2019 Compendium of Environment Statistics: The Bicol Region Experience

by

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ABSTRACT

This paper records the activities involved in the preparation of the maiden issue of the region's environment statistics, covering the period 2010-2018 and adopting the UN Framework for the Development of Environment Statistics (FDES 2013). Such compilation supports the monitoring and assessment of Sustainable Development Goals (SDG) indicators under the environment domain, as well.

The subsequent growing environmental advocacies from the different sectors of the society due to the environmental concerns that made more apparent has supported the importance of environmental statistics as we continuously look for sound direction along ecological conservation and protection and disaster risk mitigation. Specifically, the need for locally-disaggregated statistics is seen as key to better policies and decision-making, especially for the increasingly devolved local-level governance.

The first attempt to organize the team of compilers of environmental statistics in the region was the result of the series of meetings conducted among the Statistical Operations and Coordination Division (SOCD) of the Philippine Statistics Authority Regional Statistical Service Office V (PSA RSSO V) and consultations made with the Environment and Natural Resources Accounts Division of the PSA. The Training/Workshop on the FDES 2013 for the Generation of the 2019 Compendium of Bicol Region Environment Statistics was conducted, mainly to familiarize the participants and develop their appreciation for the available environment information system. It was followed-up with the conduct of the Consultation/Workshop on the Inventory and Assessment of Available Data on Environment Statistics to further mobilize the involved personnel and strengthen their inclination towards the desired final output, which is the 2019 Compendium of Bicol Region Environment Statistics.

The publication follows the UN FDES 2013 utilizing the six identified components in organizing environment statistics, namely: 1. Environmental Condition and Quality; 2. Environmental Resources and Their Use; 3. Residuals; 4. Extreme Events and Disasters; 5. Human Settlements and Environmental Health; and 6. Environment Protection, Management, and Engagement. However due to the limitation of statistics, related available data will be included upon determination of its relevance and use in the countryside.

The rigorous tasks of collaboration and the high demands in data harmonization met during the initial stages of compilation were identified as challenges. The publication is slated to be launched on October 30, 2019, as highlight in the Closing Program of the 30th National Statistics Month celebration in Region V.

1. Rationale

Bicol Region boasts both the richness of culture and natural resources. It is a home to a biodiversity that shelters diverse flora and fauna with its own fair share of endemic species. Tourists frequent the region with its impressive nature wonders and its warm and happy people. Aside from the popularity of its tourist attractions, the region's list of natural resources is almost endless. The 1,814 thousand hectares of land[1] cradles the richness of mineral resources, wildlife, forestry, commercial fishing, and agriculture in Bicol Region. The smallest fishes, *Pandaka pygmaea (sinarapan)* and the largest fishes, *Rhincodon typus (whale shark – Butanding)* both originated in the waters of the region, attracting tourists and magnets income to locals. In the 1990s, the region had the biggest reserves of limestone, and the third biggest reserves of shale. Its provinces are also known for their reserves of precious metals according to the Bicol Regional Profile of the Department of Environment and Natural Resources (DENR) V.[2]

According to a study conducted by the Geneva-based United Nations Office for Disaster Risk Reduction (UNISDR) and the Belgian-based Centre on the Epidemiology of Disasters (CRED), the Philippines has endured a total of 274 disasters for the past two decades.[3] Despite the glories of its natural resources, the geographic and physical location of the region makes it even more vulnerable to natural disasters such as storms, floods and earthquakes. Region V is frequented by natural calamities because of its location within the Pacific Ring of Fire and with agriculture as one of the economic drivers in the region, disasters directly affect its farmers and agriculturists as well as the lives of its vulnerable families.

The Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121) and the Climate Change Act of 2009 (RA 9729) envision to achieve (a) safer, adaptive and disaster-resilient Filipino communities toward sustainable development, and (b) a climate-risk resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystem.[4] Region V is notable for its good practices in Disaster Risk Reduction and Management through widest information dissemination campaigns to schools, communities and private sectors. Goal 13 of the Sustainable Development Goals (SDGs) also envisions a strengthened resilience and adaptive capacity to climate-related hazards and natural disasters in the country[5] thus, igniting the importance of programs and policies to mitigate the existence of various hazards and the region's vulnerabilities.

With the continued environmental challenges such as human caused environmental degradation aggravated by annual population growth rate; loss of agricultural land; soil erosion; air and water pollution; improper disposal of solid and toxic waste; loss of coral reef; mismanagement and abuse of coastal areas, among others faced by modern society, an increasing demand for environment statistics is renowned. Further, in recognition that human well-being are dependent on the environment and sustainability concerns to which actions needs to be taken, important indicators on environment needs to be generated which will be the basis for decision making and policy implementation.

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[1] PSA: Census of Agriculture and Fisheries Agriculture (ISSN 0116-4007), 2017

[2] DENR V: http://r5.denr.gov.ph/index.php/about-us/regional-profile, Bicol Regional Profile, 2019

[3] United Nations Office for Disaster Risk Reduction (UNISDR) and Centre on the Epidemiology of Disasters (CRED): The Human Cost of Weather-Related Disasters", 2015

[4] NEDA 5: 2017-2020 Bicol Regional Development Program (RDP), 2018

[5] United Nations Development Program: https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal13-climate-action.html

With this, the generation of the 2019 Compendium of Bicol Region Environment Statistics materializes the necessity of ensuring evidence-based decision makings in addressing environmental incapacities. It is in this context that the Philippine Statistics Authority Regional Statistical Services Office (PSA-RSSO) V recognizes the significance of environment statistics as a key to better policymaking decisions along with the growth of the demand for environmental advocacies in the area. The continuous search for ecological conservation, protection and disaster-risk prevention measures ultimately redounded to the concerted efforts for the region's environment statistics. Its compilation was anchored on the 2013 UN Framework for the Development of Environment Statistics (FDES 2013).

2. Objectives

Generally, the objective of this paper is to present the Bicol Region experience on the compilation of the 2019 Compendium of Environment Statistics.

The compendium specifically aims to: (1) provide information about the environment and the main factors that influence the environment (2) provide information on important changes in the environment over time and across locations; (3) improve knowledge on environment; (4) provide high quality statistical information; (5) provide information for the general public and specific user groups; and (6) support evidence-based policy decisions.

3. Scope and Coverage

Region V's environment statistics covers the six identified components in organizing environment statistics namely: 1. Environmental Condition and Quality; 2. Environmental Resources and their Use; 3. Residuals; 4. Extreme Events and Disasters; 5. Human Settlements and Environmental Health; and 6. Environment Protection, Management and Engagement. Other related available data will be included upon determination of its relevance and use in the countryside.

Environment statistics covers biophysical aspects of the environment and those aspects of the socio-economic system that directly influence or interact with the environment. Likewise, this include social and economic statistics describing activities with impact on the environment. For the purpose of this paper, all available environment statistics generated by source agencies were considered. Data included in the components of the FDES 2013 but not available were excluded in the report. This cover all the available environment statistics in Bicol Region and its Provinces from 2010 to 2018.

Validation and consultations regarding the available core statistics of Components 1-5 were made with the Environment and Natural Resources Accounts Division of the PSA prior to the identification of the compilers. However, due to the non-availability of some data of core statistics in components 1, 2 and 3, limited statistics will be covered.

4. Conceptual Framework
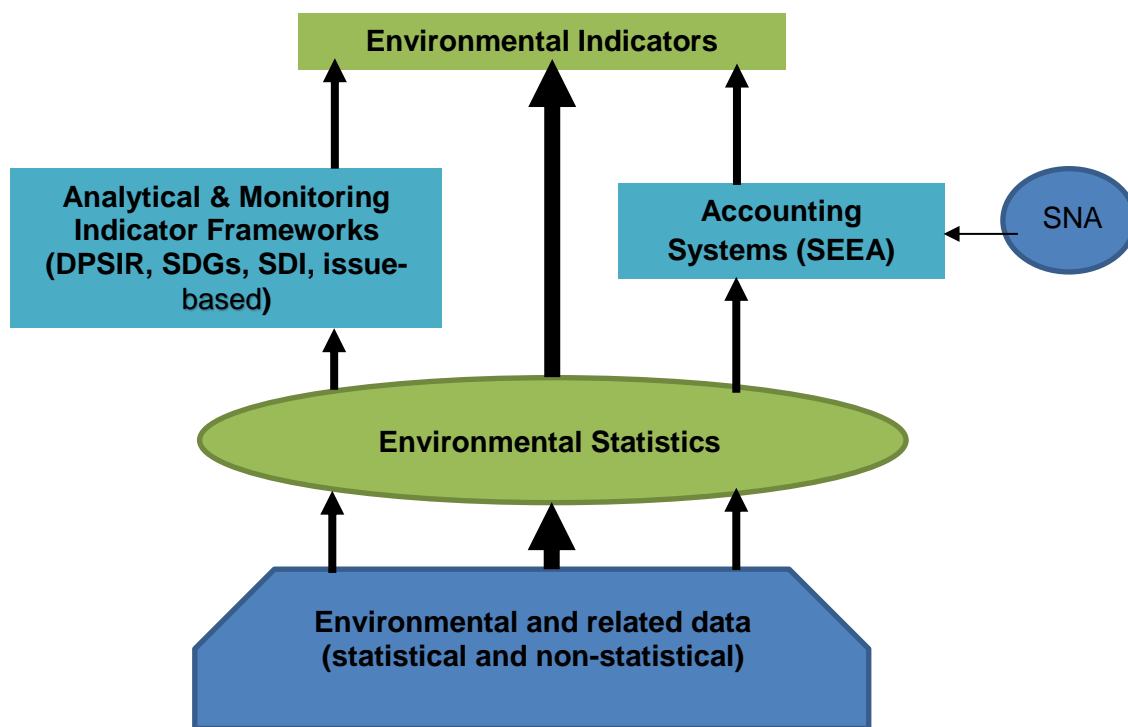
Figure 1. Generation of Environmental Indicators

Figure 1 shows the relationship of the environment statistics to other frameworks, systems and indicator sets as well as the generation of the environment indicators. Environmental and related data utilized in the generation of environment statistics as it includes data from both statistical and non-statistical resources. The generation of the environment statistics was made possible by the adaptation of the UN Framework for the Development of Environment Statistics (FDES 2013). It embodies the 6 components in the organization of the said statistics.

Figure 1 also mentions the relationship of environment statistics to the analytical and monitoring indicator frameworks and accounting systems which uses concepts and classifications in line with the System of National Accounts (SNA) in the integration of both environment and economic statistics. All of these systems and frameworks are correlated and results to significant environmental indicators.

5. Plan of Action and Implementation Phase

The Generation of the 2019 Compendium of Bicol Region Environment Statistics started with a training/workshop on the 2013 UN Framework for the Development of Environment Statistics (FDES 2013) which was conducted on May 21-23, 2019 at Patio de San Jose, Malilipot, Albay. The activity aimed to orient the participants with the compilation of regional environment statistics for Bicol Region adopting the component of the FDES 2013. Participants of the training/workshop were agencies that are sources of environment statistics such as Department

of Natural Resources (DENR) and its bureaus, the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA), Department of Health (DOH), Office of Civil Defense (OCD) and Provincial Planning and Development Office of Albay, together with the Statistical Operations and Coordination Division (SOCD) of the Philippine Statistics Authority Regional Statistical Service Office V (PSA RSSO V) and representatives of its Provincial Statistics Offices (PSOs). Trainers were from the Environment and Natural Resources Accounts Division (ENRAD) of the PSA. Each component of the FDES 2013 was thoroughly discussed especially its . The following are the components: Component 1 (Environmental Conditions and Quality) covers statistics on the physical, biological and chemical characteristics of the environment and their changes over time. Component 2 (Environmental Resources and their Use) focuses on the stocks and changes in stocks of the environmental resources brought about by human activities. Component 3 (Residuals) covers statistics on residuals which are flows of solid, liquid, gaseous materials and energy that are discarded, discharged or emitted by establishments and households through processes of consumption, production or accumulation. Component 4 (Extreme Events and Disasters) compiles statistics on the occurrence of extreme events and disasters and their impacts on human well-being and the infrastructure of the human subsystem. Component 5 (Human Settlements and Environmental Health) focuses on statistics on the living conditions of humans and how they affect their health. Component 6 (Environmental Protection, Management and Engagement) compiles information on the country's activities involving the protection and management of its environment. Participants presented the SWOT analysis of data gathering and compilation of environment statistics, data interpretation and value assessment of raw data as part of their workshop.

Table 1.8
LAND COVER CLASSIFICATIONS
2010
(In hectares)

Region/Province	Forest			Other Wooded Land			Agricultural		Fishpond	Built up Area	Other Natural Land			Inland Water	Grand Total
	Closed	Open	Mangrove	Fallow	Shrubs	Wooded Grassland	Annual Crop	Perennial Crop			Barren Land	Grassland	Marshland		
Philippines	1,934,032	4,595,154	310,531	7,247	3,355,180	3,829,046	6,275,993	6,168,360	244,968	692,079	97,303	1,431,342	131,499	481,421	29,554,156
V - Bicol Region	39,646	143,416	24,953	110	187,297	102,873	322,077	718,325	17,571	32,262	9,551	119,370	421	17,903	1,735,776
Albay	11,196	29,831	1,072	0	9,354	4,660	47,247	115,421	502	10,286	2,963	6,634	337	1,892	241,396
Camarines Norte	9,466	15,079	3,559	0	42,013	32,403	22,303	72,335	4,245	5,531	596	2,855	0	1,893	212,279
Camarines Sur	8,221	45,861	7,264	0	58,076	10,759	123,546	235,165	2,498	8,346	189	22,139	40	9,277	531,381
Catanduanes	10,763	32,249	1,995	0	56,618	2,063	9,262	26,451	307	1,709	198	3,191	0	1,330	146,137
Masbate	0	140	6,638	0	18,926	51,656	97,548	127,628	7,099	2,327	4,983	80,973	44	1,454	399,415
Sorsogon	0	20,256	4,425	110	2,309	1,332	22,171	141,326	2,919	4,063	621	3,579	0	2,057	205,169

Notes:
2010 Land cover data was generated from the interpretation of 10m resolution ALOS/AVNIR and
Administrative boundary was based from NAMRIA
Land cover classification was based from FAO 20
Source: National Mapping and Resource Information

Table 1.27
FOREST COVER OF THE BICOL REGION
2010
(In hectares)

Region Province	Closed Forest		Open Forest		Mangrove		Total	
	In Forestland	In A&D Land*	In Forestland	In A&D Land*	In Forestland	In A&D Land*	In Forestland	In A&D Land*
Philippines	1,817,173.0	116,874.6	4,079,932.8	515,258.1	203,590.6	107,002.5	6,100,696.4	739,135.2
V - Bicol Region	28,803.7	10,842.0	107,422.1	30,403.7	14,730.5	10,242.4	150,956.3	51,488.2
Albay	4,735.7	6,460.6	10,412.4	12,715.9	479.4	612.5	15,627.5	19,789.0
Camarines Norte	8,599.9	865.9	11,249.4	3,829.8	2,644.5	914.6	22,493.8	5,610.3
Camarines Sur	7,239.6	981.0	43,819.6	2,027.8	3,491.8	3,772.2	54,551.0	6,781.0
Catanduanes	8,228.6	2,534.5	28,248.1	4,000.8	700.1	1,295.1	37,176.8	7,830.4
Masbate	0.0	0.0	31.4	108.5	4,531.4	2,106.5	4,562.8	2,215.0
Sorsogon	0.0	0.0	13,661.3	7,721.0	2,883.2	1,541.5	16,544.5	9,262.5

* In A&D Land means In Alienable and Disposable Land
Source: National Mapping and Resource Information

Table 1.34
ANNUAL BIOCHEMICAL OXYGEN DEMAND (BOD) CONCENTRATION OF SELECTED FRESHWATER BODIES
2006 to 2015
(In milligrams per liter)

Region Water Body	Class*	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
V - Bicol Region											
Anayan River	C	3.0	3.9	2.8	2.9	4.0	...	...	...	...	...
Balos River	B	...	...	1.4	...	2.0	...	...	...	...	3.6
Lake Buhi	B	1.8	...	...	...	...	...	1.6	1.2	1.1	2.5
Naga River	C	...	...	...	...	...	...	...	...	70.4	6.2
Sagumayon River	C	...	10.2	6.9	17.0	23.0	14.4	15.6	11.8	23.8	22.6
Salog River	C	...	...	...	2.7	4.0	...	...	...	...	5.3

* See Annex

Table 1.35
ANNUAL DISSOLVED OXYGEN (DO) CONCENTRATION OF SELECTED FRESHWATER BODIES
2006 to 2015
(In milligrams per liter)

Region Water Body	Class*	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
V - Bicol Region											
Anayan River	C	6.7	5.9	...	6.3	5.1	...	...	...	...	...
Balos River	B	...	...	7.3	7.3	7.2	...	...	...	...	7.1
Lake Buhi	B	8.6	...	...	...	...	...	7.3	8.8	8.7	7.1
Naga River	C	...	...	6.5	...	...	...	...	...	4.6	6.5
Sagumayon River	C	...	4.3	4.3	3.8	3.1	4.5	6.4	3.5	3.5	3.8
Salog River	C	...	...	...	6.9	6.6	...	...	...	...	6.0

* See Annex

Figure 2. Examples of Accomplished Data Sheets on Different Components based on FDES 2013

A Consultation/Workshop on the Inventory and Assessment of Available Data on Environment Statistics was the next step in the process of compilation. It was conducted on July 10, 2019 at La Roca Veranda Suites and Restaurant, Gogon, Legazpi City. It aimed at producing the inventory of available data in the Bicol Region and assess which of these data should be included in the compendium. Same participants attended the said activity. Agreement on which data is to be submitted was done between PSA RSSO V and the concerned agencies. For every component of the compendium, modifications to the template of tables is allowed depending on the available data. Additional tables may also be submitted for inclusion. National data may also be broken down to smaller area for better appreciation. Remarks or notes may be included in the table for reference.

Based from the initial assessments done at the PSA ENRAD, in Region V, the following compose the available core statistics of Components 1-5, to wit:
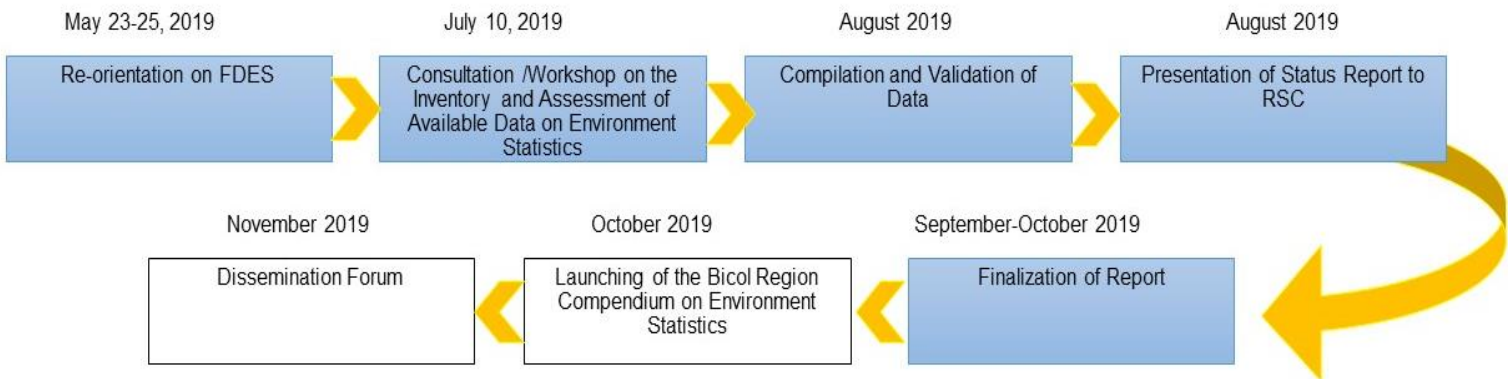
Component	Number of Core Sets
1	32
2	29
3	19
4	4
5	11

Of these components, only Components 4 and 5 will have a complete data of core statistics from the regional agencies concerned. On the contrary, six core statistics/indicators for Component 1 are not available, while Components 2 and 3 lacked one each. For Component 1, the Area of Ecosystem from the DENR Regional Office V, Conservation and Development Division will be included in lieu of the unavailable FDES 2013-designed regional data.

Representatives from partner agencies displayed enthusiasm during the two meetings conducted, however, available but incomplete data are the usual problems met by PSA RSSO V Focal Persons during the actual data collection from agencies. Also, difficulties were encountered, especially because some of the personnel sent to attend the two previous meetings were not actually the personnel-in-charge of data gathering in their offices. Collaboration within offices were also unexpected but had to be endured due to complex organizational structures and existing protocols in offices involved.

Submission of data from agencies was set in August 2019 and consolidation by the PSA RSSO V is in September 2019. Before the launching, another meeting with the concerned agencies will be conducted. During this meeting, the draft of the 2018 Compendium of Bicol Region Environment Statistics will be presented for comments and suggestions of data sources. Finalization of the book will be done before its launching which will incorporate the comments and suggestions gathered. The tentative date for launching of the 2018 Bicol Region Compendium of Environment Statistics is on October 30, 2019 as part of the 30th National Statistics Month (NSM) Closing Ceremony.

2019 COMPENDIUM OF ENVIIRONMENT STATISTICS ROADMAP

May 23-25, 2019	July 10, 2019	August 2019	August 2019
Re-orientation on FDES	Consultation /Workshop on the Inventory and Assessment of Available Data on Environment Statistics	Compilation and Validation of Data	Presentation of Status Report to RSC

November 2019	October 2019	September-October 2019
Dissemination Forum	Launching of the Bicol Region Compendium on Environment Statistics	Finalization of Report

Figure 3. 2019 Compendium of Environment Statistics Roadmap

6. Way Forward

The use of the FDES 2013 as foundation in the compilation of environment statistics in the region has led to the realization of the vastness of data which needs organization for possible inclusion in future updating of the compendium. A continuous inventory of environment data through interview of key personnel and focus group discussions (FGD) with different divisions of DENR and other offices that generate environment statistics should be conducted. Identification of more sources and its proper collection will narrow data gaps. Results of interviews and FGDs may be submitted to concerned authorities so that existing recording and data collection activities of data providers may be revised or enhanced towards responsiveness of data generated.

Plans on improving the contents of the compendium include collaborations with Local Government Units involved in disaster risk mitigation. These offices may be tapped for assessment of data requirements and also for inclusion of available data that may be replicated in other areas with similar plights.

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