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Economic Insights on Environmental Accounts of the Pacific

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Abstract

This article is among the pioneering attempts to develop official statistics on environment-economic accounts in the Pacific Islands Countries (PICs). It discusses region's challenges both in terms of statistical development and in use of environment assets. Special attention is drawn to significant rates of growth in inefficiencies and wastages, which point to developing better physical infrastructure and management practices. The study also highlights important capacity development needs for the regional NSOs, especially in relation to environment accounts which needs urgency attention.

Keywords: Official Statistics, Environmental Accounts for Pacific, Statistical Development, Water and Energy Accounts.

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1 Introduction

Climate change and its impact on human welfare and environment are real. The whole world is committed to dealing with the threats which have been induced to humans and their co-inhabitants, now with higher levels of intensity and frequency. Similarly, high-level global agenda are presently being mapped-out based on which country and regional interventions are being implemented. The intentions are to deal with unprecedented nature of climate effects and avoid other unknown threat that could potentially evolve. While climate-related events are termed *natural*, it is well-known that human activities, sometimes due to elusive quest for growth, lust and negligence can be correlated to promoting serious changes to the environment. These events seem to have weakened our asset-base, environment sustainability, income potentials, welfare and livelihoods.

The Pacific Island Countries (PICs) are highly vulnerable to such events, notwithstanding their size and nature of economic activities, but their limited ability to mitigate the threats. It is becoming highly relevant that these countries start keeping track of their carbon foot-prints, waste and resource management systems and sustainability of the supply of their resources so that use and replenish rates converge in a manner that they follow natural growth paths. In other words, we need to better account for our actions on the environment to ensure that there is a tomorrow. The United Nations and other international agencies have started investing in building capacity, knowledge-base, sustainable supply and/or use of resources to develop resilience in these economies. However, the uptake rates vary tremendously due to the initial conditions of these economies, reliability and availability of climate related data, political will, willingness to change and the ability to use the extended funding and resources.

Accounting for changes to environment and their impact on economic assets and human welfare have gained prominence following the revised global agenda on sustainable goals. It has gained additional support from a series of statistical developments championed by the United Nations dating back to early 1990s. The System of Environment-Economic Accounting (SEEA) emerged as a splendid outcome of the discussions between different agencies of the United Nations, expert groups, influential regional bodies of National Statistical Organisations (NSOs), end-

users and compilers of official statistics. This has promoted refinements in assessments of progress and measurement of indicators of sustainable development. Apart from the System of National Accounts (SNA), this framework would highly useful for developing meaningful economic accounts of the UN member countries. To date, both their implementations in the Pacific are unfortunately, incomplete. However, countries are moving to adopting variants of these frameworks to develop their economic and environment accounts.

The SEEA 2012 is the Central Framework presently used to assess the impact of the interaction of climate events on national assets (and on their stocks and changes in stocks), incomes, resources and welfare of people. The thematic areas in SEEA 2012 constitute environmental activity accounts, agriculture, forestry and fisheries, energy, air emissions account, energy, ecosystems account, land accounts, material flow accounts and account for water. The Central Framework, see United Nations (2014)⁵, represents an advancement over its 1993 version in the following ways:

1. In the previous version, there was extensive discussion on environmental degradation and associated measurement issues, included various approaches on the valuation of degradation. These have been reserved to SEEA Experimental Ecosystems Accounting and are excluded from SEEA 2012.
2. Country examples have been eliminated from the Central Framework and deposited to the SEEA website. In contrast, numerical examples are used for illustrative purposes in the 2012 framework.
3. Its previous version incorporated options for treatments of specific issues but these are not part of the Central Framework.
4. The Central Framework, however, uses SNA 2008 technical contents and national accounting language as opposed to its previous version which used the SNA 1993 constructs.

Other detailed changes to the four (4) key accounts can be found in the 2012 Central Framework, which is also the working manual for environment accounts.

⁵ The Central Framework is a joint effort of the United Nations, European Union, Food and Agriculture organization, International Monetary Fund, Organization for Economic Co-operation and Development and the World Bank.

This study surveys eleven (11) Pacific Island Economies' adaptation and use of SEEA 2012 and discusses the findings from three (3) country's selected SEEA accounts. Since these accounts are in embryonic stages of development, deeper level analyses are not possible at this stage. Nonetheless, there have been similar works by ESCAP (2017) including the UN's regional programs on capacity development in the Pacific. The present study intends to supplement the findings of ESCAP (2017). However, as more datasets became available (embedded with fine details), detailed analysis could be extended to others regional countries. Currently, the present findings are rather indicative, and we accept this fact.

This paper is structured as follows: Section 2 provides a summary of the major outputs related to SEEA accounts of the regional economies. Section 3 presents an analysis of the consistently available regional datasets in three (3) countries with key findings, while section 4 details the broader implications of this study. Section 5 concludes.

2 SEEA Outputs in PICs

This section closely concurs with ESCAP (2017) - its information basis is one of the ESCAP's region's capacity development initiatives implemented recently. Anecdotal evidences presented by the NSOs are summarized below. We find that the Central Framework was implemented in the Pacific in 2015. It was invariably well-received due to the many challenges faced by the regional data agencies, see details later. To date, four PICs (i.e. Federated States of Micronesia, Fiji, Palau and Samoa) have released variants of selected accounts compiled using the Central Framework with support from the ESCAP and other statistical development partners. Initiatives to accelerate further refinements such as deepening the scope and/or compiling other SEEA accounts are ongoing. Some of the NSOs are starting to compile selected environmental indicators and related statistics which is a good starting point. The ESCAP together with the SPC and the USP are advancing various capacity development initiatives⁶.

⁶ The SPC is driving activities on developing the core economic indicators and getting countries to advance statistical database for reporting on the SDGs. It also provides statistical development leadership and training. The ESCAP is currently developing a core set of the region's priority for reporting in on SDG, in addition to providing guidance and capacity development on SEEA. The USP is conducts academic training on official statistics and is in the process of including curriculum on SEEA under their Official Statistics program.

In Fiji, progress has been made on selected SEEA accounts, also analyzed later in this paper. Fiji's environmental policy priorities and tools are outlined in a number of national development frameworks, policies, decrees and Acts.⁷ The Fiji Bureau of Statistics has started compiling environmental statistics and have developed a variant of three flow accounts: energy (electricity), water (metered) and solid waste. Further refinements on these are ongoing - possible improvements are stated in ESCAP (2017) and summarized as follows: details of alternative sources of water supply are to be included and appropriated to the type of users, energy account needs to detail all energy production and disaggregate consumption by type of users, while the solid waste account must extend to include all disposable sites. It needs further details on supply and estimates of liquid and other wastes as well. The NSO continues to stretch its limited resources to further develop these experimental accounts, and is planning to progress towards new accounts such as land and Ecosystems.

The environmental key concerns for Papua New Guinea (PNG) are exploitation of natural resources, unsustainable logging, destruction of river systems from mine tailing and solid waste disposal. The Government of PNG has prioritized a number of policies and action plans⁸ to manage the environment. Currently, there are no existing official statistics on environment, although some environmental data can be sourced from relevant Government Ministries⁹. However, the usual caveats related to data generation apply, unless the NSO advances serious data collection exercises on PNG's environment accounts, which seems to be somewhat limited due to the lack of a coordinated national statistical system and political will.

In the Federated States of Micronesia (FSM), natural disasters, sea-level rise, warming temperature, ocean acidification, unsustainable harvesting practices, coastal erosion, solid waste and deforestation are the key environmental concerns. Accordingly, the FSM has developed a combined policy for climate change, adaptation and disaster risk management which is implemented through the various climate change and disaster

⁷ These include: Green Growth Framework, Pacific disaster, risk reduction and disaster management framework, National climate change policy, Rural Water and Sanitation Policy, National Liquid Trade Waste Policy 2013, Groundwater Resources Exploitation and Management Policy, Revised National Energy Policy 2014-2020, Offshore Fisheries Management Decree 2012, Water Resource Management Decree, Environmental Management Act (2005), Hotels Aid Act (1999),

⁸ The main ones are PNG Vision 2050, PNG Development Strategic Plan (2010-2013), and the National Strategy for Responsible Sustainable Development.

risk management policies and actions plans. The NSO's progress on compilation of environment data along the Central Framework is experimental at this stage, with support from the ESCAP. The FSM has published energy account (both physical and monetary) terms in 2015 and intends to invoke further refinements along adding alternative supply of energy, aligning with their national accounts, incorporating external use of energy. It also initiated activities to improve data collection and coordination with other institutions (ESCAP, 2017). The water and waste accounts have been identified as their next two priority accounts.

In Palau, the major environmental concerns include sea level rise, extreme weather effects, changes in seasonal rainfalls and disaster risks from droughts, typhoons and storms¹⁰. Palau has published two accounts under the SEEA framework (water and energy accounts for 2014 to 2016) and both are analyzed later in this paper. While efforts to further improve these accounts continue along the lines of the other NSOs in the region as noted above, Palau aims to compile more structured datasets on air emissions, ecosystems, biodiversity, agriculture and food security, land cover, forest and soil. It also intends to use these accounts to understudy the connection between tourism and environment to gauge economic aspects of environmental accounting. However, this remains a distant objective of almost all of the NSOs due to developments achieved so far on environmental accounting.

For Samoa, energy dependence, decrease in forest cover, fires and expansion, degradation of coastal habitats, invasive species, non-native forest species, threatened species, waste management, climate variability, forest clearance, and exploitation of natural resources are the major environmental concerns although sustainable development features strongly in Samoa's national plans¹¹. Accordingly, Samoa has prioritized environmental sustainability through developing disaster and environment resilience plans. The Samoa Bureau of Statistics produces various environmental

⁹ Relevant ones are: the Department of Lands & Physical Planning, Department of Environment and Conservation, Department of Health, Department of Education), National Research Institute, University of PNG, National Forest Authority, and PNG Water Board.

¹⁰ Policies to address these are included in Palau 2020 – National Master Development Plan, Energy Policy, Water Policy, Palau Climate Change Policy, Environmental and Natural Resources Action Plan, and EO “Zero Disposable Plastic” Policy.

¹¹ A number of Samoan Acts and Regulations pertaining to this include the Water Resources Management Act 2008, Waste Management Act 2010, National Parks and Reserve Acts 1974, Planning and Urban Management Act 2004, Ministry of Works Transport and Infrastructure Act, Disaster and Emergency Management Act 2007, Protection of wildlife regulations 2004, Marine

statistics (climate, conservation, energy, forest, and waste statistics) but so far has published only an experimental water account for 2015-2015 under the central framework. The water accounts include physical supply and use, flow, and partial monetary supply and use of water. There are plans to improve the water account by improving primary data sources, better mechanisms for data exchange and integrating this with national accounts data. Work on energy and waste account are at preliminary stages, although the statistical capacity in Samoa is far better than many other smaller NOSs of the region.

Kiribati's key policy priorities include water supply and sanitation, access to renewable energy, coastal adaptation, sustainable sea transportation, biodiversity conservation and management, waste management & pollution, and resource management¹². The environmental accounts prioritized are for water, energy, and land but with limited statistical capacity and recourses, the National Statistical Office (NSO) has not been able to make any tangible progress on these. At this stage, the NSO is compiling relevant environment datasets available from stakeholders and government departments.

Nauru has a parallel vision for sustainable management of environment and resilience to climate change. Energy, solid waste and water accounts are stated to be the main environmental accounts for this small economy. There are no development in SEEA accounts owing to limitations with compilation of environment statistics, environmental institutions, limited policy priority and instruments.¹³ However, there are some data and administrative records available from other sources¹⁴. Moreover, there exist opportunities requiring priority actions such as establishment of a Technical Working Group to organize and manage Nauru's environment statistics and a Statistics Advisory Committee (under the Bureau Statistics) to promote development of environment statistics.

wildlife protection regulations 2009, Planning and Urban Management (EIA) Regulation 2008 and Water licensing regulations 2011.

¹² Kiribati 20-Year Vision 2016-2036 (KV20: 2018), Kiribati Development Plan (KDP: 2016-2019), Kiribati Integrated Environment Policy (KIEP: 2013), Kiribati Climate Change Policy (2018), and the Environment Act 1999 (amended: 2007).

¹³ Nauru Energy Road Map (NERM 2018), Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt 2015), Nauru Water and Sanitation Master Plan (2015), and the National Solid Waste Management Strategy.

¹⁴ Related data are obtainable from the Nauru Utilities Corporation, Department of Transport, Nauru Revenue and Customs Office, Nauru Rehabilitation Corporation, community and private surveys, and other sources. Most data and information relating to environment are collected and

In the Republic of Marshall Islands (RMI), priority environmental concerns are water, land, food safety and climate-related natural disasters¹⁵ and on the flip-side, its policy priorities promote efforts to strengthen enabling environment (technology, legislations, funding and initiatives) for climate change adaptation and mitigation. However, to date, no SEEA accounts are available for the RMI and the data collection activities on environment statistics are also weak. Key accounts that the NSO considers important are water, waste and energy, as well as agriculture (for food security). At present, the most relevant data sources are various government agencies and authorities¹⁶ as well as national plans and other thematic reports.¹⁷ The NSO considers environment regulations and strengthening national statistical systems as the major way forward to developing sustainable environment accounts for the RMI.

The key environmental anxieties facing the Solomon Islands are increased demand for natural resource and space (leading to unsustainable rates of harvest/use), waste management, water pollution, sea level rise, increased natural disasters, coastal erosion, wildlife trade, overfishing and degradation of ecosystem and biodiversity. There are various sector plans¹⁸ and policy priorities¹⁹, with stakeholders and institutions managing different environment-related activities. Regardless of these possible primary data sources, there is no existing compilation of SEEA. The priority environmental data needs are for coastal and marine, biodiversity, inland waters and land. However, the NSO needs to develop (and act on) action plans to improve environment accounting as well as getting their national statistical systems activated. There seems to be a general

stored via online repository maintained by the Department of Commerce Industry and Environment.

¹⁵ Saltwater intrusion to wells and impacts of prolonged drought to crops, availability and quality of drinking water to meet the World Health Organisation (WHO) standards, storm intensity, erosion, flooding, impact of coral bleaching to coral and subsistence fisheries, changing rain patterns, air and sea temperature; and marine eco-system.

¹⁶ Economic Policy Planning and Statistics Office, National Energy Office, Office of Environmental Policy Planning and Coordination, Ministry of Foreign Affairs and Trade, Environmental Protection Authority, and the Marine Resources Authority.

¹⁷ RMI State of Environment Report 2016; Waste-Container Deposit Legislation passed by the Cabinet 2017; and the Ocean – RMI Remaanlok National Conservation Area Plan & National Oceanic Symposium Implementation Plan.

¹⁸ National Adaptation Programme of Action (NAPA) 2008; National Biodiversity Strategy and Action Plan (2016-2020); National Disaster Risk Management Plan 2010; Coral Triangle Initiative on Coral Reef, Fisheries and Food Security National Plan of Action (CTI NPOA) 2010; National Statistics Development Strategy (NSDS) 2015–2035; MFMR Strategy and Development Plan; and Tuna Management Plan.

¹⁹ Solomon Islands Water & Sanitation Policy (2013 -2025); Solomon Islands Ocean Policy and Marine Spatial Plan (in development); SI National Climate Change Policy; CTI-CFF National Plan of Action; Marine Protected Area Policy (2012); Solomon Islands National Waste Management & Pollution Control Strategy 2017-2026; Solomon Islands National Mineral Policy; Energy Policy; REDD+ Roadmap (Climate Change and Forest Management); Marine Protected Area Policy; and Aid Management Policy (2016-2020) operate under Fisheries Management Act 2015.

lack of urgency to promote statistical development in the Solomon Islands, although the NSO realizes tangible benefits of having well-constructed social and environment statistics.

Vanuatu's environmental concerns are natural disasters, deforestation, population growth, and climate change²⁰. The NSO has a clear mandate for data collection, analysis, and dissemination while the government ministries, departments, and corporations being the key data bank for environmental statistics. However, the NSO is aware of the limitations of over-relying on such data for developing valid and consistent accounts. There is no SEEA account yet, but there is an ongoing compilation of the land account's data. Environment data needs in Vanuatu are high, and these relate to food & nutrition security, blue-green economy, climate change & disaster resilience, natural resource management, and ecosystem & biodiversity.

Tonga's concerns including solid waste management, sea level rise, agricultural (for food and income security), energy, water, unplanned development, loss of biodiversity and ocean resources. Policy tools²¹ are in place, and stakeholders and institutions are more willing to supply environmental and related statistics when requested by the NSO, who does collect environmental data through specific surveys. However, to date, there is no SEEA accounts produced to Tonga. The key opportunity is the National Strategy for Development of Statistic (NSDS) which permits environment statistics to be captured by the National Statistical System (NSS).²²

As a synthesis, we can say that the Pacific region is in an embryonic stage of SEEA accounts development, and those that have some accounts developed so far, need to deepen statistical details. However, there seems to be a positive move towards understanding the prominence of environment accounts and priority seems to be land, water, energy and waste accounts. Some countries need to promote greater

²⁰ Policy priorities and tools to deal with social, economic and environmental issues are contained in the National Sustainable Development Plan, Waste & Pollution Strategy, Environmental Policy, Land Use Policy, Climate Change and Disaster Risk Reduction Policy, and Ocean Policy.

²¹ Environment Impact Assessment Regulation 2003, Environment Management (Litter & Waste Control) Regulation 2016, Park and Reserves Act 1998, Tonga Climate Change Policy 2016, Ozone layer protection Act 2014, and Biosafety Act 2005.

²² The NSDS will serve as a roadmap to address environmental data needs such as: capacity for collection of such statistics will be addressed, statistical related policies for the NSS will be in place for sustainable delivery of environment statistics; understand, address and prepare SEEA and climate change statistics; identify climate change related indicators and data needs based on knowledge and skills of SEEA accounting principles; trainings and improve Technical Assistants; increase National budget; improve communication channel with line Ministries; sharing information and data; and propose for funding opportunities and financial supports.

appreciation and political will towards environment accounts and tap-on the know-how and technical knowledge available in the other NSOs and statistical development agencies.

3 Analysis of Available Environment Accounts

This section presents data analysis of SSEA accounts which are consistently developed and available in the region (Palau, Samoa and Fiji). The FSM dataset is not congruent to others and so is excluded. Details in Table-1 indicate a mixed picture, but generally point to the “need to improve” side of story. For example, in Palau’s case, the general use of water and energy have amplified, but their contributions to economic growth have declined. This is supported by the developments in wastage which has grown sharply. Further, productive use of these resources have also declined. While energy use has gained efficiency, the same may not be true for water. Improvement in the intensity of use of water, however, seems be more apparent. It is also observed that per-capita use has declined, and further disaggregation would indicate which key agent(s) contribute to this development.

Indicators	Palau				Samoa				Fiji			
	Energy		Water		Energy		Water		Energy		Water	
	2015	2016	2015	2016	2014	2015	2014	2015	2013	2014	2015	2016
General use	-14.62	23.33	-0.08	24.91	-15.98	4.67	-9.24	-2.54	10.34	-3.125	5.97	3.39
Productive use	0.81	0.62	-6.65	-30.22	4.65	4.79	-11.54	-6.69	10.53	0	15.55	-1.24
Wastage	-15.43	22.71	6.57	55.13	-20.63	-0.12	2.3	4.15	4.76	22.73	-3.78	5.53
Efficiency	-29.31	-1.83	-23.61	-27.87	-13.26	3	3.8	-25.65	10.04	-5.31	11.27	-1.43
Intensity	0.05	0	0.02	0.05	15.29	-2.9	-3.66	34.51	-9.13	5.61	-0.06	0.08
Sustainability	-0.002	0.000	-0.001	-0.002	-1.153	-0.967	-0.963	-1.345	-0.909	-1.056	-0.005	-0.056
Per-capita use	-15.39	-0.72	-0.01	-0.04	-16.66	4.42	0.27	-24.62	10.76	-0.68	0.98	-0.14
Contribution to economic growth	2.58	1.61	-0.07	-0.39	4.2	3.02	0.616	0.985	0.28	0.01	0.123	0.102
Real GDP growth	11.39	0.53			-3.14	1.63					3.84	3.73

Source: Authors’ computations based on the available SEEA accounts

In Samoa, general use for both water and energy have increased and similar developments are notable in productive use. However, similar to Palau, wastage in the use increased. There seems to be some positive developments in the efficiency of use indicator for energy. Intensity of water use has significantly improved but efficiency has declined. Also the per-capita use like in Palau has declined. Contributions to economic growth from these resources remain low in both these countries. In Fiji, both general and productive use of both resources, together with per capita consumption seem to have declined. The wastages seem to have increased more seriously for both. Similar

indications are on the efficiency statistics, while intensity seems to have increased. Like in the other two economies, these resources are important to promoting economic growth, although their contributions remain slow moving. Nonetheless, the indicator on sustainability of these resources show only marginal developments in all cases.

4 Implications of the Study

The implications of this indicative analysis is clear. These economies need to scale-up infrastructure and technology to reduce notable losses which seem to occur at production and distribution stages, up-scale the efficiency of use, together with methods of promoting productive use of these scarce resources. Also, there remains a sizeable gap in improving intensity, although some positive developments are invariably notable. These are important for improving economic potentials to improve socio-economic lives of the people in the region.

In addition, we note that statistical developments in the region varies with the regional NSOs having serious challenges in their capacity to advance with SEEA accounts and environment indicators. Some of them have limited capacity to generate economic and social indicators. In addition, the region is faced with massive data generation tasks to fulfil their obligation on indicators of sustainable goals. However, there is some scope in re-collecting the fragmented spread of administrative records and data generated by other less organized statistical agencies within these economies.

As indicated above, the few countries that have developed segments of basic SEEA accounts have limitations. There is an incomplete set of basic statistics on supply and use, and those that exist need further refinements and dis-aggregations. Such an exercise will allow deeper level analysis of these accounts especially in pointing to the sources of inefficiencies and wastages and in connecting to real sector economic statistics. Key regional priorities are lack of technical expertise, funding, institutional coordination adequate regulatory frameworks, political will and the continuity of data supply.

5 Conclusion

This article intends to promote development of the key environment-economic accounts of the region. With limited data, it indicates that the region has a lot to progress on the development of the key accounts, as well on the use of scarce resources on the ground. Both are important developments for the Pacific region, especially in its progress towards the sustainable goals and environmental protection initiatives agreed to at local, regional and global levels. In the three countries analyzed, we find that wastages are to be minimized, efficient and economic uses be improved and sustainable practices are adopted.

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