

Annex I: Description of the Action (including the Logical Framework of the Action)

Project Title:	Support to Rural Entrepreneurship, Investment and Trade in Papua New Guinea (STREIT PNG)
Project symbol:	UNJP/PNG/010/EC
Recipient Country:	Papua New Guinea
Government(s)/other counterpart(s):	Government of Papua New Guinea, Department of Agriculture and Livestock, National Fisheries Agency, Department of Works
Expected EOD (Starting Date):	01 January 2020
Expected NTE (End Date):	31 May 2024
Contribution to FAO's Strategic Framework:	<ul style="list-style-type: none"> • Strategic Objective/Organizational Outcome: <p>SO4 - Enable more inclusive and efficient agricultural and food systems - OO: 402 - Agribusinesses and agrifood chains that are more inclusive and efficient are developed and implemented by the public and private sectors. 40203 - Value chain actors are provided with technical and managerial support to promote inclusive, efficient and sustainable agrifood chains. (65%) 40201 - Public sector institutions supported to formulate and implement policies and strategies, and to provide public goods that enhance inclusiveness/efficiency in agrifood chains (15%).</p> <p>SO 2 - Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner - Organizational Outcome: 201 - Producers adopt practices that increase and improve agricultural sector production in a sustainable manner. 20103 - Organizational and institutional capacities of public and private institutions and networks are strengthened to support innovation and the transition toward more sustainable agricultural production systems (25%).</p> • Country Outcome(s): The CPF for Papua New Guinea (2018-22) identifies three main priority areas, the third being Sustainable and inclusive economic development and job creation in rural areas and specifically: 3.1. Income, employment and food security is increase in the area of the intervention: 3.2. Strong and efficient agricultural and fisheries value chain enablers established. • Regional Initiative/Priority Area: Zero Hunger Challenge



Env and Social Risk Classification	low risk <input checked="" type="checkbox"/> moderate risk <input type="checkbox"/> high risk <input type="checkbox"/>
Gender Marker ¹	G0 <input type="checkbox"/> G1 <input type="checkbox"/> G2a <input checked="" type="checkbox"/> G2b <input type="checkbox"/>
Total Budget:	EU contribution: USD 89,470,440.64 - EUR 81,300,000 ² FAO co-funding: USD 333,149.23 - EUR 300,000 Total amount: USD 89,800,589.87 - EUR 81,600,000

Executive Summary Papua New Guinea (PNG) is one of the most culturally diverse countries in the world with over 800 languages and 1,000 ethnic groups. Over 80 percent of its 8 million population live in rural areas. The agriculture sector employs an estimated 80 percent of the population and accounts for approximately 27 percent of GDP. In addition to significant energy and extractive industries, cocoa, vanilla and fisheries are important value chains in terms of both income generation as well as household food security and nutrition. Based on the development priorities of Papua New Guinea, this Programme entitled “**Support to Rural Entrepreneurship, Investment and Trade in Papua New Guinea**” (STREIT PNG) has been developed with the general objective to increase sustainable and inclusive economic development of rural areas. The two integrated specific objectives (SO) of the Programme are:

SO1: Increased economic return from three selected value chains in the selected regions with planned results in increased sustainable production and inclusiveness of the Cocoa, vanilla and fisheries value chains (riverine, coastal and aquaculture). Major outputs include increased volume, value and improved quality of cocoa, vanilla and fisheries products, more value addition and an increased number of enterprises and people engaging in and benefitting from both income increases and enhanced food security and nutrition at household level and;

SO2: Strengthened, climate resilient and more efficient value chain enablers with planned results in a more conducive business, trade, policy and regulatory environment for sustainable rural agripreneurs and MSME’s established; value chain support services strengthened and resilient to climate change impacts; increased production of and access to renewable energy systems and Improved and climate proof rural transport infrastructure. Major outputs include an increased number of people employed and agripreneurs and MSME’s engaged in the selected value chains benefitting from reduced transaction cost and time, improved access to finance, increased availability and used of digital tools and services. Increased availability of renewable energy, improved energy efficiency and access to improved transport to include rehabilitated and better maintained roads, jetties and landing sites are also foreseen.

These planned results and outcomes will be delivered through tailored activities designed to overcome the specific value chains limitations as identified under the EU Value Chain for Development such as production and disease/pest issues such as the Cocoa Pod borer in an environmentally sustainable manner as well as improving the business environment for local MSME’s to engage in and benefit from these value chains. In line with government policy, significant investments are planned in infrastructure such as roads, jetties, landing sites and provision is also made for supporting national level improvements in relevant value chain related policy, strategy and regulations. The Programme will enable ‘hard components’ (transport infrastructure, improved energy access) to be connected with ‘soft components’ such as financing, training, market access, trade and other value chain support services for commodities, facilitated by the sustainable implementation of digital technologies, services and solutions, under a conducive business environment in order to foster and stimulate climate-resilient rural development activities.

This Programme Document addresses the EU Action and Financing Agreement as approved by the Government of Papua New Guinea and EU and will be built around four mutually reinforcing pillars: i) business enabling environment; ii) support services, key for the development of value chains; iii) climate-proof physical infrastructure (including transport, telecommunication and renewable energy) and iv) community engagement, in particular of women and youth. The geographical scope of the programme will initially be focused on the East Sepik and Sandaun provinces. After the mid-term review of the programme, cocoa value chain development activities will be considered for expansion to the neighbouring provinces of Morobe and Madang for those activities that require heavier

¹ See FAO Guidance Note on ‘Gender Mainstreaming in project identification and formulation’

² As per infoReuro exchange rate of December 2019- 1.1005 USD/EUR



localised investment. The Programme could also include a scope for expansion to the regional and/or national level when possible. Throughout the Programme, particular attention will be paid to community engagement, with an emphasis on women and youth who are the most vulnerable part of the population.

The programme will be implemented as a United Nations Joint Programme in partnership with the Government of Papua New Guinea. The main institutional partners will be the Department of Agriculture and Livestock (lead counterpart), the Department of Trade, Industry and Tourism, the Department of National Planning and Monitoring (as currently hosting the National Authorized Officer of the European Development Fund), the Department of Works, the National Fisheries Authority and many more. Additional important semi-state partners will include the Cocoa and Spice Boards, local SME organizations such as SMEC, NGO's such as Women in Agriculture, SME groups and associations, Chambers of Commerce and academic and training institutions such as the Sepik Rural Technology College. The Food and Agriculture Organization (FAO) of the UN will be the signatory of a Contribution Agreement with the EU and manage the effective co-ordination and implementation of the project with its UN Partners ILO, UNCDF, UNDP and ITU as well as with other partners that will be identified during the inception phase.

The project will have a five-year duration with a one-year inception period included to ensure consultative processes and optimise risk management and effective partnerships.

Administrative and Physical Map of Papua New Guinea



Disclaimer: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations or the European Union concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.



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ACRONYMS

AAACP - All ACP Agricultural Commodity Programme
ACP – African Caribbean and Pacific
ADB – Asian Development Bank
ANPR - Annual Narrative Progress Report
AWPB – Annual Work Plan and Budget
BH – Budget Holder
B2B – Business to Business
CN - Concept Note
CPF - Country Programming Framework
CSO – Civil Society Organizations
CTA – Chief Technical Advisor
CPF – Country Programming Framework (FAO- GoPNG)
DAL – Department of Agriculture and Livestock
DCIE – Department of Communications, Information and Energy
DNPM – Department of National Planning and Monitoring
DSA – Daily Subsistence Allowance
EC – European Commission
EDF – European Development Fund
EFA – Economic and Financial Analysis
EIB – European Investment Bank
EU – European Union
FAFA – Financial and Administrative Framework Agreement between the European Community and the UN
FAO - Food and Agriculture Organization of the United Nations
FO - Farmer Organisation
EU/FAO FIRST – Food and Nutrition Security Impact, Resilience, Sustainability Transformation Programme
FI - Financial Institutions
FNS - Food and Nutrition Security
FPIC – Free Prior and Informed Consent
GDP – Gross Domestic Product
GEF - Global Environment Facility
GI – Geographic Indication
GOE – General Operation Expenses
GoPNG - Government of Papua New Guinea
HACCP - Hazard Analysis Critical Control Point
HDI – Human Development Index
HRBA – Human Rights Based Approach
IBM – Inclusive Business Model
ICT – Information and Communications Technology
IFAD – International Fund for Agricultural Development
IFI – International Financial Institutions
ILO – International Labour Organization
IMF- International Monetary Fund
ITU – International Telecommunication Union
K – Kina (PNG)
K&M – Knowledge Management
LFM – Logical Framework Matrix
LLG – Local Level Government
LoA – Letter of Agreement
LTO – Lead Technical Officer
LTU – Lead Technical Unit



MoTI&T – Ministry of Trade, Industry and Tourism
MRDBS - Ministry of Regional Development and the Bureau of Standards
M&E – Monitoring and Evaluation
NAO – National Authorizing Officer of the EDF (DNPM)
NARI – National Agricultural Research Institute
NGOs – Non-Governmental Organizations
NICTA – National Information and Communications Technology Authority
NIP – National Indicative Programme
NPC – National Project Coordinator
OO – Organizational Outcome
P2P – Peer to Peer
PA or PO – Producers Association or Producer Organization
PGK – Papua New Guinea Kina (currency)
PIMU – Project Implementation and Management Unit (Project Coordination Unit)
PPAP – Productive Partnerships Agriculture Programme (WB, IFAD and EU funded)
PSC – Project Steering Committee
PSV – Public Service Vehicle
PTF – Project Task Force
RAP – FAO Regional office for the Asia Pacific
RBB – Results Based Budgeting
RBM – Results Based Management
REDD - Reduced Emissions from avoided Deforestation and Forest Degradation
SAMOA - SIDS Accelerated Modalities of Action
SDG - Sustainable Development Goals
SFVCD - Sustainable Food Value Chain Development
SIDS - Small Island Developing States
SLC - FAO Sub-Regional Office for the Caribbean
SME – Small and Medium Enterprises
SMEC – Small and Medium Enterprise Corporation
SO - Strategic Objectives
SP – Service Providers
SPS – Sanitary and Photo-Sanitary
TCP – Technical Cooperation Project
TDS – Total Diet Study
TOR - Terms of Reference
TSS – Technical Support Services
UNCDF – United Nations Capital Development Fund
UNCT – United Nations Country Team
UNDAF – United Nations Development Assistance Framework
UNDP – United Nations Development Programme
UNEG –United Nations Evaluation Group
UNICEF – United Nations International Children’s Education Fund
UNRC – United Nations Resident Coordinator
VC – Value Chain
VC4D – Value Chain for Development
UN – United Nations
WB – World Bank
WTO – World Trade Organization



SECTION 1 – RELEVANCE

1.1 GENERAL CONTEXT

1.1.1 Rationale

Country context:

Papua New Guinea (PNG) is one of the most culturally diverse countries in the world with over 800 languages and 1,000 ethnic groups³. It has a total land area of approximately 460,000 km² comprised of 600 islands of various sizes. The country is separated into four regions – Highlands, Islands, Momase and Southern – and 22 provinces. In 2017, its population was estimated at 8 million⁴ and of this over 80 percent live in rural areas. PNG is a relatively stable democracy. Real GDP growth was estimated at 2.8 percent in 2017, and slowed further to 0.3 percent in 2018, largely due to a contraction in the extractive sector following the February 2018 earthquake in the highlands. The country is dominated by two main sectors: the formal, capital-intensive mining and energy sector and the agriculture sector which, employs an estimated 80 percent of the population and accounts for approximately 27 percent of GDP⁵. Despite considerable natural wealth and reasonable economic performance, PNG's rural population continues to face significant challenges. More details on PNG main socio-economic indicators are detailed in Appendix VII.

PNG's Human Development Index (HDI) ranking was 155 in 2010 and improved by one place to 154 in 2015, the second lowest in the Pacific². PNG has the fourth highest child stunting rate in the world (more than double the global average) with almost one in two children in PNG suffering stunted growth from chronic malnutrition. Malnutrition rates increased from 43.5% in 2005 to 49.5% in 2015. Stunting occurs in children across all wealth classes in PNG (varying from 36% for those from wealthiest group to 55% for the poorest). It is estimated that malnutrition had an estimated cost to the PNG economy of \$USD508 million in the 2015-16 financial year (2.81% of the reported annual GDP). Within PNG, the highest child stunting rates are reported in the Momase region and highlands.

The disparity between rural and urban living conditions is exacerbated by the country's difficult and disperse terrain and islands which increases hardship, poverty, and isolation in rural areas, and limits access to basic inputs and services, road infrastructure, transport and markets. Less than 20 percent of rural households have access to electricity, 60 percent lack access to safe drinking water, and an estimated 80 percent lack access to improved sanitation². Most of the rural population do not have access to any source of electricity. An estimated 15% of the population have reliable access to telecommunications.

PNG is ranked 136 out of 157 in the World Bank's Human Capital Index and 159 out of 160 countries in the 2017 Gender Inequality Index.³ Gender-based violence (GBV) is widespread, with over two thirds of women having experienced some kind of violence in their lifetime.⁶ GBV – both within the home and in public spaces - severely affects women's ability to contribute to the economy, participate in business activities, and support family livelihoods. Gender inequalities contribute to the underperformance of the sector.

With its highly diverse terrain and locations along a major earthquake fault line, the country is subject to both El Niño and La Niña events and both can have significant impacts such as severe droughts, landslides and flooding from increased rainfall. The World Risk Report 2016 ranks PNG as

³ www.worldbank.org

⁴ PNG Systematic Country Diagnostic (October 2017 draft), World Bank.

⁵ PNG Economic Update (November 2017), World Bank.

⁶ Nationally representative GBV prevalence data is not available for PNG; however, several robust, smaller-scale studies indicate high prevalence.



10th, due to the country's high exposure to natural disasters and its high social and economic vulnerability to these events⁷. The February 2018 magnitude 7.5 earthquake and aftershocks affected 544,368 people across five provinces.

PNG is endowed with abundant renewable energy resources, yet only about 13% of the household population has access to electricity. Where power is available (generally in the main urban centres), the supply is often unreliable. PNG has significant underutilized indigenous energy sources such as hydro, natural gas, geothermal, solar-based systems and wind, development of these resources would accelerate PNG's potential to sustain economic growth and enhance the electrification rate (PNG National Energy Policy 2016-2020). Under the PNG Vision 2050, PNG will be 100% powered by renewable energy sources. In the path of achieving PNG Vision 2050, the Asia-Pacific Economic Cooperation (APEC, held in November 2018 in Port Moresby) announced 70% of PNG population will be connected to electricity by 2030. This announcement led to a partnership agreement with Australia, Japan, New Zealand and Japan to develop and roll out new electricity infrastructure in the country.

PNG's road network is highly fragmented and poorly maintained with only about 35 percent of national roads sealed² and no roads connecting most provinces and ports. PNG's vulnerability to climate risks and hazards further exacerbate problems resulting in an estimated 75 percent or more of the road network becoming impassable at some point during the year². Riverine transport is important in the programme area for the focus value chains. These factors force farmers to walk long distances⁸ to meet local PSV or boat transport and pay high prices to move themselves and goods, reducing their profits and increasing the risk of lost produce due to weather, time and insecurity.

Sector context:

Agriculture is the predominant source of livelihood in PNG. It accounts for an estimated 80% of the total labour force and contributes 27% to GDP. *Cocoa, vanilla and coffee* are key cash crops while fisheries are important for both economic well-being as well as directly for food security and nutrition. PNG is considered a small cocoa but large vanilla producer in the international market. However the high quality of its vanilla and fine flavour cocoa is recognized and sought after. Smallholders supply 95 percent of the cocoa and vanilla produced in PNG and all coastal and inland fisheries in the Sepiks.

The World Bank suggests that agriculture in PNG continues to underperform, and is characterized by low productivity and lack of competitiveness. Constraints remain in place limiting the development of cocoa, vanilla and fisheries as agribusinesses for many smallholder farmers. These include: high transaction costs due to poor economies of scale; lack of access to information and technologies due to poor extension services; poor rural infrastructure; insecurity in transport; uncertainty about land ownership and tenure; and lack of access to finance. The private sector is comprised of many local small and medium enterprises, a few larger national agribusinesses and multinationals mostly engaged in cocoa and vanilla. Microenterprises are also important mostly as aggregators and transporters linking logistically isolated smallholders to markets and input and service providers. Multinationals continue to invest in tuna fisheries and associated onshore processing of tuna catches. Private sector investment in coastal and inland fisheries is principally by small and micro enterprises.

PNG is characterized by its diverse agro-ecological environments (highlands, lowlands, islands/atolls), favorable climate and fertile soils allowing the farming of many different agricultural products, including the cultivation of both cash and staple food crops, as well as livestock production. The main agricultural exports of the country include cocoa, coffee, coconuts, palm oil, rubber, and tea. The

⁷ El Nino + UNU-EHS, 2016. World Risk Report 2016

⁸ One vanilla producer interviewed in Maprik in 2018 had walked two days to get access to a PSV and then 6 hrs on the PSV to reach Maprik to sell his cured vanilla.



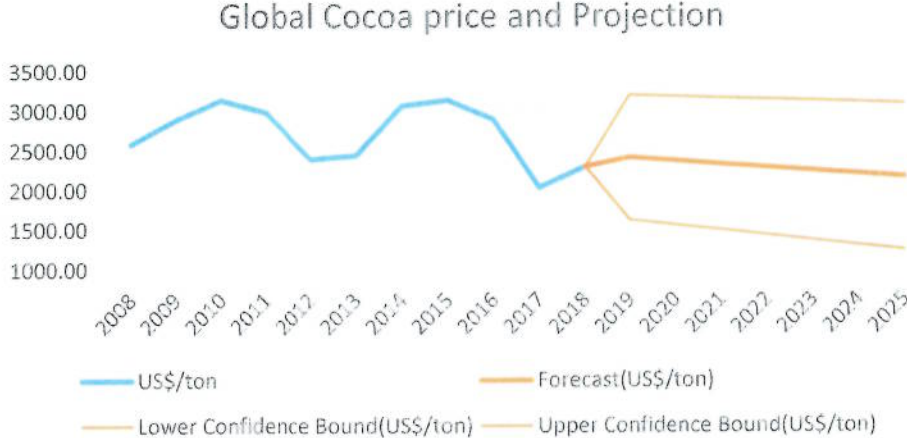
predominant mode of farming is in smallholder farms of less than 5 ha. Village agriculture, which supports over 80 percent of the population, remains dominated by subsistence food production. It generates some valuable cash income and is characterized by low productivity. Agriculture is dominated by subsistence production and 55% of the population active in subsistence agriculture are women, employing 70.3% of the female rural population. It provides employment for over 82% of the rural population. However there is little downstream processing and poor participation of smallholder producers in value chains and other productive economic and enterprise activities.

Cocoa is the third most significant agriculture crop in terms of its economic importance to PNG, after oil palm and coffee. It is a rural-based crop mainly cultivated by rural village farmers and contributes over K300 million (approx. USD 100 million) to the Gross Domestic Product (GDP) annually. About 151,000 households (representing over 2 million people) in the coastal regions of PNG depend on cocoa as a main cash crop and Cocoa production hugely affects the rural livelihoods.

At present, over 95% of Cocoa is produced by smallholder growers and less than 5% from the plantation sector. The Cocoa industry employs 31% of the national labour force (Cocoa Industry Strategic Plan, 2016-2025). Smallholders practice low-input and low-cost production systems. Average dry bean yield is just above 300 kilograms/hectare/year while the genetic potential of improved Cocoa hybrid clones is about 2,500 kilograms/hectare/year under improved management conditions.

The World Bank forecasts the Cocoa price will rise from USD 2.3/kg to USD 2.47-2.5/kg by 2022⁹. Based on the FAO and EU economic analysis of Cocoa production in the Sepiks in 2018/9, Cocoa production is profitable for smallholders when the dry bean price is >4.1PGK/kg¹⁰, equivalent to US\$1.24/kg. In the past few years, the dried bean price ranged from 5 to 7 PGK/kg, equivalent to US\$1.51- 1.81/kg during the production season. In April 2019, the price paid to farmers was 7PGK/kg of dried beans (delivered in Store e.g. in Maprik) by traders/Agmark. The basis for the project economic sustainability therefore appears quite positive for Cocoa Value Chain development with a highly conservative base figure of 5 PGK/kg dry beans delivering a minimum of 25% Internal Rate of Return (IRR) using traditional fermentary practices and a high IRR with the improved technologies/practices supported by the project.

Figure 1: Global Cocoa Price trend and projection



Source: ICCO website, accessed May 2019.

⁹ World Bank Group. 2019. Commodity Markets Outlook, April. World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO

¹⁰ 90% capacity, using improved varieties tested by the WB/EU/IFAD and Cocoa Board under the PPAP project.



Approximately 90% of the Cocoa beans produced in PNG for export are classified as “fine or flavour” beans by the ICCO Panel on Fine or Flavour Cocoa, compared to only 1% for Indonesian beans, most of which are “bulk” or “ordinary”. Fine or flavour beans, which make up around 40-50% of the total global cocoa market, command a premium price. As a result, they are used by major chocolate manufacturers in Western Europe and to a lesser extent in Japan, the US and Latin America to produce premium-quality chocolate.

The Cocoa Industry Strategic Plan (2016-2025) was developed in 2016 with a goal to improve livelihoods of farmers, processors, traders and other service providers involved in the Cocoa industry. The purpose is to improve productivity, quality and marketing systems; achieve optimal and environmentally sustainable scale of production; and provide a conducive business operating environment for productive partnerships and value addition. The Cocoa Board is the leading national body on cocoa sector development. It licences to exporters/fermenters/dry-bean cocoa dealers/etc. and monitors these value-chain players to ensure that fair pricing is maintained. There are no mechanisms in place/enforced by Cocoa Board on the pricing of dry cocoa beans¹¹. It is the middle players such as trader and exporters that decide on the pricing of the dry cocoa-beans, monitored by the Cocoa Board.

Cocoa was selected by the EU Delegation to PNG as one of the targeted Value Chains based on both the high production and capacity for dry bean production within the selected provinces of MOMASE¹² region¹³. Most importantly, Cocoa provides a regular income as cash for smallholder farm families. The major limiting factor for profitability at farm and indeed VC level is the significant (80%) reduction in cocoa production/profitability related to the infestation by the Cocoa pod borer¹⁴. While there are some fluctuations in the price, the price of Cocoa for the last ten years ranges from USD2,000/ton to USD3,134/ton providing good incomes for smallholder families in the project area. Projections by the International Cocoa Organization (ICCO) until 2025 range from USD2,000/ton to USD2,500/ton.

Vanilla

Only *V. planifolia* and *V. tahitensis* are grown commercially in PNG. Generally, *V. planifolia* are grown in PNG as this is of higher quality and is preferred by the market. Currently the vanilla industry is comparatively small but is expanding rapidly due to the ongoing high market price of cured vanilla beans. In PNG, vanilla is planted extensively at the household level on plot sizes mostly ranging from 0.1 to 0.5 ha. These subsistence farmers do not have a high level of knowledge on improved production practices (vine management, pollination techniques, harvesting etc.) and also on proper drying/curing, and other quality attributes (length, colour etc.).

Vanilla is currently a very attractive cash crop and also good complementary crop for diversification and for its attractiveness for women and youth whose role is important in vanilla production, particularly in pollination. The pollination requires steady hands, good eyesight and is tedious to perform. The distinctive flavour and fragrance of good quality vanilla is developed by a slow curing process that is labour intensive (often performed by women/girl/youth) and takes three to six months to complete.

The prevalence of significant risk of theft of green beans at farm level forces some farmers to harvest immature beans. Women and youth are particularly vulnerable to these kinds of threats which include farm level theft and armed robbery during transportation. A necessary condition for

¹¹ Source: Mr Boto Gaupu (CEO-Cocoa Board) and Ms Claire Parike (Senior Marketing Manager-Cocoa Board), pers comm.

¹² Morobe, Madang, Sepik

¹³ Action document, EU Port Moresby/Brussels, approved in November 2018.

¹⁴ Lescuyer, G., Helmes, R., Kerua, W., Syndicus, I., 2018. Cocoa Value Chain Analysis in Papua New Guinea. Report for the European Union, DG-DEVCO. Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804), 144p + annexes.



producing quality vanilla is that the beans be harvested fully ripe. Beans that are immature when harvested will have low vanillin content and will quickly go mouldy regardless of how well they are cured.

From 2015, the market price of K1000/kg of cured beans for vanilla increased exponentially which attracted farmers into intensive vanilla farming. During a field visit in February 2019, it was found that village level price of cured beans ranges from 500 to 700 Kina/kg whereas the market value of the quality dried/cured vanilla bean is K1050/kg at Maprik, renowned as the major vanilla trade centre of the province.

Most East Sepik and bordering districts of Sandaun growers both men and women bring their cured bean to Maprik for sale where buying is conducted either by agents, intermediaries or by exporters themselves. All vanilla purchases are on a cash-on-delivery basis. Some local buying places of vanilla also exist where transactions are made in cash and even in gold. For security reasons larger volumes are often purchased on-farm. Larger companies (eg. AgMark, Paradise Foods) fund purchases from their own resources (Agmark financed by their overseas parent companies) whereas small companies found it difficult to generate a timely cash flow and often struggle to remain in the vanilla business.

Formal vanilla exports amounted to just under 111 tonnes worth just under K75 million recorded by the National Statistics Office in 2017, based on data collected by NAQIA. The average price was K676/kg; ranging from K1,248/kg to K26/kg, reflecting the different qualities and values of beans exported. Indonesia was largest export destination by volume and the USA by value.

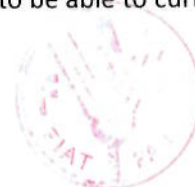
In recent years, vanilla prices significantly increased due to adverse weather or political upheaval in Madagascar mainly. The EU decision/Government of PNG to focus on vanilla as a high potential value chain commodity is based on current market prices and high profit in ideal conditions.

Fisheries

PNG harvests approximately 15% of the global tuna resources and 35% of the regional tuna stocks. The value of recent average catches by this fishery is approximately USD 280 million/year. PNG licenses foreign purse-seine vessels to fish for tuna in its EEZ with a value of > USD 200 million/year. PNG has an important, locally-based, industrial fishery within its exclusive economic zone.

Coastal fisheries comprise demersal fish (bottom-dwelling fish associated with coral reef, mangrove and seagrass habitats), nearshore pelagic fish (including tuna, Spanish mackerel, rainbow runner, wahoo and mahi-mahi), invertebrates targeted for export, and invertebrates gleaned from intertidal and subtidal areas. The total annual catch is estimated to be >35,000 tonnes and worth > USD 60 million. Demersal fish and nearshore pelagic fish are both estimated to make up ~ 40% of the total catch.

The freshwater and estuarine fisheries in PNG mainly comprise barramundi, river herring, Papuan black bass, fork-tailed catfish, saratoga, tilapia, carp, rainbow trout and Macrobrachium. These species are harvested by commercial, artisanal, subsistence and recreational fisheries. Estimates of freshwater fish catch are > 17,000 tonnes, worth over USD 17 million. Pond aquaculture of tilapia and carp is growing rapidly to produce fish for the large inland population of PNG. Recent estimates indicate that > 15,000 small ponds have been constructed. Coastal aquaculture commodities in PNG include white pearls produced from the silver- or gold-lipped pearl oyster, seaweed and hatchery-based marine fish (mainly barramundi). Despite being an island nation, average national fish consumption in PNG is estimated to be 13 kg per person per year. This is below the recommended levels for good nutrition particularly in view of the nutritional value of fish in terms of essential oils, protein and vit D. Coastal and freshwater habitats in PNG are estimated to be able to currently supply



12 kg of fish per person per year. Improving access to fish for the large inland population of PNG is a priority policy for PNG. More details on the Sepiks are contained hereunder.

Programme context:

The Programme is focused on the targeted geographical area of the Sepiks initially. The economic potential of several provinces of PNG were analysed by the EU in consultation with the government of PNG ahead of selection, also considering the previous, current and planned assistance by Development Partners. Based on this analysis, three specific value chains (cocoa, vanilla and fisheries) were selected in order to ensure maximum impact. In particular, the choice is justified and agreed by the EU and Government of PNG as follows:

- Development needs of Sepik as one of the poorest regions in PNG. To date the Sepiks have not been the beneficiary of any large scale support from Government or any Development Partners unlike other provinces of the MOMASE region.
- Some areas in Sepik and Sandaun have an alarming malnutrition problem; the region scores second highest in PNG for stunting (over 45%), severe stunting and underweight children in PNG. There is also a strong link with water and sanitation issues.
- Excellent agro-ecological potential for development of existing crops, especially in the Torricelli foothills (including cocoa, vanilla, coffee, as well as traditional food-crops and new cash crops such as Eaglewood (or agarwood) produced in PNG with the local Thymelaeaceae tree *Gyrinops ledermannii* or Galip nut – *Canarium indicum*).
- An existing road network (national Highway, ring roads and feeder roads), albeit in need of maintenance and repair, connecting the producing areas to the market and trade centre of Maprik and the provincial capital of Wewak which has an international harbour, a gateway for export of goods, a tuna fish cannery and a diesel power plant. Apart from these two urban centres, there is no electrical power supply. Madang and Morobe Provinces have well developed road network linking one another and they benefit partially from one of the three electricity grids in PNG (the Ramu grid).
- The ongoing WBG-IFAD-EU programme Producers Partnership in Agriculture Project (PPAP) is developing activities in the Morobe, Madang, and some Highland provinces supporting cocoa and smallholder coffee development and will terminate in December 2019.

Based on an EU review of the value chains in the geographic region of the Sepiks, and supported by in depth studies carried out in 2017/8 under the EU Value Chains for Development (EU VC4D) initiative and related consultants and technical specialists review and reports, the EU and Government of PNG decided to focus the EU STREIT programme on the cocoa, vanilla and fisheries value chains which are further described as hereunder. Capacity development is a key element in the programme and three mutually reinforcing and interdependent levels of capacity development will be addressed by the programme: individual, organizational, and resulting from the enabling environment.

Important existing Value chains in the Programme area:

Cocoa: The development of cocoa production and cocoa industry is being strongly promoted by the Government of PNG. In the MOMASE region, the dry bean yield on smallholder farms is currently only 300 kg/ha whereas yield from improved plantations in ENB¹⁵ and AROB¹⁶ is up to 1,600 kg/ha (Cocoa Value Chain Analysis in PNG/VC4D, EU 2018). Therefore, development of an efficient and inclusive Cocoa Value Chain especially targeting the smallholder farmers is vital and extremely important considering its significance to the rural people's welfare and the national economy.

The Sepik region has a total population of 637,741, about 60% of which are engaged in cocoa production in 10 districts. As of 2017/2018, 3,801 fermentaries were established in 32 Local Level

¹⁵ East New Britain

¹⁶ Autonomous Region of Bougainville



Governments (LLGs) and wards from 10 districts and are registered under Cocoa Board. However, less than 50% of these are in operation (1,601). Sepik region (East and West Sepik) is the leading region in Cocoa production and at one time the production reached up to 18,000 tons per year in the 1990's.

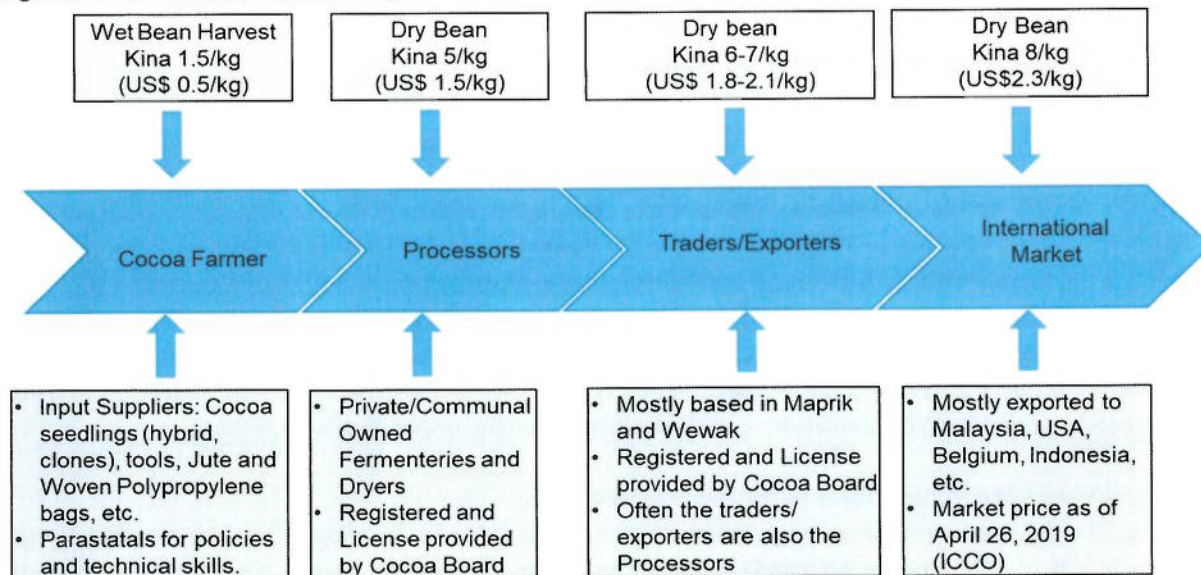
However, after the incursion of pest Cocoa Pod Borer (CPB) (*Conopomorpha cramerella*), the production has dropped significantly. In 2013, the total production in the province was 12,067 tons with the value of 30 million Kina whereas in 2016 production has reduced to 8,246 tons with the total value of 20.5 million Kina (Table 1). Cocoa Statistics of PNG published in 2017 reported that in 2015/16 Cocoa production in West Sepik (Sandaun) was 682 tons.

The invasion of CPB has forced farmers to gradually abandon the infested Cocoa trees and blocks. These led to the closing of 2200 (58%) out of 3801 cocoa seed fermentaries.

The cocoa pods are harvested and beans with pulps are removed from the pods. These Cocoa wet beans packed in a jute bag (weight of 62.5 kg) need to be transported to the fermentaries from the Cocoa blocks within 6 hours to maintain the quality. Generally, it takes around 5-6 days to ferment the Cocoa beans before it is ready for drying which takes an additional 3 to 4 days with the existing conventional wood burnin dryer model. The fuel wood consumption in the drying process is high and has a negative environmental impact. The losses occurring during the drying process range from 5 to 10% caused mainly by insufficient or over drying and beans tainted with smoke.

In Maprik town, there are reported to be 3 major Cocoa exporters who export c.72,000 bags (1 bag=62.5 kg) with the total value of 17.4 million Kina per year. Hereunder a description of the Cocoa Value Chain based on stakeholder meetings and mission findings is presented in Figure 2.

Figure 2: Cocoa Value Chain in Sepiks



The price of fresh (wet) bean is 1.0 to 1.5 Kina/kg whereas for dried bean price ranges from 5 to 7 Kina/kg (Source: Farmer/Trader during field visit in Maprik, Nov. 2017) during the production season. In April 2019, the price paid to farmers was 7K/kg of dried beans (Delivered in Store e.g. in Maprik) by traders/Agmark. This represents a positive trend in market price over the last 2 years although it may also be related to the early production price relative to the overall season when prices do fluctuate.

Cocoa in this area is a commodity that has the potential to become much more important in terms of both production and economic returns (for producers, fermentaries, traders and exporters).



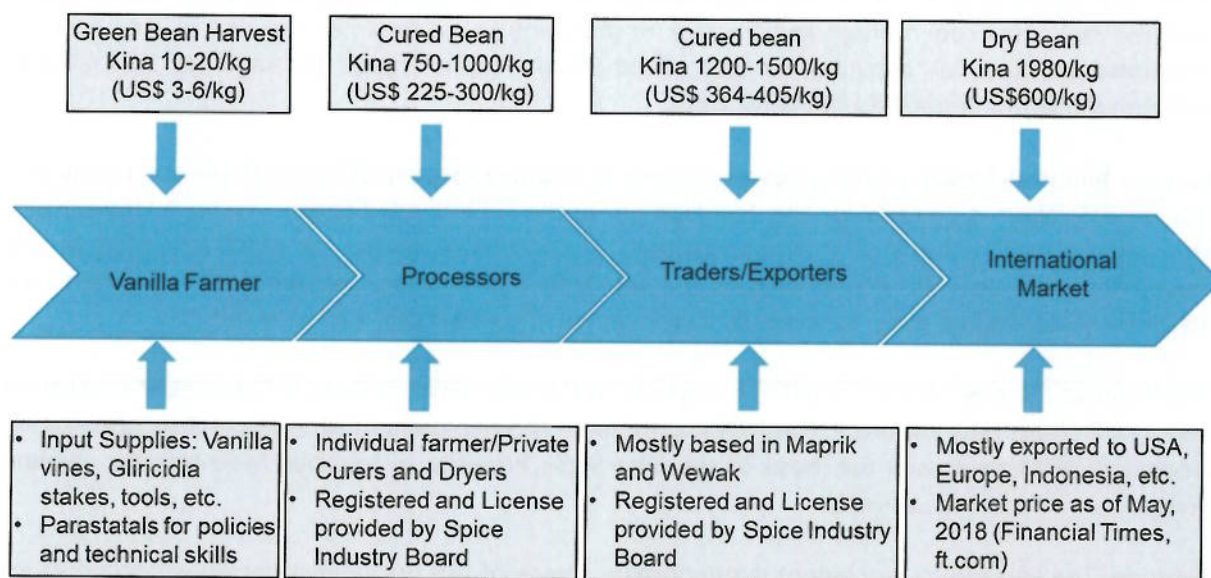
Smallholder production systems are prominent rather than large plantations, which bodes well for a more inclusive economic participation of smallholders, including women.

In line with the PNG Cocoa Industry Strategic Plan 2016-2025 and national development strategies and targets¹⁷, the cocoa-growing areas of the MOMASE region were therefore identified as the main beneficiary areas in consultation with stakeholders and through dialogue with the NAO.

Vanilla: With recent and current world market price (USD 600/kg), vanilla is an attractive cash crop in the favourable production areas of the MOMASE Region, and in the Sepiks in particular. Its high unit value and non-perishability (when properly cured) makes it particularly attractive for remote locations. Vanilla fits well into sustainable PNG agricultural systems in relation to time competition with food crops. Whilst vanilla provides significant cash return, and cocoa provides a regular income for smallholders, the bulk of farm families also have food gardens managed by the women for household consumption and local markets. With current prices¹⁸ and high market demand, producers in PNG and in the Sepiks in particular are now intensively increasing their vanilla production.

PNG vanilla production peaked at 1,000 tonnes in 2003 & 2004, but then shrank and by 2016 PNG was the 5th producer in the World with 502 tonnes (FAOSTAT). One of the reasons for the loss of market was the poorly organised value chain and also poor quality management for continued market access by traders/exporters and price volatility. The majority of vanilla trade is done through informal channels due to proximity to the Indonesian border as the major market. The cured vanilla is brought to the trading centre (such as Maprik which is the major buying centre, 3 major traders/buying houses are present and very active) or the trader collects the dried vanilla beans from the small holder farmers and exports in bulk to Indonesia by boat/combined with road transport. High variability of pricing reported for dried/cured vanilla beans – ranging from K300/kg at village level to K1000/kg at Maprik. The Vanilla Value Chain and sensitivity analysis of the vanilla price are presented in Figure 7 hereunder based on April 2019 stakeholder meetings and mission findings.

Figure 7: Vanilla Value Chain in Sepiks



Around 50–75% of PNG vanilla comes from East Sepik and Sandaun Province, with production concentrated in the Maprik, Dreikikir and Wosera/Gawi districts where 90% of a reported 90,106 households depend on income from vanilla. The East Sepik provincial DAL office recommends and

¹⁷ The cocoa board has set a production target of 100,000 tonnes of dry beans from Momase in 2021.

¹⁸ Cured vanilla trading at 1050K/kg from traders to farmers in Maprik in mid February 2019



promotes more integrated farming practices as a coping mechanism (if the price falls again) with vanilla-cocoa-eaglewood/galap nut and advise to plant 50 vanilla vines per person. In average, one pollinator can pollinate maximum of 200 flowers per day and recommend three flowers/plant.

Vanilla is a good complementary crop for diversification and for its attractiveness for women and youth whose role is important in vanilla production, particularly in pollination and also in processing. However specific technical knowledge and skills for pollination and vine management are needed to ensure good levels of production, timely harvesting, processing, curing, storage, quality management and sustainable national and international market access, competitiveness and trade.

Projected on-going strong market demand, highly suited agro-ecological conditions in PNG and existing basic know-how constitute favourable conditions for its further development. Vanilla was therefore selected as one of the focus value chains by the EU and the Government of PNG for this programme.

Fisheries: Fish is an essential part of the daily diet of riverine and coastal communities as well as a reliable source of regular income for smallholders in the Sepiks. In the low altitude villages fish consumption is the most important source of protein, comprising > 40% of all food from animal sources¹⁹. In middle and higher altitude villages, where fishing is limited to creeks and small rivers, consumption of animal proteins is more reliant on purchased sources such as preserved fish and canned products.

Within many riverine communities fishing is practiced for personal consumption with sale of excess fish providing an important source of income. Fisheries production in the Sepik has been the focus of limited past investments to address malnutrition and improve food security including the introduction of several exotic species by FAO mainly in the 1990's which is estimated to have improved yearly catches from < 3,000 t to a potential in excess of 10,000 t.

Preservation of fresh fish products has remained a persistent issue for post capture and local enterprise development. There has been limited success in establishing centralised preservation facilities that allow cool storage and the lack of proximity to markets has resulted in a reliance on traditional smoking for preservation and inland trade. Fish is traded for sago (as flour/starch) between the riverine/coastal and inland areas.

Malnutrition is highest in inland areas and access to improved supply of fish to these communities is a priority. Support is planned for the development of the fishery value chains (in-shore, aquaculture and riverine) on the basis of fisheries managed at sustainable levels, for improved incomes and household food security and improved market access and trade, including through increased adoption of ICT/digitalisation for capacity development and enhanced market access.

The National Fisheries Authority (NFA) is engaged in the area through Coastal Fisheries Management and its off-shore tuna fisheries. The NFA has initiated the deployment of In-shore Fish Aggregating Devices (IFAD) and coastal fish traps in the East Sepik Province to improve food security, income generation and alleviate poverty.

Riverine: The Sepik River catchment is the primary source of fish (including river prawns/crayfish) to the region and provides an essential transport and market route for Sepik communities. In the MOMASE region, fishing is mainly practiced by women using local canoes, some with small outboard engines, and basic fishing equipment.

¹⁹ See Van de Heuden (2002) and Charlton et al (2016)



It is estimated that >80% of women are associated with fishing livelihood and > 50% actively partake in fishing. Fish are marketed fresh but most are smoked/dried. Product may be sold or traded/exchanged for other products (e.g. sago, bananas, beetle nut).

There has been no assessment of the sustainability of the riverine fisheries in the last 20 years and government infrastructure and capacity to support the fishery is nascent. Aquatic weeds are a significant risk to riverine transport.

Aquaculture: is practiced, mostly by men, albeit at small scale throughout MOMASE. Over 10,000 small pond freshwater aquaculture enterprises operate in the Sepiks. Current knowledge and practices in terms of water supply management, breeding stock, fish pond management, feeding, and lack of storage, processing and marketing opportunities are some of the major challenges to the sustainable development of the aquaculture value chain. In the absence of efficient transportation networks aquaculture is a priority for communities without immediate access to riverine or coastal resources for food security and prevention of malnutrition, particularly stunting. Estuarine and marine aquaculture are nascent.

In shore/reef fishery: the activity is practiced along the coastal areas of MOMASE. Fishing is carried out by men, using mainly local outrigger canoes, some with small outboard motors and basic fishing nets and lines for both pelagic and high value benthic species.

Women and women's groups are often responsible for post capture handling of the product. Fish are marketed fresh to local markets and as smoked/dried products but there is very limited value addition to the fish catch. Trials of IFADs and inshore fish traps have improved catch rates and reduced costs for coastal fishers. There is some small export of frozen reef fish to specific markets (mostly restaurants) in Madang and Port Moresby.

Critical Problems the Project will address:

Missions by expert teams supported through the EU Value Chain for Development (VC4D) mechanism have taken place in 2017 and 2018 and combined with DAL consultations, provided a solid basis for analysis and planning of the following interventions on critical points in the vanilla and cocoa value chains. Data collected contributed to confirming existing assessments and were also complemented by in depth analysis and field missions by a series of FAO and other experts in programme preparation in close consultation with DAL. The EU Delegation is exploring more detailed work on fisheries by the EU VC4D in 2020²⁰. More detailed baselines will be established during the Inception Period of this Programme. The critical problems for each of the selected three value chains are outlined as hereunder.

1.1 Cocoa

- The major limitation for the realisation of production potential is the widespread infestation of cocoa pod borer or CPB (*Conopomorpha cramerella*). The CPB significantly reduces the productivity of the majority of available cultivars. However, whilst CPB tolerant cocoa cultivars have been developed in the country, these are not yet widely available in the Sepiks. An important lesson from ongoing projects indicates that the initiation of bud gardens is an important part of timely provision of improved planting materials for farming communities.
- Most farms have historically had some level of cocoa production on their plots. Very few practice improved water and (organic) nutrient management as well as so the required level of pruning or agronomic practices to optimise productivity and meet market demands.
- Weak institutional capacity, low level of resources and presence at producer level is also limiting the full engagement of smallholders in sustainable cocoa production. Low levels of

²⁰ To be confirmed with the EU Delegation, Port Moresby



financial literacy as well as limited access to finance are commonly reported in the selected programme areas.

- Cocoa is vulnerable to droughts, one of the impacts recognised in PNG's NDC. Climate-smart agricultural practices tailored to adapt to drought are needed: e.g. water-saving measures, producing and applying organic compost (this helps improve soil characteristics and resilience to dry seasons) or planting appropriate shade trees to help minimize heat stress and potential damage.
- Local MSME's such as fermentaries need support for both improved capacity in enterprise development. There are reports of up to 58% of the current existing fermentaries not functioning and/or not profitable.
- Fermentaries are registered and licensed by the Cocoa board and inspected periodically. However, the cocoa board has limited facilities and transport means to visit and support the improvement of all of these fermentaries.
- Smoke taint (caused by use of wood burning for drying) significantly limits market access, lack of suitable storage methods and facilities for cocoa result in lower grading and lower prices for smallholders. There are valuable experiences in reducing smoke taint through the use of improved combined renewable technologies such as from the WB/IFAD/EU funded PPAP project.
- Currently over 90% of the cocoa beans produced in PNG are exported as dried beans without any value-addition. Poor knowledge and limited market information, connectivity and market access (including available and affordable ICT/digital solutions, local roads), lack of quality certification and traceability also limit the level of participation and benefit for value chain stakeholders to engage in the cocoa value chain and benefit from increased trade.
- Poor road and river transport conditions resulting high transport costs are a limitation to MSMEs development and limit the volume of traders/buyers who have access to the production areas to enhance competitiveness. Feeder and ring roads are often seasonal (limited access in rainy season) with some cocoa also being brought to collection points and marketing centres using the river Sepik and its tributaries and there are reports of limited access to landing sites due to invasive river plants.

1.2 Vanilla

- At production level there are gaps in both availability of good quality planting materials (vines) as well as production practices. Vanilla plants start flowering three to five years after planting, and reach maximum production after seven to eight years and curing takes an additional four to six months, which adds most value to the beans.
- In vanilla production very few farms practice water management or plan for vanilla plot nutrient management, including for climate smart practices.
- The process of selectively pruning the vine is also important to optimise the number of pods which the vine will support. There appears to be a lack of understanding on the value of growing larger size pods which are preferred by traders and processors.
- A key element in successful vanilla production is the very delicate process of pollination. This labour-intensive work is mostly performed by women and youth. The vine flowers only for a few hours in the morning and highly expert handling and training is required to ensure pollination this is done successfully. Therefore, farmer restrict themselves to growing blocks of up to 0.5 ha which can be managed by their own household directly.
- The current production systems appear to be organic with no noted use of chemical inorganic fertilizers. However, the lack of traceability and certification systems also limits participation in international markets and trade and access to a higher market price for organic or other branded and certified vanilla and vanilla products.
- Insecurity at farm level is also a major issue for producers with individual green pods being widely reported as stolen at farm level due to their high value. There are also widespread reports and complaints from processors and traders that the vanilla is being harvested prematurely by the farmers due to risk of theft.



- The Spice Industry Board (SIB)/DAL extension service has been dysfunctional over a long period of time and there is a lack of skilled trainers and extension officers in the country. DAL is currently reviewing the SIB and its functions and staffing and this may be supported by the emerging WB DCAP project.
- Curing of the vanilla is also a very time consuming as well as labour intensive task, mainly but not exclusively done by the woman of the house. Most of the curing is done at household level with risk of theft as well as lack of knowledge and materials for improving and controlling the curing and drying rate to optimise price for the final product.
- Marketing of vanilla is a major risk area for men and women. With poor road and river infrastructure, producers appear to often sell their vanilla to traders, some of whom are offering low prices, as compared to the prices offered in important market centres such as Maprik where there is competition to purchase vanilla.
- There is a significant gap in knowledge and understanding of the traders and industry requirements in terms of vanilla size, colour, level of curing and water content at smallholder level resulting in lower pricing.
- Vanilla beans for different markets and end uses will have different specifications, for example in the moisture content, bean length and the method of packaging or the size of bundles. Different buyers may require different specifications for Vanilla depending on the intended end use of the beans. For example, the whole bean market requires Vanilla beans with a moisture content of about 20%. The essence market generally requires lower moisture content of about 17%. Growers who harvest premature Vanilla bean pods and curers and exporters continuing to buy immature Vanilla beans will not provide incentives for farmers or curers to improve their quality. Exporters have to be aware of the Vanilla quality they buy and pay a better price for good quality Vanilla.
- The risk of theft of both the vanilla and cash received is a significant and everyday risk to the producers, traders and processors. PSV's are subject to local illegal roadblocks as well as attacks on passengers and others. There is limited use of any digital payments/mobile money transactions and a very limited bank/branch network in the programme area.
- Lack of banks, unavailability and affordability of mobile banking (e.g. e-wallets) and access to savings, loans and local microfinance institutions further exacerbates this security risk and endangers farm families. Bank requirements for collateral and even national identification cards also limit smallholder, agripreneurs and MSMEs' access to a range of banking and other services.

1.3 Fisheries

- There are currently neither detailed Value Chain studies on the fisheries in the Sepiks, nor any market assessment of the demand for the diversity of fish and fishery products in the target project area. This absence of information on the quantity of product caught and retained for fisher consumption and that processed for subsequent sale and trade limits the planning for value chain interventions and targeting.
- There is a critical gap in knowledge and information technologies infrastructures that are both required to assess and plan for the sustainability of the Sepiks' riverine fisheries resources. Fishery product was estimated at the equivalent of 1 t fresh weight in the Maprik market when visited and the size class of fish were below breeding age. The latter is an indicator of the potential for unsustainable fishing in the longer term. If the volume observed is reflective of most market and market days, then it is likely that total catches are exceeding past estimates of potential yields for the Sepik.
- **Management of the riverine fisheries** is currently unregulated and unreported. The provincial government currently has no information technology and limited human capacity for management of the riverine fisheries. Support from the National Fisheries Authority, which has a local office in Wewak, is currently restricted to coastal fisheries initiatives and inspection protocols associated with the western and central Pacific tuna fisheries and international trade.



- Appropriately **trained and skilled fisheries enterprises and government support officers** in the Sepiks are lacking. The remoteness, high costs of travel and limited infrastructure exacerbates the lack of capacity.
- Fish and fish product play an essential role in **food security and nutrition** in the Sepiks. Fish caught in the coastal areas is either consumed directly by coastal communities or traded at markets.
- **Fish market facilities** are very basic and often not sufficiently well designed or planned to maintain product quality. Key fish markets are for example lacking in ice making equipment for cold storage, access to clean water systems and weather protection. This limits the market use and benefit for fish enterprises.
- There is a developing market in Maprik where there is high cash availability due to a high price of vanilla. The traditional “fish for sago” or other food staples trade continues to be highly important along the Sepik river and even more so on its tributaries where fish is often sold smoked, often with significant loss of nutritional value as compared to fresh or frozen fish.
- **Current fish drying and smoking** dehydration methods of open fire smoking are inefficient, reduce product nutritional value, and pose a health risk to fishers, particularly women who are responsible for fish smoking, preservation and marketing.
- Availability of **fingerlings for aquaculture** is limited with no local hatchery providing stocks to aquaculture enterprises in the region.
- Sepik fisheries are vulnerable to **climatic variability and change**. The recent El Nino (by example) has resulted in reduced rainfall and fish production. Water levels in the Sepik catchment were significantly lower than previous dry seasons. The impact of the drought on food security and livelihoods was significant in flood-plain and marsh zones with households reported to be eating less preferred food and having lower meal consumption. Malnutrition and under-nutrition in children aged 6-59 months were higher in vulnerable locations.
- The Sepik aquatic fauna includes species of crustaceans and coastal/estuarine species that are currently not utilised for **commercial fishing** or food security. This has been due to the requirement for significant infrastructure and finance to establish such industries. There appears to be a gap in capacity to undertake feasibility planning for new fishery enterprises to utilise currently under-exploited fisheries resources e.g. crayfish rearing in cages.
- El Nino-like conditions are expected to be more frequent under projected climate change scenarios. Implementation of adaptive strategies and **climate proofing** including in infrastructure such as roads, river facilities e.g. jetties, fish ponds, to build resilience to such events are required. Catchment and riparian vegetation clearance have resulted in bank erosion during extreme flooding events which has damaged infrastructure and reduced access to river resources. Exotic weed invasion (*Salvinia molesta*) is reported to be reducing river transport and access, including for cocoa transport/landing sites.
- Based on available information and multiple missions by fisheries technical experts, the project will prioritise the **critical problems** of low yields for fishing efforts, basic fishing practices, poor/unsafe equipment and storage access to cold chain infrastructure and losses due to poor handling and processing. The remoteness of the Sepik region may limit the current capacity for large export outside of the Sepik boundaries and this will be reviewed also under the transport/infrastructure component of the project during inception.

INTERVENTION LOGIC

As per the EU Action Document and Financing Agreement the intervention logic is based on a holistic approach to rural development in order to maximise the impact of the Programme in the area of action, focused initially on Sepik Provinces (Sandaun and East Sepik). After the mid-term review of the action, value chain development activities will be considered for expansion to neighbouring Provinces of the Momase region.

