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Economic Commission
for Africa

UNECA SRO-EA

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The Blue Economy Valuation Toolkit (BEVTK)- Presentation and Operational Manual

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ABBREVIATION AND ACRONYMES

Acronym	Description
AU	African Union
AU-IBAR	The African Union Inter-African Bureau for Animal Resources
BEA	Blue Economy in Africa
BEVTK	Blue Economy Valuation Toolkit
CICES	Common International Classification of Ecosystem Services
EAC	East African Community
EEZ	Exclusive Economic Zone
EU	European Union
EC	European Community
FAO	Food and Agriculture Organisation of the United Nations
GBP	Great Britain Pound
GDP	Gross Domestic Product
INSD	National Statistics Institute of Djibouti (L'Institut National des Statistiques de Djibouti)
ILO	International Labour Organisation
IOC	Indian Ocean Commission
ISIC	International Standard Industrial Classification
IUCN	International Union for Conservation of Nature
LME	Large Marine Ecosystem
MPI	Multidimensional Poverty Index
NACE	Nomenclature des Activités Économiques dans la Communauté Européenne
NAD	Nomenclature of Activities of Djibouti
NAEMA	Nomenclature d'activités des Etats membres d'Afristat
NAICS	North American Industry Classification System
NCA	National Capital Accounting
NBS	National Bureau of Statistics (Seychelles)
NOPEMA	Nomenclature de produits des Etats membres d'Afristat
OS	Operating System
SDG	Sustainable Development Goal
SFA	Seychelles Fisheries Authority
SNA	System of National Accounting
ToR	Terms of Reference
TRE	Resources and Employment Table (Tableau des ressources et des emplois)
SNA	System of National Accounts
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations – Economic Commission for Africa
UNECA SRO-EA	United Nations Economic Commission for Africa, Sub-Regional Office for Eastern Africa
UNEP	United Nations Environment Programme
USD	United States Dollar
VBA	Visual Basic for Application
ZAR	Zuid-Afrikaans Rand (South African Rands)

INTRODUCTION

The overall objective of the consultancy is the production of a Blue Economy Valuation toolkit (BEVTK) and associated materials. The BEVTK has been applied in three pilot countries that are Djibouti, Rwanda and the Seychelles (Figure 1-1). These countries have been identified as representative of the various typologies found in East Africa which were narrowed down to landlocked, insular and coastal countries.

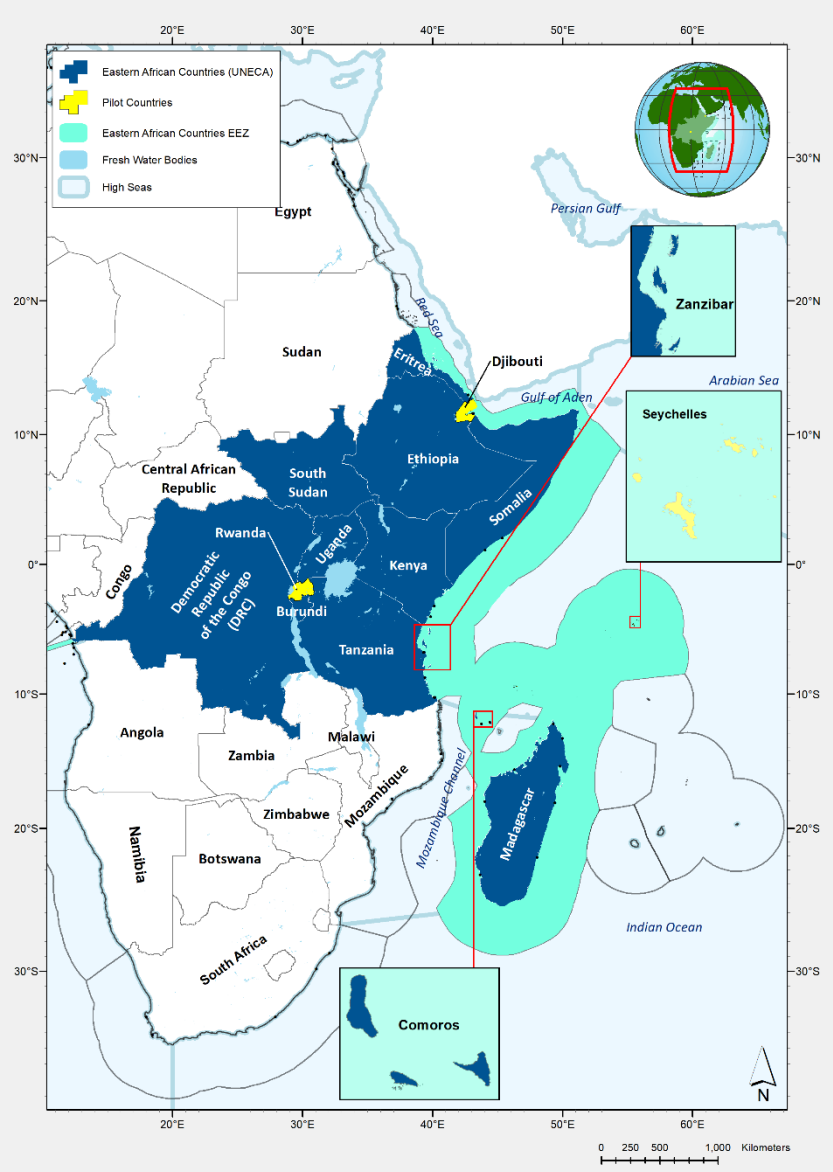


Figure 1-1: East African States and relevant EEZs identifying the 3 pilot countries, Djibouti, Rwanda and the Seychelles.

The report presents, in Part 1, the Blue Economy Valuation Toolkit and, in Part 2, the user manual. In Part 1, the objective of the toolkit, its structure and capabilities are displayed. It shows how BEVTK integrates three modules which are the economic activities, social dimension and ecosystems' services and their respective contributions to the blue economy. This part concludes with key recommendations for improving the BEVTK. In Part 2, the way to navigate with the tool, to elaborate input tables, pivot charts, summarising tables and snapshot summarizing the contribution of the selected country to the Blue Economy is presented in details.

1 PART 1: PRESENTATION OF THE BLUE ECONOMY VALUATION TOOLKIT

The Blue Economic Valuation Toolkit (BEVTK) is available for download from the following link: https://www.dropbox.com/s/d22n6lviat5xstb/BEVTK.xlsm?dl=0

1.1 Objective of the Blue Economy Valuation Toolkit

BEVTK was developed as a valuation toolkit to guide sub-regional and national in-depth socio-economic assessments that will support informed decision-making. The toolkit can complement the multisectoral approach and step-by-step methodology for policy development highlighted in the Blue Economy Policy Handbook for Africa (UNECA, 2016a). As such, BEVTK can be used for socio-economic assessments aimed to provide an accurate snapshot of the potential of the Blue Economy, in particular in Eastern Africa. The quality of any country's assessment using BEVTK will depend on the amount of data available and usable and as such it is crucial that such data be collected as completely and timely as possible. The more relevant data are available and can then be inputted into the BEVTK, the better the tool will be able to draw an accurate picture of the country's contribution to the Blue Economy.

With the BEVTK, the intent was to build a tool capable of capturing the various dimensions of human interactions with our "Blue environment" (ocean, lakes, rivers, etc..) and capable of recording the various types of benefits (utilitarian, hedonistic and/ or monetary) people gained from it.

The 3 main dimensions looked at and focused on are therefore:

- Any Economic Activities associated with the Blue Economy,
- Any Social Dimension of human interaction with the Blue Economy and
- Any Ecosystem Services related to the "Blue economy"

The Toolkit is flexible and comprehensive enough to represent any country within UNECA scope (coastal, insular or landlocked). To do so, classifications and nomenclatures systems widely accepted among international experts, compatible with systems used nationally have been used (SNA, NCA, SEEA,….). They are easily comprehensible by all stakeholders. The nomenclatures used are presented in section 3.1 of the Appendix.

1.2 Structure of the Blue Economy Valuation Toolkit

The BEVTK is organised around 3 modules,

1. **Economics Activities** associated with the blue economy,
2. **Social Dimension** associated with the blue economy
3. **Ecosystem Services** associated with the blue economy

The flows of information coming in and coming out of the tool are as follows:

1. **Collection of data** for each module from various sources (e.g. SNA, NCA, LME organisations, UNDP, UNEP, AU-IBAR, World Bank, etc.)
2. **Data entry** in the tool using predefined tabular templates and customized nested list of categories following specific nomenclatures for each module.
3. Automatic production of **summary tables and charts** for each module dynamically linked to the corresponding tabular data.
4. **Consolidation** of the summary tables and charts from the 3 modules into a "**snapshot**" summarising the country's contribution to the Blue economy with some sensitivity analysis capabilities such as:

a. Simulating a change in the state of the economy through changes in inflation, exchange rates,
b. Simulating a change in the country's state of the environment through changes in the quality of the ecosystem and
c. Simulating a change in the country's social dimension through changes in, for example, unemployment level, level of poverty, gender inequality, fair trades, …

In order to facilitate the comparison and the consolidation of the collected data in each of the three modules, the BEVTK includes a utility facility composed of historical exchange rates for each country going back 10 years and a table of deflators by country covering the same period. The facility also stores basic information on each country's physical and geographic characteristics, flags, national currency, GDP, etc.

To control how data are entered into the tool, templates were used incorporating internationally accepted systems of standards used by experts across the globe in each relevant dimension and following a system of nested categories and sub-categories[1]:

- Economic Activity: International Standard Industrial Classification or ISIC Nomenclature (revision 4)
- Social Dimension: Social Indexes from UNDEP (Human Development Indexes such as (Gini, MPI, GII,...) , World Bank and from other Internationally recognized organizations.
- Ecosystem Services: IUCN Habitats Classification Scheme (version 3.1) to describe each relevant Ecosystem and Common International Classification of Ecosystem Services or CICES Nomenclature (version 5.1)

Figure 1-1 below shows how the BEVTK is connected through MS Excel to the three modules and the utility facility to produce a dynamic Blue Economy Snapshot for the country. Such structure should, in time, enable the user of the tool to conduct sensitivity analysis on the main indicators generated by those three modules and test various scenarii in which one could ask any "what if?" question.

[1] The nested lists used for each classification/ nomenclature can be found in section 3.1 of the Appendix at the end of this report.

Figure 1-1: The BEVTK Excel toolkit, shown in the centre in yellow, in relation to the nomenclatures and classifications used inside the 3 modules (ISIC rev 4 for the Economic Activity in green, various UNDP's, World Bank's and other's indicators for the Social Dimension in red and CICES ver. 5.1 and IUCN HCS ver. 3.1 for the Ecosystem Services in blue), historical exchange rates, deflator and country specific information for the calibration and standardisation facility in purple and the resulting country's Blue Economy snapshot using Excel Pivot tables and charts in black/ grey.

Figure 1-2 below shows the flows and various stages in the BEVTK from when the data are collected to when there are transcribed, standardised, calibrated, summarised and finally presented.

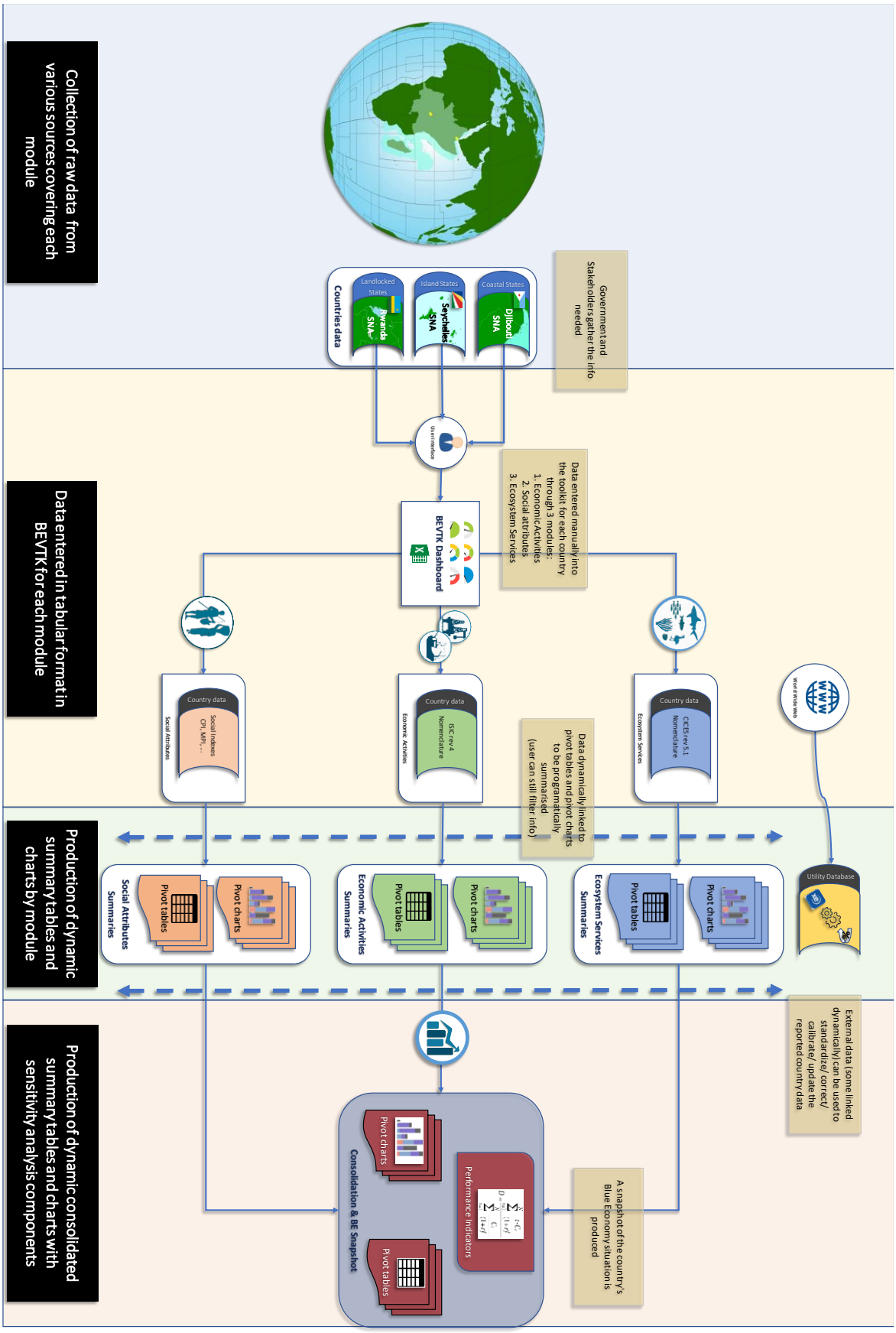


Figure 1-2: Diagram showing the final module-based structure of the Blue Economy Valuation Toolkit

1.3 Recommendations and Way forward

The main challenge remains for the relevant East African countries to collect the necessary information needed to run the toolkit. Some of this information will required surveys to be conducted to collect the missing data. The toolkit was designed as a dynamic decision-making tool and as such is flexible enough to accommodate user defined categories in each of the 3 modules and for any user to add items to the predefined list which are easily accessible by the user throughout the BEVTK. The BEVTK is therefore not a "Black Box".

This is still a work in progress and the toolkit will undoubtedly go through some more improvements. The Social Dimension could be improved somewhat to incorporate additional measure of the Blue Economy's social dimension and contribution. As an example, the toolkit could incorporate a blue economy relevant set of information similar to those presented in the International Labour Organisation (ILO) dashboard as shown below for Seychelles.

Figure 1-3: Example of an overview of the social protection in Seychelles by ILO.

2 PART 2: OPERATIONAL MANUAL OF THE BLUE ECONOMY VALUATION TOOLKIT

BEVTK was programmed in MS Excel® using Visual Basic for Application[2] (VBA) Macros. Therefore, access to Macros must be enabled upon opening the tool. MS Excel® was chosen for its flexibility and tractability between versions: the toolkit is compatible with MS Excel® version 2010 (tested), version 2019 (was used to develop the tool), version Office 365 (tested by the consultants in the pilot countries), 32-bit and 64-bit versions which were tested as well throughout the development phases. The tool has only been tested on computers running the Windows operating system but has not yet been tested on Apple iOS systems due to compatibility issues with VBA macros and some other features only operational on Windows platforms. Moreover, MS Excel® can easily be customized and programmable, thanks to VBA and the data validation options, to prevent and/ or correct any potential data entry errors; without such error trapping mechanisms, BEVKT could have produced misleading information as a result of human errors. The BEVTK was designed with the end goal to avoid the GIGO[3] effect!

BEVTK is based on an open, transparent, programmable and easily updatable platform which is both easily available and can be widely shared among stakeholders and practitioners.

2.1 BEVTK Welcome screen

The following BEVYK screenshot (Figure 2-1) shows the opening screen indicating the tool's version and the due credits, disclaimer and copyrights.

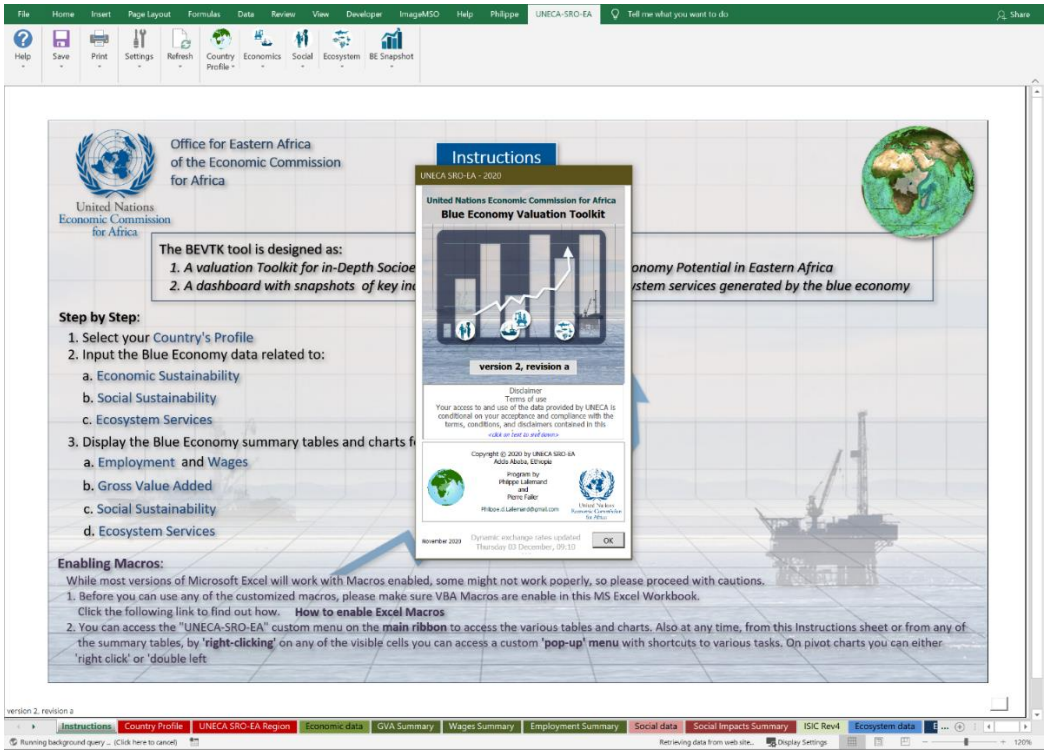


Figure 2-1: BEVTK opening credits

[2] Visual Basic for Applications (VBA) is an implementation of Microsoft's event-driven programming language Visual Basic 6, which was declared legacy in 2008. Visual Basic for Applications enables building user-defined functions (UDFs), automating processes and accessing Windows API and other low-level functionality through dynamic-link libraries (DLLs). VBA programs can be attached to a menu button, a macro, a keyboard shortcut, or an OLE/COM event, such as the opening of a document in the application. The language provides a user interface in the form of User Forms, which can host ActiveX controls for added functionality.

[3] Garbage In, Garbage Out!

2.2 BEVTK Instruction screen

The MS Excel toolkit (a.k.a. BEVTK) opens onto the instruction sheet which gives the user some basic information about the tool (Figure 1-1). The text in blue are hyperlinks and can be clicked on in order to access their underlying option: for example, from this screen the user can jump directly to the country profile selection (1.), the Economic sustainability input module (2.a.), the Social sustainability module (2.b.), the Ecosystem Services module (2.c.) and any of their corresponding summary sheets (3.a through 3.d).

This instruction screen informs the user on the necessary steps to take to efficiently run the tool: first select the country profile to then input, in any order, the data from the three modules (economics, social, ecosystem).

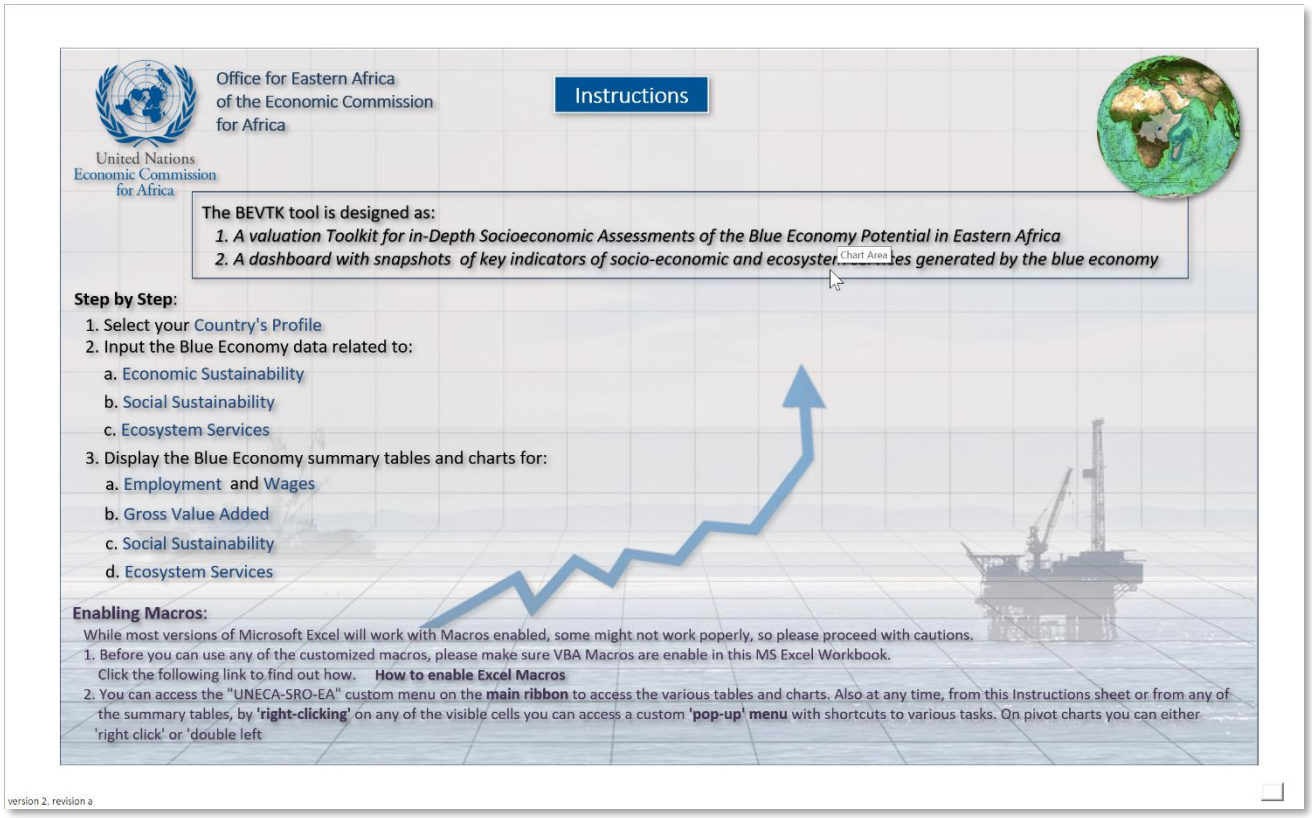
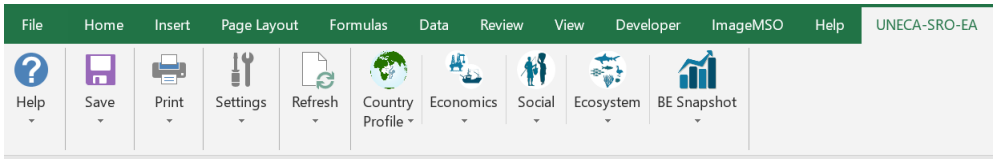


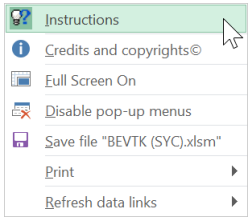
Figure 2-2: BEVTK Instruction Brief Screen

2.3 BEVTK Customise menus

The tool comes with a customised menu especially created to facilitate the navigation inside BEVTK.

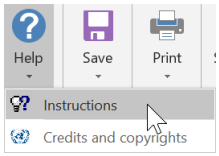


There is also a popup menu, sometime also called a context menu that can be accessed by right clicking on any cells of any of the working sheets (the popup menu is disabled for the lookup tables sheets).



The options offered in this popup menu are limited at the moment but might be extended in a subsequent version of the tool. This menu adds some functionality to the tool as it facilitates accessing some of the functions such as refreshing the pivot tables and charts or allowing for quick navigation back to the instruction sheet.

There is a **Help** option menu to access the instructions sheet or to display the tool version, disclaimers, copyrighted and credits information (see below)



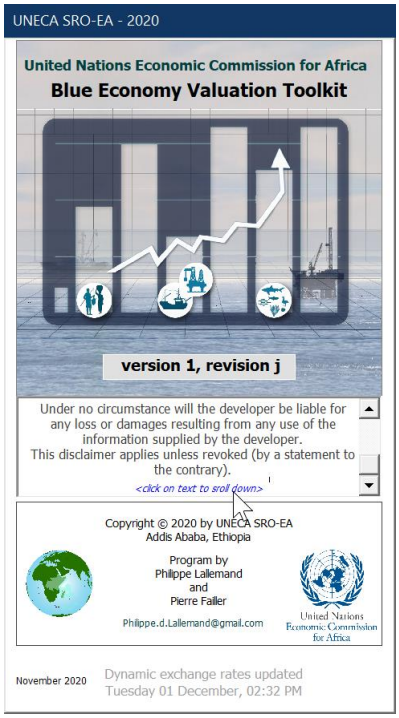
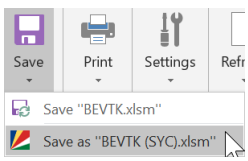
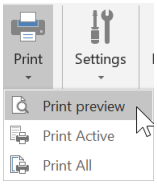


Figure 2-3: Disclaimers, Credit and Copyrights Form accessible through the Help menu on demand

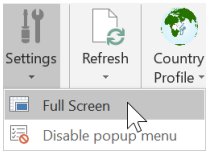
The Save options. Depending on the selected country, the user can decide to save the toolkit with the country code in parenthesis; the example below shows "(SYC)" at the end of the file name to indicate the user selected Seychelles as a country.



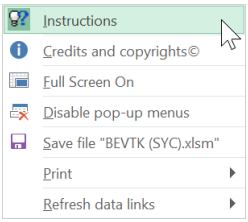
The tool comes with short cut and a customised print menu



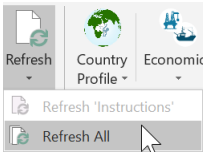
There are also two utilities under the Settings menu; the Full screen option is self-explanatory while disabling the pop-up menu refers to disabling the ability to access a popup customised menu mentioned earlier.



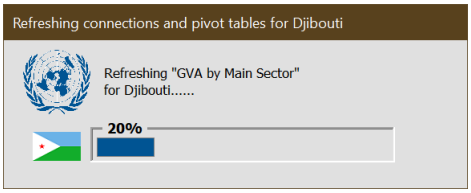
Indeed, if the popup menu is enabled, by right clicking on the Instructions Sheet the following menu will appear



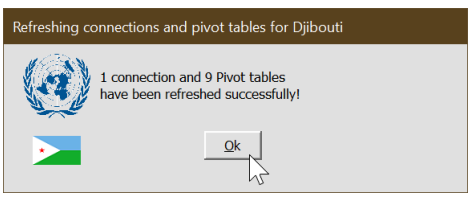
From the UNECA SRO-EA menu, the user may Refresh All summary tables at once or the active sheet if it is a summary table, the option will be greyed-out otherwise.



Example of a progressbar appearing while Refreshing all the connections and tables.

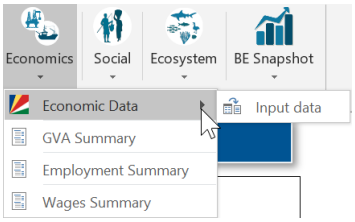


Message appearing when all tables and connections have been refreshed

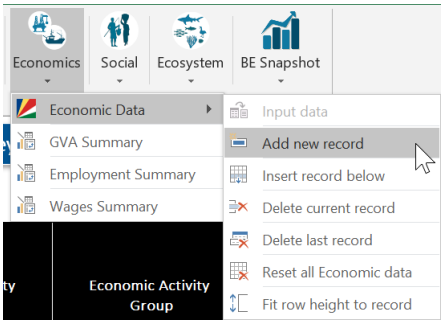


Options under Country Profile to change the active country

Options under Economics: the first option ”Economic data” will access the data table to be populated by the user. The three summary options give access to summary sheets where pivot tables and charts, linked dynamically to the data entered by the user, are automatically generated.



Once the Data table is activated, additional options are available to manipulate the records. i.e. insert, add, delete, data reset or to fit the row height to the text displayed in a specific record (i.e. row).



2.4 Selecting the Country Profile

Figure 2-4 shows six different dropdown lists from which the user can make a choice.

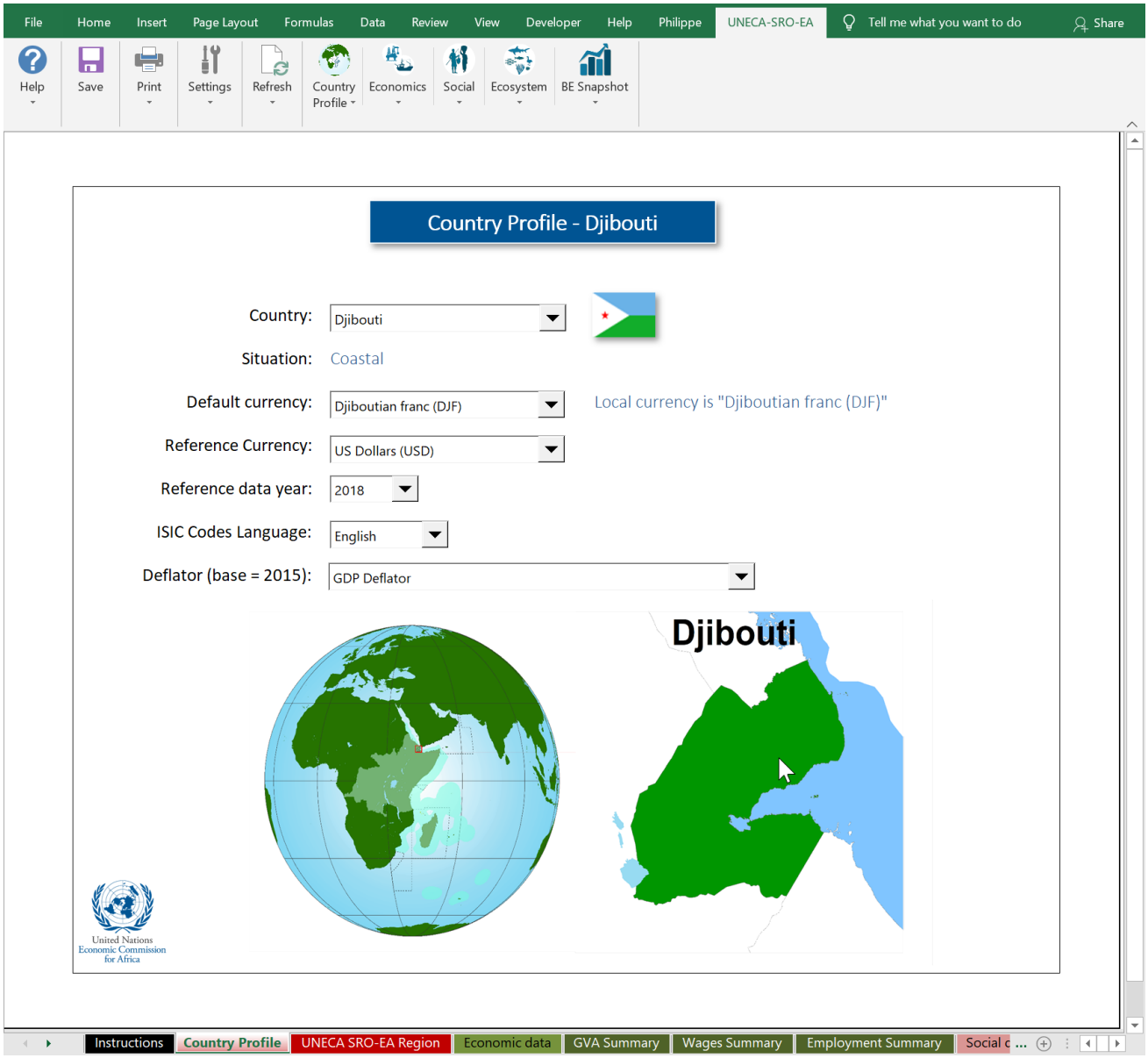
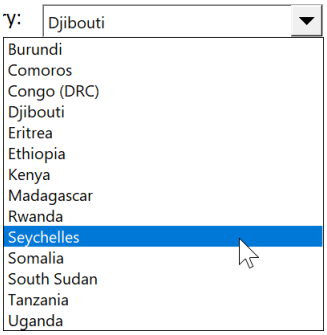


Figure 2-4: Country Profile Selection Sheet

1. Country name: The user can select among the 14 East African countries under UNECA SRO-EA jurisdiction (see Table 3-22 in Section 3.2 below)..



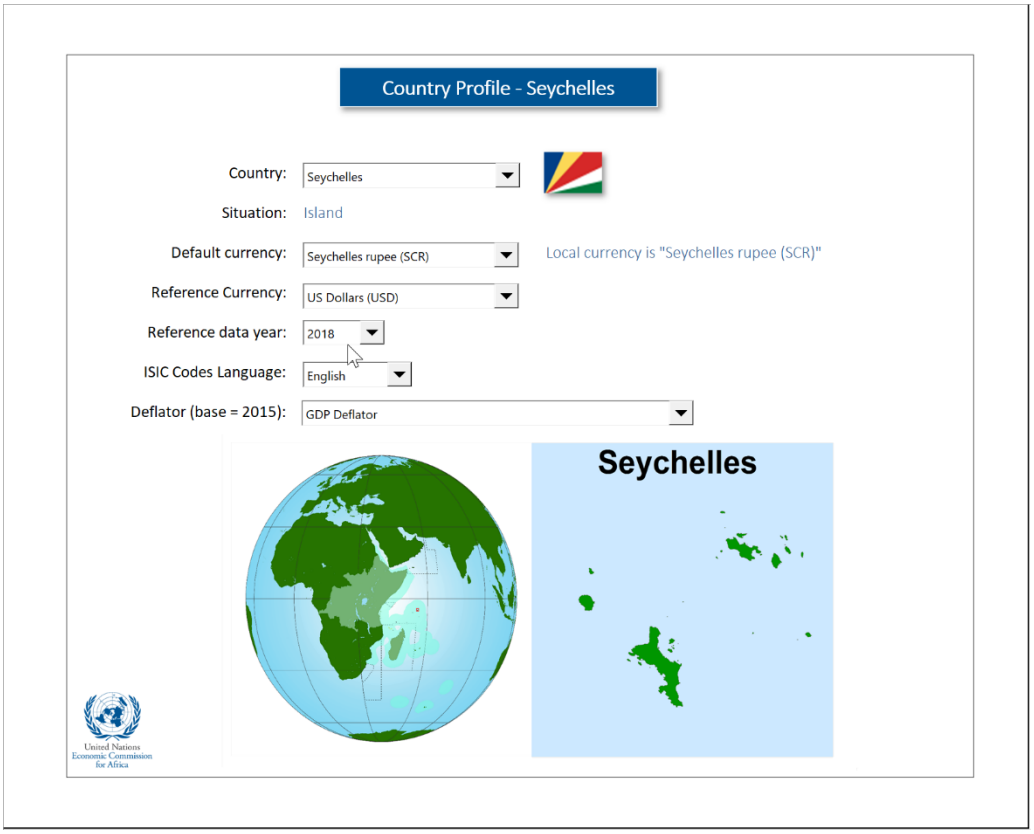
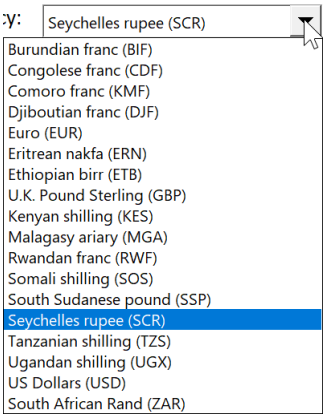


Figure 2-5: Country Profile input form with Seychelles selected.

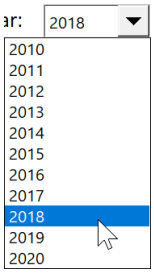
1. Default currency: Once a country is selected, the country's national currency is pre-selected by default but can be overwritten by the user if needed. The list includes currencies from the 14 SRO-EA countries plus Euro (EUR), British pounds (GDP), US dollars (USD) and South African Rands (ZAR) (see Table 3-15 in Section 3.2 below).



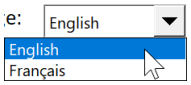
2. Reference currency: this list is composed of the same items as the Default currency list. Here the default is US dollars (USD). Once selected, this currency will be used to standardise the monetary values across the datasets to a single common currency to facilitate aggregation and potential data comparison. This means that the data can first be entered in any currency which will all be converted and expressed in a single reference automatically; this is done by converting the value in the selected currency into the reference one cross checking the relevant exchange rate in a lookup table (see Table

3-15 in Section 3.2 below).

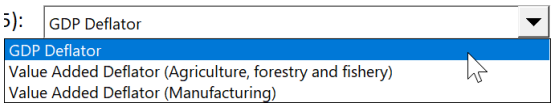
3. Reference year: In conjunction with the reference currency, the reference year is used as the reference point in time to calibrate and standardise any monetary value entered in the tool , this need to be related to a deflator which takes into account any inflation/ deflation between the year of reference and the data year (see Table 3-27 in Section 3.2 below).



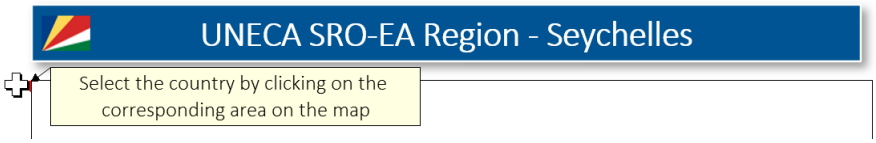
4. ISIC codes language: the nomenclature used to identify the economic activities using the series of nested lists form ISIC has been translated in French; this option let the user choose between and English or a French ISIC nomenclature.



5. Choice of deflator: the deflator used to standardise and calibrate any monetary values entered in the tool; this works in conjunction with the money of reference and the reference year..



There is an alternative way to select a country by clicking the country in question on a map.



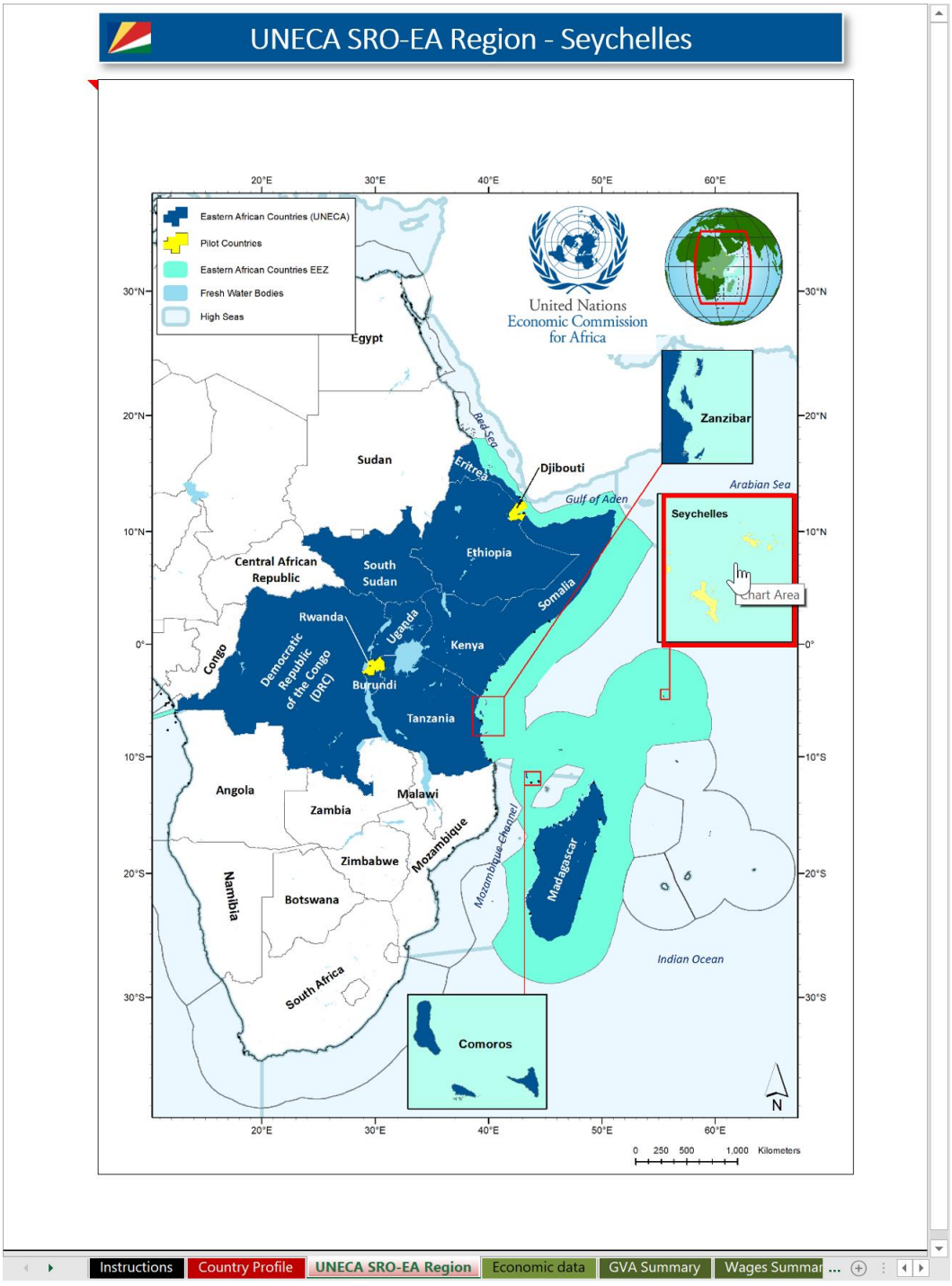


Figure 2-6: Country selection using an interactive map of the UNECA SRO-EA region of jurisdiction.

2.5 Economic Data input

The following tables summarise the steps to follow when entering data in the Economic table.

Table 2-1: Economic activity's possible levels of details from level 1 (section) to level 4 (class) following ISIC rev. 4 nomenclature.

ISIC Code	Economic Activity Section Level 1	Economic Activity Division Level 2	Economic Activity Group Level 3	Economic Activity Class Level 4	Economic Activity Description	Data Year	Data Source	Data Quality	% attributable to BE
NDX	Section	Division	Group	Class	Activity Details	Dataset C	DataSource	DataQuality	%Attributable
A03	A - Agriculture, forestry and fishing	A03 - Fishing and aquaculture			Any Agriculture, forestry and fishing: Fishing and aquaculture	2018	SNA	official	100%
C10	C - Manufacturing	C10 - Manufacture of food products			Any Manufacturing: Manufacture of food products	2018	SNA	guestimate	90%
C11	C - Manufacturing	C11 - Manufacture of beverages			Any Manufacturing: Manufacture of beverages	2018	SNA	guestimate	10%
C	C - Manufacturing				Any Manufacturing	2018	SNA	guestimate	20%
E	E - Water supply; sewerage, waste management and remediation activities				Any Water supply; sewerage, waste management and remediation activities	2018	SNA	guestimate	30%
F	F - Construction				Any Construction	2018	SNA	guestimate	20%
G	G - Wholesale and retail trade; repair of motor vehicles and motorcycles				Any Wholesale and retail trade; repair of motor vehicles and motorcycles	2018	SNA	estimate	10%
H	H - Transportation and storage				Any Transportation and storage	2018	SNA	estimate	80%
I	I - Accommodation and food service activities				Any Accommodation and food service activities	2018	SNA	reliable	98%
K	K - Financial and insurance activities				Any Financial and insurance activities	2018	SNA	guestimate	50%
M	M - Professional, scientific and technical activities				Any Professional, scientific and technical activities	2018	SNA	guestimate	15%
N	N - Administrative and support service activities				Any Administrative and support service activities	2018	SNA	estimate	80%
O	O - Public administration and defence; compulsory social security				Any Public administration and defence; compulsory social security	2018	SNA	estimate	25%
P	P - Education				Any Education	2018	SNA	guestimate	5%
R	R - Arts, entertainment and recreation				Any Arts, entertainment and recreation	2018	SNA	guestimate	20%

Each table's cell requiring an input from the user shows a "screentip" when hoovered over to indicate the kind of data expected and whether the value can be selected from a list or not. Even if a list is available, the user can overwrite the default or pre-fetched values with his/ her own. For example, those are the screentip appearing when the user hoovers over the Section, Division, Group and Class respectively:

Section
Select a section from the list

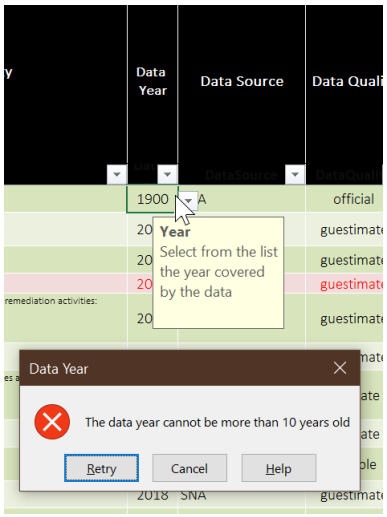
Division
Select the division from the list

Group
Select the group from the list!

Class
Select the activity from the list

There are few errors trapping checks on cells requiring input from the user. If the user enters a value outside the scope of what is expected, a warning dialog window will pop up indicating the invalid entry.

Table 2-2: Message appearing during error trapping after the user erroneously entered a year outside of the predefined scope.



Any other cells (labels, headers, description, formulae) are protected from being inadvertently changed by the user.

Table 2-3 to Table 2-6 below shows the progression of selecting an economic activity starting by the Section then Division, Group and Class following the arborescent of the nested list from the ISIC rev. 4 nomenclature.

The user may enter the activity at one, two, three or four levels of details (i.e. level 1, 2, 3 or 4).

Table 2-3: Selecting an item from the "Section" level or level 1 of the Economic Activity from the nested list of the ISIC rev 4 Nomenclature

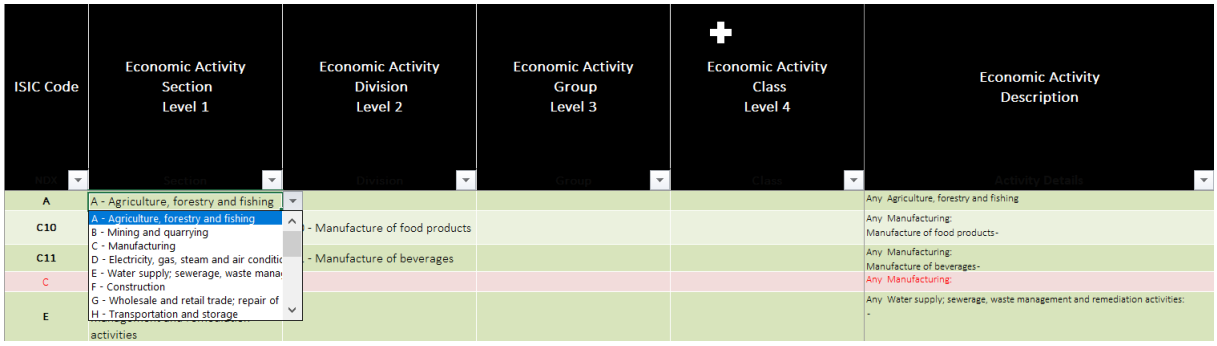


Table 2-4: Selecting an item from the "Division" level or level 2 of the Economic Activity from the nested list of the ISIC rev 4 Nomenclature. The available choices are conditional of the item selected in the previous level (i.e. the Section level or level 1 in this case).

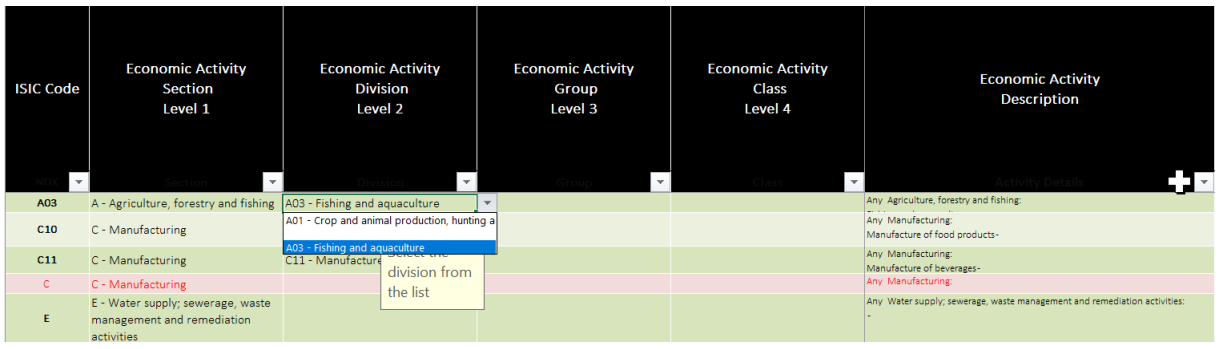


Table 2-5: Selecting an item from the "Group" level or level 3 of the Economic Activity from the nested list of the ISIC rev 4 Nomenclature.

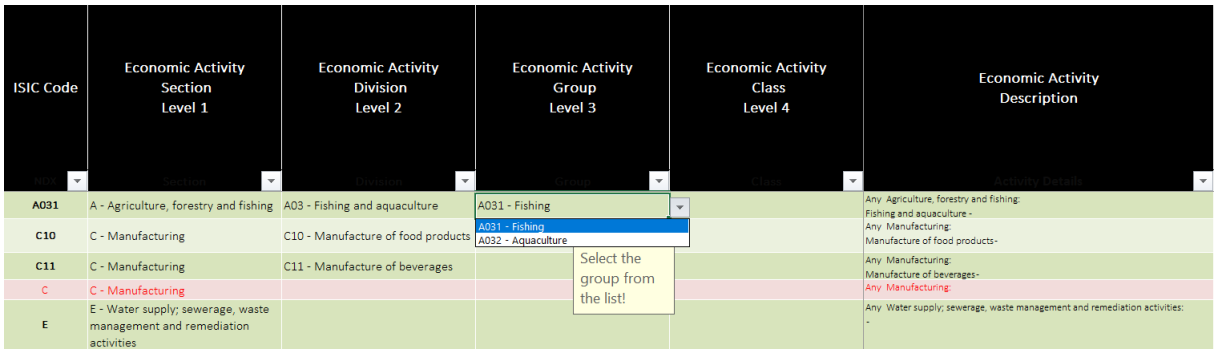
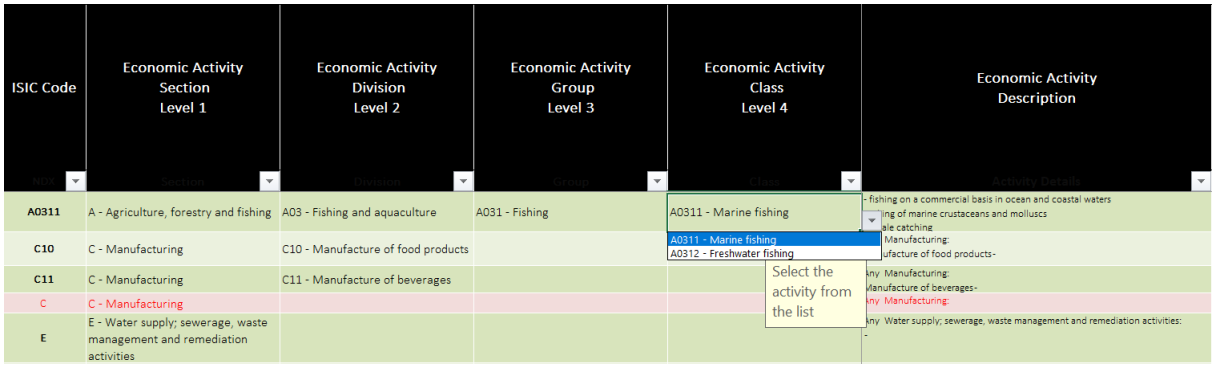


Table 2-6: Selecting an item from the "Class" level or level 4 of the Economic Activity from the nested list of the ISIC rev 4 Nomenclature



Once the economic activity has been entered/ defined, the user enters the data year, data source, data quality and % of the activity attributable to the Blue Economy. Then if the data is available, the users enters the number of males and females employed in the reported activity, and/ or the total employment in the reported activity (if the number of males and females are known and have been entered, the user can press the button labelled "calculate" to populate automatically the total number employed. ; the number of males, females and the total employment in the reported activity attributable to BE are calculated based on the % of the activity attributable to the Blue Economy.

The monetary values entered by the user will be expressed in the "selected currency" which will be automatically converted and expressed as well in the "reference currency" based on the user selection from the country profile. The user may also "on the fly" select a different reference currency from a dropdown list situated at the end of the Economic data table (Table 2-7).

Table 2-7: "On the fly" selection of the reference currency at the end of the Economic Data Table.

Selected Data Currency (SCR)	Total Wages in the reported activity in selected currency	Gross Value Added (GVA) of the reported activity in selected currency	Total Wages in the reported activity attributable to BE in selected currency	Gross Value Added (GVA) of the reported activity attributable to BE in selected currency	Total Wages in the reported activity attributable to BE (USD)	US Dollars (USD)
SCR	54,864,000	159,800,000	54,864,000	159,800,000	$ 3,871,82	
SCR	213,710,832	716,700,000	192,339,749	645,030,000	$ 13,573,67	
SCR	13,837,392	418,400,000	1,383,739	41,840,000	$ 97,652	$ 2,952,704
SCR	17,296,740	261,700,000	3,459,348	52,340,000	$ 244,131	$ 3,693,703
SCR	36,526,068	81,400,000	10,957,820	24,420,000	$ 773,308	$ 1,723,352

Burundian franc (BIF)
Congolese franc (CDF)
Comoro franc (KMF)
Djiboutian franc (DJF)
Euro (EUR)
Eritrean nakfa (ERN)
Ethiopian birr (ETB)
U.K. Pound Sterling (GBP)
Kenyan shilling (KES)
Malagasy ariary (MGA)
Rwandan franc (RWF)
Somali shilling (SOS)
South Sudanese pound (SS
Seychelles rupee (SCR)
Tanzanian shilling (TZS)
Ugandan shilling (UGX)
US Dollars (USD)
South African Rand (ZA

The user enters the total Wages in the reported activity and the gross value added (GVA) of the reported activity expressed in the selected currency (the country national currency by default)

Table 2-8: Economic data populated with employment, wages and GVA data for several economic activities identified by the user

Economic Sustainability Data for Seychelles

US Dollars (USD)

ISIC Code	Economic Activity Section Level 1	Economic Activity Division Level 2	Number of males employed in the reported activity	Number of males employed in the reported activity attributable to BE	Number of females employed in the reported activity	Number of females employed in the reported activity attributable to BE	Total employment in the reported activity	Total employment in the reported activity attributable to BE	Selected Data Currency (SCR)	Total Wages in the reported activity in selected currency	Gross Value Added (GVA) of the reported activity in selected currency	Total Wages in the reported activity attributable to BE in selected currency	Gross Value Added (GVA) of the reported activity attributable to BE in selected currency	Total Wages in the reported activity attributable to BE (USD)	Gross Value Added (GVA) of the reported activity attributable to BE (USD)
							Calculate								
A03	A - Agriculture, forestry and fishing	A03 - Fishing and aquaculture					400	400	SCR	54,864,000	159,800,000	54,864,000	159,800,000	$ 3,871,825	$ 11,277,298
C10	C - Manufacturing	C10 - Manufacture of food products					1,854	1,668	SCR	213,710,832	716,700,000	192,339,749	645,030,000	$ 13,573,672	$ 45,520,625
C11	C - Manufacturing	C11 - Manufacture of beverages					1,082	108	SCR	13,837,392	418,400,000	1,383,739	41,840,000	$ 97,652	$ 2,952,704
C	C - Manufacturing						677	135	SCR	17,296,740	261,700,000	3,459,348	52,340,000	$ 244,131	$ 3,693,703
E	E - Water supply; sewerage, waste management and remediation activities						612	183	SCR	36,526,068	81,400,000	10,957,820	24,420,000	$ 773,308	$ 1,723,352
F	F - Construction						5,910	1,182	SCR	140,407,416	687,100,000	28,081,483	137,420,000	$ 1,981,748	$ 9,697,912
G	G - Wholesale and retail trade; repair of motor vehicles and motorcycles						4,352	435	SCR	10,299,900	1,513,700,000	1,029,990	151,370,000	$ 72,688	$ 10,682,382
H	H - Transportation and storage						4,180	3,344	SCR	553,224,672	2,232,500,000	442,579,738	1,786,000,000	$ 31,233,441	$ 126,040,395
I	I - Accommodation and food service activities						9,336	9,149	SCR	1,171,012,272	2,677,900,000	1,147,592,027	2,624,342,000	$ 80,987,095	$ 185,203,304
K	K - Financial and insurance activities						1,817	908	SCR	119,856,000	872,200,000	59,928,000	436,100,000	$ 4,229,199	$ 30,776,157
M	M - Professional, scientific and technical activities						1,337	200	SCR	57,600,000	535,400,000	8,640,000	80,310,000	$ 609,736	$ 5,667,583
N	N - Administrative and support service activities						3,614	2,891	SCR	268,042,848	600,200,000	214,434,278	480,160,000	$ 15,132,912	$ 33,885,530
O	O - Public administration and defence; compulsory social security						6,209	1,552	SCR	297,294,912	1,472,000,000	74,323,728	368,000,000	$ 5,245,124	$ 25,970,249
P	P - Education						2,769	138	SCR	24,170,976	442,500,000	1,208,549	22,125,000	$ 85,289	$ 1,561,391
R	R - Arts, entertainment and recreation						1,175	235	SCR	121,375,620	91,700,000	24,275,124	18,340,000	$ 1,713,128	$ 1,294,278

If an economic activity has been duplicated in the table or if an activity's lowest level recorded has also been recorded for another activity which has a highest level of detail (i.e. recorded with more details) , the corresponding data row will be highlighted in red as to warn the user that there might be data entry duplication or potential double counting (see example in Table 2-9).

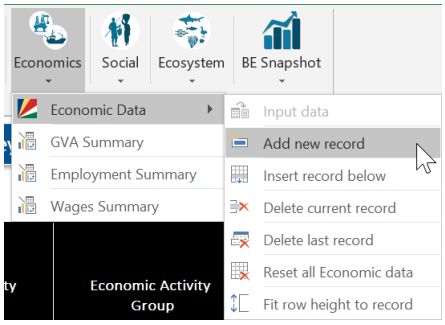
Table 2-9: Screen's clue warning (red highlights) for the user that a data row might have been duplicated or an economic activity indirectly double counted. In this case only the activity with the ISIC code "C" (i.e. level 1) is highlighted because two more activities from the same section (i.e. level 1) have already been recorded at a highest level of details (up to Level 2).

ISIC Code	Economic Activity Section Level 1	Economic Activity Division Level 2	Economic Activity Group Level 3	Economic Activity Class Level 4
C10	C - Manufacturing	C10 - Manufacture of food products		
C11	C - Manufacturing	C11 - Manufacture of beverages		
C	C - Manufacturing			

In Table 2-9 above, the warning was a false positive because under ISIC code "C", the user only associated 20% of the Manufacturing activity to BE, another portion being accounted for under ISIC codes C10 and C11.

While entering data in the Economic table, the user may add, delete, insert, reset rows in the table by accessing the customised menu under Economics -> Economic Data..

Table 2-10: customised menu with options to add, Insert, delete records, reset the entire table or adjust the row height.



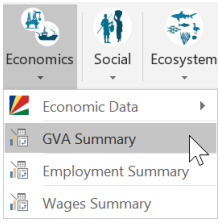
The monetary data in the last two columns of the Economic data table are the data entered by the user converted and expressed in the currency of reference (default is USD) while the value has also been adjusted by a GDP deflator or the relevant Producer Price Index (PPI) for the country in question and based on the reference year selected in the Country Profile Sheet (see Table 3-23 in section 3.2 below for the countries deflator's lookup table).

2.6 Economic Summary Results

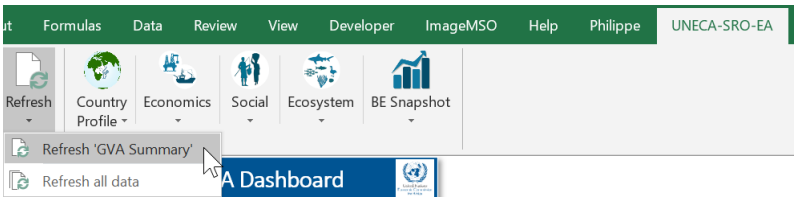
The tool currently provides three types of summaries associated with BE:

1. A GVA data summary
2. A wages data summary
3. An employment data summary

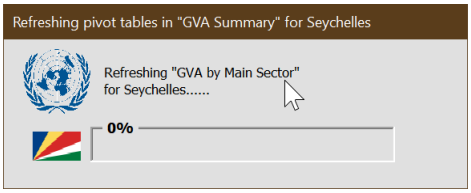
These summaries are accessible through the customised “economics” sub-menu.



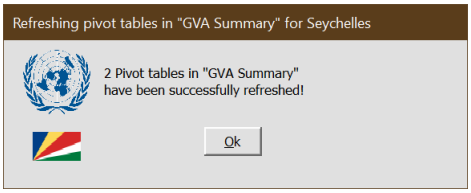
Although, each summary is automatically and dynamically generated, it is important to refresh the summaries each time new data have been entered



Once selected a similar progress bar as the following one will appear



Once the tables and charts have been updated, a message such as this will appear



Alternatively, the user may choose to refresh all summaries pivot tables and graphs at once

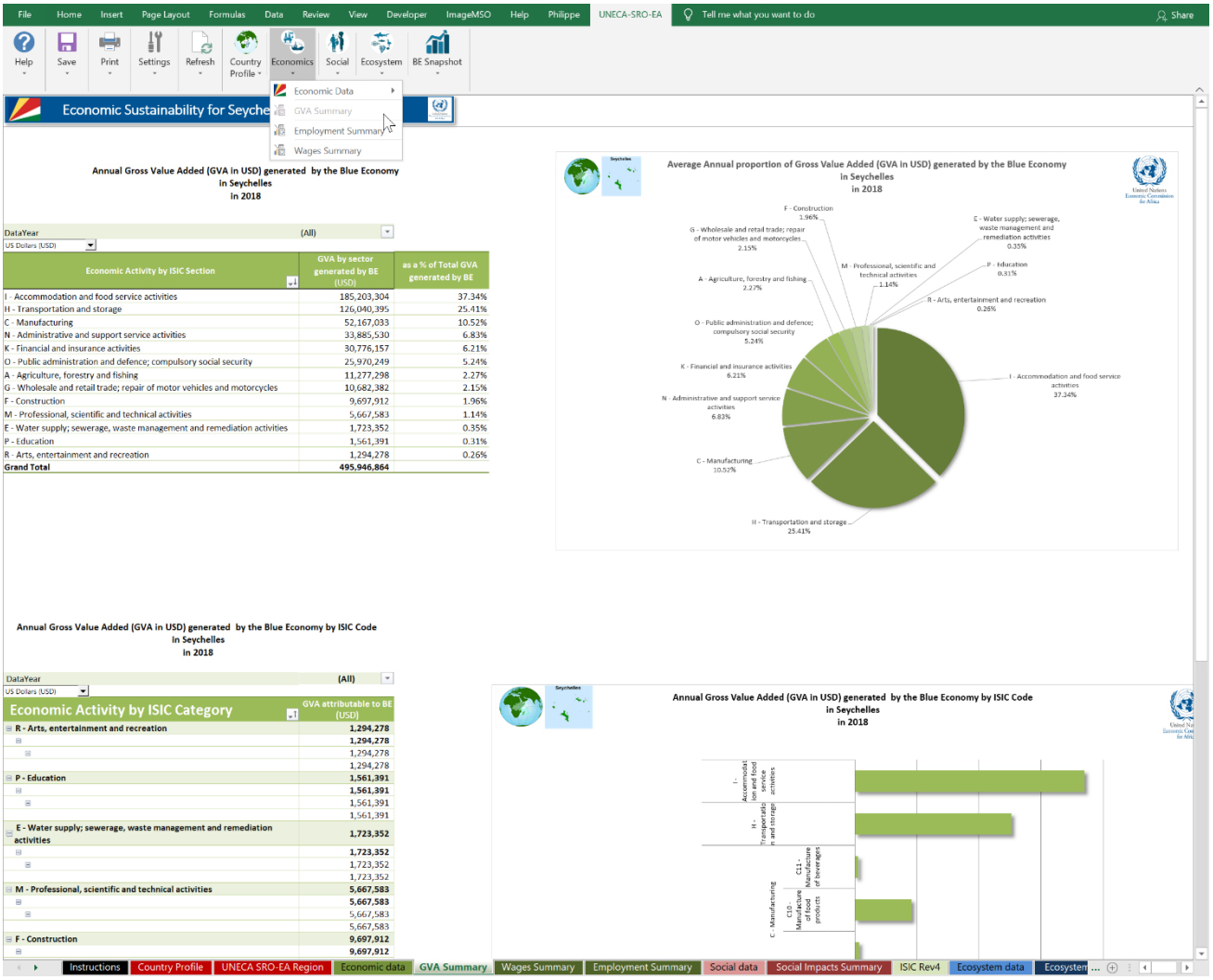
The following is a non-exhaustive list of actions a user can do while accessing any of the economic summaries:

- browse through the pivot tables and pivot charts
- expressed the summary data in any currency from the pre-defined list
- Select specific data years to be displayed
- Filter the data
- Manipulate the tables and graphs’ formatting and layout [4]

[4] Only once the sheet has been unprotected

The next three sections present the summary pivot tables and charts automatically generated by BEVTK once the data have been entered in the Economic data table and the summaries have been properly refreshed.

2.6.1 GVA Summary



Economic Activity by ISIC Section	GVA by sector generated by BE (USD)	as a % of Total GVA generated by BE
I - Accommodation and food service activities	185,203,304	37.34%
H - Transportation and storage	126,040,395	25.41%
C - Manufacturing	52,167,033	10.52%
N - Administrative and support service activities	33,885,530	6.83%
K - Financial and insurance activities	30,776,157	6.21%
O - Public administration and defence; compulsory social security	25,970,249	5.24%
A - Agriculture, forestry and fishing	11,277,298	2.27%
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	10,682,382	2.15%
F - Construction	9,697,912	1.96%
M - Professional, scientific and technical activities	5,667,583	1.14%
E - Water supply; sewerage, waste management and remediation activities	1,723,352	0.35%
P - Education	1,561,391	0.31%
R - Arts, entertainment and recreation	1,294,278	0.26%
Grand Total	**495,946,864**	

Figure 2-7: Screenshot of BEVTK's Summary sheet showing Gross Value Added (GVA) associated with BE

2.6.2 Employment Summary

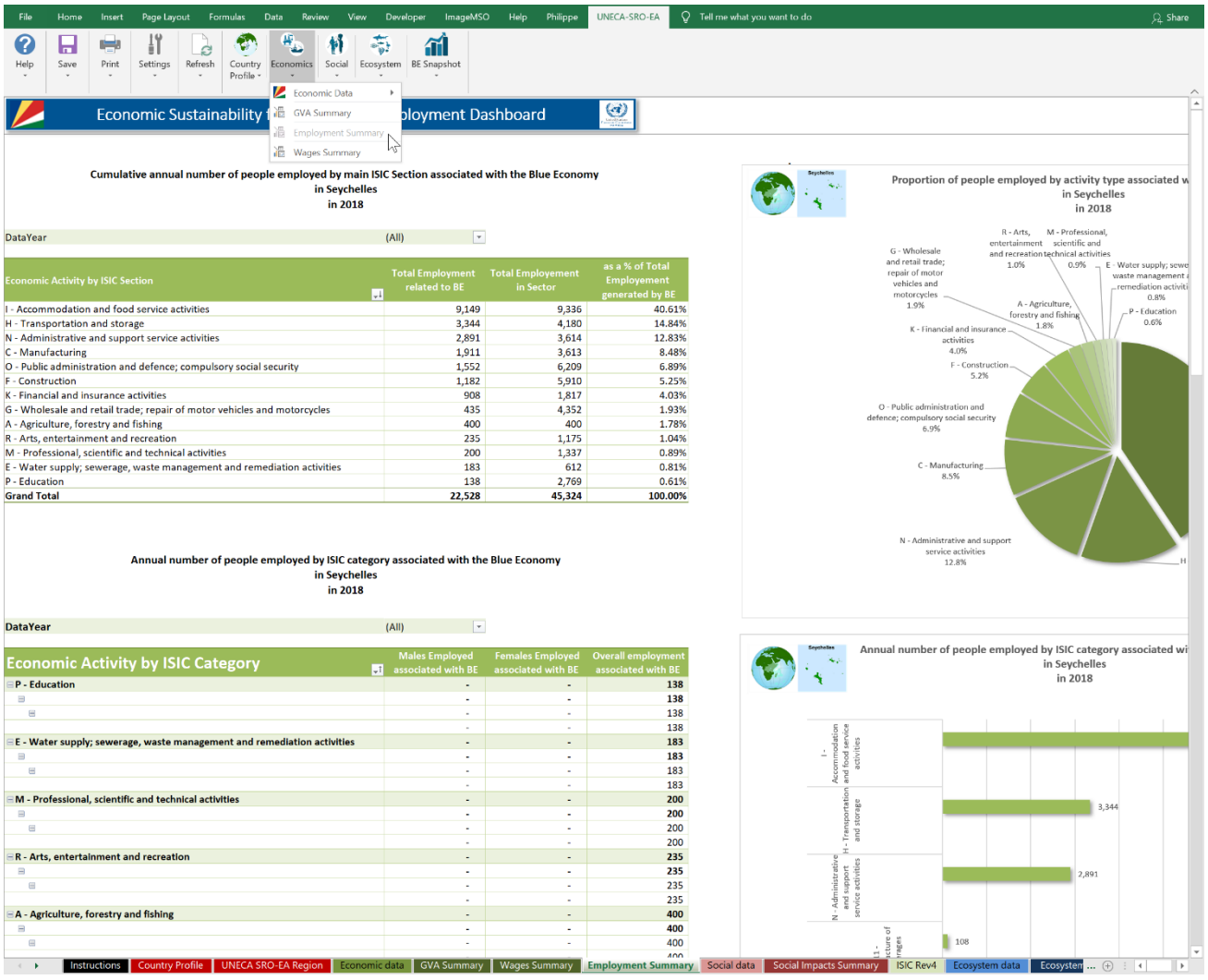


Figure 2-8: Screenshot of BEVTK's Summary sheet showing employment associated with BE.

2.6.3 Wages Summary

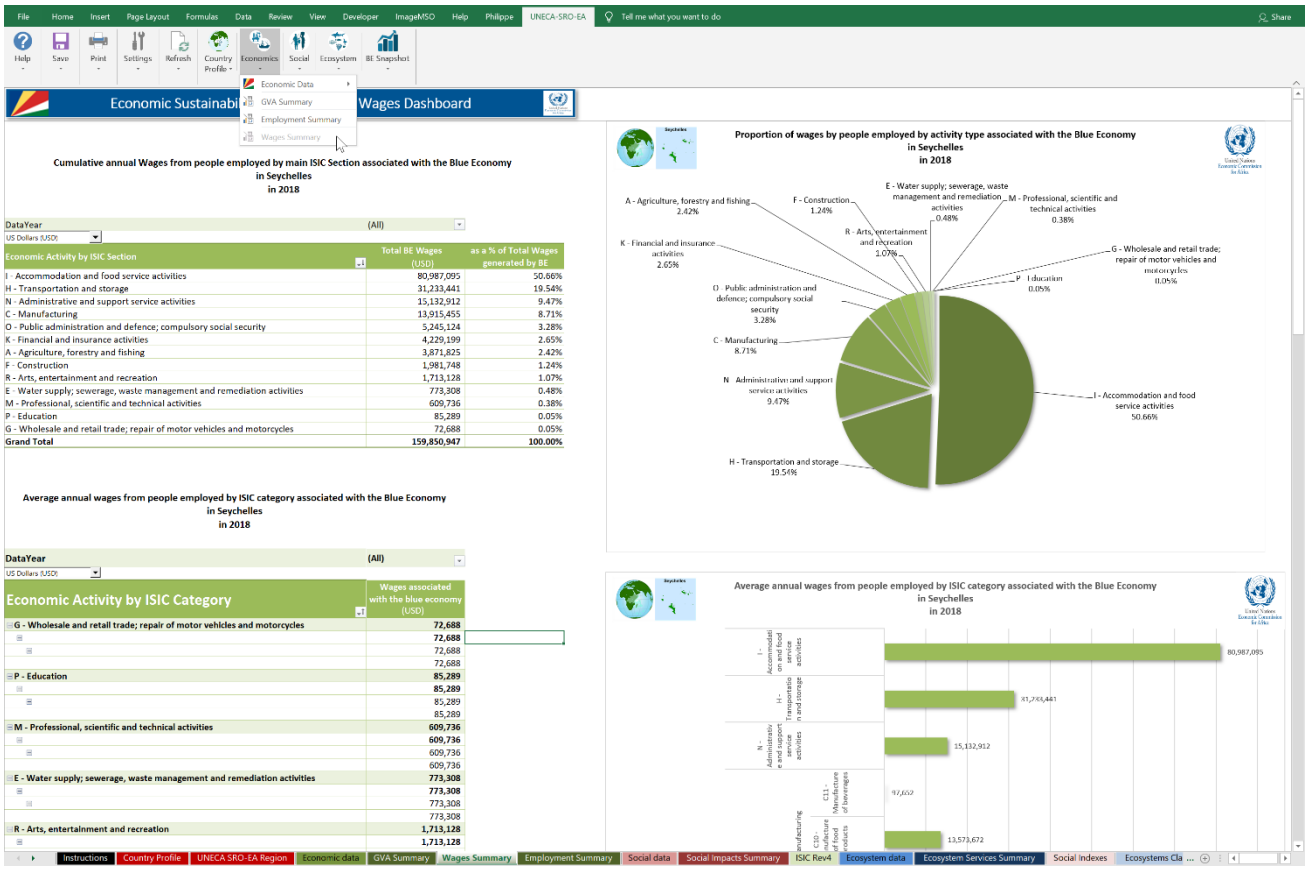


Figure 2-9: Screenshot of BEVTK's Summary sheet showing wages associated with BE.

2.7 Social Data Input

As for the economic data entry, the following tables summarise the steps to follow when entering data in the Social table. The error trapping, messages appearing, and menu options used to add, delete and insert records in the table are similar to what was discussed in section 2.5 above (i.e. the Economic Input section)

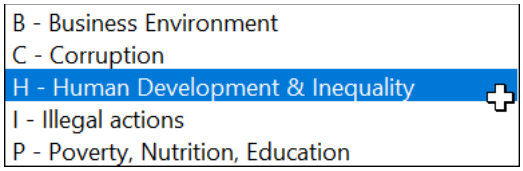
Table 2-11: Social data input table showing the levels of details available to enter the social aspect of BE from social category, social dimension to social indicator.

Social Sustainability Data for Seychelles

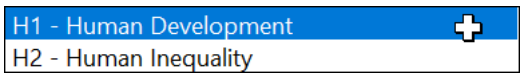
NDX	Social Category	Social Dimension	Social Indicator	Social Aspect Description	Data Year	Data Source	Data Quality	Social Indicator Value (Index)	Social Indicator Adjustment for BE (%)	Social indicator Gauge for BE
C11	C - Corruption	C1 - Government	C11 - Corruption Perception Index (CPI)	Corruption Perception Index (CPI)	2019	Transparency Internationale. (2020). Corruption Perceptions Index (CPI) 2019	reliable	66.00	100%	66.00
H11	H - Human Development & Ine	H1 - Human Development	H11 - Human Development Index (HDI)	Human Development Index (HDI)	2018	UNDP (2019). Human Development Data (1990-2018)	reliable	80.10	100%	80.10
H12	H - Human Development & Ine	H1 - Human Development	H12 - Gender Development Index (GDI)	Gender Development Index (GDI)	2018	UNDP (2019). Human Development Data (1990-2018)	reliable		100%	
H13	H - Human Development & Ine	H1 - Human Development	H13 - Youth unemployment rate (% youth pop)	Youth unemployment rate (% youth pop)	2018	UNDEP, Human Development Data (1990-2018)	reliable		100%	
H14	H - Human Development & Ine	H1 - Human Development	H14 - Overall unemployment rate (% Pop)	Overall unemployment rate (% Pop)	2018	UNDEP, Human Development Data (1990-2018)	reliable		100%	
H15	H - Human Development & Ine	H1 - Human Development	H15 - Overall unemployment rate (female to male ratio)	Overall unemployment rate (female to male ratio)	2018	UNDEP, Human Development Data (1990-2018)	reliable		100%	
H21	H - Human Development & Ine	H2 - Human Inequality	H21 - Inequality-adjusted Human Development Index (IHDI)	Inequality-adjusted Human Development Index (IHDI)	2018	UNDP (2019). Human Development Data (1990-2018)	reliable	79.70	100%	79.70

This sequence of nested list used in the Social dimension is based on existing indicators from UNDP, the World Bank and Transparency International to name but a few. This nested structure can be amended by the user to add additional indicators he/ she considers relevant for their country. Once new indicators are added to the existing list following the structure already in place, those new choice will appear in the proposed items in the relevant lists. Section 3.1.4 in the Appendix present the structure used with the nested lists for the social data entry. Because the value of most social indicators is already available for the countries within the scope of this study, some of the data were prefetched and made available to the user as items in the lists showing when entering the data; the user may choose to accept the indicator's "prefetched" value of enter their own.

The following list shows the first selection level or "social category"

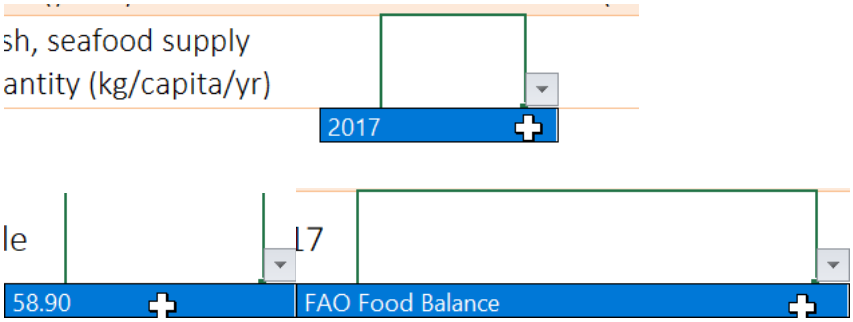


The following list shows the second selection level or "social dimension" which is dependent on the item selected from the previous list

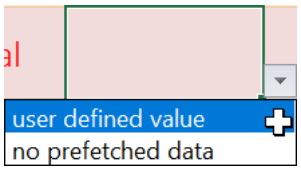


The following list shows the third selection level or "social indicator" which is dependent on the item selected from the previous list

Once the social indicator has been selected, if available, the data year, data source and indicator value's prefetched values can be selected from the lists or overwritten by the user if required.



If no value is available for a particular indicator for the country, the items labelled "user defined value" and "no prefetched data" will be listed instead meaning that no data were reported for the country on that indicator so that the user can choose to ignore this fact and enters manually his/ her own value or he/ she may decide not to include that record in the analysis by deleting it altogether.



In this example below, a value of 58.90 was prefetched for the indicator on that row, the user may kepp it or overwrite it with his/ her own value..

2.8 Social Summary Results

The following table and chart are examples of summaries BEVTK produces for the Social aspect of BE.

The following screenshot shows the Social impacts Summary sheet corresponding to the Social data table.

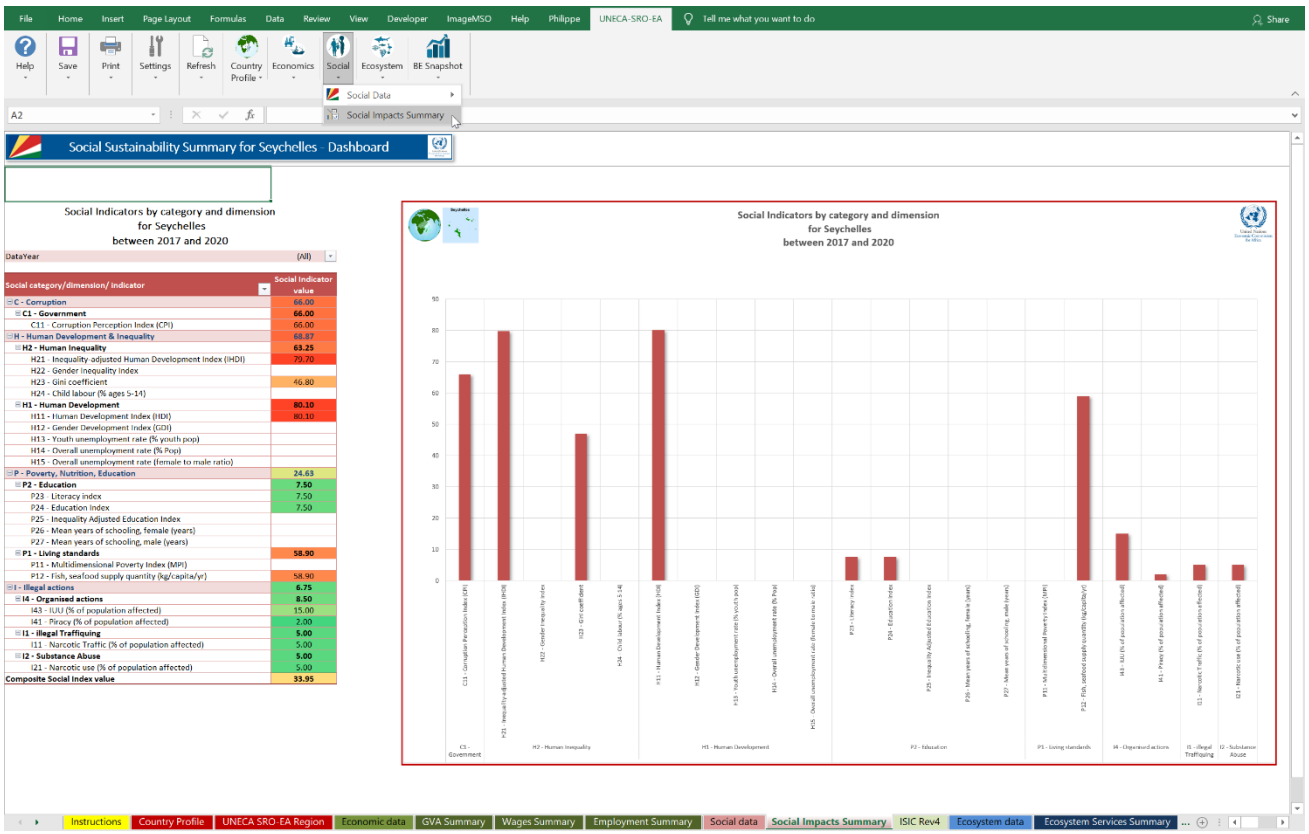


Figure 2-10: Social impacts Summary sheet corresponding to the social data table describe in the previous section.

The user may decide to show only partial data by filtering the data year (Figure 2-11)

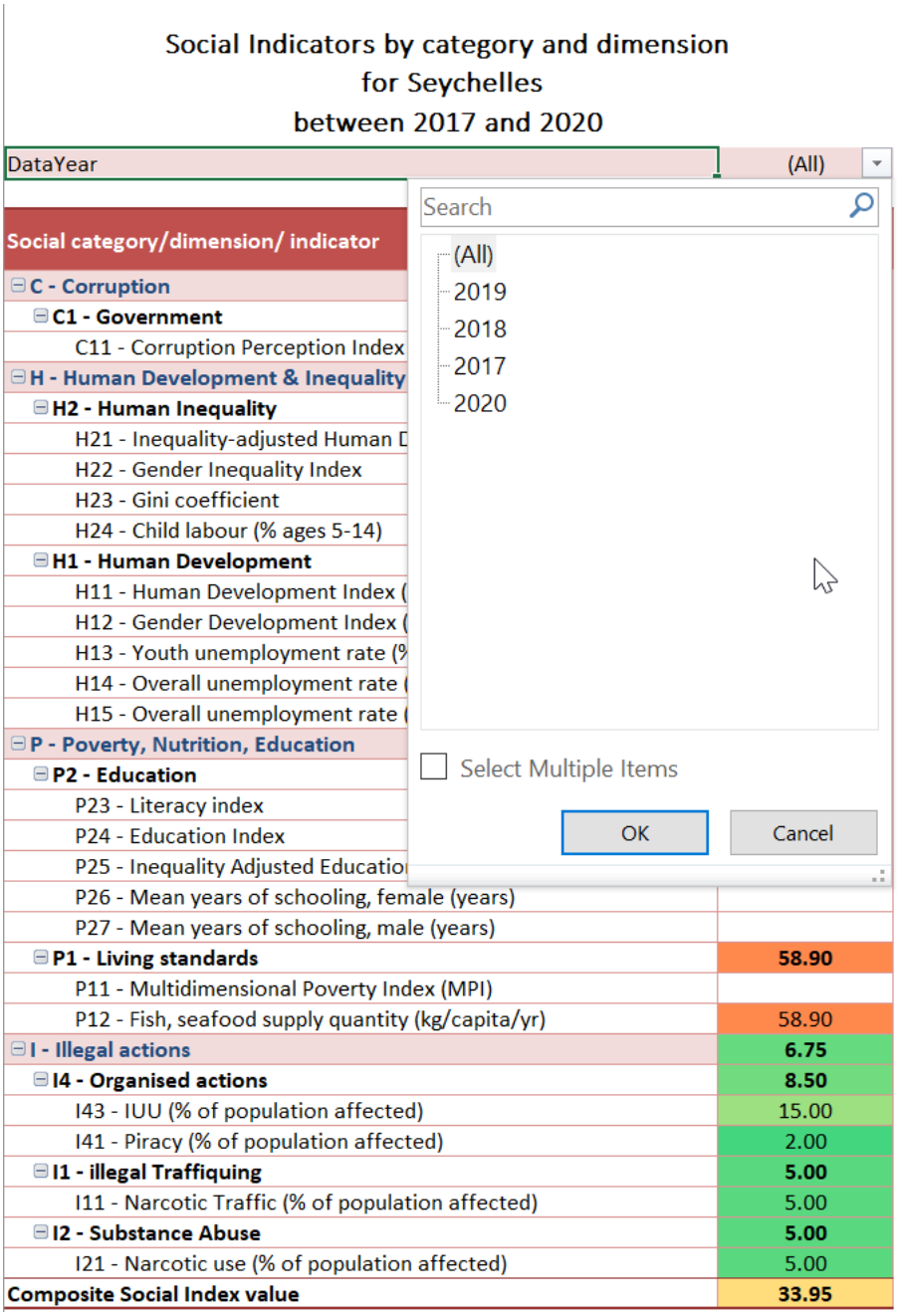


Figure 2-11: Data year selection in the social impact summary table (the default is (ALL))

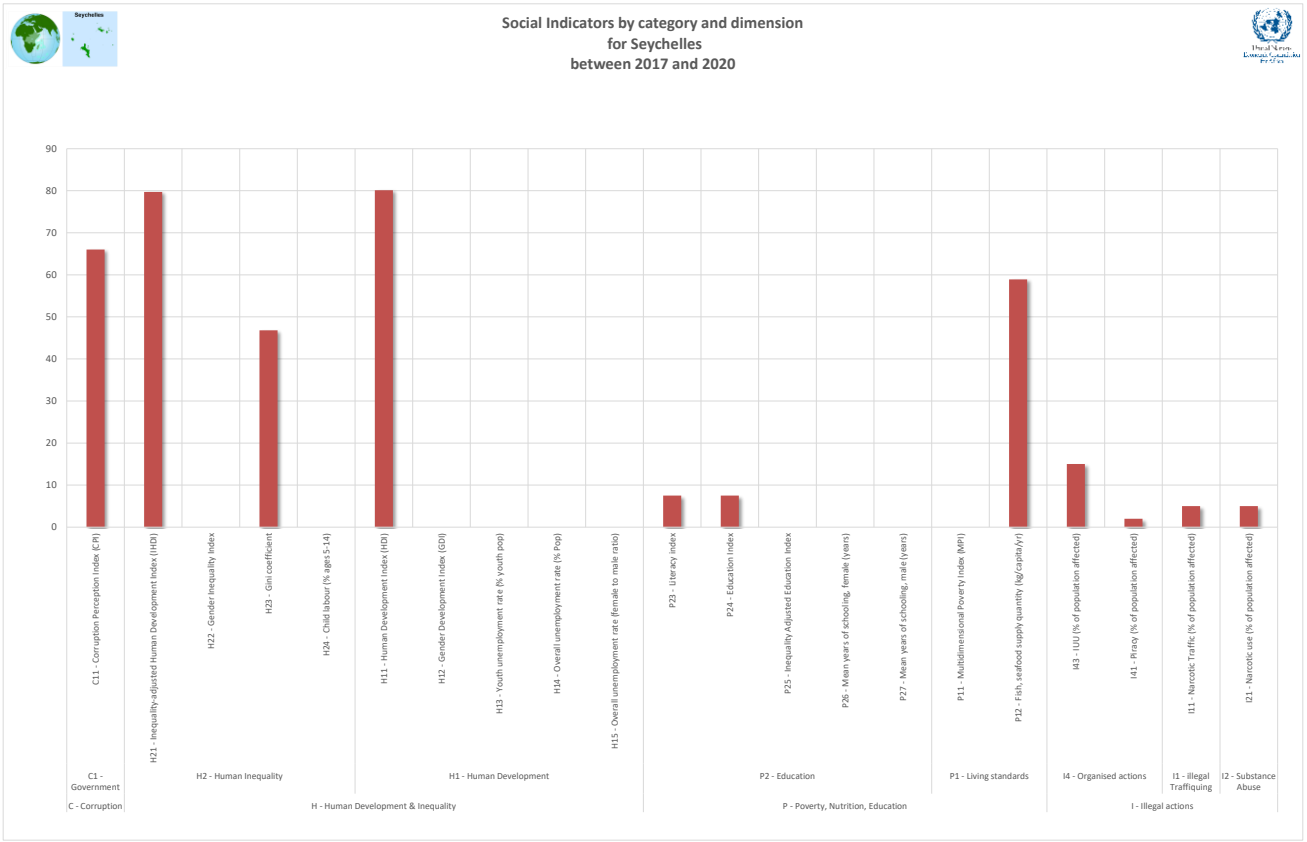
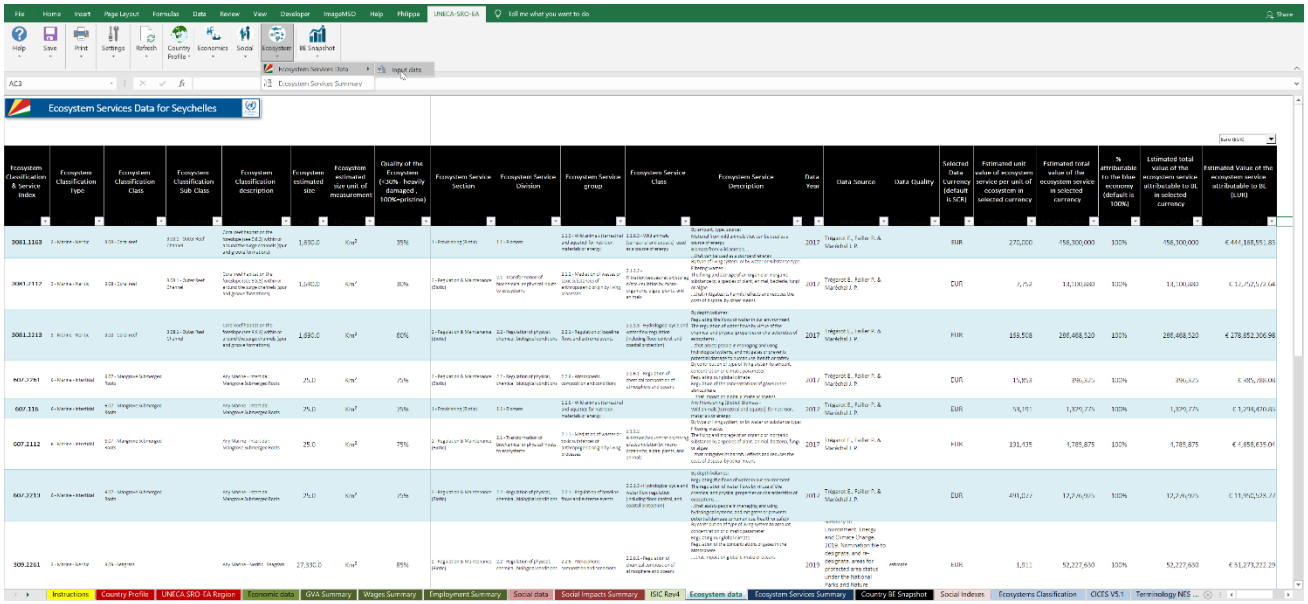


Figure 2-12: Summary of all social indicators organised by category and dimension.

2.9 Ecosystem Services data input

As for the previous two sections on data entry (sections 2.5 and 0), the following tables summarise the steps to follow when entering data in the Social table. The error trapping, messages appearing, and menu options used to add, delete and insert records in the table are similar to what was discussed in section 2.5 above (i.e. the Economic Input section)

Table 2-12: Accessing the Ecosystem Services sheet to enter data in the input table

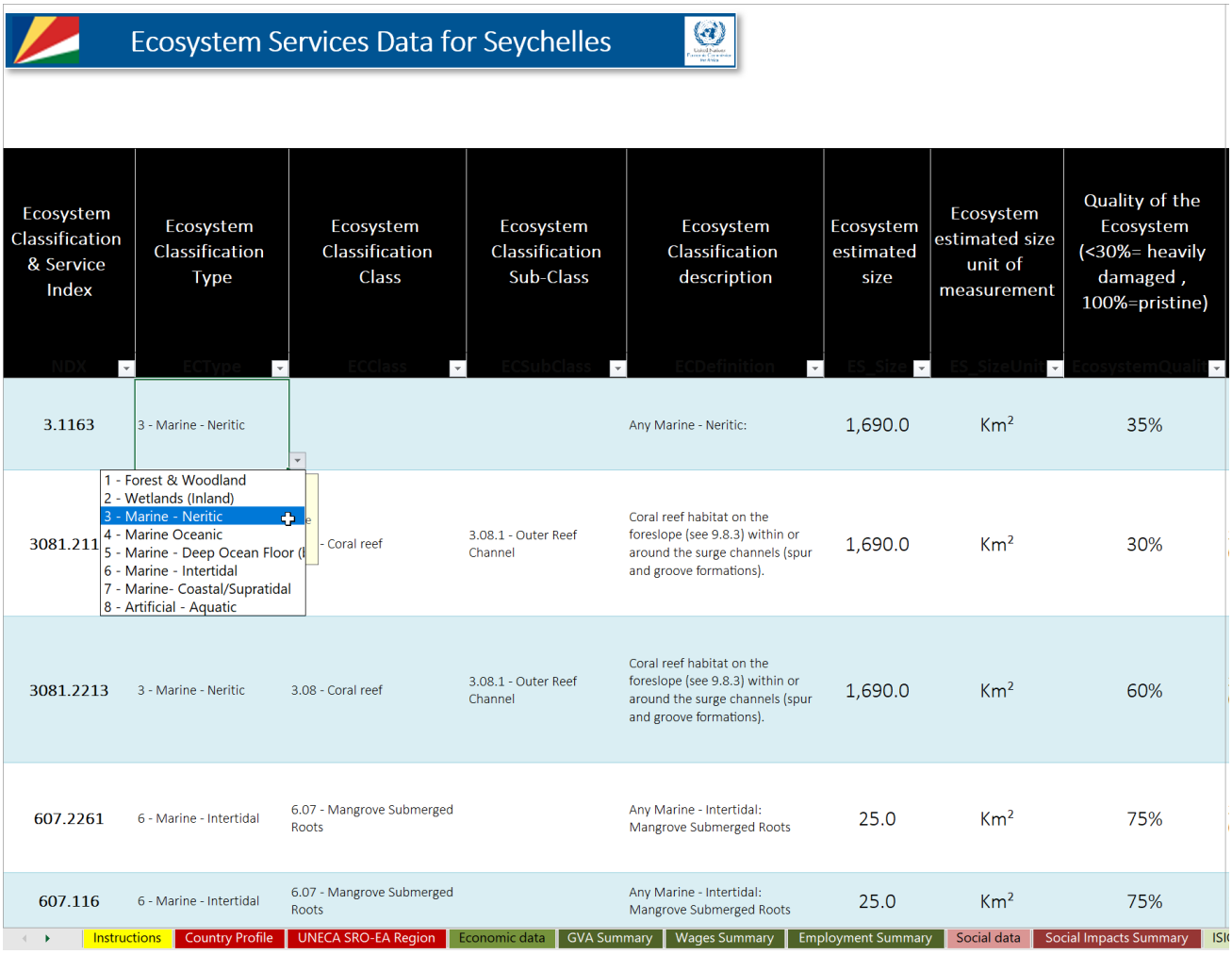


The ecosystem services data entry table is organised around three main sections:

1. Ecosystem type data entry section
2. Ecosystem service data entry section
3. Data entry on the estimate corresponding to the ecosystem's monetary contribution to BE.

The following tables show the sequence to enter the data in input table

Table 2-13: Section 1 of the table where the user enters the Ecosystem type



Ecosystem Classification & Service Index	Ecosystem Classification Type	Ecosystem Classification Class	Ecosystem Classification Sub-Class	Ecosystem Classification description	Ecosystem estimated size	Ecosystem estimated size unit of measurement	Quality of the Ecosystem (<30%= heavily damaged , 100%=pristine)
NDX	ECType	ECClass	ECSubClass	ECDefinition	ES_Size	ES_SizeUnit	EcosystemQuality
3.1163	3 - Marine - Neritic			Any Marine - Neritic:	1,690.0	Km²	35%
3081.211	1 - Forest & Woodland 2 - Wetlands (Inland) 3 - Marine - Neritic 4 - Marine Oceanic 5 - Marine - Deep Ocean Floor (I 6 - Marine - Intertidal 7 - Marine- Coastal/Supratidal 8 - Artificial - Aquatic	- Coral reef	3.08.1 - Outer Reef Channel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	1,690.0	Km²	30%
3081.2213	3 - Marine - Neritic	3.08 - Coral reef	3.08.1 - Outer Reef Channel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	1,690.0	Km²	60%
607.2261	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km²	75%
607.116	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km²	75%

Table 2-14: Section 1 of the table where the user enters the Ecosystem class

Ecosystem Services Data for Seychelles

Ecosystem Classification & Service Index	Ecosystem Classification Type	Ecosystem Classification Class	Ecosystem Classification Sub-Class	Ecosystem Classification description	Ecosystem estimated size	Ecosystem estimated size unit of measurement	Quality of the Ecosystem (<30%= heavily damaged , 100%=pristine)
NDX	ECType	ECClass	ECSubClass	ECDefinition	ES_Size	ES_SizeUnit	EcosystemQuality
308.1163	3 - Marine - Neritic	3.08 - Coral reef		Any Marine - Neritic: Coral reef	1,690.0	Km^2	35%
3081.2112	3 - Marine - Neritic	3.03 - Subtidal Loose Rock/Pebb 3.04 - Subtidal Sandy 3.05 - Subtidal Sandy-Mud 3.06 - Subtidal Muddy 3.07 - Macroalgal / kelp 3.08 - Coral reef 3.09 - Seagrass 3.10 - Estuaries	08.1 - Outer Reef annel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	1,690.0	Km^2	30%
3081.2213	3 - Marine - Neritic	3.08 - Coral reef	3.08.1 - Outer Reef Channel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	1,690.0	Km^2	60%
607.2261	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km^2	75%
607.116	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km^2	75%

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary | ISI

Table 2-15: Section 1 of the table where the user enters the Ecosystem sub-class if any.

Ecosystem Services Data for Seychelles

Ecosystem Classification & Service Index	Ecosystem Classification Type	Ecosystem Classification Class	Ecosystem Classification Sub-Class	Ecosystem Classification description	Ecosystem estimated size	Ecosystem estimated size unit of measurement	Quality of the Ecosystem (<30%= heavily damaged , 100%=pristine)
NDX	ECType	ECClass	ECSubClass	ECDefinition	ES_Size	ES_SizeUnit	EcosystemQuality
308.1163	3 - Marine - Neritic	3.08 - Coral reef		Any Marine - Neritic: Coral reef	1,690.0	Km^2	35%
3081.2112	3 - Marine - Neritic	3.08 - Coral reef	3.08.1 - Outer Reef Channel 3.08.2 - Back Slope 3.08.3 - Foreslope (outer reef slop 3.08.4 - Lagoon 3.08.5 - Inter-reef Soft Substrate	reef habitat on the lope (see 9.8.3) within or nd the surge channels (spur and groove formations).	1,690.0	Km^2	30%
3081.2213	3 - Marine - Neritic	3.08 - Coral reef	3.08.1 - Outer Reef Channel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	1,690.0	Km^2	60%
607.2261	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km^2	75%
607.116	6 - Marine - Intertidal	6.07 - Mangrove Submerged Roots		Any Marine - Intertidal: Mangrove Submerged Roots	25.0	Km^2	75%

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary | ISI

Table 2-16: Section 2 of the table where the user enters the associated ecosystem service section

Ecosystem Classification & Service Index	Ecosystem Service Section	Ecosystem Service Division	Ecosystem Service group	Ecosystem Service Class	Ecosystem Service Description
NDX	ESSection	ESDivision	ESGroup	ESClass	ESDescription
3081.1	1 - Provisioning (Biotic)				Any Provisioning (Biotic)
3081.211	1 - Provisioning (Biotic) 2 - Regulation & Maintenance (Biotic) 3 - Cultural (Biotic) 4 - Provisioning (Abiotic)	1 - Transformation of chemical or physical inputs ecosystems	2.1.1 - Mediation of wastes or toxic substances of anthropogenic origin by living processes	2.1.1.2 - Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	By type of living system, or by water or substance type: Filtering wastes The fixing and storage of an organic or inorganic substance by a species of plant, animal, bacteria, fungi or algae ...that mitigates its harmful effects and reduces the costs of disposal by other means
3081.2213	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.1 - Regulation of baseline flows and extreme events	2.2.1.3 - Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	By depth/volumes: Regulating the flows of water in our environment The regulation of water flows by virtue of the chemical and physical properties or characteristics of ecosystems.... ...that assists people in managing and using hydrological systems, and mitigates or prevents potential damage to human use, health or safety
607.2261	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.6 - Atmospheric composition and conditions	2.2.6.1 - Regulation of chemical composition of atmosphere and oceans	By contribution of type of living system to amount, concentration or climatic parameter: Regulating our global climate Regulation of the concentrations of gases in the atmosphere ....that impact on global climate or oceans
607.116	1 - Provisioning (Biotic)	1.1 - Biomass	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy		Any Provisioning (Biotic): Biomass - Wild animals (terrestrial and aquatic) for nutrition, materials or energy

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary

Table 2-17: Section 2 of the table where the user enters the associated ecosystem service division

Ecosystem Classification & Service Index (NDX)	Ecosystem Service Section (ESSection)	Ecosystem Service Division (ESDivision)	Ecosystem Service group (ESGroup)	Ecosystem Service Class (ESClass)	Ecosystem Service Description (ESDescription)
3081.1	1 - Provisioning (Biotic)				Any Provisioning (Biotic)
3081.2112	2 - Regulation & Maintenance (Biotic)	1.1 - Biomass 1.2 - Genetic material from all biota (i 1.3 - Other types of provisioning servi 2.1 - Transformi… biochemical or … to ecosystems Division from the list	…1 - Mediation of wastes or …xic substances of …thropogenic origin by living processes	2.1.1.2 - Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	By type of living system, or by water or substance type: Filtering wastes The fixing and storage of an organic or inorganic substance by a species of plant, animal, bacteria, fungi or algae ...that mitigates its harmful effects and reduces the costs of disposal by other means
3081.2213	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.1 - Regulation of baseline flows and extreme events	2.2.1.3 - Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	By depth/volumes: Regulating the flows of water in our environment The regulation of water flows by virtue of the chemical and physical properties or characteristics of ecosystems.... ...that assists people in managing and using hydrological systems, and mitigates or prevents potential damage to human use, health or safety
607.2261	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.6 - Atmospheric composition and conditions	2.2.6.1 - Regulation of chemical composition of atmosphere and oceans	By contribution of type of living system to amount, concentration or climatic parameter: Regulating our global climate Regulation of the concentrations of gases in the atmosphere ....that impact on global climate or oceans
607.116	1 - Provisioning (Biotic)	1.1 - Biomass	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy		Any Provisioning (Biotic): Biomass - Wild animals (terrestrial and aquatic) for nutrition, materials or energy

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary

Table 2-18: Section 2 of the table where the user enters the associated ecosystem service group

Ecosystem Classification & Service Index	Ecosystem Service Section	Ecosystem Service Division	Ecosystem Service group	Ecosystem Service Class	Ecosystem Service Description
NDX	ESSection	ESDivision	ESGroup	ESClass	ESDescription
3081.11	1 - Provisioning (Biotic)	1.1 - Biomass			Any Provisioning (Biotic): Biomass
3081.2112	2 - Regulation & Maintenance (Biotic)	2.1 - Transformation of biochemical or physical in to ecosystems	1.1.1 - Cultivated terrestrial plants for 1.1.2 - Cultivated aquatic plants for n 1.1.4 - Reared aquatic animals for nu 1.1.5 - Wild plants (terrestrial and aqu 1.1.6 - Wild animals (terrestrial and ac	1.1.2 - tration/sequestration/storag accumulation by micro-anisms, algae, plants, and animals	By type of living system, or by water or substance type: Filtering wastes The fixing and storage of an organic or inorganic substance by a species of plant, animal, bacteria, fungi or algae ...that mitigates its harmful effects and reduces the costs of disposal by other means
3081.2213	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.1 - Regulation of baseline flows and extreme events	2.2.1.3 - Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	By depth/volumes: Regulating the flows of water in our environment The regulation of water flows by virtue of the chemical and physical properties or characteristics of ecosystems.... ...that assists people in managing and using hydrological systems, and mitigates or prevents potential damage to human use, health or safety
607.2261	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.6 - Atmospheric composition and conditions	2.2.6.1 - Regulation of chemical composition of atmosphere and oceans	By contribution of type of living system to amount, concentration or climatic parameter: Regulating our global climate Regulation of the concentrations of gases in the atmosphere ....that impact on global climate or oceans
607.116	1 - Provisioning (Biotic)	1.1 - Biomass	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy		Any Provisioning (Biotic): Biomass - Wild animals (terrestrial and aquatic) for nutrition, materials or energy
					By type of living system, or by water or substance type:

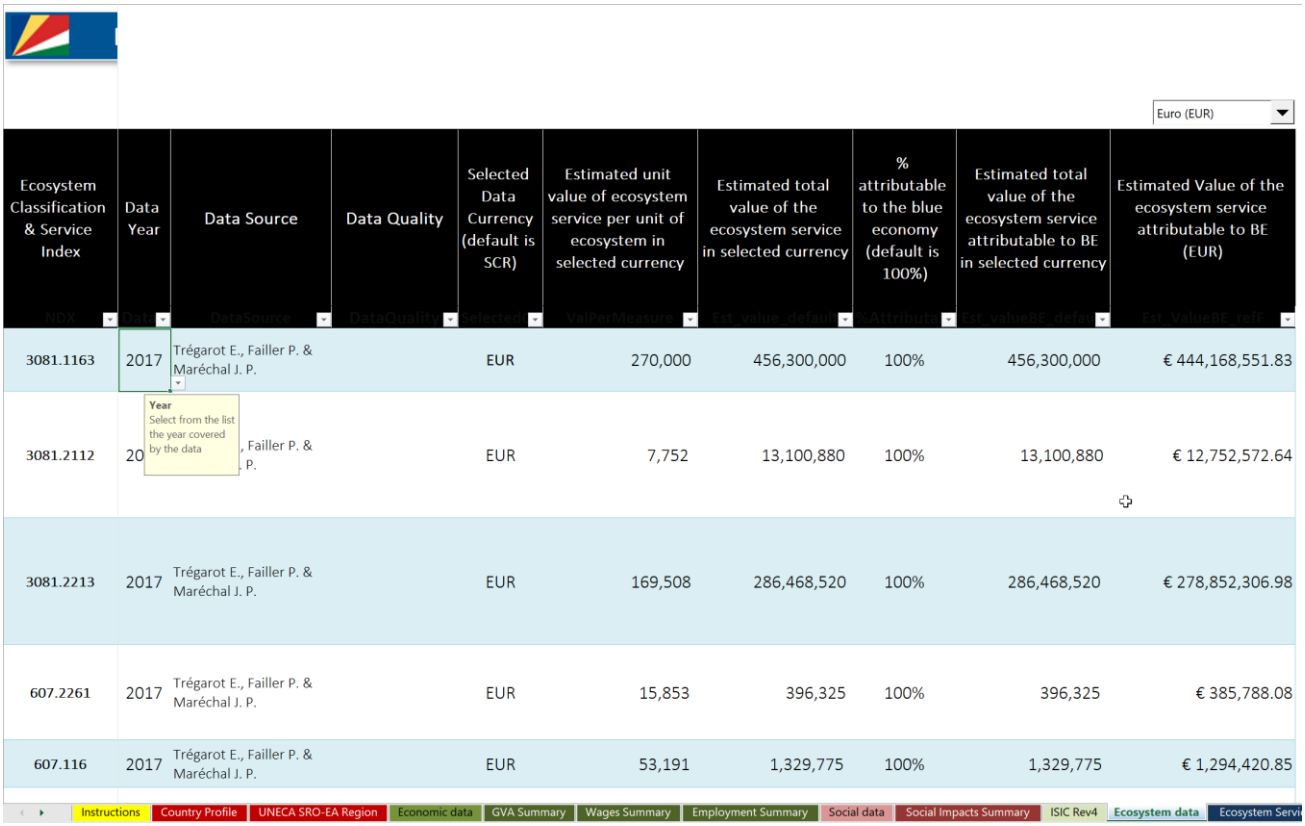
Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary

Table 2-19: Section 2 of the table where the user enters the associated ecosystem service class

Ecosystem Classification & Service Index	Ecosystem Service Section	Ecosystem Service Division	Ecosystem Service group	Ecosystem Service Class	Ecosystem Service Description
NDX	ESSection	ESDivision	ESGroup	ESClass	ESDescription
3081.116	1 - Provisioning (Biotic)	1.1 - Biomass	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy		Any Provisioning (Biotic): Biomass - Wild animals (terrestrial and aquatic) for nutrition, materials or energy
3081.2112	2 - Regulation & Maintenance (Biotic)	2.1 - Transformation of biochemical or physical inputs to ecosystems	2.1.1 - Mediation of waste toxic substances of anthropogenic origin by living processes	1.1.6.1 - Wild animals (terrestrial and 1.1.6.2 - Fibres and other materials fr 1.1.6.3 - Wild animals (terrestrial and e/accumulation organisms, algae animals class from the list!	type of living system, or by water or substance type: tering wastes e fixing and storage of an organic or inorganic stance by a species of plant, animal, bacteria, fungi algae ...that mitigates its harmful effects and reduces the costs of disposal by other means
3081.2213	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.1 - Regulation of baseline flows and extreme events	2.2.1.3 - Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	By depth/volumes: Regulating the flows of water in our environment The regulation of water flows by virtue of the chemical and physical properties or characteristics of ecosystems.... ...that assists people in managing and using hydrological systems, and mitigates or prevents potential damage to human use, health or safety
607.2261	2 - Regulation & Maintenance (Biotic)	2.2 - Regulation of physical, chemical, biological conditions	2.2.6 - Atmospheric composition and conditions	2.2.6.1 - Regulation of chemical composition of atmosphere and oceans	By contribution of type of living system to amount, concentration or climatic parameter: Regulating our global climate Regulation of the concentrations of gases in the atmosphere ....that impact on global climate or oceans
607.116	1 - Provisioning (Biotic)	1.1 - Biomass	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy		Any Provisioning (Biotic): Biomass - Wild animals (terrestrial and aquatic) for nutrition, materials or energy
					By type of living system, or by water or substance type:

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary

Table 2-20: Section 3 of the table where the user enters the data's year and source as well as the estimated contribution of the ecosystem to the BE through its service.



Euro (EUR)

Ecosystem Classification & Service Index	Data Year	Data Source	Data Quality	Selected Data Currency (default is SCR)	Estimated unit value of ecosystem service per unit of ecosystem in selected currency	Estimated total value of the ecosystem service in selected currency	% attributable to the blue economy (default is 100%)	Estimated total value of the ecosystem service attributable to BE in selected currency	Estimated Value of the ecosystem service attributable to BE (EUR)
3081.1163	2017	Trégarot E., Failler P. & Maréchal J. P.		EUR	270,000	456,300,000	100%	456,300,000	€ 444,168,551.83
3081.2112	20	, Failler P. & P.		EUR	7,752	13,100,880	100%	13,100,880	€ 12,752,572.64
3081.2213	2017	Trégarot E., Failler P. & Maréchal J. P.		EUR	169,508	286,468,520	100%	286,468,520	€ 278,852,306.98
607.2261	2017	Trégarot E., Failler P. & Maréchal J. P.		EUR	15,853	396,325	100%	396,325	€ 385,788.08
607.116	2017	Trégarot E., Failler P. & Maréchal J. P.		EUR	53,191	1,329,775	100%	1,329,775	€ 1,294,420.85

Year
Select from the list the year covered by the data

Instructions | Country Profile | UNECA SRO-EA Region | Economic data | GVA Summary | Wages Summary | Employment Summary | Social data | Social Impacts Summary | ISIC Rev4 | Ecosystem data | Ecosystem Servi

As in all the data input tables, the user may change the reference currency at any time (the drop down menu is accessible at the end of the table (top-right).

2.10 Ecosystem Services Summary Results

The following table and chart are examples of summaries BEVTK produces for the Ecosystem Services contribution to BE.

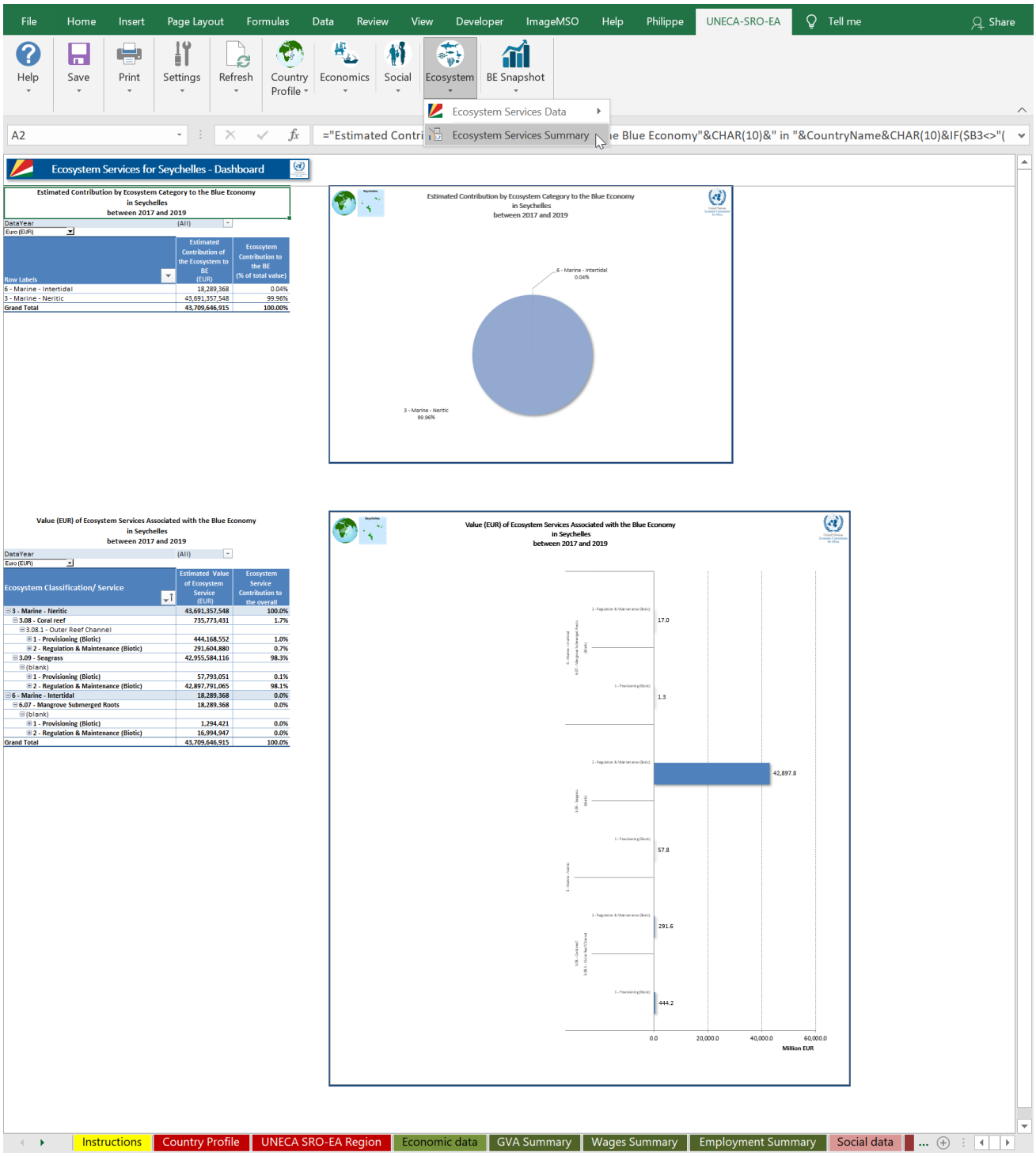


Figure 2-13: Ecosystem Services' Summary sheet corresponding to the ecosystem data table describe in the previous section.

Table 2-21: Example of output produced by the BEVTK for the Ecosystem Services contribution to the BE organised by main categories of habitats and their relative share expressed in percentage.

Estimated Contribution by Ecosystem Category to the Blue Economy in Seychelles between 2017 and 2019

DataYear (All)

Euro (EUR)

Row Labels	Estimated Contribution of the Ecosystem to BE (EUR)	Ecossytem Contribution to the BE (% of total value)
6 - Marine - Intertidal	18,289,368	0.04%
3 - Marine - Neritic	43,691,357,548	99.96%
Grand Total	**43,709,646,915**	**100.00%**

Table 2-22: Example of output produced by the BEVTK for the Ecosystem Services contribution to the BE organised by main categories of habitats, classes and sub-classes

Value (EUR) of Ecosystem Services Associated with the Blue Economy in Seychelles between 2017 and 2019

DataYear (All)

Euro (EUR)

Ecosystem Classification/ Service	Estimated Value of Ecosystem Service (EUR)	Ecosystem Service Contribution to the overall
3 - Marine - Neritic	**43,691,357,548**	**100.0%**
3.08 - Coral reef	**735,773,431**	**1.7%**
3.08.1 - Outer Reef Channel		
1 - Provisioning (Biotic)	**444,168,552**	**1.0%**
2 - Regulation & Maintenance (Biotic)	**291,604,880**	**0.7%**
3.09 - Seagrass	**42,955,584,116**	**98.3%**
(blank)		
1 - Provisioning (Biotic)	**57,793,051**	**0.1%**
2 - Regulation & Maintenance (Biotic)	**42,897,791,065**	**98.1%**
6 - Marine - Intertidal	**18,289,368**	**0.0%**
6.07 - Mangrove Submerged Roots	**18,289,368**	**0.0%**
(blank)		
1 - Provisioning (Biotic)	**1,294,421**	**0.0%**
2 - Regulation & Maintenance (Biotic)	**16,994,947**	**0.0%**
Grand Total	**43,709,646,915**	**100.0%**

As it was the case for the Social Impact and economic summary results, the user may change the reference currency and change which data year to include in the calculation.

2.11 Country BE Snapshot

The BEVTK provides a Summary and BE snapshot for the country.

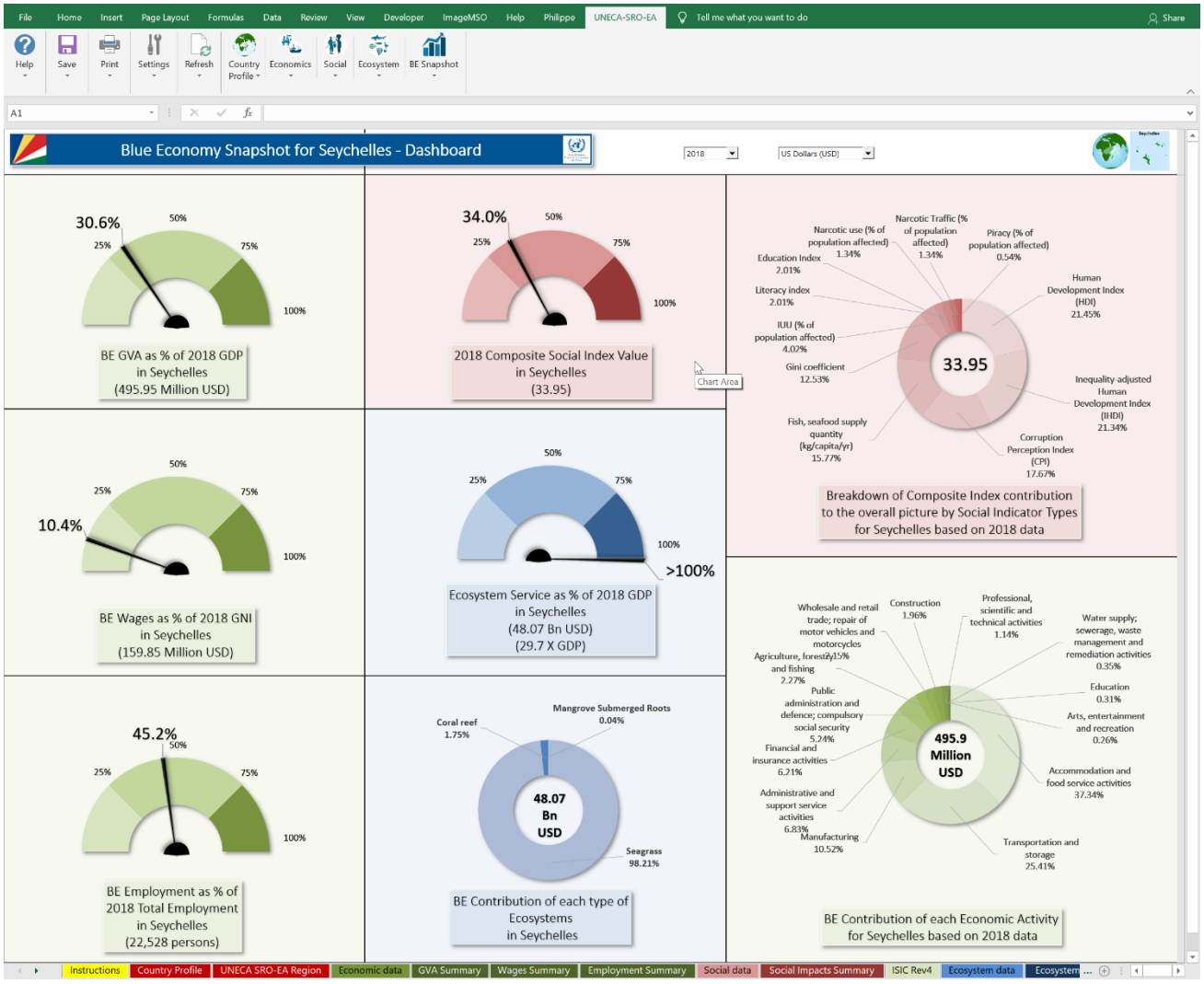
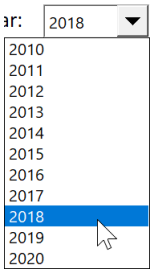


Figure 2-14: BEVTK Country's BE Snapshot summarising the three modules with gauges and pie charts

The user may at this point change the reference currency to express the monetary data in a different currency by selecting it from the pull-down list.

The user may also change the data year of reference by selecting an alternative year in the year pull down menu



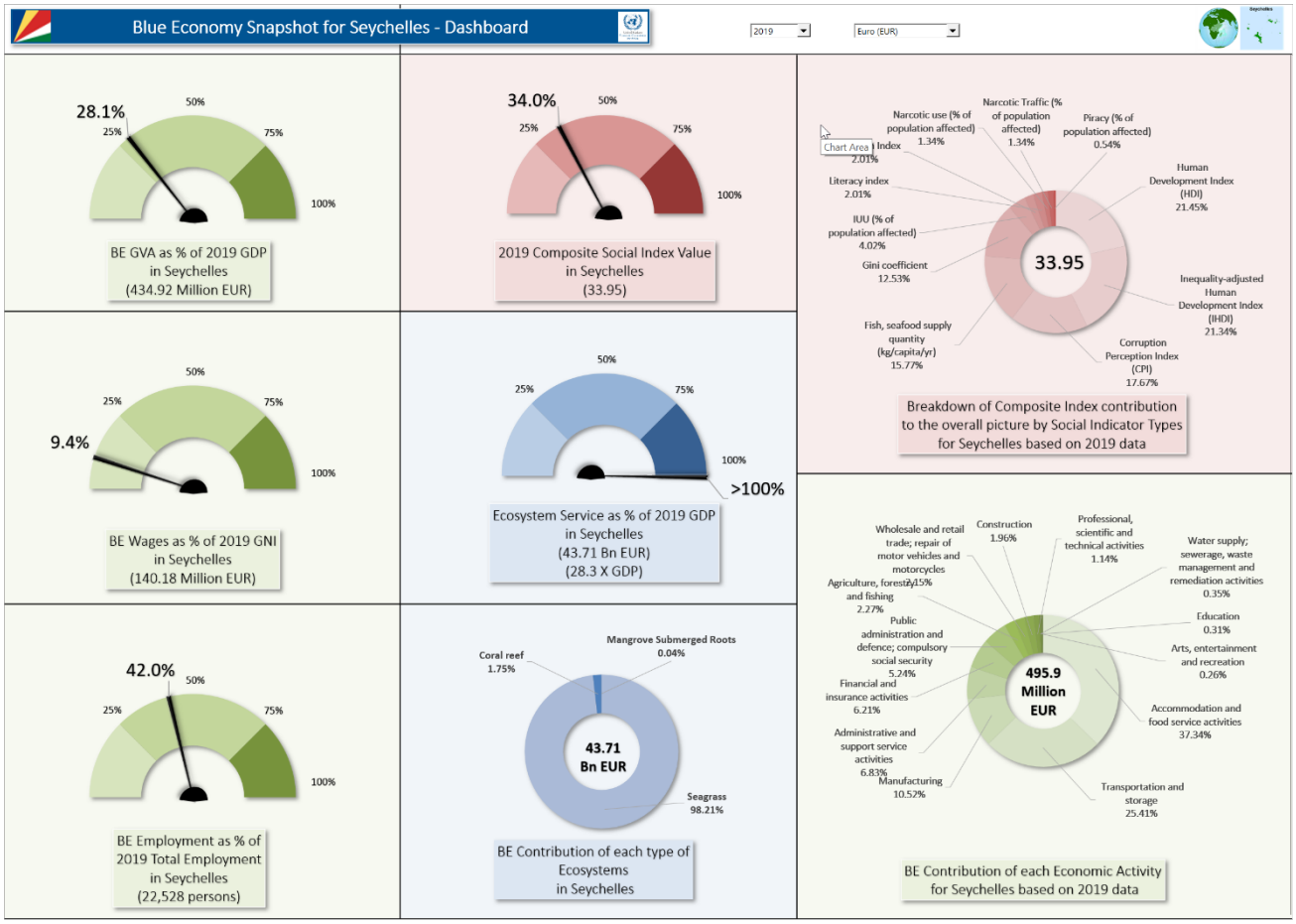


Figure 2-15: Simulation of the BE Snapshot adjusting to a change in the year of reference (from 2018 to 2019) and a change in the currency of reference (from USD to EUR)

3 APPENDIX

3.1 Nomenclature Systems Used In BEVTK

3.1.1 ISIC Rev 4

The ISIC rev 4 (UN, 2008) nomenclature was used in designing BEVTK to help identify potential economic activities contributing to the blue economy. The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be utilized for the collection and reporting of statistics according to such activities. From our discussion with the resident consultants in each of the three pilot countries, it became clear that the ISIC nomenclature from which their System of National Accounting (SNA) is based, was the best candidate to capture Economic Activity in the tool

The ISIC nomenclature is in its 4th revision. ISIC rev 4 is organised around 4 hierarchical levels, 1) Sections, 2) Divisions, 3) Groups and 4) Classes.

There are 21 Sections (or ISIC level 1) labelled from A to U, only 15 were identified as potentially relevant to activities contributing to the blue economy.

There are 88 Divisions (or ISIC level 2) labelled from A01 to U99 from which only 27 were deemed relevant to activities contributing to the blue economy.

There are 238 Groups (or ISIC level 3) labelled from A011 to U990 from which only 36 were deemed relevant to activities contributing to the blue economy.

There are 419 Classes (or ISIC level 4) labelled from A0111 to U9900 from which only 48 were deemed relevant to activities contributing to the blue economy.

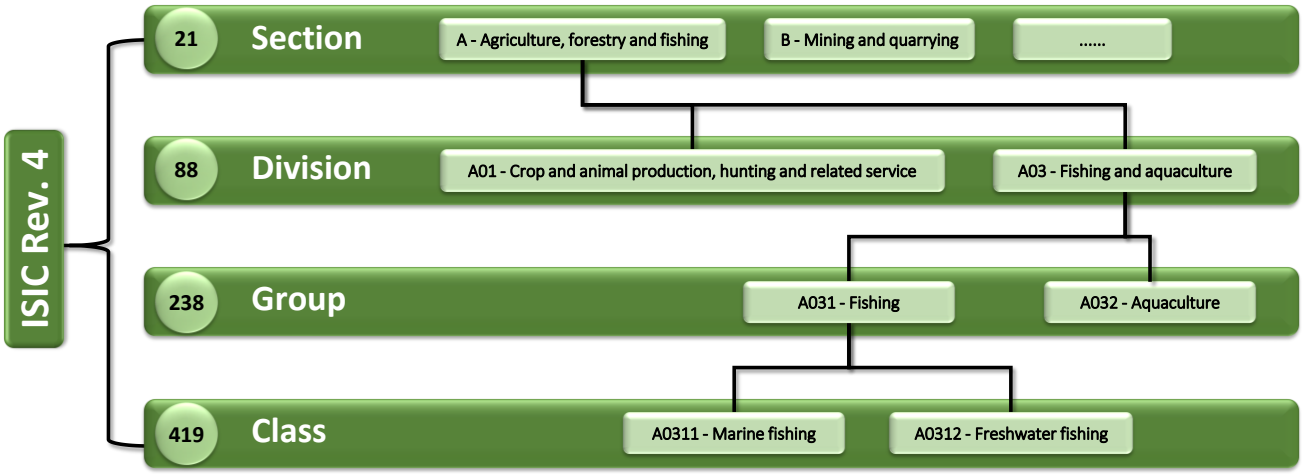


Figure 3-1: ISIC Rev 4 Nomenclature Structure

Table 3-1 to Table 3-4 show the ISIC Rev 4 nested reference tables used in the template from the Economic module

Table 3-1: Economic Activity Sections

SectionCode	SectionT	SectionTFr
A	A - Agriculture, forestry and fishing	A - Agriculture, sylviculture et pêche
C	C - Manufacturing	C - Activités de fabrication
E	E - Water supply; sewerage, waste management and remediation activities	E - Distribution d'eau; réseau d'assainissement; gestion des déchets et activités de remise en état
F	F - Construction	F - Construction
G	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	G - Commerce de gros et de détail, réparations de véhicules automobiles et de motocycles
H	H - Transportation and storage	H - Transport et entreposage
I	I - Accommodation and food service activities	I - Activités d'hébergement et de restauration
K	K - Financial and insurance activities	K - Activités financières et d'assurances
M	M - Professional, scientific and technical activities	M - Activités professionnelles, scientifiques et techniques
N	N - Administrative and support service activities	N - Activités de services administratifs et d'appui
O	O - Public administration and defence; compulsory social security	O - Administration publique et défense; sécurité sociale obligatoire
P	P - Education	P - Éducation
R	R - Arts, entertainment and recreation	R - Arts, spectacles et loisirs
S	S - Other service activities	S - Autres activités de services

Table 3-2 Economic Activity Divisions

DivisionCodeT	DivisionT	DivisionTFr
A03	A03 - Fishing and aquaculture	A03 - Pêche et aquaculture
C10	C10 - Manufacture of food products	C10 - Fabrication de produits alimentaires et de boissons
C11	C11 - Manufacture of beverages	C11 - Fabrication de boissons
C13	C13 - Manufacture of textiles	C13 - Fabrication de textiles
C25	C25 - Manufacture of fabricated metal products, except machinery and equipment	C25 - Fabrication d'ouvrages en métaux (sauf machines et matériel)
C26	C26 - Manufacture of computer, electronic and optical products	C26 - Fabrication d'ordinateurs, d'articles électroniques et optiques
C28	C28 - Manufacture of machinery and equipment n.e.c.	C28 - Fabrication de machines et de matériel, n.c.a.
C30	C30 - Manufacture of other transport equipment	C30 - Fabrication d'autres matériels de transport
C32	C32 - Other manufacturing	C32 - Autres activités de fabrication
C33	C33 - Repair and installation of machinery and equipment	C33 - Réparation et installation de machines et de matériel
E36	E36 - Water collection, treatment and supply	E36 - Collecte et traitement des eaux, distribution d'eau
E39	E39 - Remediation activities and other waste management services	E39 - Activités de remise en état et autres services de traitement des déchets
F42	F42 - Civil engineering	F42 - Génie civil
G47	G47 - Retail trade, except of motor vehicles and motorcycles	G47 - Commerce de détail à l'exception des véhicules automobiles et des motocycles
H50	H50 - Water transport	H50 - Transports par eau
H52	H52 - Warehousing and support activities for transportation	H52 - Magasinage et activités annexes des transports
I55	I55 - Accommodation	I55 - Hébergement
K65	K65 - Insurance, reinsurance and pension funding, except compulsory social security	K65 - Activités d'assurances, réassurance et de caisses de retraite, à l'exception de la sécurité sociale obligatoire
M71	M71 - Architectural and engineering activities; technical testing and analysis	M71 - Activités d'architecture et d'ingénierie; activités d'essais et d'analyses techniques
N77	N77 - Rental and leasing activities	N77 - Activités de location
N81	N81 - Services to buildings and landscape activities	N81 - Activités des services concernant les bâtiments, architecture paysagère
O84	O84 - Public administration and defence; compulsory social security	O84 - Administration publique et défense; sécurité sociale obligatoire
P85	P85 - Education	P85 - Éducation
R93	R93 - Sports activities and amusement and recreation activities	R93 - Activités sportives et de loisirs et activités récréatives
S94	S94 - Activities of membership organizations	S94 - Activités des organisations associatives

Table 3-3 Economic Activity Groups

GroupCodeT	GroupT	GroupTFr
A031	A031 - Fishing	A031 - Pêche
A032	A032 - Aquaculture	A032 - Aquaculture
C102	C102 - Processing and preserving of fish, crustaceans and molluscs	C102 - Traitement et conservation de poissons, crustacés et mollusques
C104	C104 - Manufacture of vegetable and animal oils and fats	C104 - Fabrication d'huiles et graisses végétales et animales
C107	C107 - Manufacture of other food products	C107 - Fabrication d'autres produits alimentaires
C110	C110 - Manufacture of beverages	C110 - Fabrication de boissons
C139	C139 - Manufacture of other textiles	C139 - Fabrication d'autres articles textiles
C251	C251 - Manufacture of structural metal products, tanks, reservoirs and steam generators	C251 - Construction et menuiserie métalliques; fabrication de citernes, réservoirs et générateurs de vapeur
C265	C265 - Manufacture of measuring, testing, navigating and control equipment; watches and clocks	C265 - Fabrication de matériel pour la mesure, la vérification, la navigation et le contrôle; horlogerie
C281	C281 - Manufacture of general-purpose machinery	C281 - Fabrication de machines d'usage général
C282	C282 - Manufacture of special-purpose machinery	C282 - Fabrication de machines d'usage spécifique
C301	C301 - Building of ships and boats	C301 - Construction de navires et de bateaux
C323	C323 - Manufacture of sports goods	C323 - Fabrication d'articles de sport
C331	C331 - Repair of fabricated metal products, machinery and equipment	C331 - Réparation d'ouvrages en métaux, de machines et matériel
E360	E360 - Water collection, treatment and supply	E360 - Collecte et traitement des eaux, distribution d'eau
E390	E390 - Remediation activities and other waste management services	E390 - Activités de remise en état et autres services de traitement des déchets
F422	F422 - Construction of utility projects	F422 - Projets d'installation d'équipements collectifs
F429	F429 - Construction of other civil engineering projects	F429 - Autres projets de génie civil
G476	G476 - Retail sale of cultural and recreation goods in specialized stores	G476 - Commerce de détail d'articles pour la culture et les loisirs, en magasins spécialisés
H502	H502 - Inland water transport	H502 - Transports par voies navigables intérieures
H522	H522 - Support activities for transportation	H522 - Activités annexes des transports
I552	I552 - Camping grounds, recreational vehicle parks and trailer parks	I552 - Terrains de camping, parcs pour véhicules de loisirs et caravanes
K651	K651 - Insurance	K651 - Activités d'assurances
M712	M712 - Technical testing and analysis	M712 - Activités d'essais et d'analyses techniques
N772	N772 - Renting and leasing of personal and household goods	N772 - Location d'articles personnels ou ménagers
N813	N813 - Landscape care and maintenance service activities	N813 - Activités des services d'entretien des espaces verts
O841	O841 - Administration of the State and the economic and social policy of the community	O841 - Administration générale; administration de la politique économique et sociale
O842	O842 - Provision of services to the community as a whole	O842 - Services fournis à l'ensemble de la collectivité
P854	P854 - Other education	P854 - Autres activités d'enseignement
R931	R931 - Sports activities	R931 - Activités sportives
R932	R932 - Other amusement and recreation activities	R932 - Autres activités récréatives et de loisirs
S949	S949 - Activities of other membership organizations	S949 - Activités d'autres organisations associatives

Table 3-4 Economic Activity Classes

ClassCodeT	ClassT	ClassTFr
A0312	A0312 - Freshwater fishing	A0312 - Pêche en eau douce
A0322	A0322 - Freshwater aquaculture	A0322 - Aquaculture en eau douce
C1020	C1020 - Processing and preserving of fish, crustaceans and molluscs	C1020 - Traitement et conservation de poissons, crustacés et mollusques
C1040	C1040 - Manufacture of vegetable and animal oils and fats	C1040 - Fabrication d'huiles et graisses végétales et animales
C1075	C1075 - Manufacture of prepared meals and dishes	C1075 - Fabrication de plats préparés
C1104	C1104 - Manufacture of soft drinks; production of mineral waters and other bottled waters	C1104 - Fabrication de boissons non alcoolisées; production d'eaux minérales et autres eaux en bouteille
C1394	C1394 - Manufacture of cordage, rope, twine and netting	C1394 - Fabrication de cordes, câbles, ficelles et filets
C2513	C2513 - Manufacture of steam generators, except central heating hot water boilers	C2513 - Fabrication de générateurs de vapeur (sauf chaudières de chauffage central à eau chaude)
C2651	C2651 - Manufacture of measuring, testing, navigating and control equipment	C2651 - Fabrication de matériel pour la mesure, la vérification, la navigation et le contrôle
C2811	C2811 - Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	C2811 - Fabrication de moteurs et de turbines, sauf moteurs pour avions, automobiles et motocycles
C2825	C2825 - Manufacture of machinery for food, beverage and tobacco processing	C2825 - Fabrication de machines pour le traitement des produits alimentaires, des boissons et du tabac
C3011	C3011 - Building of ships and floating structures	C3011 - Construction de navires et d'engins flottants
C3012	C3012 - Building of pleasure and sporting boats	C3012 - Construction de bateaux de plaisance et de sport
C3230	C3230 - Manufacture of sports goods	C3230 - Fabrication d'articles de sport
C3315	C3315 - Repair of transport equipment, except motor vehicles	C3315 - Réparation de matériel de transport, à l'exception des véhicules à moteur
C3319	C3319 - Repair of other equipment	C3319 - Réparation d'autres matériels
E3600	E3600 - Water collection, treatment and supply	E3600 - Collecte et traitement des eaux, distribution d'eau
E3900	E3900 - Remediation activities and other waste management services	E3900 - Activités de remise en état et autres services de traitement des déchets
F4220	F4220 - Construction of utility projects	F4220 - Projets d'installation d'équipements collectifs
F4290	F4290 - Construction of other civil engineering projects	F4290 - Autres projets de génie civil
G4763	G4763 - Retail sale of sporting equipment in specialized stores	G4763 - Commerce de détail de matériel pour le sport en magasins spécialisés
H5021	H5021 - Inland passenger water transport	H5021 - Transport de voyageurs par voies navigables intérieures
H5022	H5022 - Inland freight water transport	H5022 - Transport de marchandises par voies navigables intérieures
H5222	H5222 - Service activities incidental to water transportation	H5222 - Activités de services annexes des transports par eau
H5229	H5229 - Other transportation support activities	H5229 - Autres activités annexes des transports
I5520	I5520 - Camping grounds, recreational vehicle parks and trailer parks	I5520 - Terrains de camping, parcs pour véhicules de loisirs et caravanes
K6512	K6512 - Non-life insurance	K6512 - Activités d'assurances autres que sur la vie
M7120	M7120 - Technical testing and analysis	M7120 - Activités d'essais et d'analyses techniques
N7721	N7721 - Renting and leasing of recreational and sports goods	N7721 - Location d'articles pour le sport et les loisirs
N8130	N8130 - Landscape care and maintenance service activities	N8130 - Activités des services d'entretien des espaces verts
O8412	O8412 - Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security	O8412 - Tutelle des activités des organismes qui s'occupent de santé, d'éducation, de culture et d'autres activités sociales, à l'exception de la sécurité sociale
O8422	O8422 - Defence activities	O8422 - Activités de défense
P8541	P8541 - Sports and recreation education	P8541 - Activités d'enseignement lié aux sports et aux loisirs
R9311	R9311 - Operation of sports facilities	R9311 - Exploitation d'installations sportives
R9312	R9312 - Activities of sports clubs	R9312 - Activités des clubs sportifs
R9319	R9319 - Other sports activities	R9319 - Autres activités sportives
R9321	R9321 - Activities of amusement parks and theme parks	R9321 - Activités des parcs d'attraction et à thèmes
R9329	R9329 - Other amusement and recreation activities n.e.c.	R9329 - Autres activités récréatives et de loisirs, n.c.a.
S9499	S9499 - Activities of other membership organizations n.e.c.	S9499 - Activités d'autres organisations associatives, n.c.a.

3.1.2 IUCN Habitats Classification Scheme

Version 3.1 of IUCN's Ecosystem Classification system (IUCN, 2012) was used in BEVTK. The habitat types in the classification are standard terms used to describe the major habitat/s in which taxa occur.

The three levels of the hierarchy describe the type of Ecosystem, the class and sub-class and are self-explanatory, as they use familiar habitat terms that take into account biogeography, latitudinal zonation and depth in marine systems. The inland aquatic habitats are based primarily on the classification system of wetland types used by the Ramsar Convention[5] (see Ramsar Wetland Type Classification System).

8 types of Habitats (Ecosystems) were identified, 65 classes and 70 sub-Classes

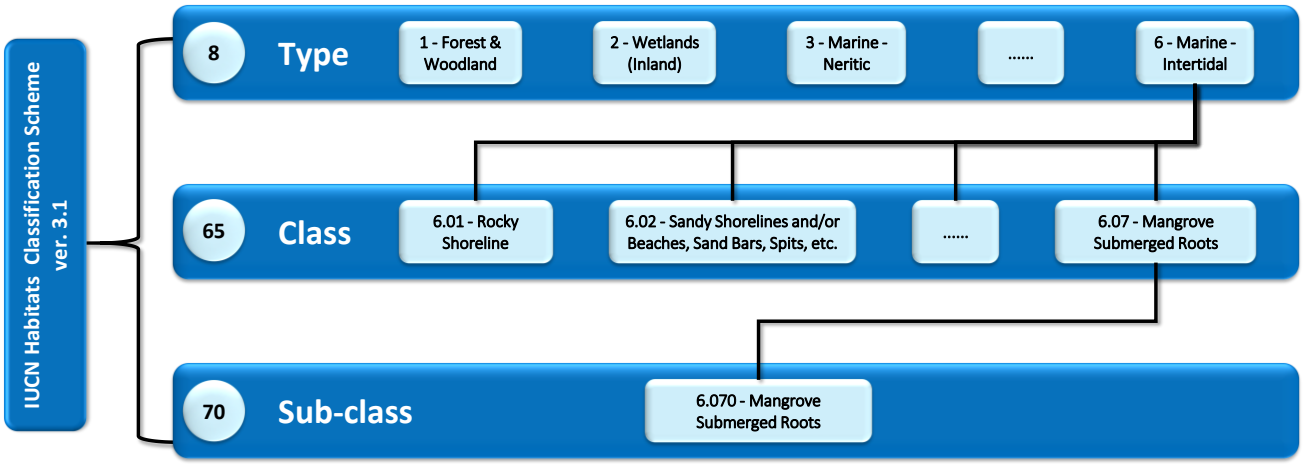


Figure 3-2: IUCN Habitats Classification Scheme

Table 3-5 to Table 3-7 shows the IUCN nested classification system used in the template to describe the ecosystem category in the Ecosystem Services module.

Table 3-5 Ecosystem Classification Types

TypeCode	Type
1	1 - Forest & Woodland
2	2 - Wetlands (Inland)
3	3 - Marine - Neritic
4	4 - Marine Oceanic
5	5 - Marine - Deep Ocean Floor (benthic and Demersal)
6	6 - Marine - Intertidal
7	7 - Marine- Coastal/Supratidal
8	8 - Artificial - Aquatic

[5] Wetlands can generally be classified into five basic systems, namely: Lacustrine, Riverine, Palustrine, Marine and Estuarine (Frazier, 1996). ... It divides wetlands into three main categories, namely: marine and coastal wetlands, inland wetlands, and man-made wetlands (http://www.fao.org/3/x6611e/x6611e03d.htm).

Table 3-6 Ecosystem Classification Classes

ClassCode	Class
1.1	1.1 - Subtropical/Tropical Moist Lowland Forest
1.2	1.2 - Subtropical/Tropical Mangrove Forest Vegetation Above High Tide Level
1.3	1.3 - Subtropical/Tropical Swamp Forest
2.1	2.1 - Permanent Rivers, Streams, Creeks
2.2	2.2 - Seasonal/Intermittent/Irregular Rivers, Streams, Creeks
2.3	2.3 - Shrub Dominated Wetlands
2.4	2.4 - Bogs, Marshes, Swamps, Fens, Peatlands
2.5	2.5 - Permanent Freshwater Lakes
2.6	2.6 - Seasonal/Intermittent Freshwater Lakes
2.7	2.7 - Permanent Freshwater Marshes/Pools
2.8	2.8 - Seasonal/Intermittent Freshwater Marshes/Pools
2.9	2.9 - Freshwater Springs and Oases
2.10	2.10 - Tundra Wetlands
2.11	2.11 - Alpine Wetlands
2.12	2.12 - Geothermal Wetlands
2.13	2.13 - Permanent Inland Deltas
2.14	2.14 - Permanent Saline, Brackish or Alkaline Lakes
2.15	2.15 - Seasonal/Intermittent Saline, Brackish or Alkaline Lakes and Flats
2.16	2.16 - Permanent Saline, Brackish or Alkaline Marshes/Pools
2.17	2.17 - Seasonal/Intermittent Saline, Brackish or Alkaline Marshes/Pools
2.18	2.18 - Karst and Other Subterranean Inland Aquatic Systems
3.1	3.1 - Pelagic
3.2	3.2 - Subtidal Rock and Rocky Reefs
3.3	3.3 - Subtidal Loose Rock/Pebble/Gravel
3.4	3.4 - Subtidal Sandy
3.5	3.5 - Subtidal Sandy-Mud
3.6	3.6 - Subtidal Muddy
3.7	3.7 - Macroalgal / kelp
3.8	3.8 - Coral reef
3.9	3.9 - Seagrass
3.10	3.10 - Estuaries
4.1	4.1 - Epipelagic (0-200 m)
4.2	4.2 - Mesopelagic (200–1,000 m)
4.3	4.3 - Bathypelagic (1,000–4,000 m)
4.4	4.4 - Abyssopelagic (4,000–6,000 m)
5.1	5.1 - Continental Slope/Bathyl zone (200–4,000 m)
5.2	5.2 - Abyssal Plain (4,000–6,000 m)
5.3	5.3 - Abyssal Mountain/Hills (4,000–6,000m)
5.4	5.4 - Hadal/Deep Sea Trench (>6000 m)
5.5	5.5 - Seamount
5.6	5.6 - Deep Sea Vents (Rifts/Seeps)
6.1	6.1 - Rocky Shoreline
6.2	6.2 - Sandy Shorelines and/or Beaches, Sand Bars, Spits, etc.
6.3	6.3 - Shingle and/or Pebble Shoreline and/or Beaches
6.4	6.4 - Mud Shoreline and Intertidal Mud Flats
6.5	6.5 - Salt Marshes (Emergent Grasses)
6.6	6.6 - Tidepools
6.7	6.7 - Mangrove Submerged Roots
7.2	7.2 - Coastal Caves/Karst
7.3	7.3 - Coastal Sand Dunes
7.4	7.4 - Coastal Brackish/Saline Lagoons/Marine Lakes
7.5	7.5 - Coastal Freshwater Lakes
8.1	8.1 - Water Storage Areas
8.2	8.2 - Ponds
8.3	8.3 - Aquaculture Ponds
8.4	8.4 - Salt Exploitation Sites
8.5	8.5 - Excavations (open)
8.6	8.6 - Wastewater Treatment Areas
8.7	8.7 - Irrigated Land
8.8	8.8 - Seasonally Flooded Agricultural Land
8.9	8.9 - Canals and Drainage Channels, Ditches
8.10	8.10 - Karst and Other Subterrranean Hydrological Systems
8.11	8.11 - Marine Anthropogenic Structures
8.12	8.12 - Mariculture Cages
8.13	8.13 - Mari/Brackish-culture Ponds

Table 3-7 Ecosystem Classification Sub-Classes

SubClassCode	SubClass	Definition	Example
1.1.0	1.1.0 - Subtropical/Tropical Moist Lowland Forest	Distributed in the subtropical/tropical regions of the Neotropics, Africa and Indo-Malesia, generally below c.1,200 m (but varying with geography and topography).	Includes (lowland/hill rain/wet/humid/moist) forest types described as evergreen or semi-evergreen or broadleaved evergreen, deciduous, dipterocarp and mixed; also riparian/riverine and gallery, Sierra maestra se Cuba, selva paranaense, bosque de quebrada, bosque sammofilo (Uruguay)
1.2.0	1.2.0 - Subtropical/Tropical Mangrove Forest Vegetation Above H	Distributed in the subtropics and tropics, growing in sheltered estuaries and along coastlines in brackish or salt water	
1.3.0	1.3.0 - Subtropical/Tropical Swamp Forest	Distributed in the subtropics and tropics. Typically flooded for at least part of the year and dependent on this flooding for its existence.	Includes forest types described as peat swamp, bog, and varzea/igapo.
2.1.0	2.1.0 - Permanent Rivers, Streams, Creeks	Not defined. Includes waterfalls.	
2.2.0	2.2.0 - Seasonal/Intermittent/Irregular Rivers, Streams, Creeks	Not defined.	
2.3.0	2.3.0 - Shrub Dominated Wetlands	Shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.	
2.4.0	2.4.0 - Bogs, Marshes, Swamps, Fens, Peatlands	Generally over 8 ha. Also includes mires.	Bogs are peat-accumulating systems fed only by rainwater and thus have very low nutrient levels. They are usually strongly acidic, and water flow is restricted. The water table is either at or just below the surface and remains relatively constant. Fens have a predominantly peat substrate, but the peat is shallower and more decomposed than bogs. They are fed by both rain and groundwater resulting in low to moderate nutrient and acidity levels. The water table is typically just below the peat surface but there are small noticeable fluctuations.Swamps are relatively high in nutrients supplied via surface runoff and groundwater from the surrounding land. The water table is usually above some of the ground surface, but there are large, seasonal fluctuations. Marshes are characterized by large periodic fluctuations of water table or water level.
2.5.0	2.5.0 - Permanent Freshwater Lakes	Over 8 ha. Includes large oxbow lakes (see 13.5).	
2.6.0	2.6.0 - Seasonal/Intermittent Freshwater Lakes	Over 8 ha. Includes floodplain lakes (see 13.5).	
2.7.0	2.7.0 - Permanent Freshwater Marshes/Pools	Ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.	
2.8.0	2.8.0 - Seasonal/Intermittent Freshwater Marshes/Pools	Below 8 ha. On inorganic soils; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.	
2.9.0	2.9.0 - Freshwater Springs and Oases	Not defined.	
2.10.0	2.10.0 - Tundra Wetlands	Includes tundra pools and temporary waters from snowmelt.	
2.11.0	2.11.0 - Alpine Wetlands	Includes alpine meadows, seepages, temporary waters from snowmelt.	
2.12.0	2.12.0 - Geothermal Wetlands	Wetlands influenced by heated geothermal water or chemistry derived from current or former geothermal activity. Often found in volcanically active areas.	
2.13.0	2.13.0 - Permanent Inland Deltas	Created by a river dividing into multiple branches, these usually rejoin and continue to the sea. They often occur on former lake beds. In some cases a river flowing into a flat arid area splits into channels which then evaporate as it progresses into the desert.	The Inner Niger Delta and Peace–Athabasca Delta are notable examples. The Amazon has an inland delta before the island of Marajó and the Okavango Delta is the best example of a desert inland delta .
2.14.0	2.14.0 - Permanent Saline, Brackish or Alkaline Lakes	Not defined.	
2.15.0	2.15.0 - Seasonal/Intermittent Saline, Brackish or Alkaline Lakes a	Not defined.	
2.16.0	2.16.0 - Permanent Saline, Brackish or Alkaline Marshes/Pools	Not defined.	
2.17.0	2.17.0 - Seasonal/Intermittent Saline, Brackish or Alkaline Marsh	Not defined.	
2.18.0	2.18.0 - Karst and Other Subterranean Inland Aquatic Systems	Not defined.	
3.1.0	3.1.0 - Pelagic	The division of the marine environment composed of all the ocean's water; living in the water column, away from the bottom.	
3.2.0	3.2.0 - Subtidal Rock and Rocky Reefs	Bottom habitat consisting predominantly of boulders (any loose rock larger than 256 mm in diameter) or consolidated rock (includes submerged coastal karst systems, but see 12.1).	
3.3.0	3.3.0 - Subtidal Loose Rock/Pebble/Gravel	Bottom habitat consisting predominantly of unconsolidated cobbles (sediment size 64 to 256 mm diameter) and pebbles (sediment size 2 to 64 mm diameter).	
3.4.0	3.4.0 - Subtidal Sandy	Bottom habitat consisting of loose particles of rock or mineral sediments (predominantly ranges in size from 0.0625–2.0 mm in diameter).	
3.5.0	3.5.0 - Subtidal Sandy-Mud	Bottom habitat consisting predominantly of a mixture of sandy (see 9.4) and muddy (see 9.6) sediment types.	
3.6.0	3.6.0 - Subtidal Muddy	Bottom habitat consisting of wet clay (any particle smaller than 0.002 mm in diameter) and silt-rich sediment (silt consists of loose particles of rock or mineral (sediment) that ranges in size from 0.002–0.0625 mm in diameter).	
3.7.0	3.7.0 - Macroalgal / kelp	Bottom habitat consisting predominantly of large algae, typically brown algae, which often forms dense macroalgal beds or forests.	
3.8.1	3.8.1 - Outer Reef Channel	Coral reef habitat on the foreslope (see 9.8.3) within or around the surge channels (spur and groove formations).	
3.8.2	3.8.2 - Back Slope	The area opposite of the foreslope (see 9.8.3), also referring to the reef flat or inner part of a barrier reef or atoll.	
3.8.3	3.8.3 - Foreslope (outer reef slope)	The outer, seaward margin of a coral reef, also referring to the seaward side of a barrier reef or atoll.	
3.8.4	3.8.4 - Lagoon	A shallow (less than a depth of 200 m), sheltered body of water separated from the open sea by coral reefs; also refers to the area between the shore and a fringing reef, between the coast and a barrier reef, or the portion of an atoll surrounded by the reef.	
3.8.5	3.8.5 - Inter-reef Soft Substrate	Area between reefs typically consisting of sandy substrate (see 9.4), but sometimes also with clay or silt sediments (see 9.5 and 9.6).	
3.9.0	3.9.0 - Seagrass	A bottom habitat consisting predominantly of grass-like marine flowering plants that grow and reproduce while submerged in seawater, such as eelgrass and turtle grass.	
3.1.0	3.1.0 -0 Estuaries	A semi-enclosed coastal embayment where fresh water and seawater meet and mix.	
4.1.0	4.1.0 - Epipelagic (0-200 m)	The oceanic pelagic environment from the surface to a depth of around 200 m; also refers to the lighted or photic pelagic zone.	
4.2.0	4.2.0 - Mesopelagic (200–1,000 m)	Uppermost oceanic pelagic aphotic zone from a depth of approximately 200 to 1,000 m.	
4.3.0	4.3.0 - Bathypelagic (1,000–4,000 m)	Pelagic aphotic zone lying between the mesopelagic and abyssalpelagic zones between 1,000 to 4,000 m.	
4.4.0	4.4.0 - Abyssopelagic (4,000–6,000 m)	Pelagic aphotic zone from a depth of 4,000 to 6,000 m.	
5.1.1	5.1.1 - Hard Substrate	The bottom habitat on the steeper, seaward section of the continental or island margin from a depth of around 200 to 2,000 m. Bottom type consisting of loose or consolidated rock, including deep karst systems (see 9.2 and 9.3).	
5.1.2	5.1.2 - Soft Substrate	The bottom habitat on the steeper, seaward section of the continental or island margin from a depth of around 200 to 2,000 m. Bottom type consisting of mud or sand or a mixture of mud and sand; most typically consisting of mud (see 9.4, 9.5, 9.6 for sediment sizes).	
5.2.0	5.2.0 - Abyssal Plain (4,000–6,000 m)	The nearly flat area of the deep ocean floor lying between 4,000 and 6,000 m.	
5.3.0	5.3.0 - Abyssal Mountain/Hills (4,000–6,000m)	The hilly or mountainous area of the deep ocean floor lying between 4,000 and 6,000 m.	
5.4.0	5.4.0 - Hadal/Deep Sea Trench (>6000 m)	The bottom below 6,000 m.	
5.5.0	5.5.0 - Seamount	Extinct volcano or steep-sided formation that rises abruptly from the deep sea floor but does not reach the surface.	
5.6.0	5.6.0 - Deep Sea Vents (Rifts/Seeps)	An environment with ambient temperatures above normal, on the deep sea floor that depends on geothermal energy as the basis for biological productivity.	
6.1.0	6.1.0 - Rocky Shoreline	Intertidal shore composed predominantly of consolidated rock or boulders (see 9.2).	
6.2.0	6.2.0 - Sandy Shorelines and/or Beaches, Sand Bars, Spits, etc.	Intertidal shore composed predominantly of sandy sediments (see 9.4 for sediment size characteristics).	
6.3.0	6.3.0 - Shingle and/or Pebble Shoreline and/or Beaches	Intertidal shore composed predominantly of pebble and cobble sediments (see 9.3 for sediment size characteristics).	
6.4.0	6.4.0 - Mud Shoreline and Intertidal Mud Flats	Intertidal shore or bottom composed predominantly of mud or sandy- mud sediments (see 9.4 and 9.5 for sediment size characteristics).	
6.5.0	6.5.0 - Salt Marshes (Emergent Grasses)	A grassy area that extends along the shores of estuaries and sheltered coasts in temperate and subpolar regions with emergent vegetation rooted in soils alternately inundated and drained by tidal action.	
6.6.0	6.6.0 - Tidepools	An intertidal depression in rocks or in sandy beaches that continues to hold water during low tide (also called tidal pools).	
6.7.0	6.7.0 - Mangrove Submerged Roots	Intertidal zone in mangrove forests (see 1.7).	
7.2.0	7.2.0 - Coastal Caves/Karst	Karsts, sea caves and other subterranean hydrological systems along the coast. (See 9.2 and 12.1).	
7.3.0	7.3.0 - Coastal Sand Dunes	Dune systems (including humid dune slacks).	
7.4.0	7.4.0 - Coastal Brackish/Saline Lagoons/Marine Lakes	Brackish to saline lagoons and lakes with at least one relatively narrow connection to the sea. Often formed from sea inlets by silting and cut off from the sea by sand or mud banks.	
7.5.0	7.5.0 - Coastal Freshwater Lakes	Includes freshwater delta lagoons (see 5.5 and 5.6).	
8.1.0	8.1.0 - Water Storage Areas	Generally over 8 ha. Includes reservoirs, barrages, dams and impoundments.	
8.2.0	8.2.0 - Ponds	Generally below 8 ha. Includes farm ponds, stock ponds, small tanks.	
8.3.0	8.3.0 - Aquaculture Ponds	For example, fish or shrimp ponds.	
8.4.0	8.4.0 - Salt Exploitation Sites	Salt pans, salines, etc.	
8.5.0	8.5.0 - Excavations (open)	Gravel, brick, clay pits, borrow pits and mining pools.	
8.6.0	8.6.0 - Wastewater Treatment Areas	Sewage farms, settling ponds, oxidation basins, etc.	
8.7.0	8.7.0 - Irrigated Land	Includes irrigation channels and paddy (rice) fields.	
8.8.0	8.8.0 - Seasonally Flooded Agricultural Land	Including intensively managed or grazed wet meadow or pasture.	
8.9.0	8.9.0 - Canals and Drainage Channels, Ditches	Linear excavations (varying enormously in size) made specifically to improve drainage of farmland, for controlling river courses, for controlling flow of water, for allowing ship movement, etc.	
8.10.0	8.10.0 - Karst and Other Subterrranean Hydrological Systems	Human-made subterranean systems.	
8.11.0	8.11.0 - Marine Anthropogenic Structures	Artificial reefs, docks, seawalls, rip rap, etc.	
8.12.0	8.12.0 - Mariculture Cages	Cages (made out of net or mesh) located in an open environment which includes both the sea and inland brackish water areas, for the culture of organisms, both plants and animals.	
8.13.0	8.13.0 - Mari/Brackish-culture Ponds	Human-made saltwater or brackish ponds for the cultivation of organisms, both plants and animals.	

3.1.3 Common International Classification of Ecosystem Services (CICES)

The Common International Classification of Ecosystem Services (CICES)[6] (Haines-Young & Potschin, 2018) has been designed to help measure, account for, and assess ecosystem services. Although it was developed in the context of work on the System of Environmental and Economic Accounting (SEEA) that is being led by the United Nations Statistical Division (UNSD), it has been used widely in ecosystem services research for designing indicators, mapping and for valuation.

Moreover, one can find equivalences between The American USEPA FEGS1 categories and the CICES V5.1 nomenclature.

Equivalences between CICES V5.1 and the USEPA FEGS1 categories are also available (Landers et al. 2016). https://www.epa.gov/eco-research/national-ecosystem-services-classification-system-nescs-plus

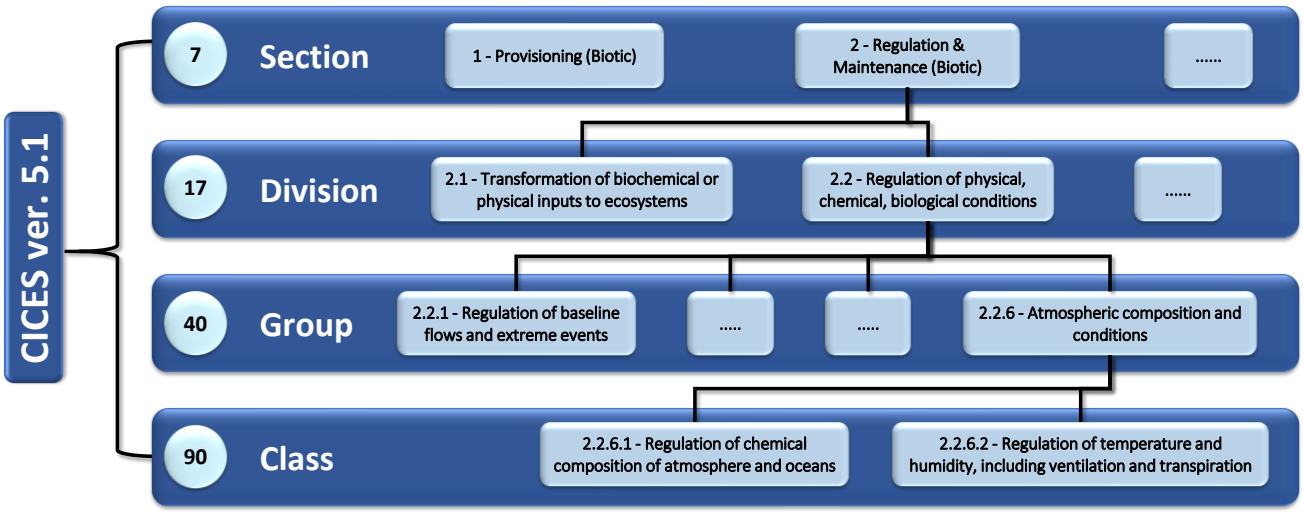


Figure 3-3: CICES Version 5.1 Nomenclature Structure

7 Sections (4 useable in this context), 17 Divisions (11 probable), 48 groups (27 probable) and 90 potential classes were identified, narrowed down to only 58 that were probable.

Table 3-8 to Table 3-11 shows the CICES rev. 5.1 nested services classification system used in the template to describe the ecosystem services in the Ecosystem Services module.

Table 3-8 Ecosystem Services Sections

SectionCodeT	SectionT
1	1 - Provisioning (Biotic)
2	2 - Regulation & Maintenance (Biotic)
3	3 - Cultural (Biotic)
4	4 - Provisioning (Abiotic)

[6] See https://cices.eu/content/uploads/sites/8/2018/03/Finalised-V5.1_18032018.xlsx and https://cices.eu/resources/

Table 3-9 Ecosystem Services Divisions

DivisionCodeT	DivisionT
1.1	1.1 - Biomass
1.2	1.2 - Genetic material from all biota (including seed, spore or gamete production)
1.3	1.3 - Other types of provisioning service from biotic sources
2.1	2.1 - Transformation of biochemical or physical inputs to ecosystems
2.2	2.2 - Regulation of physical, chemical, biological conditions
2.3	2.3 - Other types of regulation and maintenance service by living processes
3.1	3.1 - Direct, in-situ and outdoor interactions with living systems that depend on presence in the environmental setting
3.2	3.2 - Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental setting
3.3	3.3 - Other characteristics of living systems that have cultural significance
4.2	4.2 - Water

Table 3-10 Ecosystem Services Groups

GroupCodeT	GroupT
1.1.1	1.1.1 - Cultivated terrestrial plants for nutrition, materials or energy
1.1.2	1.1.2 - Cultivated aquatic plants for nutrition, materials or energy
1.1.4	1.1.4 - Reared aquatic animals for nutrition, materials or energy
1.1.5	1.1.5 - Wild plants (terrestrial and aquatic) for nutrition, materials or energy
1.1.6	1.1.6 - Wild animals (terrestrial and aquatic) for nutrition, materials or energy
1.2.1	1.2.1 - Genetic material from plants, algae or fungi
1.2.2	1.2.2 - Genetic material from animals
1.2.2	1.2.2 - Genetic material from organisms
1.3.X	1.3.X - Other
2.1.1	2.1.1 - Mediation of wastes or toxic substances of anthropogenic origin by living processes
2.1.2	2.1.2 - Mediation of nuisances of anthropogenic origin
2.2.1	2.2.1 - Regulation of baseline flows and extreme events
2.2.2	2.2.2 - Lifecycle maintenance, habitat and gene pool protection
2.2.3	2.2.3 - Pest and disease control
2.2.4	2.2.4 - Regulation of soil quality
2.2.5	2.2.5 - Water conditions
2.2.6	2.2.6 - Atmospheric composition and conditions
2.3.X	2.3.X - Other
3.1.1	3.1.1 - Physical and experiential interactions with natural environment
3.1.2	3.1.2 - Intellectual and representative interactions with natural environment
3.2.1	3.2.1 - Spiritual, symbolic and other interactions with natural environment
3.2.2	3.2.2 - Other biotic characteristics that have a non-use value
3.3.X	3.3.X - Other
4.2.1	4.2.1 - Surface water used for nutrition, materials or energy
4.2.2	4.2.2 - Ground water for used for nutrition, materials or energy
4.2.X	4.2.X - Other aqueous ecosystem outputs

Table 3-11 Ecosystem Services Classes

ClassCodeT	ClassT	Class type	Simple descriptor	Example Service	Example Goods and Benefits
1.1.1.2	1.1.1.2 - Fibres and other materials from cultivated plants, fungi, algae and bacteria for direct use or processing (excluding genetic materials)	Material by amount, type, use, media (land, soil, freshwater, marine)	Material from plants, fungi, algae or bacterial that we can use	Harvestable surplus of annual tree growth	Processed timber (Volume of harvested wood)
1.1.2.1	1.1.2.1 - Plants cultivated by in- situ aquaculture grown for nutritional purposes	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we eat	Harvestable surplus of seaweed biomass in situ	Vitamin supplement
1.1.2.2	1.1.2.2 - Fibres and other materials from in-situ aquaculture for direct use or processing (excluding genetic materials)	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we can use as an material	Harvestable surplus of seaweed biomass in situ	Seaweed as an insulating material
1.1.2.3	1.1.2.3 - Plants cultivated by in- situ aquaculture grown as an energy source	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we can use as an energy source	Harvestable surplus of seaweed biomass in situ	Seaweed as a source of energy
1.1.4.1	1.1.4.1 - Animals reared by in-situ aquaculture for nutritional purposes	Animals by amount, type	Animals that are cultivated in fresh or salt water that we eat.	Harvestable stock of bivalves	Seafood (e.g. mussels)
1.1.4.2	1.1.4.2 - Fibres and other materials from animals grown by in-situ aquaculture for direct use or processing (excluding genetic materials)	Animals by amount, type	Animals that are cultivated in fresh or salt water that we can use as a material.	Harvestable pearls produced by oyster beds	Pearls used for adornment
1.1.4.3	1.1.4.3 - Animals reared by in-situ aquaculture as an energy source	Animals by amount, type	Animals that are cultivated in fresh or salt water that we can use as a source of energy.	Biogas from aquaculture waste	Energy production
1.1.5.1	1.1.5.1 - Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	Plants, algae by amount, type	Food from wild plants	Harvestable volume of wild berries or wild mushrooms, Or Benthic macroalgae (e.g. Dulse, Laminaria (Kelp)) and macrophytes (e.g. Salicornia and other saltmarsh plants) harvested in the shallow sublittoral and/or littoral zone	Berries as food or for the production of jam
1.1.5.2	1.1.5.2 - Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)	Plants, algae by amount, type	Materials from wild plants	Harvestable volume of reeds Or Macroalgae used for thickening agents, agar and superconductor electrodes	Roofing material
1.1.5.3	1.1.5.3 - Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy	Material by type/source	Materials from wild plants, fungi and algae used for energy	Volume of harvested wood	Fuel wood
1.1.6.1	1.1.6.1 - Wild animals (terrestrial and aquatic) used for nutritional purposes	Animals by amount, type	Food from wild animals	Harvestable surplus of cod population, or deer population	Cod liver oil, Venison joint
1.1.6.2	1.1.6.2 - Fibres and other materials from wild animals for direct use or processing (excluding genetic materials)	Material by type/source	Materials from wild animals	Reindeer skins Or Zooplankton – jellyfish used to produce collagen for various purposes	Hide products
1.1.6.3	1.1.6.3 - Wild animals (terrestrial and aquatic) used as a source of energy	By amount, type, source	Material from wild animals that can be used as a source of energy	Seal blubber used by traditional cultures in lamps Or Sand eels (Historical) or Cetaceans	Fuel source
1.2.1.1	1.2.1.1 - Seeds, spores and other plant materials collected for maintaining or establishing a population	By species or varieties	Seed collection	Seeds or spores that we can harvest	Wild plant seed for commercial sale
1.2.1.2	1.2.1.2 - Higher and lower plants (whole organisms) used to breed new strains or varieties	By species or varieties	Plants. fungi or algae that we can use for breeding	Population of plant algae or fungi species used to in breeding programmes	Plant, algae or fungi species with novel characteristics that increase yields or reduce costs by resisting diseases or pests
1.2.1.3	1.2.1.3 - Individual genes extracted from higher and lower plants for the design and construction of new biological entities	Material by type	Genetic material from wild plants. fungi or algae that we can use	Harvestable share of population of plant species used to extract genes	Creation of artificial gene products
1.2.2.1	1.2.2.1 - Animal material collected for the purposes of maintaining or establishing a population	By species or varieties	Animals used for replenishing stock	Spat for fish and shellfish farms	Reduced costs of production
1.2.2.2	1.2.2.2 - Wild animals (whole organisms) used to breed new strains or varieties	By species or varieties	Wild animals that we can use for breeding	Population of animals used in breeding programmes	Animals with novel characteristics that increase yields or reduce costs by resisting diseases or pests
1.2.2.3	1.2.2.3 - Individual genes extracted from organisms for the design and construction of new biological entities	Material by type	The genetic information that is stored in wild animals that we can use	Harvestable share of population of a given species used to extract genes	Creation of a novel micro-organism to help produce a pharmaceutical product
1.3.X.X	1.3.X.X - Other	Use nested codes to allocate other provisioning services from living systems to appropriate Groups and Classes			
2.1.1.1	2.1.1.1 - Bio-remediation by micro-organisms, algae, plants, and animals	By type of living system or by waste or subsistence type	Decomposing wastes	Bio-remediation of industrial wastes by disposal on agricultural land Or Bacteria such as Marionobacter that can break the oil down into simple monomers	Sustainable disposal of wastes
2.1.1.2	2.1.1.2 - Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	By type of living system, or by water or substance type	Filtering wastes	Dust filtration by urban trees Or Macrophytes, for example salt marsh grass, can trap particles in their roots, sequestering wastes/toxicants in the sediment (Govers et al. 2014)	Reduction in respiratory disease
2.1.2.1	2.1.2.1 - Smell reduction	By type of living system	Reducing smells	Shelter belts that filter particulates that carry odours Or Birds, epifauna, infauna and bacterial communities contribute to this service by removing material such as rotting algal mats, which is in the littoral zone or offshore but could potentially wash up on shore and produce olfactory and visual impacts	Reduction in nuisance effect of smells from animal lots
2.1.2.3	2.1.2.3 - Visual screening	By type of living system	Screening unsightly things	Shelter belts around industrial structures	Visual amenity
2.2.1.1	2.2.1.1 - Control of erosion rates	By reduction in risk, area protected	Controlling or preventing soil loss	The capacity of vegetation to prevent or reduce the incidence of soil erosion Or Macroalgae, microphytobenthos, macrophytes and biogenic reef structures (epifauna and infauna) all contribute through sediment stabilisation	Reduction of damage (and associated costs) of sediment input to water courses
2.2.1.2	2.2.1.2 - Buffering and attenuation of mass movement	By reduction in risk, area protected	Stopping landslides and avalanches harming people	The capacity of forest cover to prevent or mitigate the extent and force of snow avalanche	Reduction in cost to human lives and physical damage to infrastructure
2.2.1.3	2.2.1.3 - Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	By depth/volumes	Regulating the flows of water in our environment	The capacity of vegetation to retain water and release it slowly, Or The capacity of mangroves to mitigate the effects of tsunamis Or Localised coastal influences on the hydrological cycle by phytoplankton producing Dimethylsulphide (DMS) and localised flow changes due to algal and higher plant structures. Macroalgae beds, such as a kelp forest, macrophytes and biogenic reefs (epifauna and infauna) contribute to attenuation of wave energy and flood prevention	Mitigation of damage as a result of reduced in magnitude and frequency of flood/storm events
2.2.2.1	2.2.2.1 - Pollination (or 'gamete' dispersal in a marine context)	By amount and pollinator	Pollinating our fruit trees and other plants	Providing a habitat for native pollinators Or In the context of societal efforts for the restoration of, for example, seagrass beds , it can be considered final since seed dispersal can occur through this service rather than artificially.	Contribution to yield of fruit crops
2.2.2.2	2.2.2.2 - Seed dispersal	By amount and dispersal agent	Spreading the seeds of wild plants	Acorn dispersal by Eurasian Jays	Tree regeneration in parkland
2.2.2.3	2.2.2.3 - Maintaining nursery populations and habitats (Including gene pool protection)	By amount and source	Providing habitats for wild plants and animals that can be useful to us	Important nursery habitats include estuaries, seagrass, kelp forest, wetlands, soft sediment, hard bottom, shell bottom and water column habitats. Floating seaweed clumps (macroalgae) form rafts under which juvenile fish aggregate e.g. in the North Sea in pelagic habitats	Sustainable populations of useful or iconic species that contribute to a service in another ecosystem.
2.2.3.1	2.2.3.1 - Pest control (including invasive species)	By reduction in incidence, risk, area protected by type of living system	Controlling pests and invasive species	Providing a habitat for native pest control agents Or In the Black Sea, the recovery of fish populations and an alien invader, the Beroe comb jelly, (both of whom predate nuisance alien comb jellies, Finenko et al.2009) may have been the most important contributing factors for the control of the Mnemiopsis leidyi alien comb jelly, which caused an ecosystem shift in the late 80s.	Reduction in pest damage to cultivated crop
2.2.3.2	2.2.3.2 - Disease control	By reduction in incidence, risk, area protected by type of living system	Controlling disease	Presence of native disease control agents such as microbial antagonists for the control of postharvest diseases	Reduction in disease damage due to harvested fruit or vegetables
2.2.4.2	2.2.4.2 - Decomposition and fixing processes and their effect on soil quality	By amount/concentration and source	Ensuring the organic matter in our soils is maintained	Decomposition of plant residue; N-fixation by legumes	Maintenance of soil quality; legumes used to increase/maintain N-levels in soil
2.2.5.2	2.2.5.2 - Regulation of the chemical condition of salt waters by living processes	By type of living system	Controlling the chemical quality of salt water	Fish communities that regulate the resilience and resistance of coral reefs to eutrophication	Health of coral reef and its benefits to people in terms of buffering wave action etc.
2.2.6.1	2.2.6.1 - Regulation of chemical composition of atmosphere and oceans	By contribution of type of living system to amount, concentration or climatic parameter	Regulating our global climate	Sequestration of carbon in tropical peatlands	Climate regulation resulting in avoided damage costs Or Mitigation of impacts of ocean acidification
2.2.6.2	2.2.6.2 - Regulation of temperature and humidity, including ventilation and transpiration	By contribution of type of living system to amount, concentration or climatic parameter	Regulating the physical quality of air for people	Evaporative cooling provided by urban trees	Increased thermal comfort in cities
2.3.X.X	2.3.X.X - Other	Use nested codes to allocate other regulating and maintenance services from living systems to appropriate Groups and Classes			
3.1.1.1	3.1.1.1 - Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	By type of living system or environmental setting	Using the environment for sport and recreation; using nature to help stay fit	Ecological qualities of woodland that make it attractive to hiker; private gardens Or Opportunities for diving, swimming	Recreation, fitness; de-stressing or mental health; nature-based recreation
3.1.1.2	3.1.1.2 - Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	By type of living system or environmental setting	Watching plants and animals where they live; using nature to destress	Mix of species in a woodland of interest to birdwatchers Or Whales, birds, seals and reptiles can be enjoyed by wildlife watchers	Recreation, fitness; de-stressing or mental health; eco-tourism
3.1.2.1	3.1.2.1 - Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge	By type of living system or environmental setting	Researching nature	Site of special scientific interest, Natura 2000 site	Knowledge about the environment and nature
3.1.2.2	3.1.2.2 - Characteristics of living systems that enable education and training	By type of living system or environmental setting	Studying nature	Site used for voluntary conservation activities	Skills or knowledge about environmental management
3.1.2.3	3.1.2.3 - Characteristics of living systems that are resonant in terms of culture or heritage	By type of living system or environmental setting	The things in nature that help people identify with the history or culture of where they live or come from	Sherwood Forest	Tourism, local identify
3.1.2.4	3.1.2.4 - Characteristics of living systems that enable aesthetic experiences	By type of living system or environmental setting	The beauty of nature	Area of Outstanding Natural Beauty; panorama site	Artistic inspiration
3.2.1.1	3.2.1.1 - Elements of living systems that have symbolic meaning	By type of living system or environmental setting	Using nature to as a national or local emblem	Bald Eagle	Social cohesion, cultural icon
3.2.1.2	3.2.1.2 - Elements of living systems that have sacred or religious meaning	By type of living system or environmental setting	The things in nature that have spiritual importance for people	Totemic species, such as the turtle	Mental well-being
3.2.1.3	3.2.1.3 - Elements of living systems used for entertainment or representation	By type of living system or environmental setting	The things in nature used to make films or to write books	Archive records or collections	Nature films
3.2.2.1	3.2.2.1 - Characteristics or features of living systems that have an existence value	By type of living system or environmental setting	The things in nature that we think should be conserved	Areas designated as wilderness	Mental/Moral well-being
3.2.2.2	3.2.2.2 - Characteristics or features of living systems that have an option or bequest value	By type of living system or environmental setting	The things in nature that we want future generations to enjoy or use	Endangered species or habitat	Moral well-being
3.3.X.X	3.3.X.X - Other	Use nested codes to allocate other cultural services from living systems to appropriate Groups and Classes			
4.2.1.1	4.2.1.1 - Surface water for drinking	By amount, type, source	Drinking water from sources at the ground surface	Volume and characteristics of water from a natural springs	Potable water in public supply system
4.2.1.2	4.2.1.2 - Surface water used as a material (non-drinking purposes)	By amount & source	Surface water that we can use for things other than drinking	Temperature and volume of water that can be used for cooling or irrigation	Reduced energy costs; glass house cultivation
4.2.1.3	4.2.1.3 - Freshwater surface water used as an energy source	By amount, type, source	Hydropower	Hydraulic potential (Head)	HEP
4.2.1.4	4.2.1.4 - Coastal and marine water used as energy source	By amount, type, source	Wave or tidal power	Tidal velocity	Tidal power
4.2.2.1	4.2.2.1 - Ground (and subsurface) water for drinking	By amount, type, source	Dirking water from the below ground	Aquifer volume and characteristics	Potable water in public supply system; mineral water
4.2.2.2	4.2.2.2 - Ground water (and subsurface) used as a material (non-drinking purposes)	By amount & source	Sub-surface water that we can use for things other than drinking	Characteristics and volume of water that can be used for washing purposes	Reduced material costs
4.2.2.3	4.2.2.3 - Ground water (and subsurface) used as an energy source	By amount & source	Sub-surface water that we can use as a source of energy	Hot water and steam vents	Reduces energy costs
4.2.X.X	4.2.X.X - Other	Use nested codes to allocate other provisioning services from non-living systems to appropriate Groups and Classes			

3.1.4 Social Dimension's Indicators

From UNECA BE Policy Handbook (UNECA, 2016a) the following types of indicators were identified:

- Sustainable Consumption/ food security
- Gender Equity
- Inclusive Job Creation
- Fair Trade
- Benefit Sharing
- gender mainstreaming
- food and water security
- poverty alleviation
- wealth retention
- jobs creation

After consulting several websites from UNDEP, the World Bank to Transparency International, a list of potentially useful indicators was drawn. Although not exhaustive, a list of indicators was initially narrowed down to reflect a nested system starting with the indicator's category, it's dimension and finally the indicator itself. 5 Categories, 19 dimensions and 61 potential Indicators were identified some of which might be found irrelevant depending on the country (e.g. World Bank's doing business indicators).

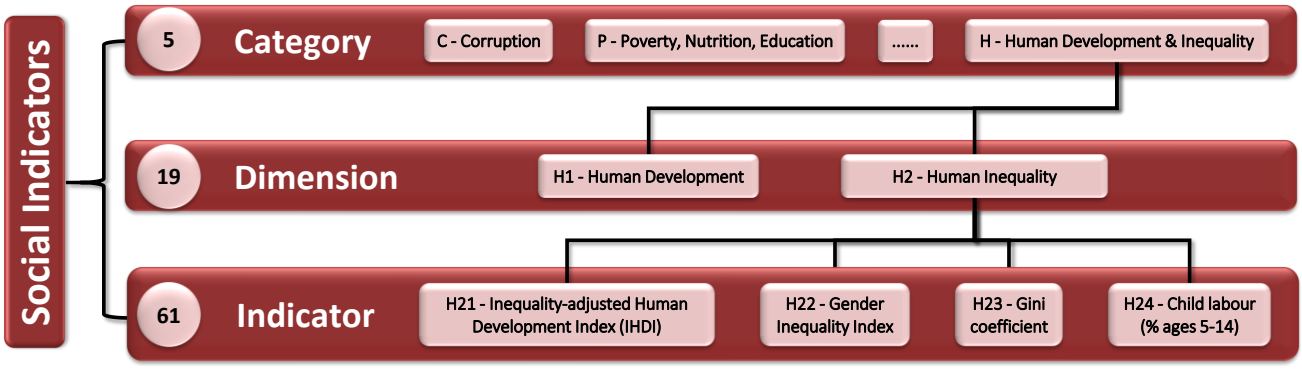


Figure 3-4: Selected Social and Human Development Indicators

Table 3-12 to Table 3-14 show the nested social indicators classification system used in the template to record the relevant social aspects of a country in the Social Dimension module.

Table 3-12 Social Dimension Categories

CategoryCode	Category
B	B - Business Environment
C	C - Corruption
H	H - Human Development & Inequality
I	I - Illegal actions
P	P - Poverty

Table 3-13 Social Dimension Categories

DimensionCode	Dimension
B1	B1 - Access to Business
B2	B2 - Access to Electricity
B3	B3 - Access to Property
B4	B4 - Access to Credit
B5	B5 - Access to Investissement
B6	B6 - Access to ownership
B7	B7 - Strenght of Tax system
B8	B8 - Access to Foreign Trade
B9	B9 - Access to legal system
C1	C1 - Government
H1	H1 - Human Development
H2	H2 - Human Inequality
I1	I1 - illegal Traffiquing
I2	I2 - Substance Abuse
I3	I3 - Human Right Abuse
I4	I4 - Organised actions
P1	P1 - Health
P2	P2 - Education
P3	P3 - Living standards

Table 3-14 Social Dimension Indicators

Indicator Code	Indicator	description	DataYear	DataSource	Burundi	Comoros	Congo (DRC)	Djibouti	Eritrea	Ethiopia	Kenya	Madagascar	Rwanda	Seychelles	Somalia	South Sudan	Tanzania	Uganda
B11	B11 - Ease of doing business (score)	Ease of doing business (score)	2020	World Bank. Doing Business 2020	46.8	47.9	36.2	60.5	21.6	48.	73.2	47.7	76.5	61.7	20.	34.6	54.5	60.
B12	B12 - Starting a business (Score)	Starting a business (Score)	2020	World Bank. Doing Business 2020	92.9	76.5	91.6	84.3	52.9	71.7	82.7	88.5	93.2	78.8	46.	71.	74.4	71.4
B13	B13 - Business Procedures - Men (Score)	Business Procedures - Men (Score)	2020	World Bank. Doing Business 2020	82.4	52.9	82.4	70.6	29.4	41.2	64.7	76.5	76.5	52.9	52.9	35.3	47.1	29.4
B14	B14 - Business Procedures - Women (Score)	Business Procedures - Women (Score)	2020	World Bank. Doing Business 2020	82.4	52.9	82.4	70.6	29.4	41.2	64.7	76.5	76.5	52.9	52.9	35.3	47.1	29.4
B15	B15 - Overall Business Procedures (Score)	Overall Business Procedures (Score)	2020	World Bank. Doing Business 2020	60.	76.	68.	56.		60.	56.	52.	60.	56.		28.	24.	48.
B21	B21 - Getting electricity (Score)	Getting electricity (Score)	2020	World Bank. Doing Business 2020	26.4	60.2	34.7	64.6		60.1	80.1	24.1	82.3	71.3			74.9	48.4
B22	B22 - Cost of Electricity (Score)	Cost of Electricity (Score)	2020	World Bank. Doing Business 2020		85.		89.7		90.5	92.4	46.5	76.3	95.8			91.5	14.4
B23	B23 - Reliability of electricity supply and transparency of tariff (Score)	Reliability of electricity supply and transparency of tariff (Score)	2020	World Bank. Doing Business 2020							62.5		75.	37.5			62.5	50.
B31	B31 - Registering property (Score)	Registering property (Score)	2020	World Bank. Doing Business 2020	62.6	58.4	46.6	58.3	35.3	50.9	53.8	44.4	93.7	70.8	48.2	36.8	50.1	53.6
B32	B32 - Cost of property registration (Score)	Cost of property registration (Score)	2020	World Bank. Doing Business 2020	79.1	49.1	32.5	62.6	39.8	59.8	60.5	40.	99.4	53.3	90.7	3.	65.5	74.
B33	B33 - Transparency of property information (Index)	Transparency of property information (Index)	2020	World Bank. Doing Business 2020			4.	1.5		1.5	3.	4.	4.5	5.			2.5	3.5
B34	B34 - Equal access to property rights (Index)	Equal access to property rights (Index)	2020	World Bank. Doing Business 2020			-1.											
B35	B35 - Strength of legal property rights (Score)	Strength of legal property rights (Score)	2020	World Bank. Doing Business 2020	16.7	50.	50.	66.7		25.	91.7	16.7	91.7	16.7		16.7	41.7	41.7
B41	B41 - Getting Credit (Score)	Getting Credit (Score)	2020	World Bank. Doing Business 2020	3.	8.	6.	8.		3.	19.	8.	19.	7.		2.	13.	12.
B51	B51 - Protecting minority investors (Score)	Protecting minority investors (Score)	2020	World Bank. Doing Business 2020	34.	26.	22.	52.	16.	10.	92.	36.	44.	34.		16.	50.	56.
B61	B61 - Extent of ownership and control (Score)	Extent of ownership and control (Score)	2020	World Bank. Doing Business 2020							85.7						28.6	71.4
B71	B71 - Paying Taxes (Score)	Paying Taxes (Score)	2020	World Bank. Doing Business 2020	60.9	49.9	40.9	62.7	55.9	63.3	72.8	62.6	84.6	84.7		76.7	51.3	73.1
B72	B72 - Labor tax and contributions (% of profit)	Labor tax and contributions (% of profit)	2020	World Bank. Doing Business 2020	10.2		12.6	17.7		12.4	1.9	20.3	6.	2.3	#N/A	19.2	17.5	11.3
B73	B73 - Total tax and contribution rate (% of profit)	Total tax and contribution rate (% of profit)	2020	World Bank. Doing Business 2020	41.2	219.6	50.7	37.9	83.7	37.7	37.2	38.3	33.2	30.1	#N/A	31.4	43.8	33.7
B81	B81 - Trading across borders (Score)	Trading across borders (Score)	2020	World Bank. Doing Business 2020	47.3	66.9	3.5	59.4		56.	67.4	61.	75.	71.8	51.6	26.2	20.2	66.7
B82	B82 - Cost to export: Border compliance (Score)	Cost to export: Border compliance (Score)	2020	World Bank. Doing Business 2020	89.7	38.6		42.9		83.8	86.6	18.1	82.7	68.7	53.3	28.1		80.2
B83	B83 - Cost to import: Border compliance (Score)	Cost to import: Border compliance (Score)	2020	World Bank. Doing Business 2020	63.	36.2		12.1		90.	30.6	50.4	76.5	71.6	20.7	34.9		62.8
B91	B91 - Strength of enforcing contracts (Score)	Strength of enforcing contracts (Score)	2020	World Bank. Doing Business 2020	43.	33.	33.3	48.4	55.9	62.8	58.3	50.	69.1	51.2	54.6	59.	61.7	60.6
B92	B92 - Quality of judicial processes (Score)	Quality of judicial processes (Score)	2020	World Bank. Doing Business 2020	27.8	30.6	30.6	30.6	16.7	38.9	50.	44.4	88.9	36.1	25.	19.4	33.3	47.2
B93	B93 - Resolving insolvency (Score)	Resolving insolvency (Score)	2020	World Bank. Doing Business 2020	30.6			65.9		30.3	62.4	34.8	57.2	52.2			39.1	43.6
B94	B94 - Strength of insolvency framework (Score)	Strength of insolvency framework (Score)	2020	World Bank. Doing Business 2020	53.1			84.4		31.3	90.6	56.3	93.8	62.5			56.3	43.8
C11	C11 - Corruption Perception Index (CPI)	Corruption Perception Index (CPI)	2019	Transparency Internationale. (2020). Corruption Perceptions Index (CPI) 2019	19.	25.	18.	30.	23.	37.	28.	24.	53.	66.	9.	12.	37.	28.
H11	H11 - Human Development Index (HDI)	Human Development Index (HDI)	2018	UNDP (2019). Human Development Data (1990-2018)	29.6	29.4	31.6	47.6	44.	47.	42.6	38.6	38.2	79.7		26.4	39.7	38.7
H12	H12 - Gender Development Index (GDI)	Gender Development Index (GDI)	2018	UNDP (2019). Human Development Data (1990-2018)	100.3	88.8	84.4			84.4	93.3	94.6	94.3			83.9	93.6	86.3
H21	H21 - Inequality-adjusted Human Development Index (IHDI)	Inequality-adjusted Human Development Index (IHDI)	2018	UNDP (2019). Human Development Data (1990-2018)	29.6	29.4	31.6	30.6	44.	33.7	42.6	38.6	38.2	79.7		26.4	39.7	38.7
H22	H22 - Gender Inequality Index	Gender Inequality Index (GII)	2018	UNDP (2019). Human Development Data (1990-2018)	52.		65.5			50.8	54.5		41.2				53.9	53.1
I11	I11 - Narcotic Traffic (% of population affected)	Narcotic Traffic (% of population affected)	2020	User defined														
I12	I12 - Human Traffiquing (% of population affected)	Human Traffiquing (% of population affected)	2020	User defined														
I21	I21 - Narcotic use (% of population affected)	Narcotic use (% of population affected)	2020	User defined														
I22	I22 - Other Illegal Substance use (% of population affected)	Other Illegal Substance use (% of population affected)	2020	User defined														
I31	I31 - Child Abuse (% of population affected)	Child Abuse (% of population affected)	2020	User defined														
I32	I32 - Woman Abuse (% of population affected)	Woman Abuse (% of population affected)	2020	User defined														
I41	I41 - Piracy (% of population affected)	Piracy (% of population affected)	2020	User defined														
I42	I42 - Organised Crime (% of population affected)	Organised Crime (% of population affected)	2020	User defined														
I43	I43 - IUU (% of population affected)	IUU (% of population affected)	2020	User defined														
P11	P11 - Nutrition	Any adult under 70 years of age or any child for whom there is nutritional information is undernourished. (weight is 1/6)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	6.7	3.	6.5			8.1	3.	7.5	4.3			9.7	4.6	4.5
P12	P12 - Child mortality	Any child has died in the family in the five-year period preceding the survey. (weight is 1/6)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	6.7	3.	6.5			8.1	3.	7.5	4.3			9.7	4.6	4.5
P21	P21 - Years of schooling	No household member aged 10 years or older has completed six years of schooling. (weight is 1/6)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	6.7	3.	6.5			8.1	3.	7.5	4.3			9.7	4.6	4.5
P22	P22 - School attendance	Any school-aged child+ is not attending school up to the age at which he/she would complete class. (weight is 1/6)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	6.7	3.	6.5			8.1	3.	7.5	4.3			9.7	4.6	4.5
P31	P31 - Cooking fuel	The household cooks with dung, wood, charcoal or coal. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5
P32	P32 - Sanitation	The household's sanitation facility is not improved (according to SDG guidelines) or it is improved but shared with other households. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5
P33	P33 - Drinking water	The household does not have access to improved drinking water (according to SDG guidelines) or safe drinking water is at least a 30-minute walk from home, round trip. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5
P34	P34 - Electricity	The household has no electricity. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5
P35	P35 - Housing	At least one of the three housing materials for roof, walls and floor are inadequate: the floor is of natural materials and/or the roof and/or walls are of natural or rudimentary materials. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5
P36	P36 - Assets	The household does not own more than one of these assets: radio, TV, telephone, computer, animal cart, bicycle, motorbike or refrigerator, and does not own a car or truck. (weight is 1/16)	2019	UNDP (2019). Multidimensional Poverty Index (MPI)	2.2	1.	2.2			2.7	1.	2.5	1.4			3.2	1.5	1.5

3.2 BEVTK lookup tables

Table 3-15 and Table 3-16 are lookup tables used to standardised the monetary values in the input data tables.

Table 3-15: Exchange rates lookup table by country between 2010 and 2020[7]

Code	Currency Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BIF	Burundian franc	1,230.75	1,261.07	1,442.51	1,555.09	1,546.69	1,571.90	1,654.63	1,729.06	1,782.88	1,845.62	1,928.12
CDF	Congolese franc	905.91	919.49	919.76	919.57	925.23	925.98	1,010.30	1,464.42	1,622.52	1,647.76	1,956.39
KMF	Comoro franc	371.10	353.44	382.92	370.42	370.32	443.41	444.45	435.49	416.58	439.46	413.72
DJF	Djiboutian franc	177.72	177.72	177.72	177.72	177.72	177.72	177.72	177.72	177.72	177.72	177.20
EUR	Euro	0.75	0.72	0.78	0.75	0.75	0.90	0.90	0.89	0.85	0.89	0.84
ERN	Eritrean nakfa	15.38	15.38	15.38	15.38	15.38	15.38	15.35	15.08	15.08	15.08	15.01
ETB	Ethiopian birr	14.41	16.90	17.70	18.63	19.59	20.58	21.73	23.87	27.43	29.07	38.05
GBP	U.K. Pound Sterling	0.65	0.62	0.63	0.64	0.61	0.65	0.74	0.78	0.75	0.78	0.75
KES	Kenyan shilling	79.23	88.81	84.53	86.12	87.92	98.18	101.50	103.41	101.30	101.99	109.37
MGA	Malagasy ariary	2,089.95	2,025.12	2,194.97	2,206.91	2,414.81	2,933.51	3,176.54	3,116.11	3,334.75	3,618.32	3,892.40
RWF	Rwandan franc	583.13	600.31	614.30	646.64	682.44	719.86	787.25	831.55	861.09	899.35	984.12
SOS	Somali shilling	1,600.00	1,639.04	1,599.58	1,218.99	824.96	625.55	575.68	585.27	579.38	570.00	575.85
SSP	South Sudanese pound	2.99	2.99	2.95	2.95	2.95	3.60	46.73	113.65	141.39	158.00	174.49
SCR	Seychelles rupee	12.07	12.38	13.70	12.06	12.75	13.31	13.32	13.65	13.91	14.03	20.71
TZS	Tanzanian shilling	1,395.63	1,557.43	1,571.70	1,597.56	1,653.23	1,991.39	2,177.09	2,228.86	2,263.78	2,288.21	2,308.03
UGX	Ugandan shilling	2,177.56	2,522.80	2,504.56	2,586.89	2,599.79	3,240.65	3,420.10	3,611.22	3,727.07	3,704.05	3,685.11
USD	US Dollars	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ZAR	South African Rand	7.32	7.26	8.21	9.66	10.85	12.76	14.71	13.32	13.23	14.45	15.36

[7] Source: International Monetary Fund, International Financial Statistics, http://api.worldbank.org/v2/en/indicator/PA.NUS.FCRF?downloadformat=excel , http://www.floatrates.com/daily/usd.xml

Table 3-16: GDP deflators lookup table by country between 2010 and 2020[8]

Country	Deflator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Burundi	GDP Deflator	85.54	90.46	90.18	90.55	95.88	100.00	101.02	106.43	108.52	108.52	108.52
Burundi	Value Added Deflator (Agriculture, forestry and fishery)	81.17	87.53	86.26	90.55	94.08	100.00	102.43	115.46	112.69	112.69	112.69
Burundi	Value Added Deflator (Manufacturing)	79.02	83.16	87.69	92.41	93.31	100.00	114.84	112.62	111.52	111.52	111.52
Comoros	GDP Deflator	119.28	126.88	118.67	119.67	118.50	100.00	97.78	99.97	106.27	106.27	106.27
Comoros	Value Added Deflator (Agriculture, forestry and fishery)	120.00	128.85	120.62	119.08	117.28	100.00	97.14	106.35	110.18	110.18	110.18
Comoros	Value Added Deflator (Manufacturing)	106.51	128.75	115.38	122.08	130.87	100.00	110.85	104.03	98.09	98.09	98.09
Congo (DRC)	GDP Deflator	82.65	92.66	98.13	100.85	101.25	100.00	103.89	93.49	110.69	110.69	110.69
Congo (DRC)	Value Added Deflator (Agriculture, forestry and fishery)	81.23	91.73	98.27	99.32	100.15	100.00	108.06	102.50	121.69	121.69	121.69
Congo (DRC)	Value Added Deflator (Manufacturing)	79.38	88.48	95.38	96.77	97.81	100.00	108.16	102.46	117.33	117.33	117.33
Djibouti	GDP Deflator	84.83	87.90	91.12	96.30	97.58	100.00	100.15	100.71	100.71	100.71	100.71
Djibouti	Value Added Deflator (Agriculture, forestry and fishery)	73.62	77.73	76.43	83.15	90.96	100.00	113.17	129.56	115.54	115.54	115.54
Djibouti	Value Added Deflator (Manufacturing)	92.37	98.43	95.18	97.93	95.23	100.00	104.75	106.14	90.83	90.83	90.83
Eritrea	GDP Deflator	61.22	69.39	76.09	83.52	91.54	100.00	110.79	124.78	138.48	138.48	138.48
Eritrea	Value Added Deflator (Agriculture, forestry and fishery)	61.22	69.39	76.09	83.52	91.54	100.00	110.79	120.85	134.03	134.03	134.03
Eritrea	Value Added Deflator (Manufacturing)	61.22	69.39	76.09	83.52	91.54	100.00	110.79	122.43	136.05	136.05	136.05
Ethiopia	GDP Deflator	69.02	70.66	90.07	89.81	94.78	100.00	106.35	103.35	101.18	101.18	101.18
Ethiopia	Value Added Deflator (Agriculture, forestry and fishery)	67.06	69.68	98.84	94.66	97.58	100.00	107.58	104.48	97.44	97.44	97.44
Ethiopia	Value Added Deflator (Manufacturing)	78.47	72.83	83.78	85.52	91.99	100.00	124.85	115.87	108.01	108.01	108.01
European Union	GDP Deflator	114.07	120.87	113.01	117.69	118.28	100.00	100.26	102.86	108.38	108.38	108.38
European Union	Value Added Deflator (Agriculture, forestry and fishery)	116.17	124.45	126.02	120.31	113.55	100.00	103.52	107.45	116.46	116.46	116.46
European Union	Value Added Deflator (Manufacturing)	113.76	119.19	111.69	117.04	116.03	100.00	99.04	99.74	103.74	103.74	103.74
Kenya	GDP Deflator	81.77	80.82	92.88	95.88	101.49	100.00	102.09	110.82	116.34	116.34	116.34
Kenya	Value Added Deflator (Agriculture, forestry and fishery)	62.85	68.23	79.14	82.89	91.95	100.00	106.27	133.09	137.10	137.10	137.10
Kenya	Value Added Deflator (Manufacturing)	89.78	91.66	103.86	104.16	105.69	100.00	104.28	102.01	105.10	105.10	105.10
Madagascar	GDP Deflator	100.58	114.58	111.49	116.93	114.06	100.00	100.62	107.66	108.23	108.23	108.23
Madagascar	Value Added Deflator (Agriculture, forestry and fishery)	98.37	111.63	105.66	112.95	109.34	100.00	100.81	108.10	106.43	106.43	106.43
Madagascar	Value Added Deflator (Manufacturing)	98.41	110.30	107.44	117.33	120.85	100.00	118.73	114.13	125.78	125.78	125.78
Rwanda	GDP Deflator	100.36	105.63	108.66	107.90	105.44	100.00	96.61	98.15	94.06	94.06	94.06
Rwanda	Value Added Deflator (Agriculture, forestry and fishery)	90.51	98.71	106.96	106.36	104.41	100.00	103.20	110.22	101.66	101.66	101.66
Rwanda	Value Added Deflator (Manufacturing)	102.40	103.64	110.24	107.59	104.84	100.00	94.71	97.69	91.15	91.15	91.15
Seychelles	GDP Deflator	89.45	89.13	89.42	105.73	102.31	100.00	99.17	100.09	98.17	98.17	98.17
Seychelles	Value Added Deflator (Agriculture, forestry and fishery)	89.70	89.93	84.05	112.16	108.45	100.00	100.85	97.57	98.60	98.60	98.60
Seychelles	Value Added Deflator (Manufacturing)	109.92	97.85	94.72	116.96	113.76	100.00	97.94	103.04	98.87	98.87	98.87
Somalia	GDP Deflator	86.40	87.56	114.13	129.04	116.56	100.00	94.35	95.95	92.89	92.89	92.89
Somalia	Value Added Deflator (Agriculture, forestry and fishery)	84.47	85.56	114.45	129.40	115.87	100.00	95.95	96.67	93.84	93.84	93.84
Somalia	Value Added Deflator (Manufacturing)	84.42	85.51	114.42	129.47	115.81	100.00	95.92	96.61	93.78	93.78	93.78
South Africa	GDP Deflator	131.86	141.64	131.88	119.05	111.79	100.00	92.99	107.99	113.00	113.00	113.00
South Africa	Value Added Deflator (Agriculture, forestry and fishery)	147.33	153.42	136.20	116.61	108.25	100.00	110.55	114.17	116.50	116.50	116.50
South Africa	Value Added Deflator (Manufacturing)	136.30	134.87	122.81	111.35	110.20	100.00	92.64	109.17	111.61	111.61	111.61
South Sudan	GDP Deflator	93.14	107.36	119.23	128.16	123.71	100.00	51.17	57.87	60.27	60.27	60.27
South Sudan	Value Added Deflator (Agriculture, forestry and fishery)	93.14	107.36	119.23	128.16	123.71	100.00	51.17	57.87	60.27	60.27	60.27
South Sudan	Value Added Deflator (Manufacturing)	93.14	107.36	119.23	128.16	123.71	100.00	51.17	57.87	60.27	60.27	60.27
Tanzania	GDP Deflator	91.43	91.38	100.53	109.06	112.01	100.00	98.37	98.76	99.16	99.16	99.16
Tanzania	Value Added Deflator (Agriculture, forestry and fishery)	78.66	80.71	95.61	108.58	107.32	100.00	102.88	108.90	109.11	109.11	109.11
Tanzania	Value Added Deflator (Manufacturing)	100.55	111.94	121.88	131.29	130.80	100.00	94.24	91.43	95.09	95.09	95.09
Uganda	GDP Deflator	99.18	102.25	112.71	113.21	117.20	100.00	98.75	100.76	102.40	102.40	102.40
Uganda	Value Added Deflator (Agriculture, forestry and fishery)	90.25	103.68	118.00	115.38	121.23	100.00	99.98	108.91	100.05	100.05	100.05
Uganda	Value Added Deflator (Manufacturing)	99.63	116.60	119.22	118.79	112.81	100.00	100.36	103.77	116.34	116.34	116.34
United Kingdom	GDP Deflator	93.42	98.85	99.08	99.91	107.08	100.00	90.27	87.67	92.60	92.60	92.60
United Kingdom	Value Added Deflator (Agriculture, forestry and fishery)	100.76	99.27	113.52	118.22	113.32	100.00	94.68	95.80	103.49	103.49	103.49
United Kingdom	Value Added Deflator (Manufacturing)	89.23	92.84	94.53	100.72	105.37	100.00	89.77	85.79	90.42	90.42	90.42
United States of Am	GDP Deflator	91.78	93.70	95.50	97.17	98.97	100.00	101.04	102.94	105.45	105.45	105.45
United States of Am	Value Added Deflator (Agriculture, forestry and fishery)	94.28	121.27	124.96	128.66	118.59	100.00	86.77	93.60	90.54	90.54	90.54
United States of Am	Value Added Deflator (Manufacturing)	89.09	92.25	95.81	96.09	97.24	100.00	99.32	100.67	102.90	102.90	102.90

Table 3-17: Real GDP for the UNECA SRO-EA countries between 2010 and 2020

Real GDP Billion USD (Nominal GDP divided by GDP deflator base 100 = 2015)
source: National Statistics and World Bank from tradingeconomics.com and https://www.statista.com/ and GDP deflator base 2015 =100 - FAOSTAT data retreived on 11-7-2020

Country Name	Country Code	Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Trend
Burundi	BDI	Real GDP	2.38	2.47	2.59	2.71	2.83	3.10	2.93	2.98	2.80	2.78	2.53	
Comoros	COM	Real GDP	0.76	0.81	0.86	0.93	0.97	0.97	1.03	1.08	1.11	1.12	0.93	
Congo (DRC)	COD	Real GDP	26.09	27.89	29.86	32.40	35.46	37.92	35.74	40.67	42.31	42.75	36.59	
Djibouti	DJI	Real GDP	1.33	1.41	1.48	2.12	2.26	2.43	2.61	2.73	2.99	3.30	3.03	
Eritrea	ERI	Real GDP	3.46	3.76	4.02	4.21	4.33	4.44	4.52	4.66	4.85	4.69	3.79	
Ethiopia	ETH	Real GDP	43.36	45.22	48.09	53.06	58.67	64.59	69.86	79.12	83.29	94.99	92.90	
Kenya	KEN	Real GDP	48.92	51.91	54.27	57.47	60.55	64.01	67.77	71.26	75.45	82.09	69.62	
Madagascar	MDG	Real GDP	9.92	10.08	10.39	10.62	10.98	11.32	11.78	12.24	12.80	13.01	11.09	
Rwanda	RWA	Real GDP	6.13	6.54	7.08	7.28	7.85	8.58	9.04	9.42	10.24	10.76	9.89	
Seychelles	SYC	Real GDP	1.08	1.20	1.18	1.26	1.31	1.38	1.44	1.52	1.62	1.73	1.58	
Somalia	SOM	Real GDP	1.24	4.00	3.16	3.02	3.40	4.05	4.45	4.70	5.08	5.23	6.46	
South Sudan	SSD	Real GDP	15.68	13.89	10.01	14.38	11.28	12.00	39.11	33.28	32.37	36.65	38.69	
Tanzania	TZA	Real GDP	35.01	37.93	39.44	41.89	44.61	47.38	50.60	53.99	58.49	63.71	56.98	
Uganda	UGA	Real GDP	26.68	27.04	24.03	25.33	27.60	32.12	29.34	30.53	32.00	33.58	31.35	

note: The real gross domestic product (GDP) is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year (expressed in base-year prices) and is often referred to as constant-price GDP, inflation-corrected GDP, or constant dollar GDP.

Table 3-18: Total employment for the UNECA SRO-EA countries between 2010 and 2020

Data Source: World Development Indicators, ILO (Derived using data from International Labour Organization, ILOSTAT database. The data retrieved in June 21, 2020) and estimations based on polynomial R^2=1 (Seychelles)
Employment

Country Name	Country Code	Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Trend
Burundi	BDI	Labor force, total	3,748,367	3,860,027	3,972,540	4,086,043	4,201,649	4,350,268	4,503,184	4,660,778	4,822,373	4,983,237	5,148,173	
Comoros	COM	Labor force, total	171,254	176,337	181,731	187,180	193,020	199,105	204,984	211,006	217,181	223,593	229,999	
Congo (DRC)	COD	Labor force, total	23,053,225	23,378,057	23,709,989	24,482,056	25,282,845	26,127,406	26,995,422	27,898,477	28,829,943	29,741,906	30,690,929	
Djibouti	DJI	Labor force, total	344,434	352,285	360,171	367,950	375,763	383,775	391,027	398,751	406,696	415,214	423,670	
Eritrea	ERI	Labor force, total	1,399,724	1,412,071	1,420,769	1,426,943	1,432,917	1,438,419	1,458,352	1,476,283	1,495,202	1,518,958	1,550,174	
Ethiopia	ETH	Labor force, total	39,200,114	40,614,909	42,102,901	43,655,318	45,172,444	46,718,750	48,240,655	49,804,178	51,412,462	53,195,214	54,994,539	
Kenya	KEN	Labor force, total	16,791,816	17,540,848	18,328,404	19,149,317	19,993,005	20,855,980	21,750,718	22,401,022	23,057,935	23,879,160	24,728,107	
Madagascar	MDG	Labor force, total	10,638,131	10,958,031	11,286,313	11,611,874	11,931,368	12,238,090	12,620,212	13,010,466	13,409,202	13,851,504	14,307,144	
Rwanda	RWA	Labor force, total	4,958,711	5,089,382	5,226,281	5,368,436	5,513,220	5,668,191	5,837,087	6,007,191	6,178,259	6,362,559	6,555,834	
Seychelles	SYC	Labor force, total	35,168	39,547	42,399	44,101	45,029	45,556	46,062	46,922	49,886	53,632	55,368	
Somalia	SOM	Labor force, total	2,961,297	3,034,384	3,121,047	3,219,574	3,324,728	3,433,878	3,549,907	3,671,052	3,797,583	3,924,821	4,059,573	
South Sudan	SSD	Labor force, total	3,935,224	4,072,075	4,194,850	4,302,956	4,396,493	4,476,729	4,536,023	4,580,761	4,621,451	4,678,892	4,753,851	
Tanzania	TZA	Labor force, total	21,182,726	21,660,222	22,146,911	22,639,079	23,136,032	23,877,145	24,659,135	25,467,538	26,304,005	27,170,342	28,076,821	
Uganda	UGA	Labor force, total	11,717,458	12,149,266	12,606,240	13,061,480	13,549,586	14,078,249	14,657,926	15,285,775	15,935,453	16,658,774	17,383,132	

Table 3-19: Real GNI for the UNECA SRO-EA countries between 2010 and 2020

Source: UNSTATS (https://unstats.un.org/unsd/snaama/Downloads) and World Development Indicators, ILO (2019)
real GNI at constant prices in US Dollars

Country Name	Country Code	Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Trend
Burundi	BDI	Real GNI	2.36	2.74	3.08	3.14	3.15	3.11	3.09	3.02	3.02	2.78	2.78	
Comoros	COM	Real GNI	0.76	0.80	0.85	0.93	0.97	0.99	1.04	1.07	1.06	1.12	1.12	
Congo (DRC)	COD	Real GNI	24.83	26.70	28.80	29.54	34.87	37.11	38.13	39.54	41.83	41.45	41.45	
Djibouti	DJI	Real GNI	1.60	1.81	2.04	2.31	2.46	2.64	2.81	2.91	3.06	3.43	3.43	
Eritrea	ERI	Real GNI	3.43	3.72	3.99	4.17	4.29	4.40	4.48	4.71	4.91	4.91	4.91	
Ethiopia	ETH	Real GNI	38.05	42.29	46.09	51.71	56.99	62.82	67.62	73.84	78.87	94.53	94.53	
Kenya	KEN	Real GNI	48.69	51.92	53.93	56.84	59.69	63.32	67.39	70.46	74.93	80.43	80.43	
Madagascar	MDG	Real GNI	9.82	9.92	10.06	10.29	10.67	10.89	11.29	11.86	12.38	12.59	12.59	
Rwanda	RWA	Real GNI	5.71	6.16	6.66	6.94	7.43	8.08	8.55	9.11	9.90	10.42	10.42	
Seychelles	SYC	Real GNI	1.00	1.04	1.12	1.19	1.23	1.29	1.33	1.39	1.54	1.68	1.68	
Somalia	SOM	Real GNI	1.21	1.25	1.28	1.36	1.41	1.45	1.52	1.55	1.60	1.60	1.60	
South Sudan	SSD	Real GNI	21.12	22.03	12.52	13.32	14.73	14.94	13.55	13.54	14.00	14.00	14.00	
Tanzania	TZA	Real GNI	33.88	36.55	38.59	41.16	44.11	46.66	49.63	52.95	56.75	62.10	62.10	
Uganda	UGA	Real GNI	19.51	20.67	21.26	22.23	23.23	24.70	25.24	26.36	28.46	32.69	32.69	

Table 3-20 et Table 3-24 below are used throughout the tool to better identify the country selected as the active country.

[8] Source: GDP Deflators USD 2015 - local 2015 - FAOSTAT data retreived on 11-7-2020

Table 3-20: Country's maps lookup table

Country Name	Country Map
Burundi	
Comoros	
Congo (DRC)	
Djibouti	
Eritrea	
Ethiopia	
Kenya	
Madagascar	
Rwanda	
Seychelles	
Somalia	
South Sudan	
Tanzania	
Uganda	

Table 3-21: Country flags lookup table

Country	Code	Flag
Burundi	BDI	
Comoros	COM	
DRC	COD	
Djibouti	DJI	
Eritrea	ERI	
Ethiopia	ETH	
Kenya	KEN	
Madagascar	MDG	
Rwanda	RWA	
Seychelles	SYC	
Somalia	SOM	
South Sudan	SSD	
Tanzania	TZA	
Uganda	UGA	

Table 3-22: Countries lookup tables used to identify the country's geographic situation, national currency, etc.

Country Name	Nom du Pays	Shape	Situation	Alpha-2 code	Alpha-3 code	Numeric	Currency Name	Currency Code	Currency
Burundi	Burundi	Burundi	Landlocked	BI	BDI	108	Burundian franc	BIF	Burundian franc (BIF)
Comoros	Comores	Comoros	Island	KM	COM	174	Comoro franc	KMF	Comoro franc (KMF)
Congo (DRC)	Rep Dem du Congo	Congo_DRC	Landlocked	CD	COD	178	Congolese franc	CDF	Congolese franc (CDF)
Djibouti	Djibouti	Djibouti	Coastal	DJ	DJI	262	Djiboutian franc	DJF	Djiboutian franc (DJF)
Eritrea	Érythrée	Eritrea	Coastal	ER	ERI	232	Eritrean nakfa	ERN	Eritrean nakfa (ERN)
Ethiopia	Éthiopie	Ethiopia	Landlocked	ET	ETH	231	Ethiopian birr	ETB	Ethiopian birr (ETB)
Kenya	Kenya	Kenya	Coastal	KE	KEN	404	Kenyan shilling	KES	Kenyan shilling (KES)
Madagascar	Madagascar	Madagascar	Island	MG	MDG	450	Malagasy ariary	MGA	Malagasy ariary (MGA)
Rwanda	Rwanda	Rwanda	Landlocked	RW	RWA	646	Rwandan franc	RWF	Rwandan franc (RWF)
Seychelles	Seychelles	Seychelles	Island	SC	SYC	690	Seychelles rupee	SCR	Seychelles rupee (SCR)
Somalia	Somalie	Somalia	Coastal	SO	SOM	706	Somali shilling	SOS	Somali shilling (SOS)
South Sudan	Soudan du Sud	South_Sudan	Landlocked	SS	SSD	728	South Sudanese pound	SSP	South Sudanese pound (SSP)
Tanzania	Tanzanie	Tanzania	Coastal	TZ	TZA	834	Tanzanian shilling	TZS	Tanzanian shilling (TZS)
Uganda	Ouganda	Uganda	Landlocked	UG	UGA	800	Ugandan shilling	UGX	Ugandan shilling (UGX)

There are several prefetched lookup tables that can be used to offer predefined choices where relevant; these lookup table can be overwritten by the user and only constitute a guideline. This lists can be expanded to accommodate the user's choices.

Table 3-23: Deflator lookup table (predefined); the 3 choices in this table correspond to lookup categories in Table 3-16.

Code	Deflator
1	GDP Deflator
2	Value Added Deflator (Agriculture, forestry and fishery)
3	Value Added Deflator (Manufacturing)

Table 3-24: Data source lookup table (prefetched)

NDX	Source
1	African Union
2	Grey Litterature
3	National Account
4	Survey
5	UN Comtrade
6	UNDEP
7	UNECA
8	user defined
9	World Bank

Table 3-25: Measurement types lookup table (prefetched)

NDX	Measurement type
1	Pourcentage of the population affectée
2	Gradients (poor, moderate, high)
3	monetary
4	boolean (yes, No)
5	number of people affected

Table 3-26: Measurement units lookup table (prefetched)

NDX	Unit
1	%age of population
2	ha
3	Kilogram
4	kilometer
5	Km^2
6	Km^3
7	Kilowatts per hour [kWh]
8	m^2
9	m^3
10	meter
11	number of individuals
12	ppb
13	tonne
14	user to define

Table 3-27: Data year lookup table (prefetched); the table automatically adjust each year to list the past 10 years.

Ndx	Year
1	2010
2	2011
3	2012
4	2013
5	2014
6	2015
7	2016
8	2017
9	2018
10	2019
11	2020

Table 3-28: Data quality lookup table (prefetched)

Ndx	Data Quality
1	estimate
2	guestimate
3	official
4	other
5	poor
6	provisional
7	reliable
8	unknown
9	unofficial
10	unreliable
11	updated

Table 3-29: Alternative data source lookup table (prefetched)

Ndx	Data Source
1	Composite of various sources
2	FAO
3	Grey Litterature
4	Industry Data
5	Official Statistics
6	Other
7	Other International Organisation
8	Other NGO
9	Other official document
10	Other UNECA
11	Other United Nations
12	Personal Communication
13	UNDP
14	UNECA SRO-EA
15	UNEP
16	World Bank
17	WWF

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