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## **Final Report for**

# **Development of a Social Accounting Matrix and the Artisanal Fisheries Component of Seychelles' Fisheries Satellite Account**

**Project Name/ID:** Third South West Indian Ocean Fisheries  
Governance and Shared Growth Project (SWIOFish3) / P155642

**Contract Number:** N03/SWIO3/C/2021

**Initial draft:** 01 January 2023

## **1. Introduction – background:**

Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3) / P155642 was established for “The Development of a Social Accounting Matrix and the Artisanal Fisheries Component of Seychelles’ Fisheries Satellite Account” with two main activity goals: 1. Artisanal fisheries component of the Satellite Account” and 2. “Development of the balanced Social Accounting Matrix”.

The Project contracted with the Consultant, Sachiko TSUJI, on 18 January 2021 to deliver the project activities and Mr. Kenneth Racombo, Principal Secretary, Blue Economy Department was designated as the Coordinator who would be responsible for the coordination of activities under this Contract. Terms of Reference (ToR) of the Contract is attached as Annex A.

The initial draft of the inception report was provided on 01 March, 2021, which was approved after several modifications in a middle of April 2022. In the process of preparation of the inception, it was recognised that the Social Accounting Matrix (SAM) for the Seychelles, one of main objectives of the Project, was already compiled by Mr Patrice Guillotreau, Institut de Recherche pour le Développement, France, in a collaboration of National Bureau of Statistics (NBS) and Seychelles Fishing Authority (SFA) based on the revised 2014 System of National Accounts (SNA) (referred as SAM 2014 afterword) based on Supply-Use and Input-Output Tables (SUT, IOT). Therefore, the main focus of the project activity was shifted from a simple compilation of SAM to i) enhancement of knowledge on economic aspects of artisanal component of the Seychelles fisheries, and ii) integration of additional economic relevance derived from, or relating with the fisheries resource uses, identified during the development of the Seychelles Fisheries Satellite Accounts under the Phase IV of IOTC-OFCF Collaborative Project, 2017-2019 (referred as SFSA afterword).

According to the inception plan, the Consultant visited the Seychelles and conducted a field work from 29 August to 24 September, 2021, mainly consultation with the staffs in NBS and SFA and data mining and analysis on small scale fishery component in the Seychelles. Mr Guillotreau was also in the Seychelles in the last week of the Consultant’s stay in the Seychelles and discussed intensively on technical issues, including on conceptual differences between SAM and Satellite Accounts and mutual benefits and constraints. This helped a lot, together with the frequent consultation mainly with Mr Kevin Bistoquet, to understand the exact procedures applied and nature of data sources utilized in the SAM 2014 as well as the revised SNA. In the NBS SUT and IOT, all information was basically collected from individual company that was strictly linked to one economic activity. Due to confidentiality constraints and pragmatic difficulty in modifying categories of any companies, it was considered not possible to disaggregate a contribution of some activities, e.g. fishery-related component, other than those already categorized as “Fishing” or “Manufacture of fishery products”.

Accordingly, the Consultant failed to deliver the SAM compilation, consistent with the SFSA, and explained that it could not find a way to incorporate an economic contribution by industrial fishing and through port services, two major component inflating fishery economic contribution in the SFSA, and that only deliverable SAM would not make substantial difference from the SAM 2014 considering a relatively minor economic contribution of small scale fisheries. In the end, the explanation was accepted and Addendum was agreed.

When reviewing all findings from field activities together with the SFSA data for preparation of this final report, it was noted that the SAM is in fact a way of compiling everything focusing on flow of commodities and services, and therefore, disaggregation and/or re-grouping would be possible in a similar way as SFSA, regardless the structure of source data. This led to an introduction of inflated/ restructured fishery related economic activities in SAM, which was shown in Section 3.

Section 2 described the economic aspects of the small-scale component of the Seychelles fisheries, together with some findings. The Section focused on data preparation for SNA compilation. General characteristics and economic performance of the component were partially covered with a presentation made at the end of field trip, which was attached in Appendix 2. Check list against inception work plan was in Appendix 3.

## **2. Economic aspects of small-scale fishery component in the Seychelles:**

Majority of works was conducted through review of publications and analysis of detailed raw data that SFA kindly provided only for the purpose of the Project.

Here, the small-scale fishery component in the Seychelles was defined as all harvesting activities with any gears, other than industrial longline and purse seine fisheries. This also corresponded to the definition of Fishing activity in the context of SNA. Unless otherwise noted, landing statistics published through SFA, Fisheries Statistical Reports, were utilised. More detailed catch and effort information as well as structure of artisanal fisheries, gear used, etc were extracted from SFA Technical Report: Seychelles Artisanal Fisheries Statistics. Although the Seychelles Artisanal Fisheries Statistics ceased its dissemination for 2016 onward, the equivalent information was provided by SFA.

Statistics collected and compiled by the SFA were generally in terms of quantity. In order to convert landing quantity into value, average unit price by species by year was determined using the raw data of quantity and value purchased by local processors, Oceana Fisheries Co. (Pty) Ltd and Sea Harvest Co. Pty Ltd. ("Artisanal\_Fish purchase.xls"). File contained the information on Buyer, Seller type, fish species, process type, weight and value for each purchase. Average unit price was calculated for each species by year only using data on whole fish. Since Sea Harvest only provided weight information, this analysis fully relied on data from Oceana, and extrapolate to estimate purchase value by Sea Harvest. Average Unit price by species was further aggregated with a mean to obtain average price for species group to be used to convert landing quantity to landing value. Estimated average unit price of commonly utilised species group was in Appendix 1.

Landing values were estimated using two different unit price values, one with Consumer Price Index (CPI) compiled by NBS and the other as estimating landing values by species/ species groups with average purchase price of local processors and then accumulate. In this case, the price was considered to be close to producer price. The results were shown in Table 1, with indicative average price obtaining total value divided by total landing weight.

SFA also provided a file of raw data of export of individual commodities, with exporters, species, processed type, weight, value, destination and type of freight (“SFA\_Exportyyyy.xls”). Together with the Fish purchase file, product flow of fish landing was summarised in Table 1.

Regarding the fishing operational cost, fuel consumption in quantity was estimated from the Government expenditure for fuel subsidise, available in Table 9 of Fisheries Comprehensive Plan, 2019, and then converted to fuel expenditure. Result was in Table 1. Fuel price was picked up from anecdotal articles available in the web, though more accurate historical price data might be retrievable from the SEYPEC who disseminating fuel price for recent years. SFA is collecting bunkering data 2019 onwards.

Claim for the concession, submitted to the MoF, was analysed to estimate the operating cost. Data file (“Tax concession 2005-2019.xls”) contained date, name of applicant, description on items, quantity and value. Based on a description, claims were classified according to Seychelles Product Classification and placed an additional tag when clearly indicated as fishing equipment, and then aggregated by commodities for 2014 and 2018, as shown in Table 2. The result should be taken only as indicative due to rather high level of expected errors in classification, as a result of combination of a difficulty in interpreting item description and a shortage of the Consultant’s knowledge on items as a whole. The results also excluded all claims from Seychelles Fishing Authority and Seychelles Port Authority.

It should be noted that the commodities essential for fishing operations, including fishing gears, baits, boat engines, and fishing boat itself, were claimed not only by fishers but also by local processors. The existence of middle man was frequently pointed as not only for a role of connecting fishers and markets, but also who providing necessary equipment for fishing and retrieving harvest with reduced price. The table indicated that local processors played the similar role and their involvement seemed to be increasing in recent years.

General flow of goods and products seemed to be rather simple and almost no upstream nor downstream activities within the country, and there was not much value of applying satellite account approach. At the same time, the whole process from preparation of fishing, actual harvesting and landing, and marketing and processing was closely connected as one inseparable group, where middle-man and local processors acting as key driver by covering the first and third roles. Considering extremely scarce information on middle-man and increasing involvement of local processors, it would be most beneficial and pragmatic to consider a group including fishers, middle man and local processors as one unit of economic activity. Such a close linkage from harvesting to marketing was already systematized in the case of sea cucumber fishery.

### **3. Alternative fishery-focused SAM:**

#### **3.1. Observation on the SAM 2014 and issues noted:**

NBS kindly shared the compilation file of revised SNA, “SAM\_2014.xlsx”, that also included the SAM 2014 compilation file of revised SNA and SAM-2014. The file contained all data utilised, aggregated either by Seychelles Product Classification (SPC) or by Seychelles Industry Code

(SIC), including GDP by Production, GDP by Expenditure, Supply Use Balance, SUT Summary, as well as individual components of “Use” (i.e. Imports, Output, Margins and Taxes) and “Supply” (i.e. Intermediate Consumption (IC), Household Final Consumption Expenditure (HFCE), other final demands (OtherFD), and Exports) together with a sheet showing a balancing between supply and use.

The file provided details on all compilation processes and adjustments applied once aggregated input value was finalized. NBS explained that majority of input data was derived from annual Business Tax Return (BTR) of medium and small enterprises (BTR\_M&S), as well as from the company of Seychelles International Trade Zone (SITZ). In the case of fishery related companies, the IOT is only SITZ company under the category of Fish & aquaculture products (AB) and Processed fish (CA). Regarding the BTR\_M&S, 5 companies under AB, two of which are sea cucumber fishery operators, one company under Wholesale and retail trade (G\_A) and two companies, Oceana and Sea Harvest, under CA, were listed at the time of 2014. All the production was considered as output of allocated commodities.

First thing to note with the revised SNA was a large increase of total supply of AB from 183 million SCR as estimated with old SNA to 731 million SCR, of which 394 million SCR was made by the IOT owned purse seiners and therefore translated into CA output. The remaining local output was calculated by adding intermediate consumption (IC) of 145 million SCR, claimed by BTR\_M&S of AB categories, to the estimated landing value of 192 million SCR that was calculated by multiplying the total landing amount provided by SFA with indicative consumer price collected and compiled by NBS. In the past, this same amount was considered as total output but with no IC data available, was also taken as GVA. Total landing value was considered as a relatively solid data to represent output and IC should be deducted from this value to obtain GVA. By reversing the process, it created non-existing inflated fresh fish production.

In addition, the BTR\_M&S of AB categories included two companies specialised for sea cucumber operation, which required much more equipment and was subject to higher taxes and trade margins, than finfish harvesting operation. They are usually operated as one group covering from harvesting, processing until exporting dried final products. Their final outputs are classified as CA, processed fishery products. There could be strong doubt of mismatch between IC and final outputs occurring.

CA category is now composed with the IOT and two local processing companies who mainly exported local fish in frozen. Quick glance of IC indicated a similarity with those obtained directly from the IOT for compilation of SFSA, but seemed to cover other IC expenses more thoroughly. Relatively large claim of professional service cost might indicate the employment cost, i.e. should not include in IC, as happened at the time of SFSA compilation.

It should be noted that in the Seychelles revised SNA, SIC and SPC were utilized in almost interchangeable way, even though proper distinction was applied where needed. This sometimes caused a confusion and misunderstandings on implication of data and treatment. SNA compilation based on SUT and IOT was supposed to allow more flexibility and traceability in monitoring flow of commodities and services among economic activities. Rigid one to one relationship between economic activities and commodities/ services produced seemed to negate the biggest advantages of SUT/IOT approach.

### 3.2. Alternative fishery- focused SAM:

IOTC-OFCF SFSA identified three major components that had substantial economic contribution as fisheries related activity but not well reflected in the conventional SNA: review and revision of IOT IC, production made by industrial purse seiners and longliners under the Seychelles flag, and economic gain obtained through port service activities. This section described attempt to incorporate the contribution of industrial purse seine fishery as well as that of port services, in addition to better integration of small-scale fishery component, indicated as one of Project objective. Because of lack of necessary information and low relevance with national economy, the contribution of Seychelles flagged industrial longliners was not considered this time.

Rational and actual modification applied were described below for each component. Modification of IC and outputs of those proposed components were also shown in Table XXX and SAM reflected in those changes in Table XXX, focusing more on fishery-related commodities and services. For comparison, TAB XXX showed SAM-2014 in the same format.

The SAM was compiled in an extreme rush since the idea came at the last moment in preparing this report. The results showed still contained minor unbalances and contradiction, as well as would be subject to errors. The alternative compilation increased a contribution of fishery-related activities to 22% in total output and 14% in GVA, from 16% and 7% of original SAM-2014, respectively. Due to time constraints, no interpretation was made.

#### 3.2.1 Small scale fishery component:

Project field study revealed a strong linkage among fishers, processors, and traders in small scale fisheries component in the Seychelles. Sea cucumber fishery established a system for the same group(s) covering a whole process from harvesting, processing until exporting, either through contracts or under the same company's umbrella. So-called "Middle man" provided fishing equipment and other needs, such as ice and fuel, to fishers and retrieved catch with reduced prices for domestic marketing, though no solid information existed on their economic activities. It seemed that local processing and fish exporting companies, e.g. Oceana and Sea Harvest, played a similar role as "middle man" and their involvement in fishing activities seemed to be increasing in recent years.

All of this made it extremely difficult to separate economic contribution and became one of the reasons of mismatch observed in the revised SNA. Strong and close linkage of harvesting and processing activity is commonly observed in small scale operations, not only fisheries but also agriculture, e.g. within household processing of agricultural products. In such cases, combining them together and treating as one economic activity was also broadly accepted way. The Consultant proposed to apply the same approach.

Here, the small-scale fishing was considered to include all small-scale fisheries, including sea cucumber fishery and semi-industrial longline, plus supporting processing and trading activities, i.e. local processors under CA category. Fishery related component under G\_A category would not be included simply due to a lack of information.

IC claimed under AB category and accumulated amount claimed for import concession were integrated into IC of this alternative activity. The latter amount was extracted from IC under CA category, considering to account for the expense by local processors. This corresponded to the absolute minimum of expenditure and definitely largely underestimated. Since BTR\_B&S and SITZ inputs were distinguished in the compilation process, it would be highly recommended to separate IC claimed by local processors based on actual claims made.

Output by this alternative activity included two commodities, fresh fish (AB) and processed fishery products (CA). AB output would cover all finfish landings, converted into value with NBS indicative CPI. Assuming no difference in the IOT claim between SAM-2014 and FSFA regarding to output, unclaimed amount of CA supply was allocated as CA output of small-scale fishing and processing activity. Fish purchased and utilized by local processors of 51 million SCR was double-counted but no adjustment was made at this time.

The modification resulted in reduced fresh fish (AB) output to the level corresponding to the landing amount and large GVA of small-scale fishing and processing activity. The imbalanced treatment between output and expenditure (i.e. IC), i.e. CA output accounting for all except IOT claimed, while based on accumulation of absolute minimum, was the main cause of large GVA. Once it would become possible to extract the CA output and IC directly from BTR\_M&S under CA category, the more balanced estimate of GVA would be obtained.

### 3.2.2 Industrial purse seine:

SAM-2014 included output made by the industrial purse seine fishing owned by the IOT. This discrimination in treatment of industrial purse seine activity was based on the status of owners, either SITZ or joint-ventured offshore ownership, but not desirable from fisheries management view point. Seychelles flagged purse seine vessels were considered to be based at Victoria, and frequently offloaded and transhipped their catch at Victoria. When the landing was utilized in e.g. IOT production, this portion was considered as domestically supplied and encountered the difficulty to absorb unless having economic activity. Insertion of economic activity of "Industrial purse seine" would provide a house covering the substantial fish supply from Seychelles fleet to the IOT, eliminate discriminatory treatment of the same activity according to the owners' status, and would become more consistent with the flag nation responsibility identified with the United Nations Convention on Law of the Sea (UNCLOS). Therefore, it should be less controversial than inclusion of industrial longline.

It was assumed that industrial purse seine only produced fresh fish (AB), noting that the manufacture of fish product (C101) claimed the utilisation of 605 million SCR of AB and that the comparable amount was claimed as fish supply from the Seychelles flagged vessels in the FSFA. Their total output and export were extracted from the value obtained in the SFSA. The general fishing operational cost was constructed by inflating IC of small-scale fishing and processing with ratio of AB output, i.e. 6.8, except fuel (CDC), port service (H) and administrative (N) cost. SFSA values were used for Port service and administrative cost and no fuel cost included, assuming that all fuel was provided through port bunkering service.

Since this was an insertion of new activity, it introduced imbalances. In an attempt to absorb the impact of modifications within the SAM-2014, the general expenditure for fishing operation

was deduced from the expenditure of Manufacture of fish products (C101) as much as possible, assuming that some IC Expenditure required for purse seine operation was included here. However, some could be treated as services to the External World, i.e. Export, some might be absorbed and simply hidden. Further investigation would be needed on proper procedure to estimate IC in order to include this economic activity in the future SNA. economic contribution of the Seychelles flagged supply vessels would require clear visibility in the SNA and SAM.

### 3.2.3 Manufacture of canned tuna (IOT, previous C10):

IC used in the SAM-2014 for Manufacture of fishery products (C101) showed similarity in value obtained through SFSA, in particular for those commodities and services reported directly by the IOT in 2018. However, by covering local processors and purse seine fishing owned by the IOT under the same activity, economic contribution of IOT became less clear. Attempt was made to return the IC of this activity as only representing the situation of IOT. Exercise here provided a tentative mitigation and the IOT should be treated independently as previous SNA did.

IC was adjusted based on several rules: i) when comparable estimates available from both SAM-2014 and SFSA, take SAM-2014 value, ii) when SFSA figure substantially higher than those in SAM-2014, in principle take SFSA figure, iii) when no SFSA figure available, take SAM-2014 figure after deducting the amount claimed by small-scale fishing and processing and industrial purse seine. Some additional minor adjustments were applied when needed based on expert judgement.

Total output of process products (CA) was taken from SFSA and that of fresh fish (AB) was removed to be covered under the industrial purse seine.

### 3.2.4 Port services to fishing vessel:

Many economic activities, not only fishing and fish processing, actually relied on utilisation of aquatic resources. Fishery Satellite Account was developed in order to evaluate a potential impact in the Seychelles economy when its fishery resources depleted, and therefore, the fishery-related economic activity was defined as those would have significant impacts by disabling a fishery access to aquatic resources. Port services to fishing vessels was one of major economic activities with fishery relevance that made significant contribution to the national economy.

Transportation and storage (SIC:H49-53, SPC:H) included several activities relating with port services, such as "Service activities incidental to water transportation" (ISSIC 5222), "Cargo handling" (ISSIC 5224), and "Other transportation support activities" (ISSIC 5229). The largest expenditure on petroleum products (CDC) suggested that a bunkering service could be covered under this activity. SFA compiled the port expenditure of fishing and support vessels for both national and foreign fleet, total 2,033 million SCR. Then, by separating data in prorata basis with service purchased by fishing fleets, it would be possible to create a 'virtual' economic activities covering port services directed to fishery related activities.

The application seemed to work fine and obtained of GVA 463 million SCR, in the similar level obtained in SFSA, 473 million SCR. The approach would be quite useful in disaggregating a



portion with a specific interest, e.g. fishery related, as long as the purchase information by commodities and service receiver would be available.

#### **4. General consideration and recommendation:**

Both this project and IOTC-OFCF project tried to establish a way to evaluate a contribution obtained from utilisation of aquatic resources in national economy. It should include contribution directly obtained from harvesting resources, through fishing and manufacturing, marketing and trading fishery products, as well as many supporting economic activities, e.g. supply vessels, transshipment and other port services, transportation of crews, satellite communication services, etc. Extracting a part supporting fishing operation from those supporting business was extremely cumbersome and challenging tasks, due to its complexity and broadness, but also from the fact that business statistics did not distinguish final use of its goods and services.

Concept of 'virtual' segment would allow to extract prorata economic information from a certain economic activity, according to the purchase made by interested segment, e.g. satellite communication and monitoring services, utilized by fishing vessels, or for monitoring purposes. From the view of Fishery-related SAM or Fishery Satellite Accounts, this would have two big advantages; i) extraction only requiring service purchase data by receiving segment, and ii) process causing no impacts on the base SNA. In the other words, Fishery Agency could make an extraction independently based on the purchase information collected from the fishing sector using disseminated SNA or SAM figures.

While NBS statistics is for monitoring monetary flow within the country, MoF seeks for information to assist decision making for management of the country's aquatic natural resources within the EEZ and national flagged fleet. Since the foreign fleet operating within its EEZ as well as its national fleet also operating in high seas and other countries' EEZ, MoF needs to cover much broader range of information, but with specific focus on fishing and fish resources. In the past, the fishery statistics was extremely biased toward biological information, such as catch quantity and CPUE, but the Seychelles MoF and SFA rapidly expand its capacity and coverage and collecting many essential social and economic information of the sector. It would be desirable for MoF/SFA to establish an independent capacity to compile fishery-focused SNA/ SAM, based on the SNA/ SAM disseminated by NBS.

Having said that, several issues were noted in particular for handling fishery-related information. First of all, it was strongly recommended to incorporate industrial purse seine within SNA compilation. Partial inclusion of its product apparently caused a problem in finding home for unknown source of products. Second, IOT and other local processors should be clearly separated, at least during the compilation. Nature of two components was totally different and combining them together made everything smeared and made it difficult to review and analyse. If needed, aggregation should be done at the last moment for dissemination.

Analysis indicated rapid shifting and changing in recent years. Application of fixed ratio, e.g. I/O ratio, output/GVA ratio, should be avoided as much as possible.

## **5. Acknowledgement:**

Tasks could not be achieved without strong support and critical inputs from all the staffs involved. First of all, the greatest appreciation to Ms. Sheriffa Morel, Ministry of Fishery, who was a driver of the whole project. Her strong, committed and continuous support together with her consistent request along the fisheries need made the fishery focused compilation of macro statistics possible. To all the staffs working at Ministry of Fishery, special thanks for accepting me so nicely at office and providing everything needed. No way to express my appreciation adequately to Mr Sharif Antoine, Ms Juliette Lucas and other SFA staffs. The work was built directly upon their efforts and achievement for long years, which they generously shared with many useful advices. Same for Mr Kevin, Bistoquet, Mr Deano Louise and other NBS staffs, for SNA and SAM component. Particularly grateful for their patience in fulfilling my knowledge gap. Mr Patrice Guillotreau guided me to enhancing understanding on macro-statistics. Intensive face-to-face discussion in the MoF office was quite stimulative and enjoyable. Great thank to all the members of Technical Communication Network for their continuous support and advices. At the last but not the least, special thanks to Jan Robinson and Ms Meggy Tirant of SWIOFish Project, in particular for their patience and flexibility, helping to overcome many troubles I brought in. Thank you all.

Dear Sheriffa and Kevin:

Through conversation within the Ministry of Fishery, I noted a small frustration in the MoF against that the FSA developed under IOTC/OFCE project was not yet incorporated into NBS statistics. On the other hand, I fully understand the constraints in NBS in maintaining full consistency throughout the SNA (i.e. among all economic activities involved) as well as being consistent with the UNSD guideline.

The FSA developed contains some distortion, by exploring the economic linkage only from fishery expenditure side without considering internal adjustment among economic activities, and by applying Law of the Sea concept on catch attribute which contradicting to the guideline on attribute of economic value, in particular for beneficial owners. So, it is natural for NBS not being possible to accept as it is. In fact, NBS already incorporates the IOT SUT into its SNA.

The biggest benefit of FSA is to allow filtering of economic activities relevant to specific interest (e.g. tourism, and fish resource management including both utilisation and conservation), independent from SNA where a linkage is only based on direct flow of products. Therefore, in my mind, MoF will be more appropriate as an agency to compile and disseminate FSA in a suitable format to support and appeal its political position.

On the other hand, the current exercise, as well as that under IOTC/OFCE project, does provide many useful inputs directly usable by NBS in improving its SNA (e.g. IOT SUT, output estimate procedure for domestic fishing and its SUT).



Table 1. Summary of economic indicators of small scale fisheries, including semi-industrial logliners.

	2014	2015	2016	2017	2018
<b>Total landing in quantity (t):</b>	3,715	3,409	3,482	5,464	5,454
<b>Total landing in value (SCR mil):</b>					
- multiplied with CPI	201.4	199.4	210.3	346.6	344.4
Indicative CPI (SCR/kg)	54	58	60	63	63
- converted with purchase price by processors	121.2	97.6	131.0	128.9	128.8
Indicative average PP (SCR/kg)	33	29	38	24	24
<b>Value purchased by local processors (SCR mil):</b>					
(Oceana and Sea Harvest)	55.7	35.6	50.3	17.6	23.2
Indicative average price (SCR/kg)	38	35	38	42	42
- Exported value (SCR mil)	15	18	58	56	45
<b>Export value of fishery products (SCR mil):</b>					
- Frozen fish	14.7	18.3	87.9	106.2	190.8
Tuna	0.4	5.6	63.4	67.4	120.1
- Sea cucumber (dried)	41.1	37.1	26.5	18.9	44.0
- Shark fin (dried)	0.4	0.2	0.4		0.4
<b>TOTAL</b>	<b><u>56.3</u></b>	<b><u>55.6</u></b>	<b><u>114.7</u></b>	<b><u>125.0</u></b>	<b><u>235.3</u></b>
<b>For frozen fish:</b>					
- Number of companies involved	2	2	5	5	6
- Proportion covered by Oceana and Sea Harvest	100%	100%	65%	54%	24%
<b>Fuel cost:</b>					
- Subsidise as SCR8/litre (SCR mil)	34.6	30.8	31.5	41.6	32.3
- Fuel consumed in Q (t)	4.3	3.9	3.9	5.2	4.0
- Fuel consumed in V (SCR mil)	<u>84.4</u>	<u>61.2</u>	<u>59.9</u>	<u>88.0</u>	<u>75.4</u>
Indicative unit price (SCR/litre)	20	16	15	17	19

Table 2 Values claimed for tax concession by commodity categories, submitted to Ministry of Fishery, for year 2014 and 2018. Unit is thousand SCR.

YEAR 2014					YEAR 2018				
	Oceana	Sea Harvest	Others	TOTAL		Oceana	Sea Harvest	Others	TOTAL
CA	441	0	469	910	CA	5,780	1,752	5,068	12,600
Baits	441		469	910	Baits	5,780	1,752	5,068	12,600
CDA	507	0	39	546	CDA	196	10	183	388
Fishing gears	17		9	26	Fishing gears			40	40
Others	490		31	521	Others	196	10	143	349
CDB	769	0	28	797	CDB	107	210	869	1,186
	769		28	797		107	210	869	1,186
CDC	50	0	57	107	CDC	0	0	15	15
	50		57	107				15	15
CDD	7,680	3,879	1,253	12,812	CDD	3,562	577	5,216	9,354
Fishing gears	443		384	828	Fishing gears	369		282	651
Others	7,237	3,879	868	11,984	Others	3,193	577	4,933	8,703
CDE	50	0	487	537	CDE	31	0	179	210
Fishing gears			45	45	Fishing gears			168	168
Others	50		441	491	Others	31		11	42
CDF	753	0	585	1,338	CDF	4,413	28	2,187	6,627
Fishing gears	271		126	397	Fishing gears	56		224	280
Others	482		459	941	Others	4,357	28	1,963	6,348
CDG	6,228	11	7,033	13,272	CDG	3,307	8	8,443	11,758
Engines			4,445	4,445	Engines	76		5,742	5,818
Fishing equip.	258		1,153	1,412	Fishing equip.	178		285	463
Communication	25		827	852	Communication	59		168	227
Others	5,945	11	607	6,563	Others	2,994	8	2,247	5,249
CDH	31,200	0	6,986	38,186	CDH	25,772	0	14,829	40,601
Boats	30,607		4,255	34,862	Boats	25,419		6,052	31,471
Land Viecles	563		2,728	3,292	Land Viecles	279		8,094	8,373
Others	29		3	32	Others	73		683	757
CDI	324		10	334	CDI	3,463		10	3,473
<b>Grand Total</b>	<b>48,002</b>	<b>3,890</b>	<b>16,946</b>	<b>68,838</b>	<b>Grand Total</b>	<b>46,629</b>	<b>2,585</b>	<b>36,998</b>	<b>86,212</b>

Table 3 Comparison of intermediate consumptions for fishing (A03) and manufacture of fishery products (C10) obtained among different analyses and proposed alternatives for the modified SAM to be developed under the SWIOFish Project.

	Products X Industry		Fishing: 2014 SAM	Extraction from concession file	SWIOFish artisanal F analysis	Small scale fisheries and processing: SWIOFish SAM	Industrial PS: OFCF SFA	Industrial PS: SWIOFish SAM	Manufacture of fishery products: 2014 SAM	IOT: OFCF SFA	IOT: SWIOFish SAM
		SIC	A03	A03	A03	A03.C10	A03	A03	C101	C10	H522
		SPC	AB	AB	AB	AB	AB	AB	CA	CA	H
1	Agricultural products	AA	0	0	0	0	0	0	3	0	3
2	Fish & aquatic products	AB	0	0	0	0	0	0	605	609	605
3	Quarry products	B_	0	0	0	0	0	0	1	0	1
4	Processed fish	CA	0	1	0	1	0	0	1,624	954	1,623
5	Other food products	CB	0	0	0	0	0	0	135	133	135
6	Beverages and tobacco	CC	0	0	0	0	0	0	0	0	0
7	Textiles, clothing, footwear and leather goods	CDA	15	1	0	16	0	109	19	0	0
8	Wood, paper and printed products	CDB	0	1	0	1	0	0	143	0	142
9	Petroleum products	CDC	89	0	84	89	0	0	44	48	44
10	Chemicals, rubber and plastic products	CDD	0	13	0	13	0	89	283	0	182
11	Non-metallic mineral products	CDE	0	1	0	1	0	0	0	0	0
12	Metal products except machinery	CDF	0	1	0	1	0	0	109	0	107
13	Machinery and equipment	CDG	3	13	0	16	0	56	117	0	48
14	Transport equipment and parts	CDH	0	38	0	38	0	0	11	0	11
15	Furniture and other products	CDI	0	0	0	0	0	0	2	0	1
16	Repair and installation services	CDJ	1	0	0	1	0	6	20	0	14
17	Electricity, gas, steam and water supply	CE	4	0	0	4	0	0	24	98	98
18	Water supply, sewerage and drainage	CE	0	0	0	0	0	1	1	19	19
19	Construction	F_	1	0	0	1	0	7	26	0	19
20	Wholesale and retail trade	G_A	0	0	0	0	0	0	0	0	0
21	Repair of motor vehicles and motorcycles	G_B	2	0	0	2	0	0	17	16	17
22	Transportation and storage	H_	2	0	0	2	422	422	310	11	11
23	Accommodation services	I_A	0	0	0	0	0	0	0	0	0
24	Food and bar services	I_B	1	0	0	1	0	7	7	32	1
25	Information and communication	J_	1	0	0	1	0	8	24	0	16
26	Financial and insurance services	K_	4	0	0	4	0	14	21	0	6
27	Real estate services	LA	9	0	0	9	0	0	6	19	6
28	Owner occupied dwellings	LB	0	0	0	0	0	0	0	0	0
29	Professional, scientific and technical activities	M_	1	0	0	1	0	0	187	0	187
30	Administrative and support activities	N_	4	0	0	4	0	30	34	0	4
31	Public administration and defence	O_	4	0	0	4	13	13	33	31	31
32	Education	P_	2	0	0	2	0	14	15	0	2
33	Human health and social work	Q_	1	0	0	1	0	5	6	0	1
34	Arts, entertainment and recreation	R_	0	0	0	0	0	3	3	0	0
35	Other services	S_	0	0	0	0	0	0	0	0	0
36	Travel debits and credits	V_	0	0	0	0	0	6	26	0	19
	<b>Total Intermediate consumption: Sum</b>		<b>145</b>	<b>69</b>	<b>85</b>	<b>214</b>	<b>434</b>	<b>789</b>	<b>3,856</b>	<b>1,969</b>	<b>3,352</b>
	<b>Total domestic output at basic prices</b>		<b>337</b>	<b>337</b>	<b>224</b>	<b>750</b>	<b>1,261</b>	<b>1,374</b>	<b>4,668</b>	<b>3,668</b>	<b>3,724</b>
	<b>Gross value added basic prices</b>		<b>192</b>	<b>192</b>	<b>192</b>	<b>535</b>	<b>826</b>	<b>585</b>	<b>811</b>	<b>1,699</b>	<b>372</b>

Table 4 Proposed diagggregation of Port service for fishing vessels from SPC:H Transportation and storage

		<b>Products X Industry</b>		<b>Transportatio n and storage</b>	<b>Port services: SWIOFish SAM</b>
			<b>SIC</b>	H49-53	H522
			<b>SPC</b>	H_	H_
	1	Agricultural products	AA	4	2
	2	Fish & aquatic products	AB	0	0
	3	Quarry products	B_	0	0
	4	Processed fish	CA	1	0
	5	Other food products	CB	11	5
	6	Beverages and tobacco	CC	1	0
	7	Textiles, clothing, footwear and leather goods	CDA	16	8
	8	Wood, paper and printed products	CDB	8	4
	9	Petroleum products	CDC	882	669
	10	Chemicals, rubber and plastic products	CDD	11	5
	11	Non-metallic mineral products	CDE	8	4
	12	Metal products except machinery and transport equipment	CDF	6	3
	13	Machinery and equipment	CDG	59	30
	14	Transport equipment and parts	CDH	61	31
	15	Furniture and other products	CDI	5	3
	16	Repair and installation services	CDJ	80	41
	17	Electricity, gas, steam and air conditioning	D_	50	25
	18	Water supply; sewerage, waste disposal and remediation	E_	4	2
	19	Construction	F_	39	12
	20	Wholesale and retail trade	G_A	0	0
	21	Repair of motor vehicles and motorcycles	G_B	42	21
	22	Transportation and storage	H_	717	363
	23	Accommodation services	I_A	27	14
	24	Food and bar services	I_B	93	14
	25	Information and communication	J_	66	33
	26	Financial and insurance services	K_	55	28
	27	Real estate services	LA	109	16
	28	Owner occupied dwellings	LB	0	0
	29	Professional, scientific and technical activities	M_	54	27
	30	Administrative and support activities	N_	313	158
	31	Public administration and defence	O_	12	6
	32	Education	P_	6	3
	33	Human health and social work and activities	Q_	2	1
	34	Arts, entertainment and recreation	R_	1	1
	35	Other services	S_	0	0
	36	Travel debits and credits	V_	76	39
		<b>Total Intermediate consumption: Sum</b>		<b>2,819</b>	<b>1,570</b>
		<b>Total domestic output at basic prices</b>		<b>4,018</b>	<b>2,033</b>
		<b>Gross value added basic prices</b>		<b>1,199</b>	<b>463</b>





Appendix 1 Estimated unit value in commonly used species/species group, obtained from purchase information at local processors.

Species/ species group	2014	2015	2016	2017	2018	Species/ species group	2016	2017	2018
C.balo	23	25	20	13	22	ALB	62	23	20
Other caranx	22	25	22	19	22	SWO	36	20	10
M.doux	13	13	13	10	7	BET	62	23	40
Other maquer	13	13	13	10	7	BXQ	18	20	22
Bonite	22	20	14	5	7	PEL	18	10	10
Other pelagic	14	18	22	7	13	SFA	13	20	10
Becune	13	16	11	5	5	TUN	63	40	20
Cordonier	25	28	33	30	100	YFT	58	23	40
Other trap fish	25	28	33	30	7	SKH	5	5	5
R.snapper	51	34	18	13	12	MZZ	5	5	5
Bourgeois	84	91	92	86	87	BOURGEOIS	92	86	100
Job	38	42	38	40	41	RED SNAPPER	18	13	10
Maconde	81	64	54	54	52	CAPITAINE	33	28	26
Other vieille	80	78	59	55	53	JOB	38	40	40
Capitaine	39	35	33	28	28	MACONDE	54	54	50
Shark&Ray	14	5	5	5	5	OTHER VIELLE	59	55	50
Octopus	100	100	108	110	122	CARANGUES	22	19	20
Others	7	5	5	7	7	BECUNE	11	5	5
Crab	90	76	78	74	78	BONITE	14	5	7
						OTHER PELAGICS	22	5	5
						SHARKS & RAYS	5	5	5
						CRAB	78	74	78
						OTHERS	5	7	7

Appendix 1 (contd.)			
	Species/ species group	2014	2015
	Bourgeois	89	91
	Bordemar	65	92
	Therese	23	15
	Vara vara	43	34
	Job gris	35	39
	Job jaune	48	48
	Batrican	30	48
	Other snapper	30	48
	Vielle maconde	81	64
	Vielle platte	80	64
	Tioffe	104	101
	Croisant	104	102
	Other vielle	76	74
	Capitaine blanc	44	36
	Guelle longue	22	15
	Lascar	22	20
	Dame berrie	22	20
	Capitaine rouge	43	36
	Other capitane	22	15
	Carangue balo	23	25
	Carangue platte	23	25
	Other Carangue	22	25
	Saumon	36	21
	Sailfish/Marlin	38	31
	Kingfish	15	15
	Yellowfin	21	22
	Other tunas	36	22
	Bonite	22	20
	Thon le dents	36	11
	Dorade	10	14
	Tazard	12	15
	Becune	14	18
	Shark & Ray	13	5
	Others	20	13
	Crabs	75	76

**REPORT ON PROGRESS – SWIOFISH3**

DEVELOPMENT OF A SOCIAL ACCOUNTING MATRIX  
AND THE ARTISANAL FISHERIES COMPONENT OF  
SEYCHELLES' FISHERIES SATELLITE ACCOUNT

Sachiko TSUJI

1

**Overall picture – Field trip (8/28 – 9/24/2021):**

**Main objectives:**

- Establishing Satellite Account for Artisanal Fishing Component:
  - Assembling the existing data – Concession application in fisheries, Q/V purchased by Oceana and Sea Harvest, updated list of vessel registration and fishing licenses
  - Preliminary estimates of inputs and outputs at fishers' level
  - Consultation on product flow and structure of artisanal fishing components still ongoing
- Drafting SAM inputs and structure:
  - Consultation with NBS and Patrice – understand the SAM-2014 compiled
  - Agreed to maintain the basic SAM-2014 structure
  - Draft proposal in modifications in I/O Table for fishing and sea-food processing – ongoing

2

**Artisanal Fishing Components**

Rough picture extracted from available information

- **WARNING** – All very preliminary, subject to change with the additional information and facts to be revealed

3

**Output value**

- Total output value at market price – same as SNA:
  - [Mean CPI for fish: ca. SCR 50 in 2014] \* [Landed quantity]
- Total output value at producer price: i.e. income for fishers
  - Unit price for whole fish purchased by fish processor: ca. SCR 30 in 2018; then multiplied with quantity landed

	Artisanal Fishing	Semi-industrial LL
Output value (2014)	178.7	4.0
Fishers' take	111.3	1.4
Output value (2018)	108.1	51.7
Fishers' take	125.3	41.7

4

**Cost: Intermediate consumption -- Fuel**

- Fuel:
  - Back calculated from subsidiaries
  - Distribute among different boat size group using ratio in fuel-quota limit
- Fishing gear, ice, baits: some info in concession application
- Engines, boats, and other vehicles: some info in concession application
- License/ Administration fees

Mil.SCR	Pirogue	Outboard	Sch.,Whaler	s.i.LL
Output	1.3	39.1	64.3	1.4
Fuel cost	0	(18.2)	(47.0)	(19.2)
subsidies	0	7.5	19.3	7.9
	1.3	28.4	36.6	(9.9)
Gain per capita	496	835	3,108	n.a.

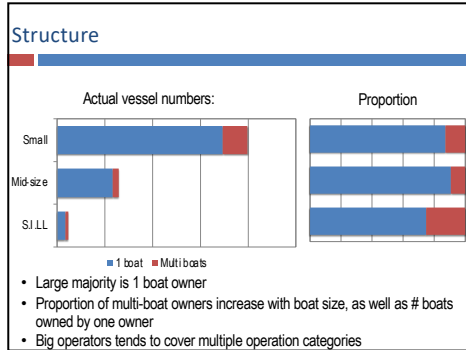
5

**Composition of boats size**

Actual vessel numbers:

Proportion:

6



7

### Cost: Analysis of concession file

□ No attempt to disaggregate artisanal and semi-industrial LL

Mil.SCR	Boat-owner (2014)	Others (2014)	Boat-owner (2018)	Others (2018)
Fish (LL Bait)	0	0.9	1.1	12.6
<b>Man. products</b>	<b>16.1</b>	<b>51.5</b>	<b>20.7</b>	<b>46.9</b>
Boat engines	5.6	0.02	5.8	0.6
Fishing equip.	0.6	1.5	0.4	0.5
<b>Boats</b>	<b>3.0</b>	<b>30.6</b>	<b>6.0</b>	<b>25.5</b>
Comm. Dev.	0.8	0	0.2	0

- Not representative for whole artisanal fishing component; Maybe, mostly for semi-industrial LL
- Only materials, no service cost covered

8

### Social Accounting Matrix (SAM)

**WARNING**

- All very preliminary, short-term (quick dirty) solution

9

- ### Nature and Status of SAM-2014 [Fishing, Fish processing]
- Decision to be based on the SAM-2014:
    - Project mainly focus on an evaluation and improvement of IOT
    - SAM to be compiled by NBS/Patrice with the same procedure as SAM-2014
  - SAM-2014: presented to TCN by Patrice
    - Based on Input Output Table developed by NBS, SAM expansion by Patrice:
      - Compilation of Supply and Utilization data reported from the company under SITZ and BTR
      - Fulfill gap if no data available, but otherwise no raising
      - Canned tuna component uses revised report from IOT
      - No industrial fishing is included
      - NBS internal work, not for publicly dissemination; plan for the next compilation for 2019

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### Seychelles Fisheries Satellite Account – What was done with IOTC-OFCF Project:

- Step 1: Revision of IOT and its IO Table; Introduction of processed and exported products from domestic fishing sector
- Step 2: Inclusion of industrial fleet component
- Step 3: Inclusion of related/ supporting activities

	Total GVA	Fishing	C10	Related activities	Fl ratio
<b>Original SNA</b>	<b>14,111</b>	<b>183</b>	<b>438</b>	<b>0</b>	<b>1.3%</b>
Step 1	15,562	224	1,851	518	16%
Step 2	15,718	1,790	438	109	15%
Step 3	14,111	183	438	472	8%
<b>Total GVA</b>	<b>17,173</b>	<b>1,790</b>	<b>1,851</b>	<b>956</b>	<b>27%</b>

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- ### Nature and Status of SAM-2014 [Fishing, Fish processing] cont.
- Noted few strange points (e.g.):
    - Fishing contribution too high, if not including industrial fleet
    - No import and export of fish (fresh and frozen) from fishing sector
  - Finding through NBS consultation:
    - Company/individuals operating fishing registered under different categories (e.g. 'Fishing', 'Fish processing', 'Manufactures of machineries', 'Exporter, wholesaler, retailer')
      - One report by company > Supply and utilization related to 'Fishing' may placed under different categories
      - Only small fraction of 'Fishing' companies/individuals subject to BTR
    - Separation of fishing related IOT from the report of the companies conducting 'Fishing', but under different categories
  - Supplement the IOT for 'Fishing' not yet covered with the information collected for the Artisanal Fishing Component

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### Next step

- Identification of companies with major activities relating with fish and fishery products (fishing, processing, retail/wholesale business) [NBS, MoF]:
  - Separation of fishing related activities for IOT
  - Revision of draft IOT for 'Fishing' and 'Fish Processing'
- Analysis on fish trade data with species breakdown [SFA]
  - Identify the value and quantity used for LL baits
  - Quantity of exported fish caught by artisanal component
- Artisanal Fishing Component [SFA]
  - Further consultation with SFA to clarify issues:
  - Processing 2019 Artisanal Fishing statistics:

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### Missing/uncertain components

- Flow of net fishery product (sardines, mackerels, crevices):
- Insights of semi-industrial Longline – big mystery:
  - Linkage and arrangements with fish processors (e.g. Oceania, Sea harvest)
  - Products flow; sources of baits [detailed trade data may help]
  - Number of peoples involved
- Processing at fishing community level:
  - Dried, salted, fish in oil, fish in brine [NBS CPI people may know something] – negligible in SNA level, can be important in fishing community life and

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### **Appendix 3 Check list against the incentive work plan:**

#### Activity 1: Establishing a technical communication network

- 1.1. Establishing technical communication network, in particular with National Bureau of Statistics (NBS), Seychelles Fishing Authority (SFA), Central Bank of Seychelles, Mr Emmanuel Chassot (IOTC), Mr Patrice Guillotreau (University of Nantes), in addition to Blue Economy Department and Ministry of Fisheries and the Blue Economy  
*Completed as planned*
- 1.2. Establishing information sharing platform, e.g. through Dropbox.  
*Information sharing was done through e-mail exchanges, No Dropbox platform established.*

#### Activity 2: Development of final consumption block

- 2.1. Retrieval of the 2013 Household Budget Survey (NBS)  
*NBS estimation for SAM-2014 accepted as it is*
- 2.2. Alternative estimation of per capita fish consumption of the Seychelles in distinguishing between tourists and local uses  
*NBS estimation for SAM-2014 accepted as it is*
- 2.3. Estimation of expenditure to fish and fish products for local households, hotels and restaurants, and others  
*NBS estimation for SAM-2014 accepted as it is*

#### Activity 3: Development of labor and salary block

- 3.1. Retrieval of non-published employments and earning survey results by sector by industries and separation between local and expatriate (NBS)  
*Not conducted because of difficulty in accessing the new survey data*
- 3.2. Develop a way to raise formal employment figure to total for each fishery related activities  
*Not conducted*

#### Activity 4: Development of artisanal fisheries component of the Satellite Account

- 4.1. Retrieval of information relating with artisanal fisheries components, in particular, to be collected in recent years, including those from the survey conducted by Ministry of Fisheries and the Blue Economy and sea-cucumber fishery survey conducted by SFA  
*Mostly completed as planned*
- 4.2. Data and information mining relating to artisanal fishery, in collaboration with SFA  
*Completed as planned*

- 4.3. Establishing communication and interviews with Oceana Fisheries, Sea Harvest Ltd, and Fishing Boat Owners Association (FBOA), in collaboration with the Ministry  
*Since SFA already establish a way to collect adequate information of target institutes, efforts were placed on analyses of accumulated information and no attempt to establish additional communication with them.*
- 4.4. Interviews through questionnaires to local artisanal fishing communities, in collaboration with SFA  
*Not conducted, since the field trip did not indicate the need of additional survey, in particular due to lack of strong fishing communities in a traditional sense.*
- 4.5. Compilation of information collected into the artisanal fisheries component of the Satellite Account  
*Completed as much as possible but concluded no benefit of taking Satellite Account approach*
- 4.6. Presentation to and feedback gathering from SFA and stakeholders  
*Done as much as possible.*

#### Activity 5: Development of the balanced Social Accounting Matrix (SAM)

- 5.1. Define general structure and contents to be included as an initial plan  
*Not completed during the Project period, struggling to define the way to incorporate indirect fisheries relevance activities (e.g. Port services) into the existing SAM structure*
- 5.2. Initial compilation based on the results obtained from Activities 2, 3, and 4 as well as from the Fisheries Satellite Account  
*Not competed during the Project period, but relevant results provided*
- 5.3. Submission of initial compilation results of SAM  
*Same as above.*
- 5.4. Modify the initial SAM to incorporate feedback obtained from the first presentation and conduct second compilation  
*Due to termination of the Project before completion, no relevance*
- 5.5. Explore the utilization of SAM for policy decision makings  
*Not conducted*
- 5.6. Second compilation and presentation to a validation workshop  
*Due to termination of the Project before completion, no relevance*
- 5.7. Finalization of module and preparation for technical transfer  
*Same as above*

## Activity 6: Preparation of final deliverables

6.1. Preparation of the final report

*Completed*

6.2. Develop info-graphics on key results

*Not conducted*



## ANNEX A

### Terms of Reference and Scope of Services

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#### 1. Background

Fisheries constitute a productive sector of the Seychelles' economy and are expected to continue to play a key role in the socio-economic development of the country. In the context of multifaceted challenges facing the sector and evolving governance structures, the need for improved economic data and decision-support tools for fisheries policy formulation, sector development and management has been recognised. This is true given the difficulties in estimating the overall contribution of fisheries and fisheries-related activities towards the economy. To many, its contribution has been substantially underestimated. However, efforts have been made to improve data collection and also to better understand the dynamics of the fisheries-related industries, particularly on the economic and social contribution.

In 2010, the National Bureau of Statistics (NBS) attempted to estimate the fisheries and fisheries-related contribution to the national Gross Domestic Product (GDP) and the result showed that its contribution was 7 percent of the total GDP. In 2018, Seychelles benefited from technical assistance on the development of a Fishery Satellite Account. It established a methodology for evaluating the overall economic and social contribution derived from the utilization of fish resources, by developing a satellite account for fishery-related activities that included downstream activities such as processing, marketing, retailing and upstream activities such as boat building, gear and machinery supply and fuel supply. The compilation result of the revised national accounts and corresponding fisheries satellite account for the year 2015 showed that the economic contribution of fisheries and fisheries related activities was estimated to contribute 27 percent towards GDP. There were some limitations though, as economic importance of activities is not always matched with its importance in social aspect, especially for the artisanal fisheries.

There is now a need to establish better indicators to reflect actual benefits and impact of aquatic resource use. The Fishery Satellite Account is a powerful tool but it does not form part of the national accounting system. It has now become imperative to develop a system flexible enough to allow the integration of further and recently developed activities relying on fish resources, like aquaculture with clear visibility on relation and economic flows with other activities.

The Department of Fisheries is now recruiting a consultant to undertake the development of a Social Accounting Matrix (SAM) including the enhancement of the artisanal component for the Fishery Satellite Account.

#### 2. Objective of the assignment

The aim of the assignment is to improve on national accounting methods on the contribution of fisheries to the economy and to examine both growth and distributional issues within a single analytical framework.

The specific objectives are to:

- Improve the Fishery Satellite Account by including the artisanal fisheries component.
- Extend the work-in-progress on the Supply and Use Table (SUT) and the future development of the Input Output Table (I-O table) being developed by NBS to a fully articulated SAM;
- Integrate detailed fishery and fishery-related sectors into the SAM;
- Provide necessary information on the backward and forward linkages of the fishery sectors to the other sectors of the economy and the household sector;
- Provide information on the economic importance and value of the various fishery sectors to the economy in terms of their contributions to output, value added, tax revenue, household income, and employment;
- Estimate and suggest ways to minimize leakages from the economy;
- Examine the fishery's sector distributional effect upon household income;
- Guide decision-making in the fisheries management context;
- Apply SAM multiplier analysis in different policy scenarios to optimise efficiency, mobilise resources appropriately and reduce costs.

### **Scope of work**

The consultant will be expected to undertake the following tasks:

1. Artisanal fisheries component of the Satellite Account.
  - i. Conduct a situational analysis on the national accounting framework;
  - ii. Compile artisanal fisheries data to improve the contribution of the fisheries sector in the satellite account and SAM;
  - iii. Capture own production and consumption of fisheries on a household basis, as well as estimating unobserved economy of fisheries, to the extent possible;
2. Development of the balanced Social Accounting Matrix.
  - i. Design the structure and contents to be included in the SAM, such as;

- a) Identify relevant components and sources of data, including those obtained through the work including those obtain for the Artisanal fisheries component of the Satellite Account.
  - b) Establish the appropriate input for the SAM, including by not limited to the supply use table (SUT), input-output table, balance of payment (BOP), Government Finance Statistics (GFS), Fiscal report/Government budget, employment and earnings
  - c) Examine the reliability, consistency and comparability of data
  - d) Establish an administrative framework for data sharing and future systematic compilation of SAM
- ii. Design the compilation methodologies and identify data sources;
  - iii. Prepare and compile the SAM that could be used for analysing socio-economic impact of measures such as fisheries policies (for instance, private investment support, export subsidies or import protection, tax reforms, infrastructural investment policies, sector or specific sub-sector policy measures);
  - iv. Provide recommendations on how to improve the developed SAM and ways to reduce leakages
  - v. Develop infographics showing key results of the study for dissemination to decision makers and stakeholders.
  - vi. Produce a zero-draft report, consisting of the detailed findings, draft proposal of the SAM structure and corresponding data sources, and proposed enhancements in artisanal fishery component.
  - vii. Undertake a stakeholder validation.
  - viii. Conduct a training explaining the methodologies and compilation approaches to assigned staff.
  - ix. Produce a final report

### **3. Key deliverables**

Deliverables include:

- i. Conduct an inception meeting and submit inception report detailing the methodologies to be used and work plan;
- ii. Monthly report presented at monthly meetings with the steering committee;
- iii. Submit a zero-draft report
- iv. Compile and submit the preliminary SAM result;
- v. Conduct a validation workshop;

- vi. Transfer of capacity and knowledge through trainings, training materials and a training report;
- vii. Submit a final report with data and metadata used in the compilation of the SAM;

#### 4. Duration

The consultant will be recruited by the Department of Fisheries for a period of Eleven months' maximum.

Activity and deliverable	Timing / Deadline	Time input
Signing of the contract	January 2021	
D1-Introductory meeting with Steering Committee (remote)	January 2021	
D2-Submission of the inception report [to the inception meeting?]	Mid-February 2021	10wd (home)
Field work in Seychelles	May /June 2021	20wd
D3-Submission of the zero-draft report	End of June 2021 after field work in Seychelles	
D4-Compilation and Presentation of the initial result of SAM (remote)	Mid- August 2021	15wd (home)
D5- 2 <sup>nd</sup> Compilation and analysis of the SAM	October 2021	10wd
D6-Presentation of the preliminary SAM result to a validation workshop (either remote or real, if not remote, combine with transfer of technique in one mission)		2wd
D7- Transfer of technique (Remote or Trip to Seychelles)	October/November 2021	15wd
D8-Submission of the final report	End of November 2021	5wd

#### 5. Supervision responsibility

The consultant will report to the Department of Fisheries but will be required to work in collaboration with other relevant ministries and agencies as required. A Steering Committee will

be established comprising of the Seychelles Fishing Authority (SFA), the Blue Economy Department, the National Bureau of Statistics (NBS) and the MFA to guide and support the firm. The Steering Committee will also invite key stakeholders on an ad hoc basis to be part of the Committee. The firm will provide monthly progress summaries to the Steering Committee and will respond to a timely manner to queries and draft documents.

## **6. Consultant qualifications**

For this assignment, the Department of Fisheries is seeking a consultant having the following profile and specific qualifications:

- Master's degree or higher qualification and at least 5 years' experience in economics or statistics, fisheries management, science or related discipline;
- Familiar with national accounting methods, System of National Accounts (SNA 2008);
- Demonstrated experience in the development of SAM;
- Strong analytical and report writing skills;
- Excellent communication and facilitation skills;
- High computer literacy in statistical software such as Excel, R and others;
- Full proficiency in English is a requirement and knowledge of French would be an advantage.

