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Improving The Monitoring Of SDG Indicators Related To The Environment And Agriculture Themes For Sub-Saharan African States.

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Abstract

There is still a lack of updated and reliable environmental and agricultural statistics in the world, even though they cover 36.6% of SDG indicators used by the United Nations to date. It is with this in mind that the idea of developing this guide was considered, with a view to helping sub-Saharan African States, in this case AFRISTAT members, to make progress in monitoring the SDG indicators related to these themes. The state of data availability revealed a significant gap in the production of environment and agriculture-related SDG monitoring indicators for both international and national sources. However, it was found that the indicators available from national sources are mainly from administrative sources. This further illustrates the need to strengthen survey data collection mechanisms for monitoring the environmental indicators of the SDGs. In fact, the methodological notes developed in this document show that a simple readjustment of the survey questionnaires already in place in these countries could improve the collection of certain indicators, such as indicator 2.3.1. It also emerges from this methodological work that greater collaboration between national statistical offices and the private or industrial sector could have a positive impact on the monitoring of the environmental indicators of the SDGs in these countries, such as indicator 6.3.1.

1. Introduction.
2. Methodology.
3. Results.
4. Conclusions.
5. Annexes.

1. INTRODUCTION

UN member states pledged to "leave no one behind" in the implementation of the 2030 Agenda, at the high-level plenary meeting of the General Assembly convened at the UN summit on September 25-27, 2015UN member states pledged to "leave no one behind" in the implementation of the 2030 Agenda, at the high-level plenary meeting of the General Assembly convened at the UN summit on September 25-27, 2015. Armed with this commitment, world leaders adopted the 17 Sustainable Development Goals supported by the 2030 Agenda, calling for a data revolution to seamlessly track countries' progress toward the goals.

This revolution requires strengthening the capacities of national statistical systems, which must also adapt and use innovative tools to reduce the costs inherent in traditional methods on the one hand, but also to shorten collection and analysis times. Monitoring the 232 SDG indicators selected by the United Nations to date remains a global challenge.

A study initiated in 2016 by IPAR on Senegal's national potential to cover some of the SDG indicators revealed that the environment and governance sectors posed the most challenges in informing the associated indicators (IPAR Annual Report 2019).

The growing need for quality and availability of statistical data to measure progress toward the SDGs is particularly relevant regarding the environment domain, where timely and reliable statistics remain lacking worldwide.

In developing countries, there is a recurring need for statistical capacity building, and this need is coupled with the need to improve data and statistics to reduce gaps in monitoring progress.

This paper aims to help Sub-Saharan African countries make progress in monitoring environment and agriculture-related SDG indicators.

Among other things, it aims to identify common environment and agriculture-related indicators to initiate a more harmonized approach to monitoring, review data availability for relevant indicators, and propose approaches to improve monitoring of identified indicators.

To this end, the working approach that has been adopted is as follows:

- Identification of all indicators, targets and SDGs related to the environment and agriculture;

- Collection of available data for AFRISTAT member countries according to data sources (administrative, survey databases, international databases);

- Participation in methodological work for the indicators with the most missing values in the database;

- Appropriation of the environmental context of Mali;

- Evaluation of the capacity of the current monitoring system to measure the indicators;

- Proposal of methodological notes adapted to the context of these countries;

2. METHODOLOGY

This work focuses on SDG indicators related to agriculture and the environment. The scope of Sub-Saharan African countries considered here is limited to the 22 AFRISTAT member states.

Table 1 below summarizes the different SDGs, targets and indicators related to the environment and agriculture themes.

Table 1: Summary of indicators, targets and SDGs related to the environment and agriculture themes.

SDG	ODD 2	ODD 3	ODD 6	ODD 7	ODD 9	ODD 11	ODD 12	ODD 13	ODD 14	ODD 15	TOTAL
TOTAL INDICATORS	10	2	11	6	1	15	11	8	7	14	85

Source: The author.

This table shows that 85 of the SDG indicators are related to the environment or agriculture, or 36.6% of the total number of SDG indicators selected by the UN to date. This illustrates the importance of scaling up measures to improve monitoring of SDG indicators related to the above themes, particularly in developing countries. These indicators cover 60 targets for a total of 10 SDGs, of which 07 are entirely environment-related.

a) Availability of SDG indicators related to the environment and agriculture in Sub-Saharan African countries

This section presents, via a few graphs, what emerged from the second stage of the work methodology, namely the collection of available data for AFRISTAT member countries. However, since the objective of this document is to serve as a tool for strengthening the capacities of sub-Saharan African countries to measure and monitor progress in sustainable development, we will limit ourselves to illustrating through graphs the availability of data from national sources (administrative or survey data).

Figure 1 below shows, for each of the 10 SDGs contained in our framework, the different countries for which at least one associated indicator was found to be available from national sources, following our data collection exercise. This data collection was carried out by browsing the websites of the various NSIs of these countries, as well as their reports of participation in the various High Level Political Forums.

Figure 1: Availability of SDG indicators on agriculture and the environment from national sources in the various sub-Saharan African states.
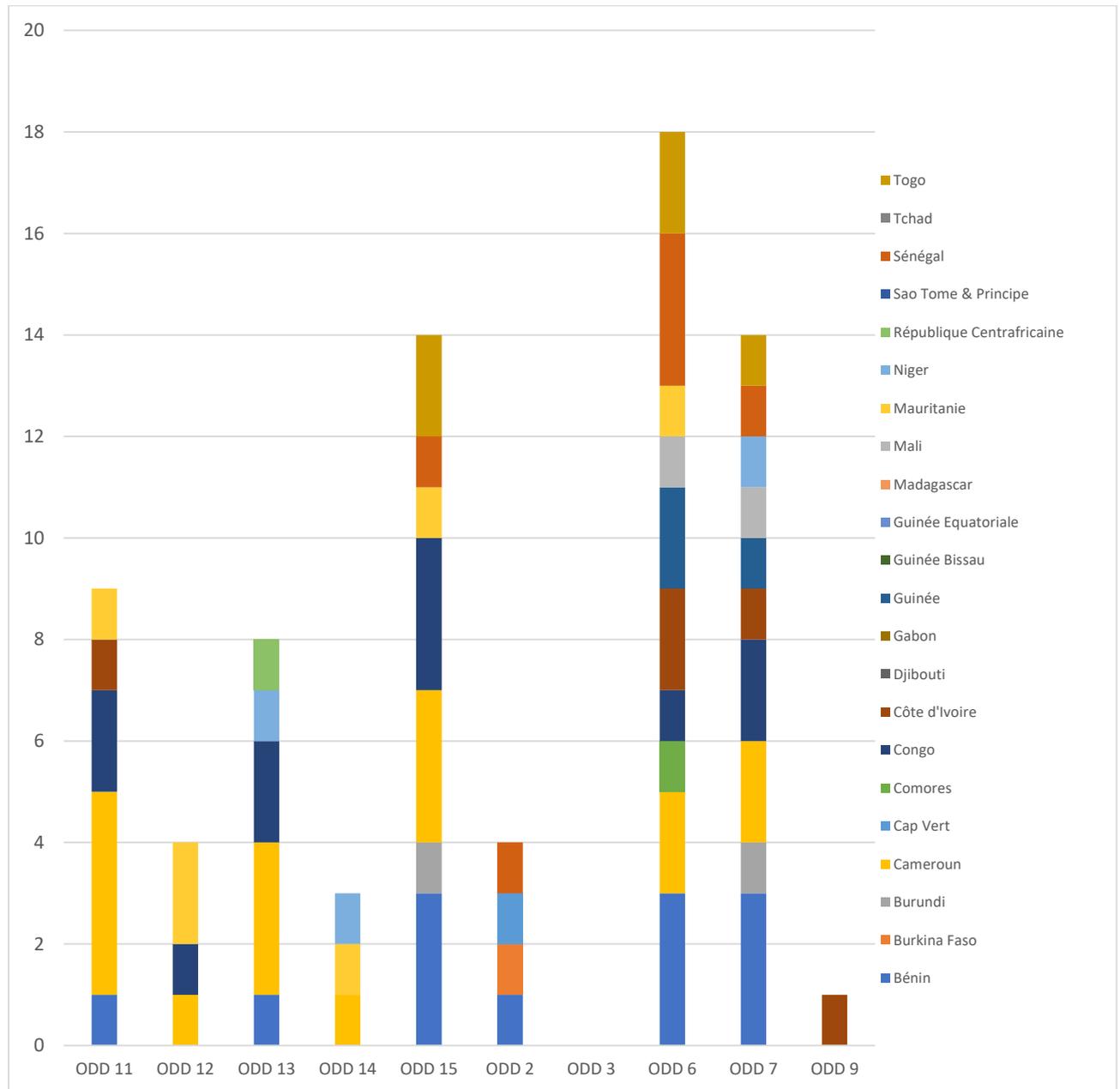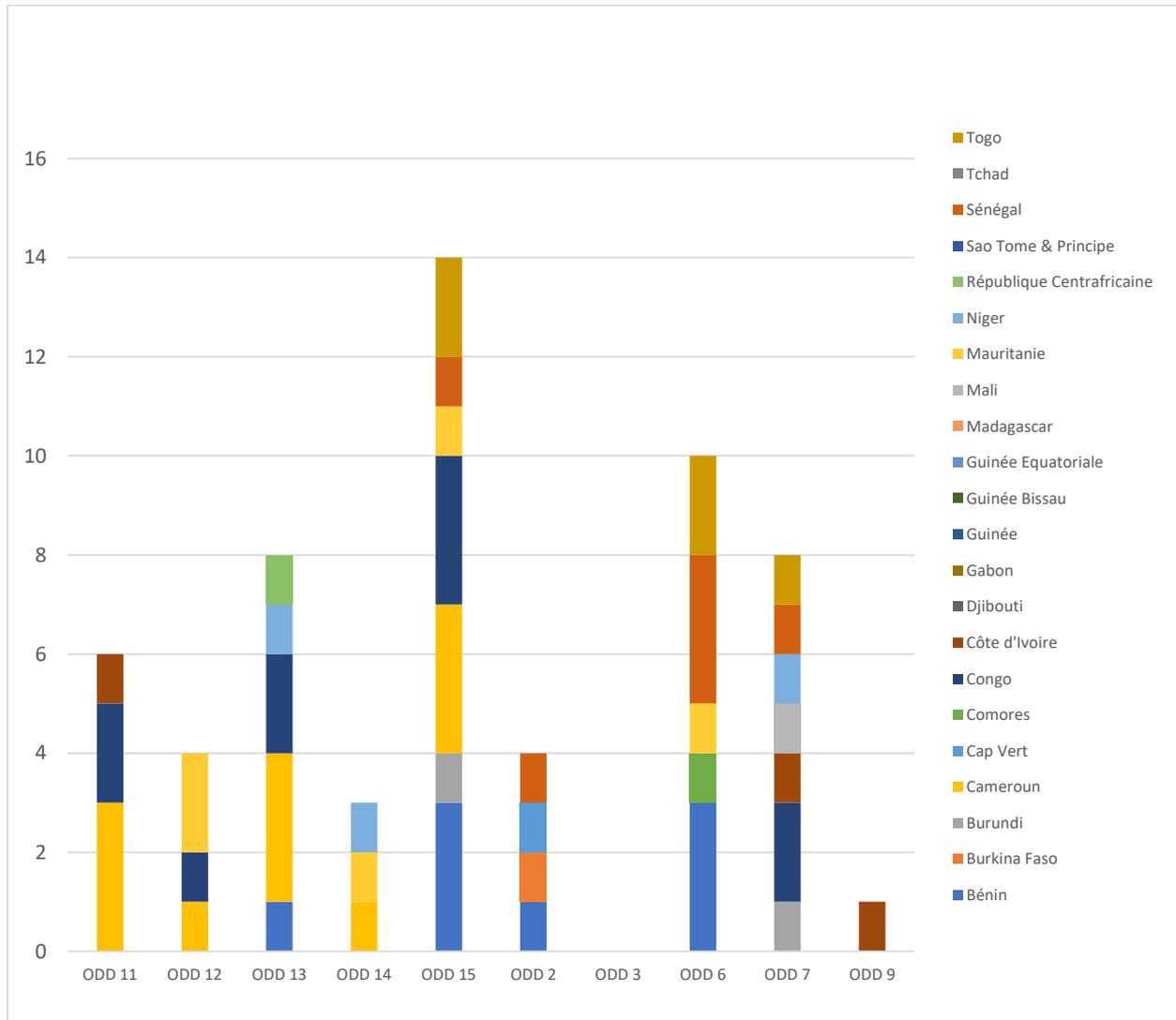

Source: Our data from the collection operation of the available indicators.

The graph shows that, among the environment and agriculture-related SDGs, SDGs 6, 7 and 15 have the most Sub-Saharan African countries reporting at least one associated indicator, including 10 countries for SDG 6.7, and 07 countries for SDG 15. Conversely, none of these countries were able to measure the environmental indicators for SDG 3. SDGs 2, 3, 9, 12, 13, and 14 are those for which most SSA states were unable to produce any environmental indicators. For each of these SDGs, the efforts made by the 22 countries are presented in Annex 2 of this document. This annex also reports on the availability of data from international sources for each SDG.

Figures 2 and 3 illustrate, respectively, for each of the 10 SDGs of interest to us, an inventory of the availability of environmental and agricultural data from administrative sources and those directly from survey data.

Figure 2: Availability of SDG indicators on environment and agriculture from administrative sources in the different Sub-Saharan African states.
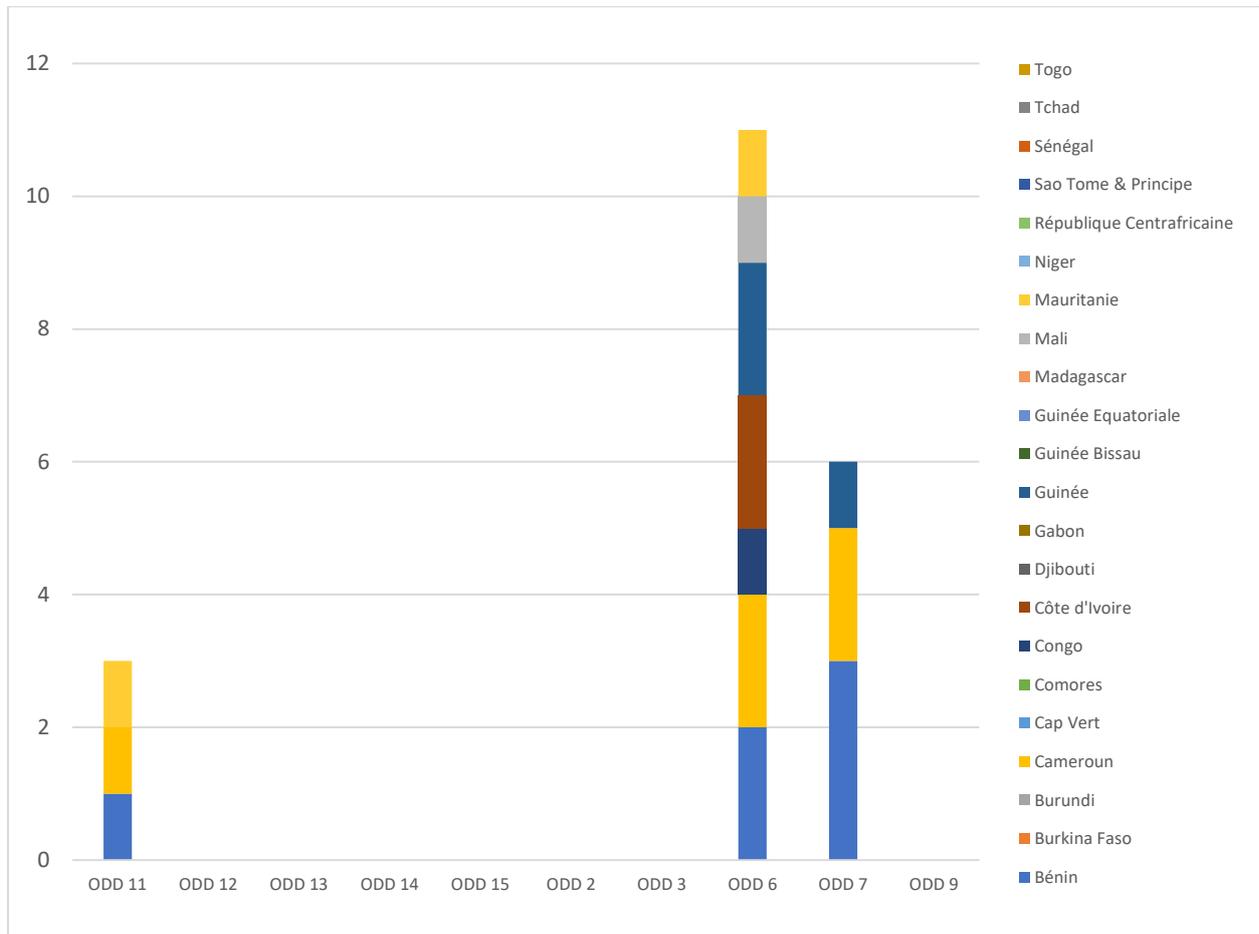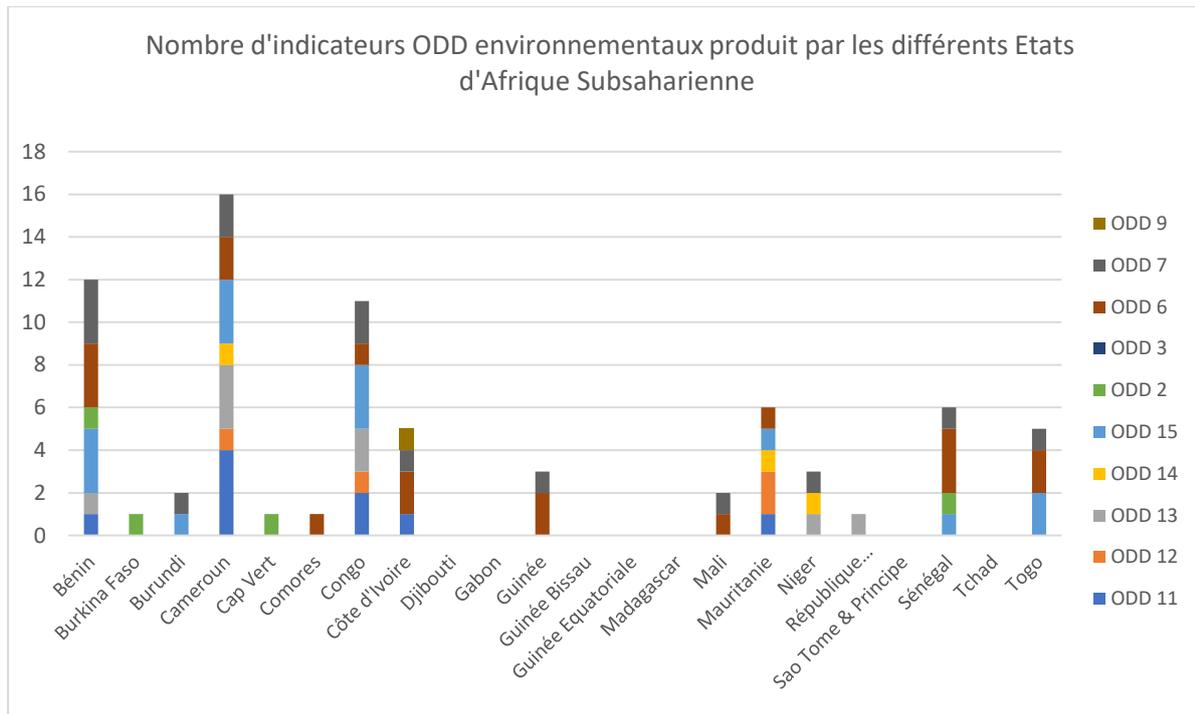

Source: Our data from the collection operation of the available indicators.

These two graphs show that, with the exception of a few indicators related to SDGs 06, 07, and 11, the available SDG indicators on environment and agriculture in Sub-Saharan African countries come from administrative sources. This suggests that there are gaps in the survey data production systems in these states to capture the environment and agriculture-related SDG indicators. This last finding further strengthens the initiative to write this methodological guide.

However, it cannot be ruled out that this difference in the performance of administrative or survey data production systems in monitoring environmental or agricultural SDG indicators can be explained by the intrinsic nature of each of these indicators, as well as by the mechanisms for monitoring the implementation of the SDGs that have been put in place by the different countries. It should be noted that this line of thought has not been explored further in this work.

A rough outline of the state of progress of the various Sub-Saharan African states in producing SDG indicators related to the environment and agriculture is illustrated in Figure 4 below.

Figure 4: Performance of individual Sub-Saharan African states in producing SDG indicators related to the themes of environment and agriculture.

It shows that Cameroon is the country that has produced the largest number of indicators for monitoring the environment or agriculture SDGs, namely 16 indicators covering a total of 07 SDGs. It shows that Cameroon is the country that has produced the greatest number of indicators for monitoring the environment or agriculture SDGs, namely 16 indicators covering a total of 07 SDGs. It is followed by Benin and Congo, for which data availability shows 12 and 13 SDGs respectively, each relating to a total of 06 SDGs. It is followed by Benin and Congo, for which the data availability reports indicate 12 and 13 SDGs respectively, each relating to a total of 06 SDGs. Mali, on the other hand, is among the least developed countries, with a total of 02 indicators produced, as are Burundi and Guinea. The graph also shows that among the least developed countries are Burkina Faso, Cape Verde, Comoros, Djibouti, Gabon, Guinea Bissau, Equatorial Guinea, Madagascar, Niger, Central African Republic, Sao Tome and Principe, and Chad. A detailed country-by-country presentation is provided in Annex 1 of this document.

a) Methodological choices and justification

This section presents the indicators used to be the subject of methodological notes, as well as the supporting elements that motivated these choices.

✓ Criteria for the selection of indicators submitted to the drafting of methodological notes.

Given the large number of SDGs related to the environment and agriculture, certain criteria were selected in order to retain a short list of SDG indicators on which to focus in the context of this work, for the drafting of methodological notes. In general, these criteria are all intended to make this guide useful for Sub-Saharan African countries in particular. These include:

- ✓ ☐ be included in the list of indicators selected as priorities by Mali. The objective here is to make Mali the pilot country for the application of the methodologies contained in this document;
- ✓ ☐ Be part of the list of indicators that have been moved from level 3 or 2 to level 1, or from level 3 to level 2, following the latest reclassification of July 17, 2020, by the United Nations Expert Group (IAEG-SDG);
- ✓ ☐ be part of the indicators whose collection requires the application of a calculation formula. This does not include indicators related to the existence or not of laws or administrations dealing with environmental or agricultural issues;
- ✓ ☐ be one of the indicators with a significant gap in the data collected to date by Sub-Saharan African countries.

3. RESULTS

On the basis of the criteria listed above, indicators 2.3.1, 6.3.1, 6.3.2, 12.3.1 have been selected for the development of methodological notes adapted to the environmental context of Sub-Saharan African countries. A characteristic description of each of these indicators is given in this section, including graphs illustrating the respective gaps in the monitoring of each of these indicators for Sub-Saharan African countries. However, this document will only focus on indicators 2.3.1 and 6.3.1. The aim here is to present the methodology proposed by the United Nations and an alternative solution, based on the limitations of the existing methodology.

☐ INDICATOR 2.3.1: Volume of production per work unit by farm/pastoral/forestry enterprise size categories.

Figure 5: Availability of data on indicator 2.3.1, for Sub-Saharan African countries.
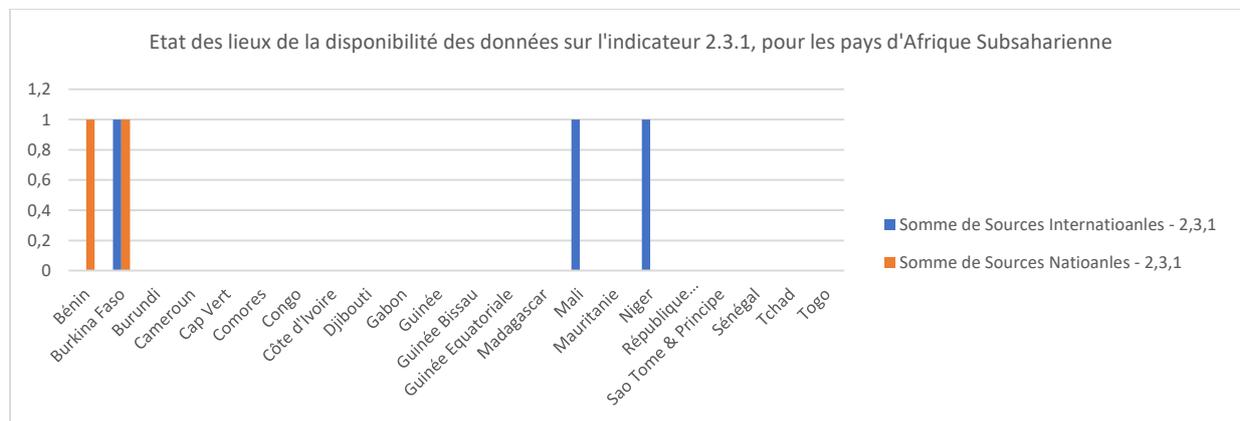
Source: Our data from the collection operation of the available indicators.

We show in Figure 5 that, among the countries covered by this study, Benin and Burkina Faso are the only countries to have produced a proxy for indicator 2.3.1. Furthermore, after mining international data sources, a proxy for this indicator was found only for Burkina Faso, Mali and Niger.

It should also be noted that, according to the SDG classification update report published by the United Nations on July 17, 2020, this indicator is part of the list of indicators that have migrated from the level 3 SDG group to the level 2 SDG group, following the revisions made during the 2018 exchange meeting organized by the United Nations SDG working group. Also, at the end

of the 6th session of this group, it became clear that work was still needed to clarify the definition of small-scale agricultural producers.

        a.   Presentation of the methodology proposed by the United Nations

        ✓ Definition of concepts

Indicator 2.3.1: Volume of production per work unit by size category of agricultural/pastoral/forestry enterprise;

Volume of agricultural production of small-scale food producers in crop, livestock, fishery and forestry activities, by number of days.

Small-scale food producers The FAO proposes to define as producers those who:

- farms an amount of land that is in the top two quintiles (the lowest 40 percent) of the cumulative distribution of land area at the national level (measured in hectares);
- operates a number of animals that is in the top two quintiles (lowest 40 percent) of the cumulative distribution of the number of animals per unit of production at the national level (measured in tropical livestock units - TLUs);
- has an annual economic income from agricultural activities that falls within the top two quintiles (lowest 40 percent) of the cumulative distribution of economic income from agricultural activities per unit of production at the national level (measured in purchasing power parity dollars) not exceeding \$34,387 purchasing power parity.Formula for calculating the indicator

$$SDG\ 2.3.1 = I_{2.3.1}^t = \sum_{j=1}^{n} \left(\frac{\sum_i V_{ij}^t p_{ij}^t}{Ld_j^t} \right) / n$$

- V_{ij}^t is the physical volume of the agricultural product that I sold by the small food producer j in year t;
- p_{ij}^t is the constant selling price received by the small food producer j for agricultural product i in the same year t;
- Ld_j^t is the number of working days used by the small food producer j in year t;
- n is the number of small food producers.

        ✓ Breakdown criteria and analysis of the methodology

Indicator 2.3.1 should be disaggregated by farm/pastoral/forestry enterprise size categories, as well as by gender, enterprise type and reference community.

What information will be collected to determine whether or not we are dealing with a small producer?

- - type of operation (agricultural, pastoral, forestry) ;
- - the size of the farm (area of cultivated land, number of animals)
- - annual economic income from farming activities.

What information will be collected to obtain the volume of production sold annually by a given smallholder?

- Type of production;
- The number of annual production and sales seasons;

- The volume of the harvest obtained per year of production;
- The volume of production sold per sales season, as well as the corresponding unit sales price.

What information will be collected to obtain the number of working days used by the small-scale food producer in a given year?

- the nature of the guarantor (farm owner, non-owner farm manager);
- the number of male/female workers per crop year;
- the frequency of their work on the farm during the crop year.

    a.   Proposal to add an agricultural module to the survey questionnaire

For this indicator, we considered making a proposal to add an AGRICULTURE module to the national household surveys, because of the national coverage of this survey;

Possibility of starting with questions on the activity of the head of the household, to end up with an agricultural module allowing information to be entered by producer;

A proposal for agricultural/environmental modules to be included in the EMOP questionnaire is presented in Annex 3.

☐ INDICATOR 6.3.1: Proportion of domestic and industrial wastewater treated safely.

This indicator is among those that migrated from Level III to Level II of the SDG indicators following the inclusion of the 51st United Nations Statistics Congress (UNSC 51) revisions in the 2020 SDG classification review report.

Figure 6: Availability of data on indicator 6.3.1, for sub-Saharan African countries.
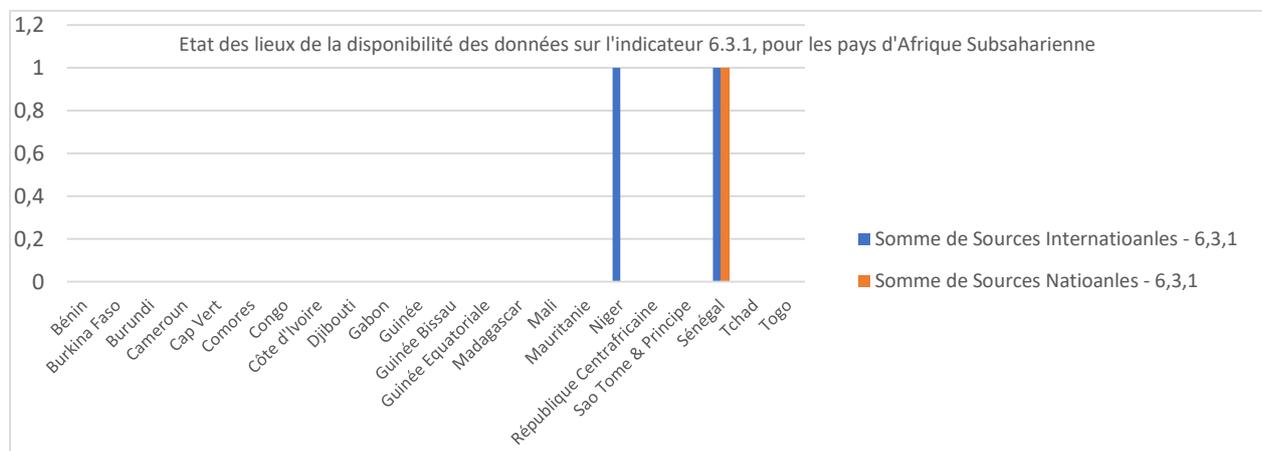
Source: Our data from the collection operation of the available indicators.

Figure 6 above shows that of the 22 AFRISTAT member states, this indicator is available for at least one period of the year, only for Niger and Senegal. The latter is the only country for which the indicator was found to be available in the national data sources.

    a. Presentation of the methodology proposed by the United Nations

✓ Definition of concepts

This indicator measures the volumes of wastewater that are generated by households, services and industrial economic activities, as well as the volumes of wastewater that are safely treated before being discharged to the environment.

Wastewater flows will be classified into industrial, service and domestic flows, with reference to the International Standard Industrial Classification of all Economic Activities, revision 4 (ISIC). To the extent possible, the proportion of each of these waste streams that is safely treated before discharge to the environment will be calculated.

Domestic wastewater generated by households, as well as wastewater generated by economic activities covered by the ISIC categories, may or may not be pre-treated on-site before being discharged to sewers for further treatment or directly to the environment.

Total wastewater flows can be classified into three main categories:

• Industrial (ISIC divisions 05-35)

• Services (ISIC Divisions 45-96)

• Domestic households (private households)

Wastewater treatment can be classified into three broad categories (see the "disaggregation section" for more details:

• Primary

• Secondary

• Tertiary

Domestic wastewater: Wastewater from residential facilities that originates primarily from human metabolism and domestic activities.

Industrial (process) wastewater: Water discharged after being used or produced by industrial production processes and which has no other immediate value for these processes. Where process water recycling systems have been installed, process wastewater is the final discharge from these systems. To meet quality standards for possible discharge to public sewers, it is understood that this wastewater is subjected to ex-process treatment in the plant. Cooling water is not considered here. Sanitary wastewater and industrial runoff are also excluded.

Total wastewater generated is the total volume of wastewater generated by economic activities (agriculture, forestry and fishing; mining and quarrying; electricity, gas, steam and air conditioning; and other economic activities) and households. Cooling water is excluded.

Urban wastewater: Domestic wastewater or mixture of domestic wastewater with industrial wastewater and/or stormwater.

Sewage: Wastewater is water that is no longer valuable for its intended purpose because of its quality, quantity, or timing. Cooling water is not considered here.

Wastewater discharge: The amount of water (in m3) or substance (in kg BOD/d or comparable) added/delivered to a body of water (fresh or not) from a point source.

Wastewater Treatment: The process of adjusting wastewater to meet applicable environmental or other quality standards for recycling or reuse.

✓ Formula for calculating the indicator

The amount of wastewater produced is calculated by summarizing all the wastewater generated by the various economic activities and households. It is measured in units of 1000 m3/day, although some data sources may use other units that require conversion.

The amount of wastewater safely treated is calculated by summarizing all wastewater flows that receive treatment considered equivalent to secondary or better treatment. This wastewater flow is expressed in units of 1000 m3/day, although some data sources may use other units requiring conversion.

The proportion of wastewater flows that are safely treated is calculated as a ratio of the amount of wastewater safely treated to the amount of wastewater generated.

Where it is possible to quantify both generation and treatment by source (industrial, tertiary or domestic), the proportion of wastewater treated will also be calculated separately by source.

b. Alternative proposal for data collection on the indicator

It can be estimated that 80% of the water supply that enters private households will subsequently leave the home as wastewater. Therefore, if data are available on per capita water consumption, they can be used to estimate domestic wastewater generation.

Household survey and census data can be used to indicate the proportion of the population using different locally available water supplies (e.g., municipal piped water, private boreholes with overhead tanks) and the proportion of the population using non-local water sources (e.g., communal boreholes).

Collaboration between National Statistical Offices (NSOs) and National Drinking Water Supply Companies can provide them with data on the per capita water consumption of people living in this category of households.

On the basis of a classification of households according to place of residence, household size and equipment, the value of per capita water consumption of people living in other household categories could be imputed.

With respect to the volume of treated wastewater, collaboration between NSOs and water treatment plants in different countries can provide data and estimate the volume of treated wastewater in each country.
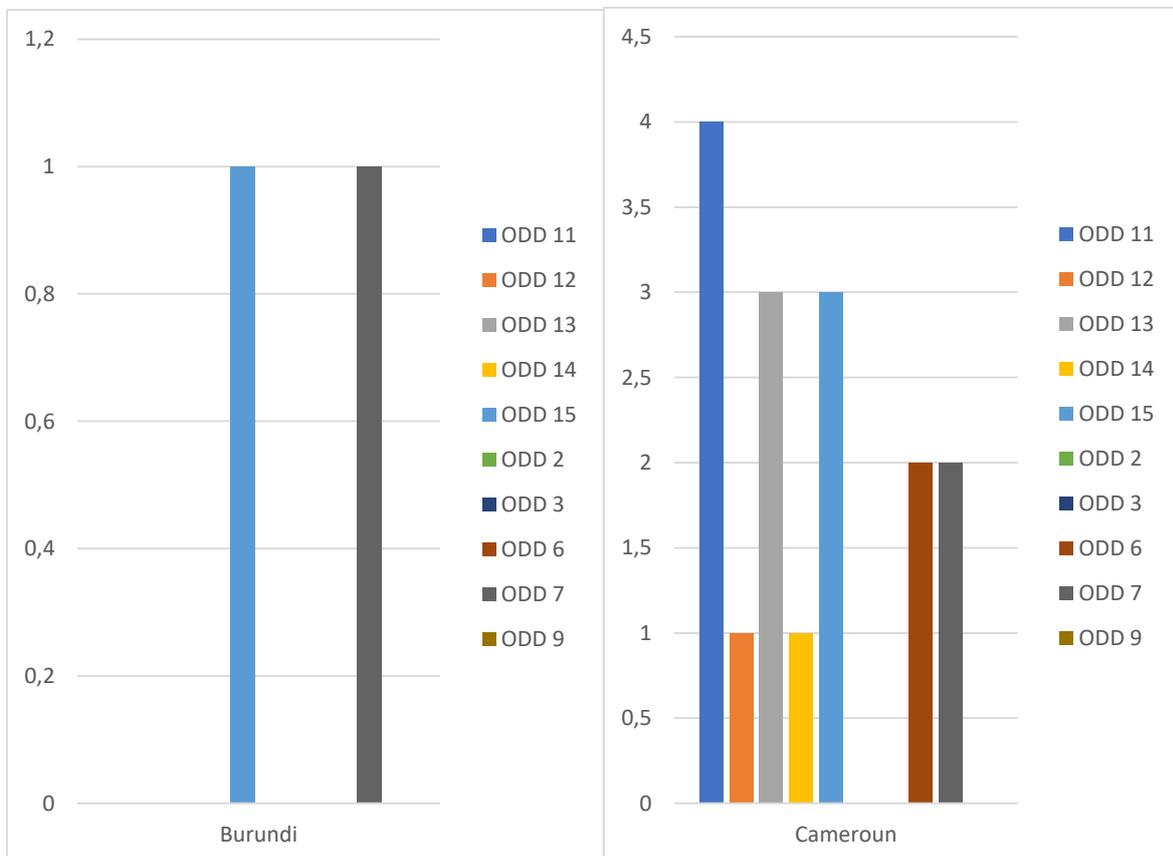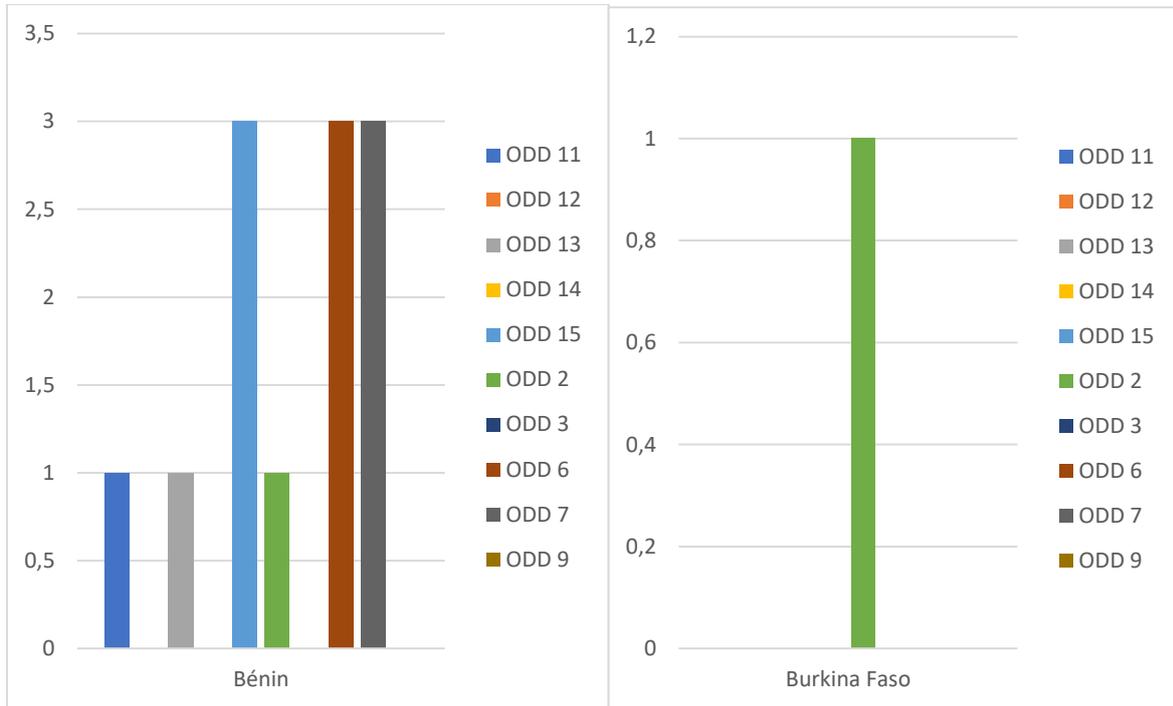
CONCLUSION

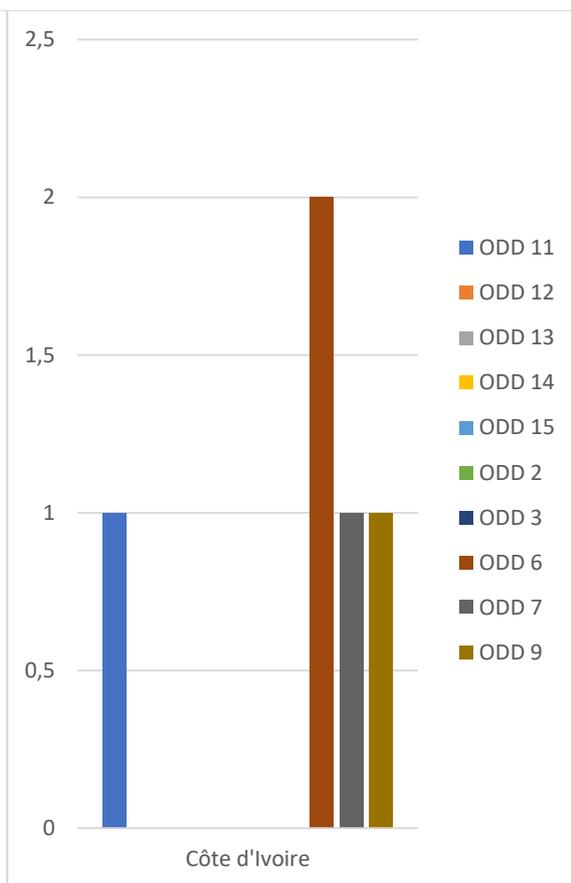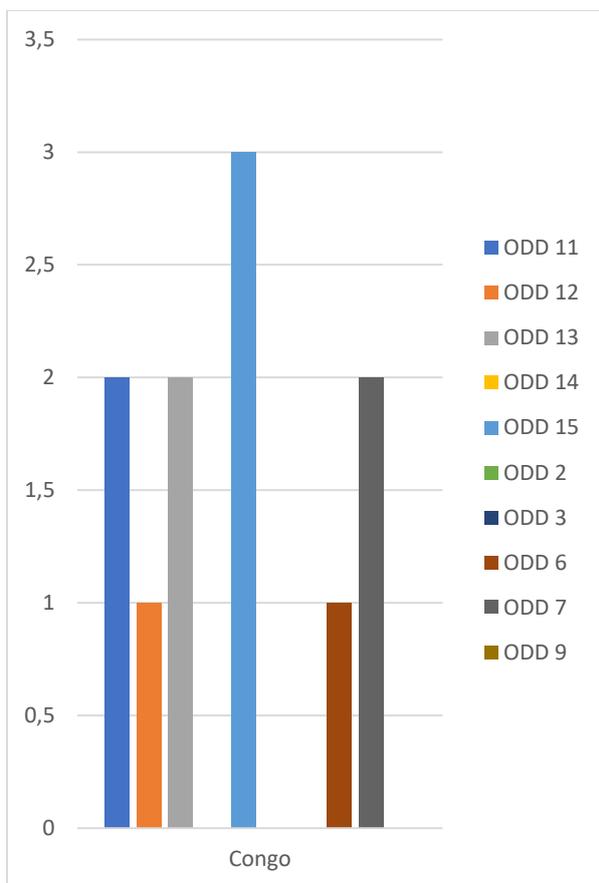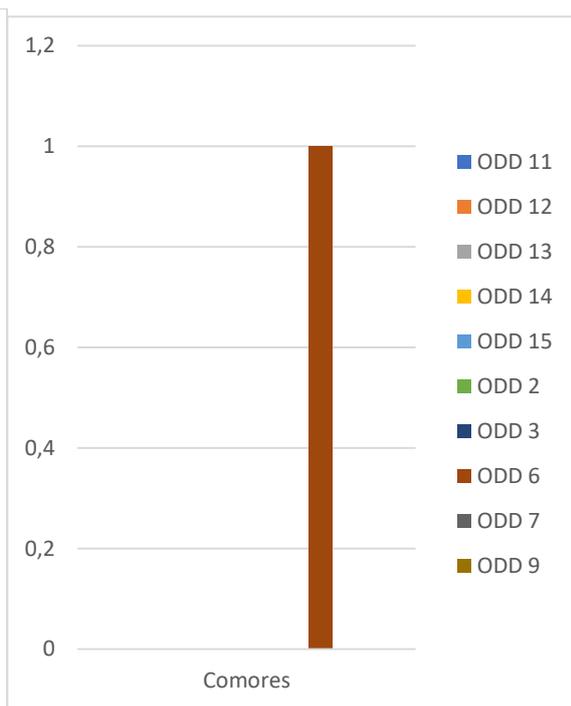The recommendations resulting from this work are intended for the international data production community.
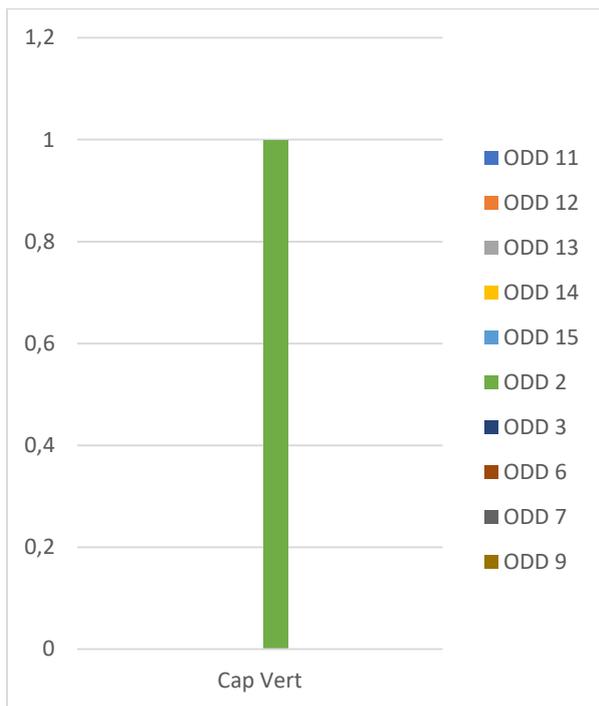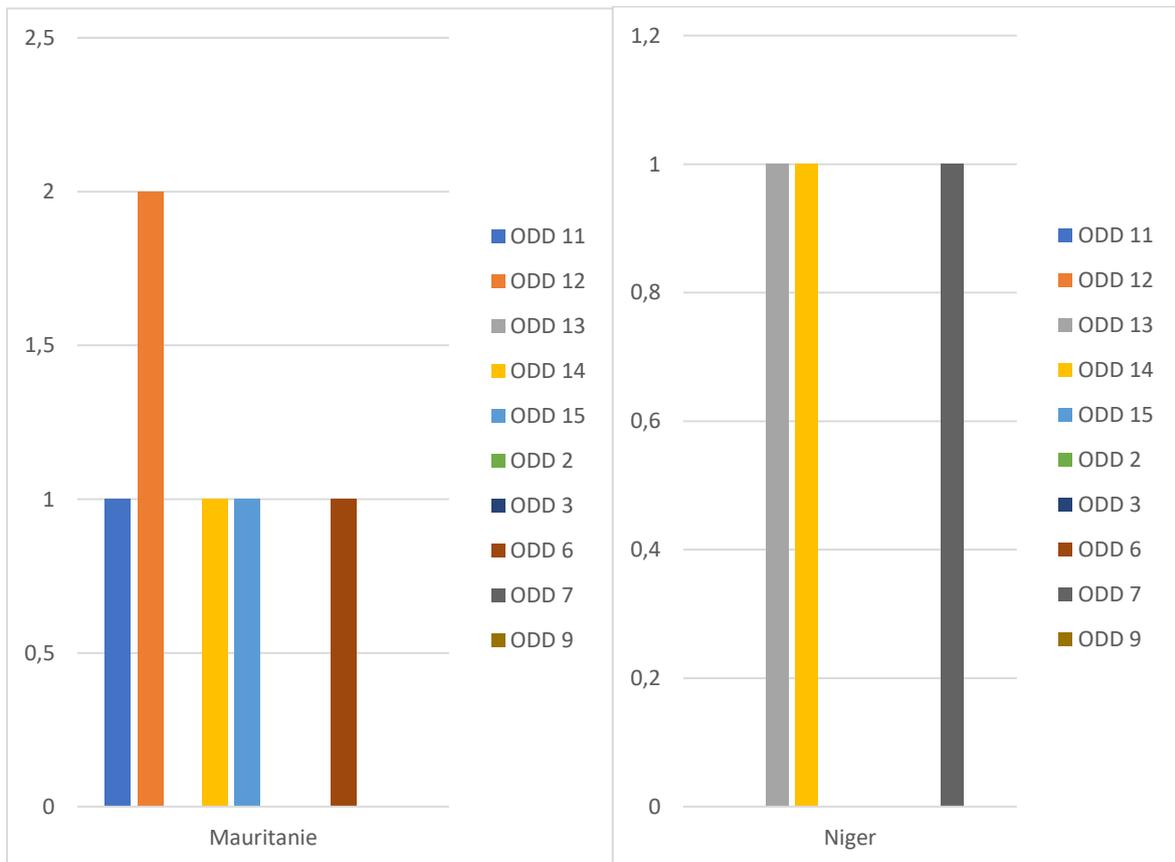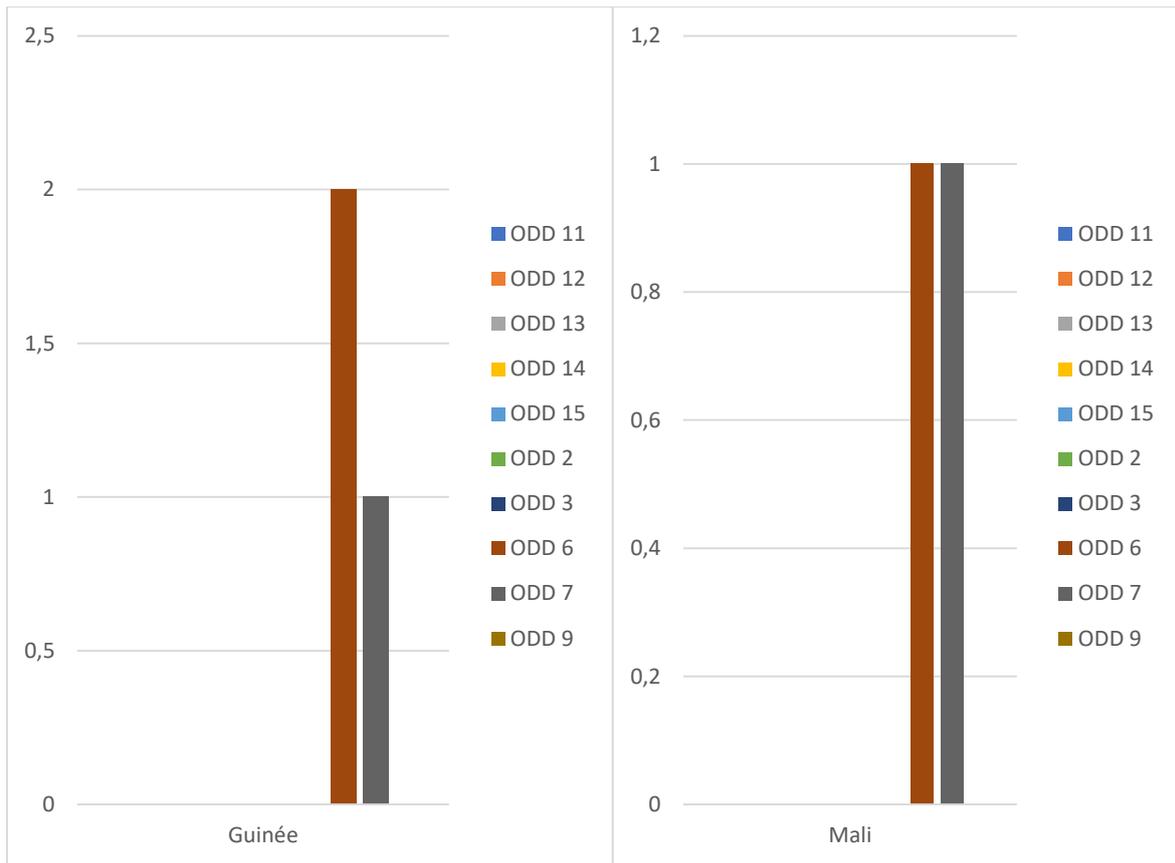
To the international data community, we suggest:

i. the establishment of a sustainable financing system for regular surveys; the involvement of the private sector and civil society in data production;

ii. the strengthening of statistical and institutional capacities for the systematic production of environmental statistics.

iii. The establishment of institutional measures to facilitate collaboration between NSOs and the private sector in the production of relevant statistical data for monitoring the implementation of the SDG indicators.
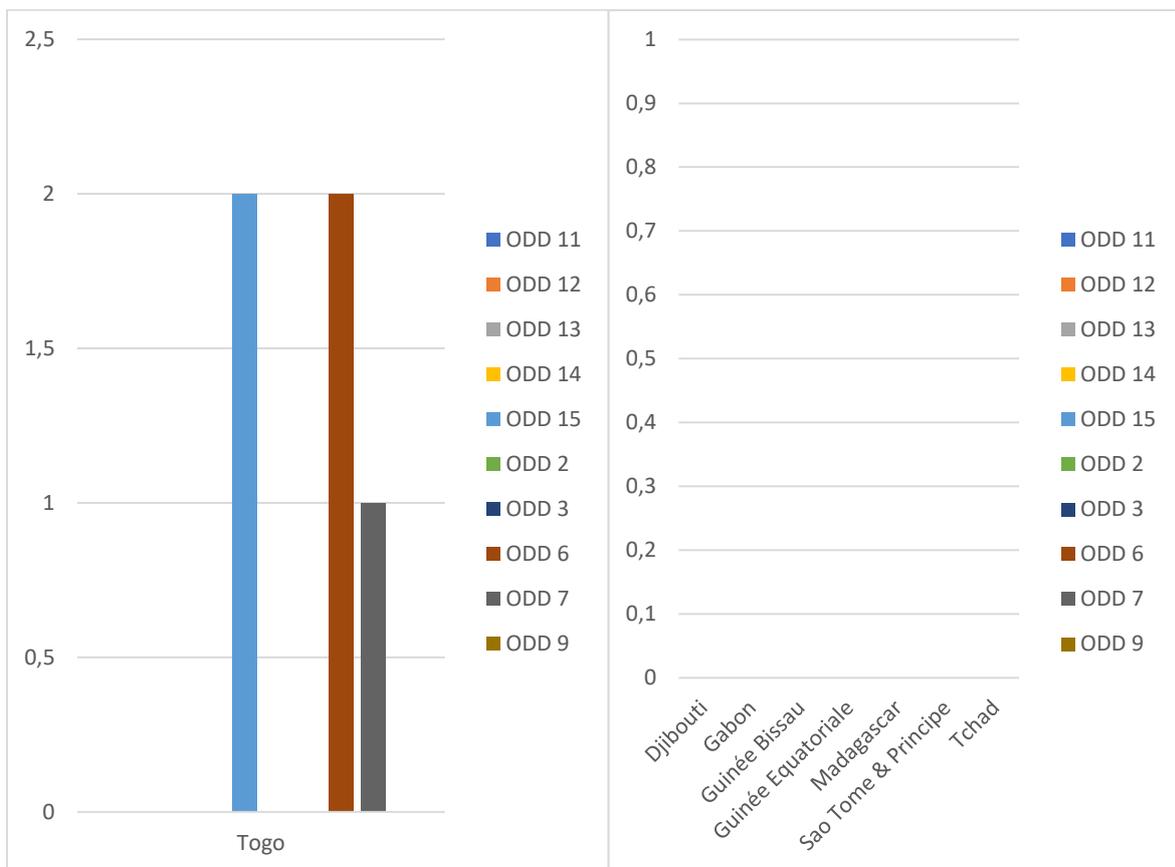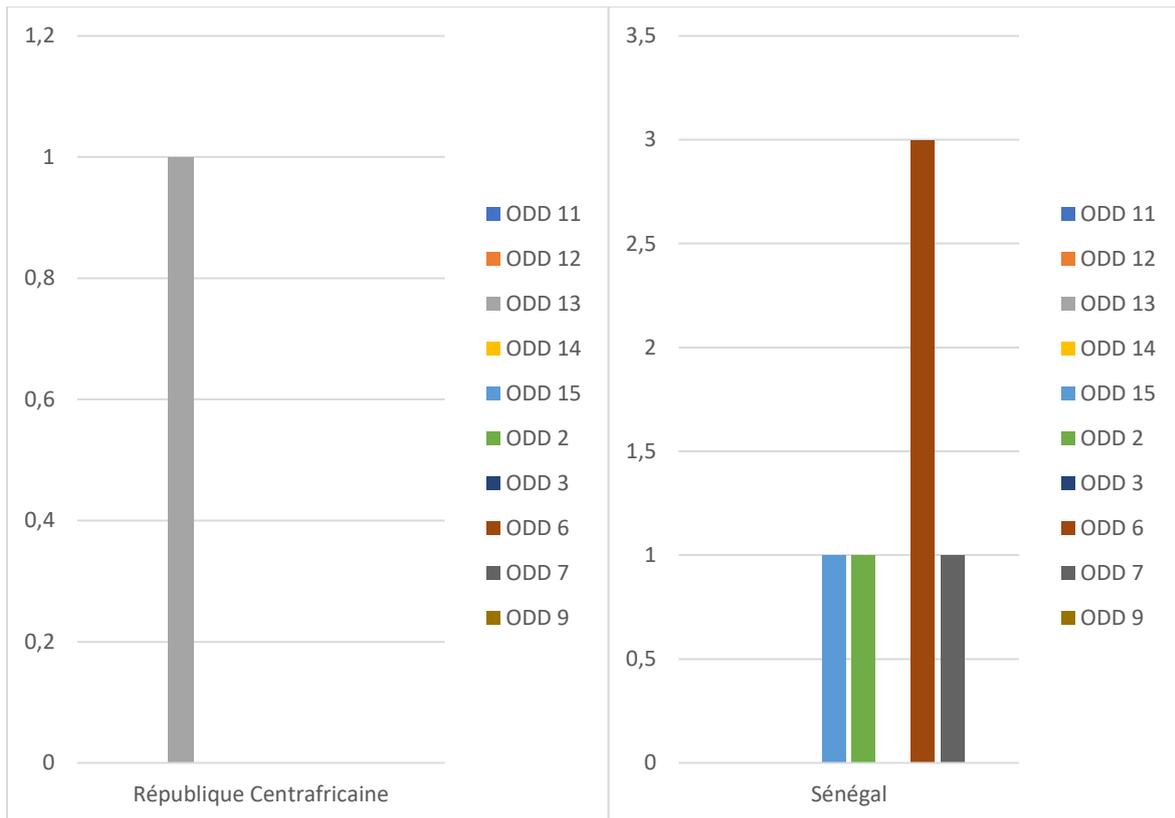
4. ANNEXES

Annex 1: Number of indicators produced by each sub-Saharan African country, according to the different SDGs related to the environment and agriculture.
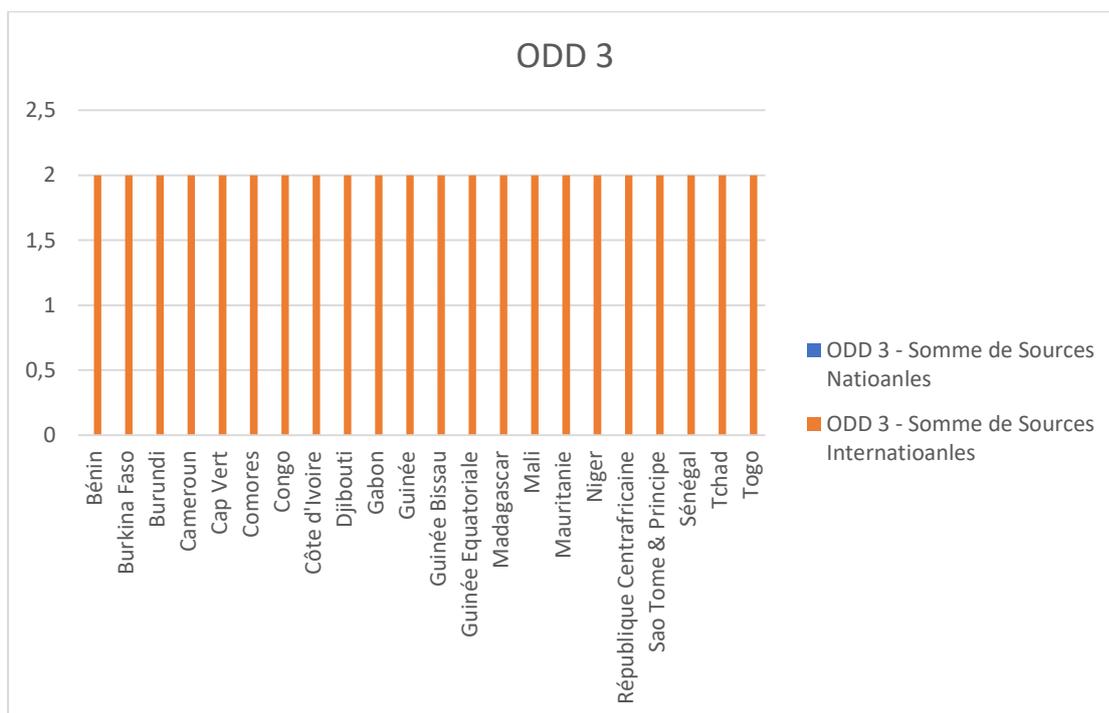
Cap Vert

ODD 11
ODD 12
ODD 13
ODD 14
ODD 15
ODD 2
ODD 3
ODD 6
ODD 7
ODD 9

Comores

ODD 11
ODD 12
ODD 13
ODD 14
ODD 15
ODD 2
ODD 3
ODD 6
ODD 7
ODD 9

Congo

ODD 11
ODD 12
ODD 13
ODD 14
ODD 15
ODD 2
ODD 3
ODD 6
ODD 7
ODD 9

Côte d'Ivoire

ODD 11
ODD 12
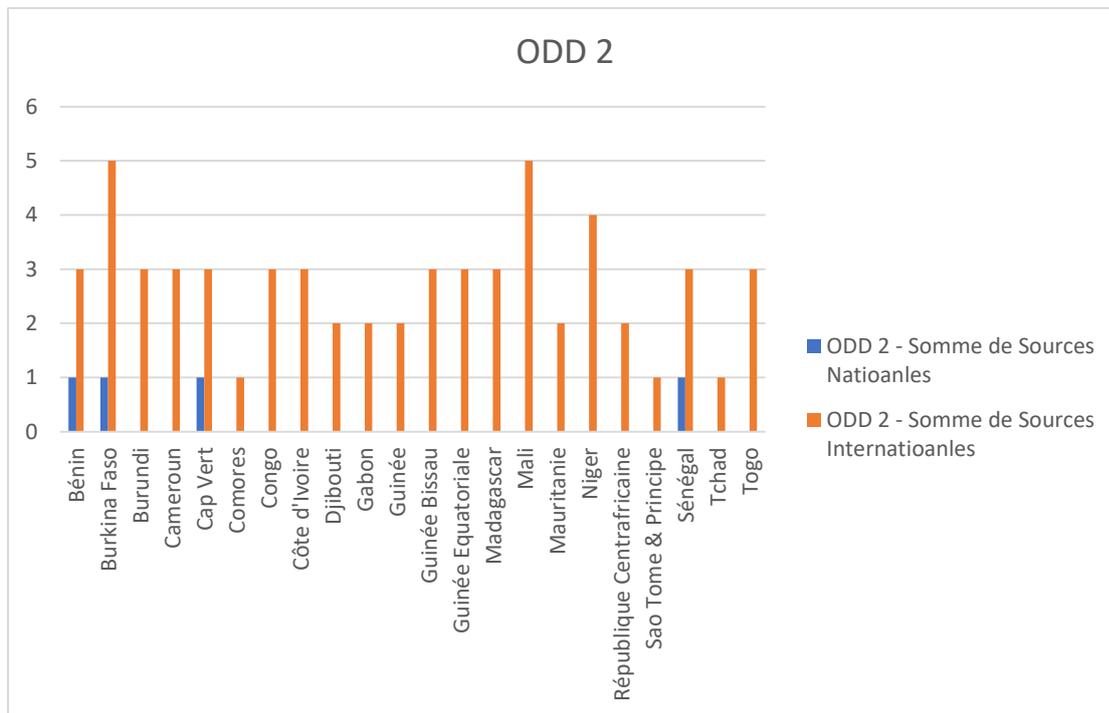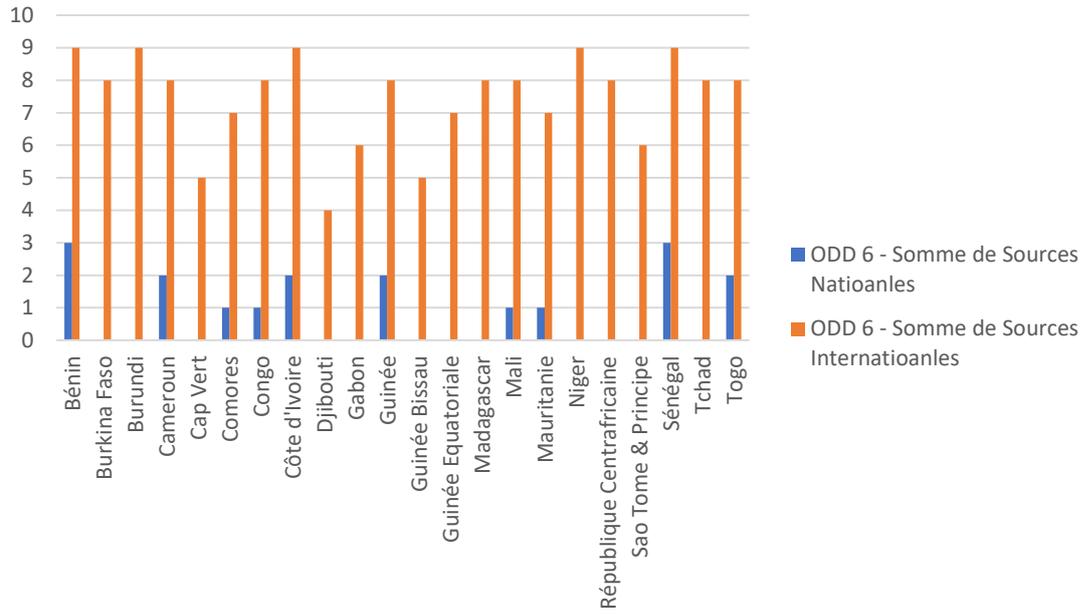ODD 13
ODD 14
ODD 15
ODD 2
ODD 3
ODD 6
ODD 7
ODD 9

Source: Our data from the collection operation of the available indicators.
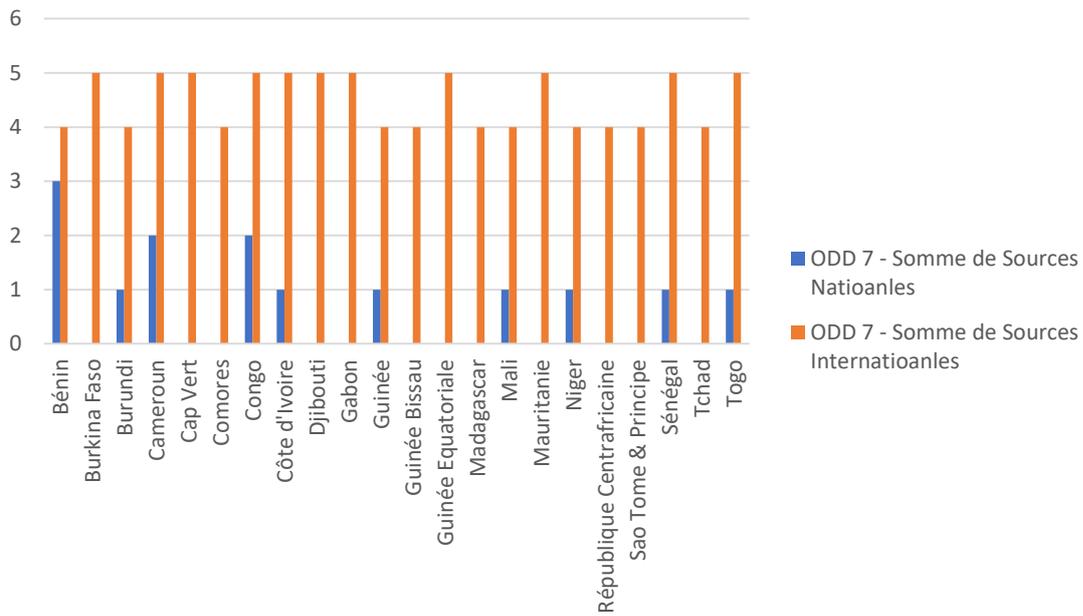
Annex 2: Number of indicators available for each of the Sub-Saharan African States, from different data sources (international or national), for the different SDGs related to the environment and agriculture.

ODD 6

- ODD 6 - Somme de Sources Natioanles
- ODD 6 - Somme de Sources Internatioanles

ODD 7

- ODD 7 - Somme de Sources Natioanles
- ODD 7 - Somme de Sources Internatioanles

ODD 9

ODD 9 - Somme de Sources Natioanles
ODD 9 - Somme de Sources Internatioanles

ODD 11

ODD 11 - Somme de Sources Natioanles
ODD 11 - Somme de Sources Internatioanles

ODD 12

Legend:
- ODD 12 - Somme de Sources Natioanles
- ODD 12 - Somme de Sources Internatioanles

ODD 13

Legend:
- ODD 13 - Somme de Sources Natioanles
- ODD 13 - Somme de Sources Internatioanles

ODD 14

Legend:
- ODD 14 - Somme de Sources Natioanles
- ODD 14 - Somme de Sources Internatioanles

ODD 15

Legend:
- ODD 15 - Somme de Sources Natioanles
- ODD 15 - Somme de Sources Internatioanles
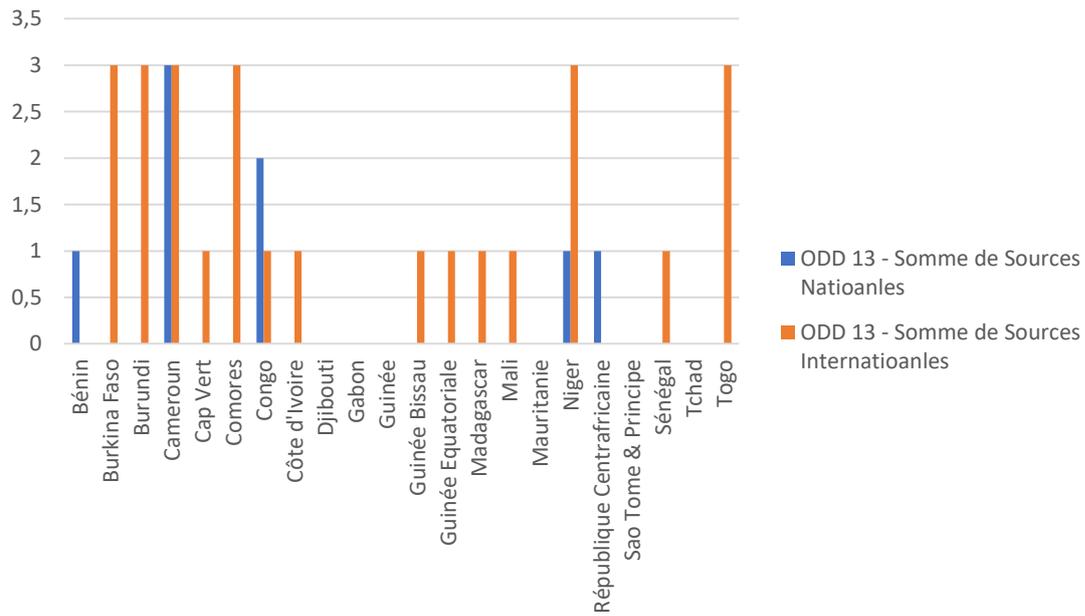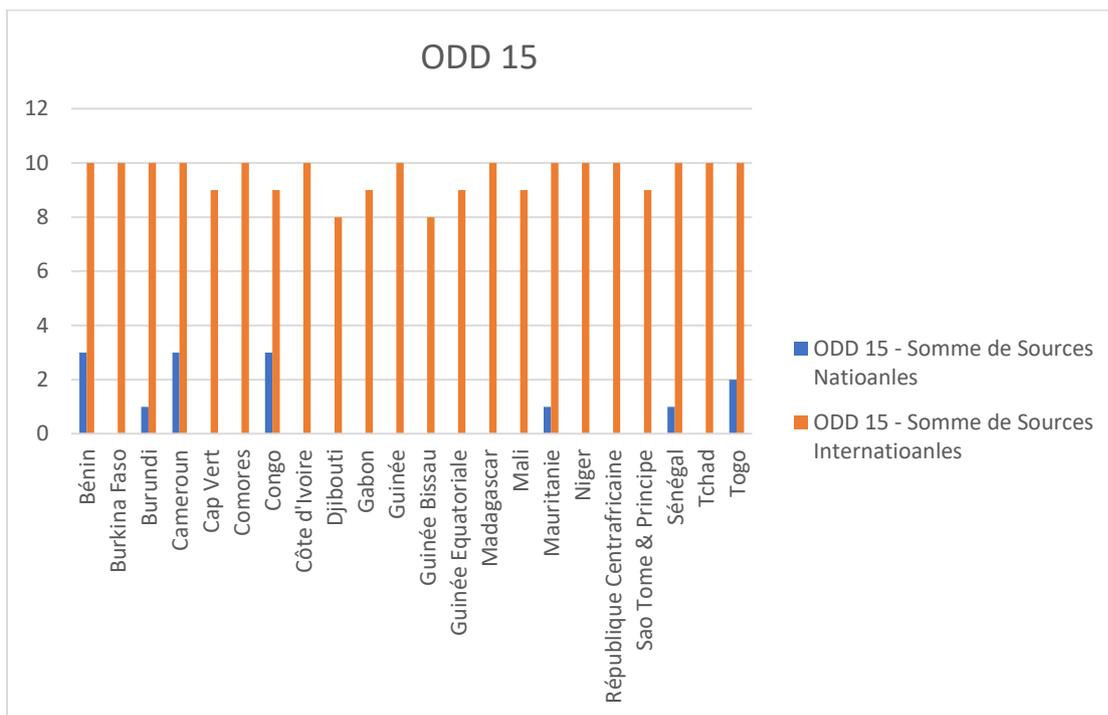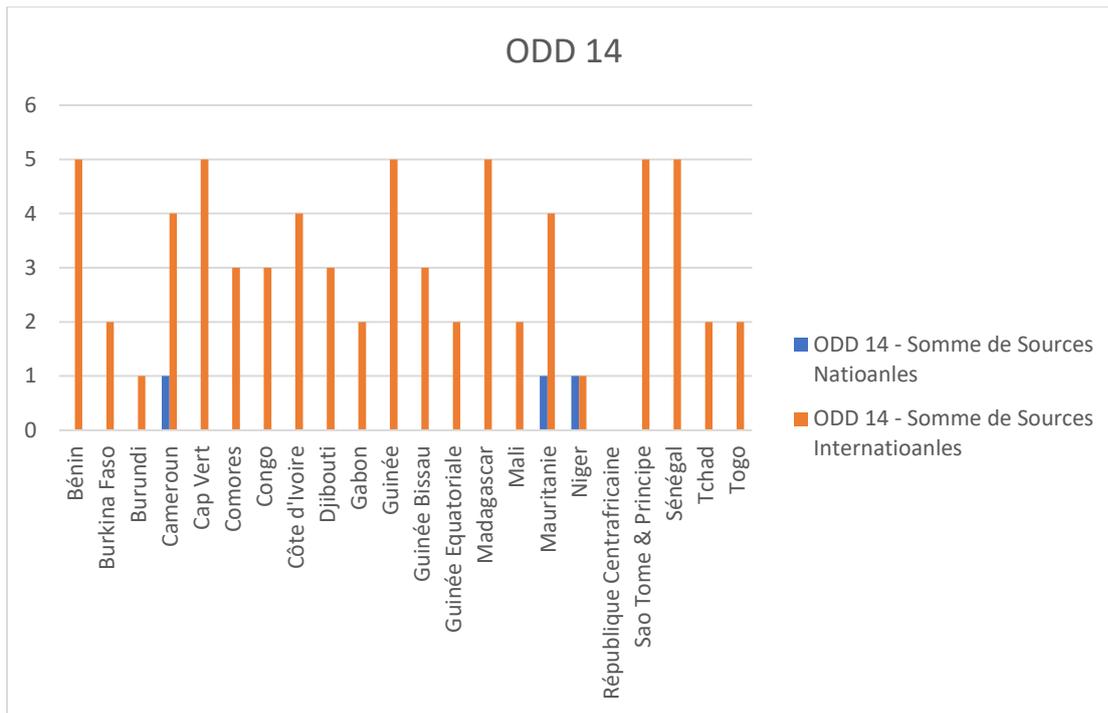
Annex 3: Agricultural module for the collection of data relevant for the calculation of indicator 2.3.1, based on the EMOP questionnaire

Numbers	Questions	Answers		jump
IA.1	**What is the nature of the respondent?**	1=Owner of the holding 2=non-owner farm manager 3=Other /__/		
IA.2	**What agricultural activities is your household involved in?**	A=Food /__/__/__/__/__/__/	A=Yam B=Rice C=corn D=Mil E=Cassava X = Other to be specified	
		B=annuity /__/__/__/__/__/__/__/	A=cashew B=cotton C=Cocoa D=Coffee E=Rubber F=Oil palm X=Others to be specified...........	
		C=Breedinge /__/__/__/__/__/	A=cattle B=Sheep C=Goat D= poultry X= Others to be specified...........	
IA.3	**What is the total area of land owned by the household?** **(Both those in operation and those not yet in operation or fallow).**	*Surround the appropriate unit of measurement* /__/__/__/__/__/ **Ha** ou **M²**		

IA.4	What is the current total area of plots devoted to agricultural activities?	*Surround the appropriate unit of measurement* /__/__/__/__/__/ **Ha** ou **M²**	
IA.5	How many plots does the household have for the practice of your agricultural activity?	/__/__/	
IA.6	What is the number of animals in your breeding activity?	/__/__/__/__/	
IA.7	How many production campaigns did you do last year?	/__/__/	
IA.8	What is the average number of workers you used per production campaign?	Men /__/__/__/ women /__/__/__/	
IA.9	What was their average frequency of work?	number of days devoted to agricultural activity per week /__/__/__/ day/week Number of hours worked per working day /__/__/__/ day/week	
A.10	What is the average volume of production you obtained per campaign?	/__/__/__/__/__/__/ Specify the unit ………………………..	
A.11	How many sales campaigns did you do last year?	/__/__/__/	
A.12	What is the average volume of production sold per sales campaign?	/__/__/__/__/__/__/ Specify the unit ………………………..	
A.13	What was the unit price of sales?	/__/__/__/__/__/__/ Specify the unit ………………………..	

| A.14 | How much do you estimate your average income from farming last year? | /__/__/__/__/__/

 Specify the unit
……………………. | |