interviewees about certain aspects of the sustainability of operations, such as economic performance or environmental performance, or their unwillingness to share such information due to fears that it could undermine the competitiveness of the business. Specific challenges encountered in all project countries were related to the difficulty in obtaining some of the required data for the envisaged detailed analyses. In particular, in the process of data collection at actor level, it was identified that some types of data, especially economic data, posed two types of risks: i) due to the lack of knowledge or the sensitive nature of the data, many actors were not able to provide the requested figures, particularly relating to costs, prices, profits, and taxes; ii) there was a risk that these figures were not accurate. This was addressed by cross-checking with secondary data (existing publications and publicly available data sources) as well as through stakeholder consultations, workshops and data validation sessions. The service providers were required to investigate and seek to improve the quality of the data. In general, the reliability of the collected primary data was properly evaluated, and only reliable data were used, or plausible assumptions were made when necessary. Where discrepancies were identified or when issues were raised by stakeholders, additional data were collected by the service provider, or clarifications were provided to justify the existing numbers; iii) the risk of undermining the competitiveness of the actors who disclosed economic data was addressed by always presenting the data in aggregated form, or by relying on publicly available data; iv) during stakeholder meetings, a variety of VC stakeholders was present, and in certain cases there were pre-existing tensions between them, linked to different interests in the VC. Utmost care was taken by the facilitators to avoid any conflicts and always steer the conversation in a constructive direction.

G. FOLLOW-UP ACTIONS FOR GOVERNMENT ATTENTION

In general, there are no remaining issues to be addressed under the project. On the basis of the analyses performed, and in consideration of the need for assistance with the establishment of recommendations for the sustainable development of VCs, upgrading strategies were developed in line with the objectives of the project.

In particular, a preparation for moving beyond the scope of the project, into the implementation of the development recommendations identified in the value analysis, was initiated, with a focus on Lebanon, given its priority status among the five project countries in terms of food insecurity and rising poverty, as well as the potential for addressing the significant sustainability issues facing the VCs. As mentioned above, based on the results of the VCA conducted within the SVC4Med project in Lebanon, particularly considering the threats to the sustainability of the trout value chain and the critical economic and food security situation in the country, a proposal was formulated for the development and implementation of a crucial National Aquatic Animal Health Strategy for Lebanon. The study proposes the establishment of an NAOHS and includes a PMP/AB in Lebanon. The idea was welcomed by government representatives and initial discussions and coordination activities have been initiated to define the implementation framework for a possible follow-up activity/project subject to funding availability.

Lebanon

In 2019, Lebanon entered what the World Bank describes as one of the “most severe (financial) crises episodes globally since the mid-nineteenth century” (World Bank, 2021). The currency was devalued by 90 percent, coupled with high rates of inflation. Unemployment increased from 11 percent in 2019 to 30 percent in 2022 (World Bank, 2022). More than half the country’s population was probably already below the poverty line.

A collapse of public services, power and water shortages were some of the other common consequences citizens experienced daily. Disease outbreaks increased, including cases of cholera. Moreover, the economic crash significantly undermined the food security of those living in Lebanon, a country already affected by institutional and social fragility and hosting a high number of refugees.

Based on the current classification, in 2023, 21 percent of the Lebanese population (about 806 000 people), and 36 percent of the Syrian refugee population (some 540 000 people) were estimated to be in Integrated Food Security Phase Classification (IPC) Phase 3 (Crisis) or above, requiring urgent measures to reduce food gaps, diversify food

intake, protect, and restore livelihoods and prevent acute malnutrition (IPC, 2023). The social impact, already profound, could have become worse.

Action to prevent malnutrition, and protect and restore livelihoods needed to be taken throughout the food production system, including the aquatic foods VC, which is an important source of protein and essential nutrients. The vast majority of aquatic food products in Lebanon were imported, which, due to currency devaluation were increasingly unaffordable for the local population. At the same time, there was considerable potential for increasing the utilization and sustainable use of the country's aquatic resources.

Thus, the development of a sustainable domestic aquaculture VC was a viable way to achieving those objectives. In 2022, more than 90 percent of the national aquaculture production in Lebanon consisted of rainbow trout. According to the same source, rainbow trout production increased by 57 percent between 2011 and 2019, reaching its ever-recorded maximum of more than 4 100 tonnes in 2019.

In the same year, there were around 367 trout farms, concentrated in the caza (district) of Hermel along with the Assi River (Comprehensive Aquaculture Census, 2019). Most of the farms were microscale family-owned and operated ventures with around 50 percent of the farms having a total pond/raceways volume of less than 500 m³. After land crop production, aquaculture is the second most important economic activity in the Hermel region.

Due to the importance and high potential of the rainbow trout VC for further development, it was selected for analysis within the SVC4MED project. Field visits by local experts in 2022-2023 and interviews with farmers and other VC actors revealed that the sustainability of trout farming was compromised by a number of issues, a primary one among these was disease outbreaks, resulting in productivity loss, food loss, and a risk of developing antimicrobial resistance.

Moreover, a more formal stakeholder meeting was organized in 2023, which served as a platform for various participants, including farmers, input suppliers, processors, distributors, government representatives, and academia, to have a constructive discussion on how to address the main challenges, explore opportunities, and identify priority actions for improvement.

The farmers reiterated that they were suffering from fish disease-related losses and the lack of veterinary services. Without the understanding of the fish diseases, farmers have no control over their production. A disease outbreak can result in a loss of investment and months of hard work of taking care of the fish and facilities. No specialized diagnostic laboratories, nor veterinarian services for fish diseases were available to family farmers. There was no formal fish disease diagnosing process. Instead, farmers relied on general

animal veterinary shops to get advice and medicaments for their fish farms. In most cases, the treatments offered by the veterinary shops involved a type of antibiotic. Indiscriminate use of antibiotics, however, increases the risk of developing antimicrobial resistance.

Indeed, the issue about fish diseases is symptomatic of a more serious problem. The aquaculture industry in Lebanon operates as an informal sector, outside of the management and administrative boundaries of the Lebanese government. This issue is not uncommon for aquaculture in many countries around the world, where it has evolved faster than the administrative structures designed to ensure its sustainable development. According to FAO, around 50 percent of the countries have complete and enabling policy, legal, institutional frameworks for aquaculture in line with the Code of Conduct for Responsible Fisheries. In the case of Lebanon, a formal administrative framework has been drafted but has not yet implemented.

A long-term sustainable solution to the problems experienced by farmers would require the establishment of a firm foundation for aquaculture and its future development. This can only be possible if relevant laws are established and a formal strategy for the development of the sector is adopted. The administrative framework and strategy will ensure that the production is environmentally sustainable and does not enter in conflict with other resource users. When the sector is formally recognized, farmers should be able to benefit from increased support from the government, in the form of service provision such as veterinary and diagnostic services and training.

Therefore, a follow-up activity to the project VCA envisages that support be provided to the Lebanese government to implement the governance framework for aquaculture. Moreover, as mentioned above, the development and implementation of an NAOHS is also planned as a priority follow-up activity, since it is vital that these aspects are addressed simultaneously as the country is making progress towards formalizing the aquaculture sector and developing an administrative framework. These foundational documents will serve as a basis for the sustainable transformation and further development of the Lebanese aquaculture industry, and thus provide support to a vulnerable population.

Appendix 1

LOGFRAME MATRIX - ACHIEVEMENT OF INDICATORS

Results chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	Baseline ³	End target (<i>expected value at project completion</i>)	Achieved		
Impact	The final objective of this project is to develop upgrading visions (set of goals) including policies and strategies to improve the competitiveness and sustainability of wild shrimp species and farmed rainbow trout value chains in the Mediterranean region.					
Project Outcome	New improved approaches, strategies and policies developed and adopted.					
Activity 1 Measuring performance of Food Value Chains- Sustainability Dimensions	Definition of maps of wild shrimp species and farmed trout value chains.			Achieved Based on secondary data available and primary data (quantitative and qualitative) collected through the interviews, VC maps for wild shrimp species and farmed rainbow trout and preliminary reports were drafted. The main output was analyses of wild shrimp species and farmed trout value chains in the target countries, revealing their performance and resilience in terms of economic, environmental and social dimensions of sustainability. Coordination in the collection and analysis of data across the countries with same species was ensured throughout this activity.		

³ Baseline and targets: specific literature on value chains for shrimp species and trout in the Mediterranean is scarce. It was therefore impossible to define clear baseline for the project before its inception. The outputs and outcomes of the project would thus generate in-depth analysis of value chains for both group of species and provide clear data and information to be the baseline in the Mediterranean. (From the Project Document).

Results chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	Baseline ³	End target (<i>expected value at project completion</i>)	Achieved		
Activity 2 Understanding performance and analysing the dynamics of the value chains	Knowledge of structure, dynamics and end market of wild shrimp species and farmed trout value chains in targeted countries.			Achieved Value chain analysis helped to understand the structure of the VCs in every node of the chain, end markets, commercial behaviour of individual stakeholders, as well as core drivers of performance or the root causes of underperformance. Analysing the enabling environment (infrastructure, policies, institutions, services and processes that enable or hamper the optimal functioning of the VC) was also a core element of assessments. Price composition and transmission along the nodes of the supply chain were used to identify market power asymmetries.		
Activity 3 Finalization of the vision document through stakeholder consultation	Preparation of plans for improving the competitiveness and sustainability of wild shrimp species and farmed rainbow trout value chains in targeted countries including the business models and strategies.			Achieved Workshops were organized to share with stakeholders and elaborate the drafted visions, supporting strategies and action plans for upgrading the value chains for: i) increased economic performance; ii) enhanced environmental sustainability; iii) improved social sustainability		

Results chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	Baseline ³	End target (<i>expected value at project completion</i>)	Achieved		
				and inclusiveness; and iv) enhanced enabling environment and governance. The drafted vision documents (core strategies and action plans) were shared and discussed with relevant stakeholders (fishers, fish farmers, processors, exporters, retailers, producers' organizations, policy and decision-makers, researchers/ academics) in the target countries for co-construction, validation and finalization of vision documents, including upgraded business models.		

Appendix 2**DOCUMENTS PRODUCED DURING THE PROJECT**

FAO. 2024. Annex 1 - *Main activities and key achievements at country level.*

FAO. 2024. *Proposal for the development and implementation of a crucial National Aquatic Animal Health Strategy for Lebanon.* (It has been finalized and is available on request).

Value Chain Analysis reports have been finalized for each country. (Available on request).

Appendix 3**PROJECT STAFF⁴**

Function	Dates of Service	
	Starting Date	Concluding Date
<i>International staff</i>		
Lead Technical Officer	8 June 2021	31 July 2024
Programme Officer	8 June 2021	31 July 2024
Value chain analysis and development expert	8 June 2021	31 July 2024
Senior Project Adviser on Fishery and Aquaculture	8 June 2021	31 July 2024
Aquaculture and Fishery value chain expert for Italy	8 June 2021	31 July 2024
Aquaculture value chain expert for Türkiye	8 June 2021	31 July 2024
Fishery value chain expert for Tunisia	8 June 2021	31 July 2024
Web communication expert	8 June 2021	31 July 2024
Administrative support Consultant	8 June 2021	31 July 2024
<i>National staff</i>		
Aquaculture value chain expert for Lebanon	8 June 2021	31 July 2024
Aquaculture value chain expert for Lebanon	8 June 2021	31 July 2024

⁴ The project staff has been mobilized at the beginning of the project, during the First Reporting period, cost-shared with other FAO projects and Regular Programme activities. They all worked under the GCP/INT/745/ITA for a limited number of days throughout the overall project implementation period.

Appendix 4**TRAINING AND STUDY TOURS**

Number of Participants	Title of Study/Training Tour	Place	Date
22	Project introduction & methodology training workshop on the methodology for data collection at national level, VCA approach and its adaptation to local conditions.	Online	23-24 February 2022
22	Follow-up workshop on the research process and the presentation of a preliminary version of the VC map.	Online	14-17 March 2022

ANNEX 1: MAIN ACTIVITIES AND KEY ACHIEVEMENTS AT COUNTRY LEVEL

The final report on the main activities and key achievements at country level is provided in this document.

Türkiye

Preparatory phase

The first coordination/kick-off meeting was organized (virtually) on 1 April 2022, with the participation of the project national focal point (General Directorate of Fisheries and Aquaculture, Ministry of Agriculture and Forestry), experts from the Department of Capture Fisheries, experts from the national partner identified (SÜR-KOOP) and Project Management Unit (PMU). One international consultant was identified and recruited to serve key roles in coordination and data analysis.

Aquafarm2022 (international conference and trade show on aquaculture, algaculture and fishing industry) held in Pordenone (Italy) on 25 and 28 May 2022, was an opportunity to organize a meeting with Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily (MedSudMed) project team (26 May) to introduce the Sustainable Fisheries and Aquaculture Value Chains for the Mediterranean (SVC4MED) - Turkish Wild shrimp value chain (VC) project activities and discuss possibilities of scientific support of the MedSudMed project with the Turkish team, including the share of information and experience. Consultation with the MedSudMed team on the finalization process of constructed questionnaires for data collection in Türkiye was one of the first outcomes of this scientific collaboration.

Secondary data collection

A scoping review, including scholar journals, books, newspapers, websites and official statistical began in the first phase and was continuously updated during the first phases of the project, reaching over 100 sources in the fields of governance/conservation, technical/gear selectivity, seafood consumption, economics and trade, quality/processing, biology/taxonomy, catch composition/bycatch/discard, and seafood safety issues. Quantitative data and qualitative information extracted from these sources are not only meant to complement primary data but also shed light on “missing data” to be collected by primary data collections schemes.

Primary data collection

The bulk of the quantitative and qualitative information for functional analysis, sustainability assessments and VC upgrading was planned to be collected through VC actor interviews, key informants’ interviews, and stakeholder consultations. The interviews covered core actors along the wild shrimp VC, including fishers, middlemen/commissioners/wholesalers, processors, exporters, and retailers, using actor-specific semi-structured questionnaires.

Draft questionnaires were constructed for face-to-face interviews. Questionnaires included sections on general information, technical information, financial data, markets and marketing, suppliers (for processors, wholesalers, retailers, and exporters) wages and working conditions and ecological/environmental aspects.

The draft questionnaires were shared with the PMU for consultation and finalization. Having a long experience in fisheries in the Mediterranean and field surveys, the MedSudMed project team was also consulted for this purpose. Following feedback from the PMU and MedSudMed project

teams and proposed modifications and fine-tuning, the questionnaires were finalized and used in field surveys for primary data collection. The final version of the questionnaires was then translated into Turkish by the FAO consultant, to be used in the interviews.

The number of fishers (fishing vessels) to be interviewed was computed by sampling techniques. Sample size included 86 vessels using different gear in the Aegean, Mediterranean and Marmara regions. The data were collected by the end of September 2022.



*Photo 1: Mersin, East Mediterranean Coast of Türkiye. Interview with processors.
(Credit: ©FAO).*



*Photos 2 and 3: Güllük Fishing Port. Güllük/Muğla. Aegean Coast of Türkiye. Interview with fishers.
(Credit: ©FAO).*



*Photos 4 and 5 Processing. İzmir. Interviews with a processor. Aegean Coast of Türkiye.
(Credit: ©FAO).*

A short questionnaire was constructed and shared with the PMU to collect qualitative data on wild shrimp VC from national experts, including researchers from fisheries research institutes, universities, and local technical personnel. The questionnaire covered economic, social and biotechnical/ecological aspects of the wild shrimp VC, and was sent to targeted informants by email.

During the surveys, it was not possible to include all the vessels belonging to selected length/fishing gear classes, as planned. Some of the fishers/processors/wholesalers/retailer did not accept to answer the questionnaires.

Value chain analysis (VCA), strengths, weaknesses, opportunities and threats (SWOT) and upgrading strategies

Data collected through interviews were consequently digitalized, tabulated and statistically processed (descriptive and diagnostic), using SPSS and Excel programs. The processed data were used in functional analysis and sustainability assessments (Indicators). Data were presented as 56 bar charts and 16 tables in the value chain analysis report. Demographic, labour and wages, recruitment types, distribution channels, trade, apparent domestic consumption, fishing costs and revenues, operating accounts, direct value added, economic, environmental, and social indicators were among the quantitative data presented in the report. A qualitative assessment, including SWOT and resilience analysis and a sustainability heat map was also covered in the report. The final report underwent several revisions following the comments and inputs from project team members. In the light of the findings of the project, along with SWOT and resilience analysis and sustainability assessments, a vision and a set of upgrading policies and strategies with supporting actions were developed. The developed upgrading strategies were revised and finalized, in line with discussions and objectives identified in consultation with stakeholders.

Validation and consultation workshop with stakeholders

The findings of the project and formulated vision and upgrading strategies were shared with a wide array of stakeholders, including fishers, processors, wholesalers, and retailers for validation and consultation purposes in Mersin in April 2023. The workshop was organized in close cooperation with SÜR-KOOP as the local service provider and the Ministry of Agriculture and Forestry, General Directorate of Fisheries and Aquaculture. Food and Agriculture Organization of the United Nations(FAO) staff from Rome headquarters and the country offices also attended the workshop. Several goals/objectives were also identified by stakeholders, which were included in the final VC report. The finalized VC report documents were presented to stakeholders, including the Ministry of Agriculture and Forestry, General Directorate of Fisheries and Aquaculture and fisheries cooperatives for further approval.



Photo 5: Value chain stakeholder meeting in Türkiye. (Credit: ©FAO).

Tunisia

Preparatory phase

Some initial issues with the signature of the project documents by the Government of Tunisia caused a delay in the commencement of project activities in Tunisia. Once the start of project activities at country level was officially approved for Tunisia, the national partner was identified (Institut National des Sciences et Technologies de la Mer [INSTM]). However, the finalization of the Letter of Agreement (LoA) with INSTM for the execution of planned activities in Tunisia experienced further delays due to some controversy regarding the provision/use of primary data.

Considering the challenges of online communication (response time) as well as the need to resolve the issue quickly and begin data collection, a mission to Tunis to meet in person with representatives of the service provider and negotiate the terms of the LoA was organized in July 2022, as described below.

Secondary data collection

A bibliographical review of previous work on VCA of target shrimp species was undertaken to extract relevant quantitative and qualitative information. During this phase, coordination was sought with the Tunisian government institution Groupement Interprofessionnel des Produits de la Pêche (GIPP), which had already carried out two studies directly related to the objectives of this project.

Furthermore, coordination was pursued with the FAO project MedSudMed, which is also interested in the shrimp fishery in Tunisia, with a focus on upstreaming VC nodes. The first coordination meeting with MedSudMed for shrimps in Tunisia was held on 4 May 2022 to identify common points and synergies and optimize the use of the available resources. After that, online follow-up meetings and exchanges were held between the two projects teams, allowing them to share information and methodologies and fine-tune the questionnaires.

Mission to Tunis

A field mission to Tunis (Tunisia) was organized from 25 to 28 July 2022. The primary objective of the mission was to meet in person representatives of the local service provider identified (INSTM) to negotiate the terms of the LoA and to resolve identified issues linked to the provision of primary data on the Tunisian shrimp VC. During the mission, an agreement was successfully reached with INSTM on the workload within the allocated budget and a provisional sampling strategy was developed. The mission also represented an opportunity to meet with other key local stakeholders from the public and private sectors and a professional organization, to introduce the project and secure their cooperation and future support for the project. Recommendations were obtained on the potential VC issues that the project could address. The terms of reference of the LoA between FAO and INSTM were negotiated and concluded during the field mission, which also included the provision of a methodological approach to collect and analyse primary data, including fine-tuning of the drafted questionnaires, to be adapted to local context. Two shrimp VCs were selected for analysis: deep-water rose shrimp in the Northern region and caramote prawn in the Southern region of the country.

Primary data collection

In order to undertake the sustainability assessment and the VC heat map and to formulate upgrading strategies, secondary data needed to be complemented with primary data to address specific aspects of the VC, including technical and financial data, markets and marketing issues, wages and working conditions, as well as environmental aspects. The data collection process covered all the actor types in the VC, namely fishers/producers, wholesalers, processors and retailers.

In this respect, questionnaires were drafted and shared with the MedSudMed project team for review, based on their extensive experience in data collection for targeted shrimp fisheries in Tunisia. A series of discussions and exchanges between the SVC4MED and MedSudMed teams made it possible to review and improve the drafted questionnaires.

Fieldwork on the deep-water red shrimps (DWRS) VC began in January 2023, in four governorates, namely Jendouba (Tabarka fishing port), Bizerte (Zarzouna fishing port), Tunis (La Goulette port) and Nabeul (Kélibia fishing port). Ports were selected because the largest share of the fishing fleet exploited this shrimp in this area. The sampling aimed to cover the different actors in the DWRS VC, starting with the fishers, passing through to the traders, arriving at the transformation of the shrimp in the processing plants, and finally, the destination of the product.

Fieldwork on the caramote prawn VC began in July 2023 at the fishing port of Sfax in the Governorate of Sfax. It was selected due to being the main location for the fishing fleet involved in caramote prawn harvesting in the area. It indeed serves as the primary port for nearly all the trawlers operating in Southern Tunisia. Furthermore, surveys were conducted in local markets and processing facilities dedicated to caramote shrimp activities in the Sfax region.

The collected data were entered into electronic form and were presented by the service provider and discussed with the project team. Comments were formulated and submitted to the service provider for revision and/or clarification. The service provider provided responses and clarifications to the issues raised. Some of the requested data, particularly relating to costs, were difficult to obtain due to the sensitive nature of the information and general reluctance of interviewees to share such information or due to the absence of record-keeping. To address the issue, the reliability of the data was examined, and only reliable data were used, or plausible assumptions were made.

The collected primary data on VC activities of DWRS and caramote prawn enabled the international consultant to undertake the sustainability assessment analysis and prepare a draft value chain report.

Economic performances were calculated for the key VC actors, mainly fishers and processors. The indicators were compared and cross-checked with previous publications.

The findings of the VCA served as a basis for a stakeholder meeting in which the results were presented to VC actors and representatives of relevant organizations and the government, in order to validate the results and obtain stakeholders' feedback on the potential upgrading VC strategies developed in the report, as described below.

Stakeholder workshop

A stakeholder meeting was organized on 30 January 2024 with the support of FAO Tunis and the national project partner, INSTM. It was attended by a wide range of stakeholders, including representatives of the fishing industry, the processing industry, government, research and trade. Participants comprised high-level government officials, including the directors-general of the Directorate-General for Fisheries and Aquaculture (DGPA), the GIPP and the INSTM. The meeting was conducted in a hybrid mode, which allowed a wider participation, including FAO experts, while reducing costs and greenhouse gas emissions.

The results presented were based on the data collected by the national partner, INSTM. While they were generally accepted, some stakeholders emphasized that there was a price difference for DWRS products destined for export and domestic markets, which was not captured in a sufficient level of detail in the analysis. Moreover, there were concerns that the reported prices for export products were higher than the actual prices. This feedback necessitated additional data collection and consultation in order to further verify the data and expand the dataset.

The elements of the upgrading strategy were welcomed by the participants. Some of the proposed actions were deemed highly relevant, in particular the modernization of landing facilities, capacity building for actors along the VC, and support for scientific research.



*Photo 6: Tunisian shrimp value chain stakeholder meeting in Tunis, 20 January 2024.
(Credit: ©FAO).*

Additional data collection and revision of the VC report

As necessitated by the stakeholder meeting, additional data were collected by INSTM in order to verify the first sale prices of DWRS and update the economic performance indicators in the sustainability analysis. Visits were made to La Goulette port where fishers were interviewed, and consultations were carried out with key informants, including economists at INSTM, GIPP, as well as the Tunisian Union of Agriculture and Fisheries (UTAP). As a result, an additional level of analysis was included in the report, covering seasonality in prices and differences according to the targeted market. The finalized report is being shared with stakeholders and will be published.

Albania

Following the methodological training, the implementing partner collected primary and secondary data, as per the methodological guidelines, which served as a backbone to the subsequent VCA phase.

Secondary data collection

No previous study had been conducted on the VC for rainbow trout in Albania, so the preparation of the draft report was focused on gathering all the available information for the aquaculture industry and especially for trout aquaculture. Hydra collected secondary data through literature review consultations with the national Institute of Statistics (INSTAT) and the Directorate of Fishery Service and Aquaculture at the Ministry of Agriculture and Rural Development (MARD), and other sources such as project reports. The secondary data gathering continued throughout the project to update the findings with data and information from new publications.

Primary data collection

Based on the secondary data, Hydra prepared the questionnaires for primary data collection and drew up a plan for the collection of primary data, which were revised by the PMU.

The plan for the collection of primary data aimed to cover all licensed trout farms in Albania (which was subsequently updated to include all trout farms, 29 in total in 2023) and to investigate the domestic markets for fish and seafood (since the VC was simple, and detailed investigation of other VC links was not applicable). The farm-level survey was conducted through interviews with farmers, following a detailed quantitative and qualitative data questionnaire, while the market study took the form of semi-structured interviews with retailers, shop assistants and consumers.

The process of primary data collection was completed in September 2022. In consideration of the limited secondary data availability, the VCA needed to be based mostly on the primary data that were collected from the field and the materials provided by the project PMU.

In addition, the information needed for the VCA would cover only the last decade, due to the limited time series.

The Hydra team participated in the workshop in FAO headquarters from 28 to 30 September 2022, which aimed to review the progress in primary and secondary data collection on the trout VCs, as well as to discuss trends and issues emerging from the research and establish priorities for further work. The meeting was also instrumental in providing guidance to perform the functional analysis and sustainability assessment and other analyses of the farmed trout value chain in Albania, to propose an upgrading strategy for the sector.

Value chain analysis, SWOT and upgrading strategies

In the second phase of the project, Hydra NGO Fishery and Aquaculture Research Centre sought the expertise and collaboration of two esteemed partners: the Agricultural University of Tirana and the MARD, which together carried out an analysis of the collected data, in line with the requirements for a functional and sustainability assessment in the project methodology. This included an end-market analysis, analysis of the actors along the VC (farmers, processors, wholesalers), as well as the role of the enabling environment (support providers, social and natural environment, governance).

The functional analysis was accompanied by an assessment of the economic, environmental and social impacts of the VC. On the basis of these assessments an analysis of the SWOT was performed, and a set of policy recommendations were developed. Throughout the preparation of the VC report, the Hydra NGO Fishery and Aquaculture Research Centre team received invaluable support and expertise from specialists within the MARD and the PMU team. This collaborative effort was instrumental in crafting a comprehensive report that encapsulated all the essential information and analysis pertaining to the rainbow trout VC in Albania.

Several revisions of the report were made. By drawing on the insights garnered from data analysis, expert guidance, and the designated template, the team endeavored to create a report that not only provided a comprehensive overview of the VC, but also offered a deep and insightful analysis of the intricate dynamics within the sector. This final report aimed to serve as a valuable resource for stakeholders, decision-makers and individuals invested in the sustainable development and enhancement of the rainbow trout aquaculture sector in Albania.

Stakeholder workshop

In addition, a workshop focused on the rainbow trout VC in Albania was convened in Tirana. The workshop served as a crucial forum for engaging with stakeholders from various facets of the sector. It was attended by farmers, input suppliers, processors, distributors, government representatives, and academia, to convene and discuss the sustainable development of the trout VC. The main objectives were to address challenges, explore opportunities, and identify priority actions for improvement. All participants actively engaged in constructive dialogues, particularly between producers and the public administration.

The workshop not only provided a platform for open discussions among stakeholders, but it also underscored the importance of addressing these critical issues for the continued growth and sustainability of the rainbow trout aquaculture sector in Albania. The proposals put forth by stakeholders served as a vital input to the VC upgrading strategy section of the report and for the prioritization of the further action needed to improve the sustainability of the value chain.

Challenges encountered

The project encountered several challenges during its implementation:

1. *Lack of previous documentation*: one of the initial challenges faced was the absence of prior documentation related to the VCs of farmed and fished species in Albania. Consequently, the VCA had to rely heavily on the information collected during this project and the documentation provided by the PMU.
2. *Limited historical data*: due to a limited time series, the project was constrained to utilize data spanning only the last decade. To ensure the reliability of the analysis, data exclusively from reputable sources such as INSTAT, MARD, and FAO-STAT were incorporated into the study.
3. *Accessibility issues*: the project encountered difficulties in accessing certain small trout companies, primarily due to challenging terrain and a lack of road infrastructure. These accessibility issues affected the timeline of the data collection process. In some instances, the team overcame these challenges by accompanying farm owners or even by resorting to walking to reach remote farm facilities.
4. *Questionnaire preparation challenges*: the preparation of questionnaires posed another hurdle. It was essential to design questionnaires that could effectively gather the required

information for the VCA, especially through field surveys. With the guidance and support of the PMU, the questionnaires were crafted. The questionnaires were comprehensive, requesting detailed information, which sometimes made their practical use in the field challenging. Particularly for small family-run farms, gathering all the necessary information proved difficult. To address these gaps, the project team had to leverage their expertise in the aquaculture sector and supplement the questionnaires with additional information, where possible.

Navigating these challenges required resourcefulness and adaptability on the part of the project team, highlighting their commitment to the project's success and the importance of their knowledge and field experience in overcoming these obstacles.

Italy

The first activity implemented by the national partner was the adaptation of the standard methodological approach to the Italian context of the farmed rainbow trout (*Oncorhynchus mykiss*) and wild shrimp. The approach was highly participatory, involving VC stakeholders from the public and private sectors from the outset in order to ensure national ownership.

Shrimp from capture fisheries

During the initial phase of project implementation, the work distribution and the plan to collect data and information were carried out and organized. Two case studies were selected based on the most representative fishing fleets carrying out the fishery of the deep-water rose shrimp (*Parapenaeus longirostris*), giant red shrimp (*Aristaeomorpha foliacea*), and blue and red shrimp (*Aristeus antennatus*) in Italy. They were:

- The area from Monopoli to Manfredonia - Molfetta (Apulia region) within geographic subarea (GSA) 18, Southern Adriatic Sea;
- Mazara del Vallo (Sicily region) within GSA 16, South of Sicily.

Secondary data gathering and literature review

Secondary data and information on shrimp production and value chain sources included, among others, the Fisheries Dependent Information (FDI) database containing data submitted by the European Union (EU) Member States under the Data Collection Framework (DCF; Regulation (EU) 199/2008). The FDI was complemented by market data and reports sourced from the Italian Chambers of Commerce System database on wholesale prices (Borsa Merci Telematica Italiana [BMTI]) and the European Market Observatory for fisheries and aquaculture products (EUMOFA) database.

In addition to market reports, secondary data sources included available administrative and organizational records, publicly available reports (e.g. Scientific Advisory Committee on Fisheries [SAC] - Working Group on Stock Assessment of Demersal Species [WGSAD], 2022), as well as scientific papers. In particular, for the deep-water rose shrimp – GSA 18 case study, the great bulk of information was derived from the preliminary VCA developed under the BluFish Project,¹ by means of a survey implemented in some of the main ports of the Southern Adriatic Sea. Data and information were organized in a database for further analysis. A first draft VC report based on

¹ <https://www.msc.org/what-we-are-doing/pathway-to-sustainability/blufish-project>

secondary data was prepared and a preliminary list of data gaps and needs was developed for both study areas.

Primary data collection

Rapid appraisals were carried out through visits to local markets and key or typical VC actors, such as local fishers' retailers and wholesalers. The draft questionnaire was prepared based on the agreed project methodology. Draft versions of the questionnaire were shared with the PMU for feedback and to ensure that the questionnaire was aligned with those of other countries in the project. Subsequently the questionnaire was finalized and tested.

Interviews were mainly intended to collect qualitative, additional and not otherwise available data. For data concerning the fleet, production and market, interviews mainly served to validate information already collected based on the above-mentioned secondary data or sourced from the balance sheets of companies. The interviews were carried out either face-to-face or by phone.

Functional analysis and sustainability assessment

Data input in the database was carried out regarding the production of socioeconomic indicators collected from the EUMOFA database and the European data collection databases. Data analysis covered the functional analysis of the VC, including the VC maps of both case studies, which were updated and expanded on the basis of information collected during the field interviews. The sustainability assessment covered the economic, social, environmental and resilience analysis and the first draft of the sustainability heat map. Some revisions of the results were made based on newly available data and further information collected from key informants.

In particular, revisions of the report on the deep-water rose shrimp VC included establishing stronger links with other projects and initiatives active in the region, such as BlueFish Project and the General Fisheries Commission for the Mediterranean (GFCM), and the initiative for improving governance of the fishery through ecocertification by the Marine Stewardship Council. Improvements in the economic and environmental sustainability analyses were carried out throughout the reports. Importantly, throughout this period, significant improvements were made to the SWOT analyses and upgrading strategies for all VCs, by identifying appropriate and realistic response actions to existing opportunities and threats.

Stakeholder workshop

The results were further validated and developed with the inputs from stakeholders at the VC stakeholder meetings organized in Mazara del Vallo, the main port in Italy, with the largest share of the Italian fleet targeting giant red shrimp, and where most of the harvest is landed. The stakeholder meeting was organized by Nisea Societa cooperativa (a fisheries and aquaculture economic research cooperative) and held within the National Research Council of Italy (CNR) in December 2023 in a hybrid mode, allowing in-person participation by a majority of stakeholders based locally in Mazara, as well as experts from Rome and other countries.

The results were presented and discussed in detail by stakeholders. During the meeting, participants shared their feedback, reviewing upgrading options and suggesting new strategies. The results were generally accepted, since most of the primary data were collected through key informant interviews with the same stakeholder groups. A number of strategic actions were proposed, including the need for greater coordination between research and operators at all levels of the VC, greater coordination

in the management of share stocks, improving the competitiveness of giant red shrimp against imports through certifications (e.g. a brand of Mazara).

It was also suggested that there was a need to increase efforts to improve the participation of young people in fishing and related activities in order to ensure its future existence, as well as ensure good control on the whole supply chain (from production to exports and imports) as a solution to fight against fraud, such as through improved traceability and sustainability certification of fishing operations and chain of custody certification. Market-based measures, such as promotion and the use of certifications to differentiate the product from the competition, combined with campaigns to raise consumer awareness about the certification schemes and labels, were also suggested by stakeholders.

Similarly, a stakeholder meeting was held on the VCA of deep-water rose shrimp from the Southern Adriatic Sea (GSA 18), where the results were presented and discussed with fishers, wholesalers, researchers, sustainability certification representatives and experts from FAO. The stakeholders agreed with the findings and expressed their concerns about the most pressing issues in the VC, namely the low interest by young people to seek a career in fishing, the low bargaining power of fishers against buyers, and competition with imports from third countries.

Potential upgrading strategies of the deep-water rose shrimp VC suggested by stakeholders include aggregation of supply to allow producers to acquire more market power. Consultations also emphasized the possibility of transforming the VC by introducing new and improved production methods, based on a circular economy approach (e.g. by-products valorization) to increase profitability, while reducing waste. Based on the current experience of fishers operating from Molfetta port, sustainability certification was also explored as a possible route to improve the value added of the product and its competitiveness in the entire area.

Further, the results of the analysis were also disseminated at the GFCM Fish Forum 2024, the Forum on fisheries science in the Mediterranean and Black Sea held in Antalya, Türkiye from 19 to 23 February, with a presentation on the findings and recommendations from an analysis of the deep-water rose shrimp VC in Italy. The presentation, titled “Strengths, weaknesses, and upgrading strategies of the pink shrimp fishery value chain in Southern Adriatic”, was delivered by a Fishery economist and project manager from NISEA Società cooperativa, FAO’s national partner in Italy, responsible for conducting the analysis.

Rainbow trout

In Italy, trout farming is based on a long tradition and history, and currently there are aquaculture farms in several areas, mainly in the north and central regions. A case study approach was adopted, focusing on the most representative and important region for trout production in Italy. Based on a preliminary analysis of secondary data on the number of companies and geographical distribution, as well as the annual volume produced and the turnover, the Northeastern region of Triveneto was chosen for a focus on the project activities.

Secondary data collection and literature review

Secondary data and information on trout production and VC sources focused on the detailed EU sources of data submitted by EU Member States under the Data Collection Framework (DCF; Regulation [EU] 199/2008) and the EU multiannual programme for data collection (EU MAP). These were complemented by market data and reports sourced from the Italian Chambers of Commerce System database on wholesale prices (BMTI) and from the EUMOFA database and a recent report on trout in the most representative European market.

Based on the findings from secondary data sources, a gap analysis was performed and a plan of interviews with key informants was defined; specifically, interviews were planned with the representatives of two trout farmers' organizations: organization of producers ASTRO (Trentino Alto Adige Region) and Organizzazione Produttori Allevatori Ittici Friulani (O.P.A.I.F. Friuli Venezia Giulia Region). The definition of the sample of companies representing the main production segments was defined, and the validation of the questionnaire contents for further data collection was done using interviews with businesses and key informed representatives.

Primary data collection

The three draft questionnaires (i.e. for farmers, processing plants, market/retailers – available on request) were prepared based on the agreed project methodology. The draft version of the questionnaires was shared with the SVC4MED project teams for feedback and to ensure that the questionnaires were aligned with those of other countries in the project. The questionnaires were tested and validated by key informants.

It was not possible to carry out field interviews with the farming companies due to external events, such as the prolonged drought that impacted Italy until September 2022. This natural disaster affected all trout farmers, especially in terms of animal welfare and increased mortality, and such events prompted the intervention of farmers to put in place all possible safe management measures to save their crops. Instead, interviews were carried out by phone and with key informants.

The sample of companies was reasoned and included the two main producer organizations, as they represent about 90 companies that fall within the trout production segments. In parallel and based on the first analysis of the trout VC, it emerged that a new line of production was starting, that of non-embryonated trout eggs sold for human consumption, such as trout caviar. In this regard, a company was selected that produced these eggs.

Challenges encountered

The difficulties encountered were the finalization of some interviews with trout wholesalers and their processors. Some difficulties involved carrying out face-to-face interviews with trout producers, as the drought generated a state of natural calamity that practically prevented the planning of visits to the farms. The difficulty was mitigated by reviewing the initially defined interview methodology, proceeding with very short interviews on specific aspects for which information was acquired through interviews with key informants within the Associazione Piscicoltori Italiani ([API] <https://www.acquacoltura.org/>).

The analysis of the VC was based on the results obtained from the secondary and primary data collection campaign, guided by the PMU and with several revisions, adding newly available data where possible. The results were presented to stakeholders and individual consultations with important stakeholders were carried out.

Dissemination and stakeholder consultation

The workshop, titled “The value chain of farmed rainbow trout – opportunities and challenges”, was held in Pordenone, Italy, in February 2024. Pordenone is a town in Triveneto – the main trout aquaculture production region of Italy – which was also selected as a case study and focus of the VCA of farmed trout in Italy. Moreover, the timing of the workshop was chosen to coincide with the annual Aquafarm Expo held in Pordenone, specializing in Italian aquaculture and related activities, and attended by a wide variety of stakeholders from Italy and other European and Mediterranean countries.

The aim of the workshop was to i) disseminate the results from SVC4Med project countries where the trout value chain was analysed; and ii) create conditions for shared learning and exchange of experience across the Mediterranean and Black Sea region. Thus, presentations of the results from Mediterranean project countries (Albania, Italy and Lebanon) were joined by additional Black Sea bordering countries (Bulgaria, Georgia and Türkiye), each of which represented a different level of development of the trout VC. The workshop was attended by a diverse group of stakeholders, including industry representatives, government officials, FAO experts, researchers and students. The presentations were focused on the challenges and opportunities to sustainable growth in the six case studies, allowing comparisons and strategic implications to be drawn regarding the potential for sustainable intensification.

Furthermore, individual consultations were held with stakeholders attending Aquafarm Expo, including representatives of the Italian Fish Farmers Organization and private companies to validate the findings and receive further inputs on strategy formulation. All feedback received from stakeholders was incorporated and addressed in the final version of the VC report.

Lebanon

Preparatory activities

The national team for Lebanon attended a virtual training workshop on the standard methodology delivered, which allowed the team to become familiar with the VC approach to develop and identify the data needs for a comprehensive VCA of farmed rainbow trout in Lebanon. Follow-up communications between the PMU and the national team helped the closer alignment of the work to the methodology. Additionally, meetings with FAO/GFCM staff who had carried out similar project activities in Lebanon were held to identify synergies and opportunities for building on ongoing efforts and avoiding overlaps.

An in-person progress meeting was held in FAO headquarters in Rome from 28 to 30 September 2022 to review the progress of secondary data collection and analysis and prepare a primary data collection strategy. The national consultants working on the Lebanese farmed trout VC attended the meeting. The discussions focused on establishing the relevance of existing data to the standard methodology and identifying gaps to be addressed with the collection of primary data. A draft report based on secondary data was presented, and feedback was given to the national team on improving the structure and content to increase relevance and alignment with the standard methodology.

The initial work of secondary data collection was carried out by two national consultants. One of the consultants could not continue beyond July 2022, thus, the ongoing and future activities were carried out by a national consultant and an international consultant, who was recruited to support the remaining work based on his inside knowledge of the sector and the governance system of Lebanon.

The national consultant acted as a coordinator of the activities at national level, including coordinating inputs from staff of the Lebanese University and Lebanese government, and had responsibility over data analysis and report writing, while the international consultant supported the development of a data collection strategy and data analysis and acted as an adviser to the national consultant and PMU. His expertise in trout aquaculture and aquaculture economics was a particular asset to the VCA.

Data collection activities

1. Literature review and secondary data collection

Existing secondary data sources were identified, including academic publications, FAO production data, aquaculture country profile, international trade statistics, and results from previous studies on the Lebanese seafood VC. The most relevant sources of secondary data were a national aquaculture farm census conducted in 2020, with the support of the GFCM, and an Assessment of the Commercial Seafood Chain in Lebanon (2018). The secondary data was compiled into a first draft report, presented and discussed in a dedicated meeting at FAO headquarters in September 2022.

2. Preparation for primary data collection

During the progress meeting in FAO headquarters, a recent aquaculture census and consumer behaviour survey were identified, which eliminated the need for an extensive collection of primary data and survey of the sector. It was decided that the existing secondary data needed to be complemented by additional primary data to cover the needs for a comprehensive VC assessment and that key informant interviews, group discussions and expert observations would be a suitable means to do that.

Moreover, based on the data collected and the participants' expertise, a number of provisional upgrading strategies were listed as sources for discussion during the key informant interviews and group discussions. These strategies focused particularly on upgrading the governance system, which at present is not well-developed for aquaculture. A range of other strategies for better management along the VC, aiming to improve the efficiency and sustainability of production, were also proposed.

Primary data collection

The secondary data collection served as a scoping study, and on the basis of this a preliminary list of data and needs was prepared that needed to be addressed through primary data collection. Structured and semi-structured questionnaires for data collection were developed. The questionnaire was reviewed by the PMU and used in a first round of interviews with key stakeholders and experts in the field.

This was followed by a primary data collection phase, consisting of surveys, observational visits, interviews with key VC actors and key informants. A sample of 19 farmers, ten wholesalers and three processors, a detailed questionnaire, for each group, was used. The fish farm interviews were selected from and conducted in Hermel region, which was considered a representative region for trout

production, since it is where the majority of the farms are located, and trout production is concentrated (accounting for 90 percent of the total number of trout farms and about 89 percent production in the country).

The data were entered into electronic format and checked for inconsistencies and anomalies, with the help of the PMU. Expert opinion was sought when anomalies were encountered, and a set of group discussions with key stakeholders was held to supplement the results of the key informant interviews and assess the feasibility of upgrading strategies.

Analysis of data and report writing

Following the preparation of the first draft report, based on secondary data, the newly collected data from the field were used to supplement them, fill gaps in knowledge, and uncover issues of importance to the analysis. The report was reviewed and amended in several versions with the help of the PMU, in order to improve the quality and accuracy of the content. A number of provisional upgrading strategies was listed as sources for discussion during the final stakeholder meeting. These strategies focused particularly on upgrading the governance system, which at present is not well-developed for aquaculture. A range of other strategies for better management along the VC, aiming to improve the efficiency and sustainability of production, was proposed.

Value chain stakeholder meeting

A VC stakeholder meeting was held on 8 July 2023 in Hermel region in Northeast Lebanon, which is the primary region for rainbow trout production in the country. It was organized in close collaboration with FAO Lebanon office and held in a hybrid mode. The meeting was attended by farmers, processors, distributors, academics and government officials. The project staff also attended the meeting by connecting remotely. The meeting served as an opportunity for a productive discussion about the challenges and opportunities encountered in the VC and potential actions that can be followed to improve performance.

Challenges encountered

Due to the small-scale and informal nature of trout aquaculture businesses in Lebanon, one of the main challenges was the collection of accurate data on the economic and production-related aspects of fish farming. Farmers rarely keep records of the inputs and outputs on the farm and often do not know or are unsure about the exact economic implications of their practices. Moreover, discussion about some farming practices, such as the use of certain feeds, were avoided by farmers, since they are not allowed by law. These practices, and the extent of their application, needed to be inferred from other sources such as trade statistics and expert opinion.

Further steps

A preparation for moving beyond the scope of the project, into the implementation of the development recommendations identified in the value analysis, was initiated with a focus on Lebanon, given its priority status among the five project countries, in terms of food insecurity and rising poverty, as well as the potential for addressing the significant sustainability issues facing the value chain. (See Section G. FOLLOW-UP ACTIONS FOR GOVERNMENT ATTENTION in the Terminal Report).