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ACCOUNTING FOR ENVIRONMENT IN THE PACIFIC

Pacific island governments face difficult decisions related to finding the balance between utilising the natural environment as a driver of **economic growth** and preserving the environment for the cultural, social and economic well-being of current and future generations. Good **environmental policy** making requires good information and analysis. Environment statistics, through accepted **statistical frameworks** such as the System of Environmental- Economic Accounting (SEEA), underpin the ability to develop macro- economic policies that are sustainable (or green) in the **long-term**.

Why do we care about green growth?

In some Pacific Islands, neglecting green growth is adversely affecting food and water supply.

Population in PICs is rapidly increasing and the demand for healthy food and water will do so as well.

Green economy is the solution to many ecological, socio-cultural and economic problems.

Favorable economic outcomes can only be achieved if PICs learn to embrace green growth.

The Pacific Ocean spans 180 million square kilometres, or approximately one- third of the Earth's surface, but there are only 0.55 million square kilometres of total land in the Pacific island developing countries[1]. Excluding the large land mass of Papua New Guinea, the Pacific islands are approximately 0.09 million square kilometres – roughly between the size of New Zealand's North Island and Australia's Tasmania. The Pacific includes some of the most densely populated countries in the world (for example, Nauru and Tuvalu have more than 400 people per square kilometre – more densely populated than India).[1] While the habitable land mass of the Pacific is slowly shrinking due to climate change, the population of Pacific islands is rising.

Economic and social development of Pacific communities is necessary for reducing poverty, improving employment opportunities, providing social services, etc. However, the depletion of natural resources and the effects of development on the environment are often not taken into account in policy making. The natural environment is the basis for economic production and provides the basis for the supply of all essential goods (food, air, water, shelter, land and other resources). Unsustainable development not only depletes the resources necessary for future economic development but also degrades the capacity of the environment to provide the poor with subsistence services.

Stopping the vicious cycle of environmental degradation and social inequality relies on good policy making.

To develop integrated policies a strong evidence base through statistics, which bring together economic, social and environment data into a comparable and coherent framework, is essential.

"Environmental-economic accounting brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment. By using common concepts, definitions and classifications, the System of Environmental-Economic Accounts (SEEA) provides a transparent information system for strategic planning and policy analysis which can be used to identify more sustainable paths of development."[2]

The SEEA can be used to compile and organize existing data and also to identify and address data gaps and data quality issues. It provides a framework for statistics related to stocks and flows of natural capital (such as forests, water, energy or marine resources); the resource use of production and consumption; resource efficiency; emissions and wastes; land use and land cover; green jobs; government expenditure on adaptation and mitigation; ecosystem health; and other aspects of sustainable development.

Utilization or exploitation of natural resources

The depletion of natural resources reduces the sustainability of economic and social development. For most economies, there is a lack of information available for understanding resource use and depletion. In some cases (eg. forests, minerals, energy, agriculture) a wealth of data is available, but this data has often not been compiled or integrated into statistics that are useful for influencing national wa-

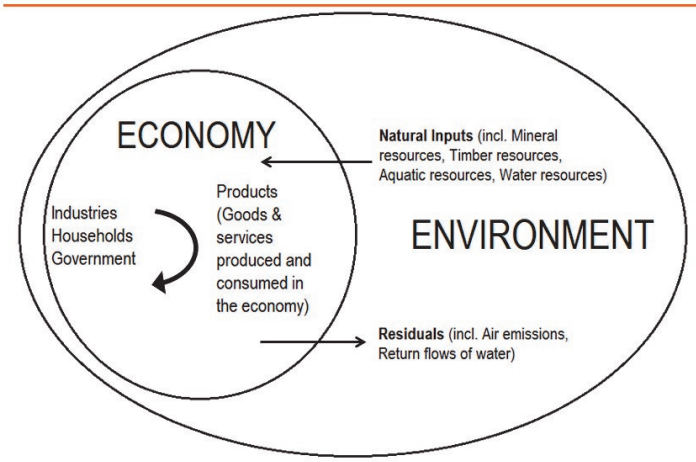
ter, marine resources, biodiversity), data availability is more limited. Environmental-economic accounting can be used as a framework for compiling integrated statistics and as a mechanism for identifying data gaps.

Oil and mineral resources are a scare, non-renewable resource.

Mining is a major, and increasing, component of the economy of three Pacific island countries: Papua New Guinea's nickel and gold mining; Fiji's gold mining; and the Solomon Islands' gold and nickel mining. In Papua New Guinea mining export earnings are estimated at 60-80% of total exports over the last 15 years[3]. In operations, many countries across the Pacific are involved in mining sand, gravel and rock – both for economic livelihood and subsistence[4]. The sea bed mining industry may further expand the contribution of mining to Pacific economies.

Mining can be a key source of economic growth and fiscal revenue that can finance development and help a country rise to a higher level of development.

Figure 1. Physical flows of natural inputs, product and residuals



Source: The System of Environmental-Economic Accounts Central Framework

However, to maximize the benefits, policy makers must determine a good tax and regulatory framework which takes into account the stock of available resources. Calculating the 'right' resource rent tax is a perennial problem in mining taxation. Environmental-economic accounting can provide a basis for determining the rate of recovery of resource rent by Government and for making decisions related to taxation (for example, see the Australian Minerals Resource Rent Tax Act 2012, which is an attempt to ensure that the "Australian community receives an adequate return for its taxable resources") .

The System of National Accounts 2008 defines a method for determining the operating surplus from mining and the net present value of natural mineral resources reserves. The SEEA further elaborates that the operating surplus can be used to calculate the "resource rent" after deducting the costs of production – the resource rent measures the value of depletion and scarcity. The SEEA also provides a framework for capturing the stocks and flows of mineral assets (see figure 2).

Land provides the foundation for income and food security of most Pacific island economies

Managing land in a way that protects biodiversity and forest health, generates fiscal revenue and ensures that both ecosystem health and fiscal revenue are sustainable is very complex and relies on good data. Land accounting can provide critical information for evidenced-based land management to inform zoning, land use and the establishment of protected areas. In the Pacific, unsustainable land management has resulted in inefficient development and a loss of biodiversity and forest cover. For example in the Solomon Islands forest cover has declined from 80% in the 1990s to 76% in 2009.

Agriculture is a major component of many Pacific island economies and subsistence farming provides food security to Pacific people. Additionally, forests provide valuable market and non-market resources which will be lost if timber use occurs faster than regrowth. Policy relevant agriculture and forestry indicators are necessary to evaluate how to promote sustainable agriculture for enhancing the food security and income of vulnerable populations. The SEEA provides a mechanism for the derivation of agriculture indicators and for the compilation of forest accounts.

Approximately half of all households in the Pacific rely on fishing as either a primary or secondary source of income[5].

Coastal resources are the main source of animal protein for many coastal communities[6]. Additionally, coastal and marine resources, particularly tuna, are a primary source of economic activity for many Pacific Islands. Overfishing and marine degradation threatens both livelihoods and food security.

The Secretariat of the Pacific Community produces estimates of the stocks of tuna and other high value fish resources[7]; however, few coastal resource assessments have been conducted in the region. Understanding fish stocks and annual changes in stocks, is necessary to make decisions to improve sustainable food security, economic livelihoods and long-term macroeconomic stability. The SEEA provides a framework for measuring both physical and monetary stocks and flows of coastal and marine resources.

The Pacific is completely dependent on imports to meet fossil fuel demand

According to the ADB, 85% of energy supply in the Pacific is from fossil fuel (this translates to approximately US$873 million and 1.3 billion litres of fossil fuel)[8]. Most of the energy is consumed in either the transport or industrial sector and many households lack access to electricity. A dependence on energy imports in the Pacific translates into vulnerability to changes in prices.

Energy security is a high-level political priority for many countries in the Pacific. The Government of Tonga in particular has been at the forefront of the initiation of the Sustainable Energy for All (SE4A) global commitment. The SEEA can provide a mechanism for capturing the proportion of energy from renewables which is useful for monitoring the commitments of Pacific Islands to increase the use of renewable fuel sources. For energy statistics to be useful it is important that there are regular (i.e. annual) data collections that provide up to date information on energy supply and demand.

The SEEA provides a framework for measuring energy use by industrial classification. Although some statistics on energy supply and demand already exist in the Pacific, data collections provide limited information on which industries are using the most energy and where that energy is coming from. By better understanding energy, it would be possible to assess the energy efficiency of each industry (i.e. energy use versus value added to the economy).

Many Pacific islands face acute challenges in coping with water security

Efficient use of limited water resources is an increasing concern for many small islands. For example, a few of the key issues include: (1) some small islands (or parts of islands) do not have a ground water supply and thus are completely dependent on rainwater catchment or desalination facilities (for example, Nauru); (2) available freshwater resources require careful management so that pollution, improper disposal of waste and salt water intrusion do not reduce the availability of freshwater; (3) rain water harvesting requires careful management to ensure that enough water is collected and that it remains safe to drink over time; (4) climate change, natural disasters, increasing population size, urbanisation, changes in water use patterns and industrialisation place additional pressure on the water supply; and (5) water infrastructure on small islands is very expensive on a per capita basis (for example, consider the difficulty of water infrastructure in Tuvalu which has a population of less than 10,000 spread across six atolls and three reef islands).[9]

Figure 2. Examples of basic accounting: minerals and forest

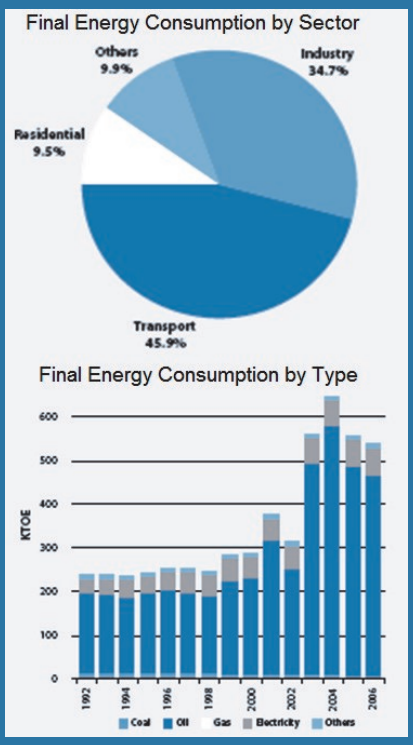
Monetary minerals account	*Gold*	*Copper*	*Nickel*	*Etc.*
Opening value	212,321	3,124	5,167	300
Additions				
Discoveries	5,135			3
Upwards reappraisals			561	
Reclassifications		51		
Total additions	5,135	51	561	3
Reductions				
Extractions	8,200	111		
Catastrophic losses	235			
Downwards reappraisals				
Reclassifications		10		
Total reductions	8,435	121	0	0
Revaluations	-3,300	-70	561	3
Closing value	209,021	3,054	5,728	303

Physical forest account	*Cultivated*	*Natural*
Opening stock	7,459	2,100
Additions		
Natural regrowth	610	511
Reclassifications		25
Total additions	610	536
Reductions		
Removals	372	
Felling residues		
Natural loses		
Catastrophic loses	413	230
Reclassifications	25	10
Total reductions	810	240
Revaluations	-200	296
Closing stock	7,259	2,396

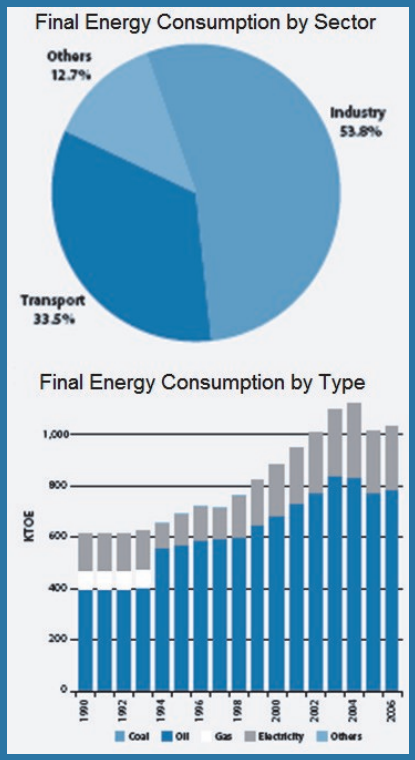
The numbers in this table are for example. They do not represent data from any country.

Figure 6. Energy consumption and supply in Fiji and Papua New Guinea

Fiji, 2006



Papua New Guinea, 2006



Source: Energy Statistics in Asia and the Pacific (1990–2006), ADB, 2009.

Water accounts could provide a framework for compiling information to answer questions, such as: Who has access to water? Who is using water? What is the overall availability of water resources?

Generation of wastes and emissions

The same way that economic development often relies on natural capital, economic development often generates additional waste and other residuals such as emissions. The impacts of wastes and emissions depend on the absorption capacity of the environment.

Increasing industrialisation, import dependency and urbanization have resulted in a growing generation of waste in the Pacific

Public health, Environmental health, water quality, tourism, fisheries, agriculture and individual well-being are in jeopardy from the lack of waste disposal options on small islands. Many Pacific island countries have highly limited land available for landfills and waste disposal which in some cases has resulted in improper terrestrial and marine dumping.

In many small island economies, strategies to promote certain sectors, such as tourism, do not consider the waste efficiency of the sectors being promoted. Understanding both the natural inputs required and the wastes produced is necessary for integrated sustainable development. A waste account is useful for demonstrating who produces wastes and what happens to the waste after it is produced.

The Pacific has an interest in being a global advocate for emission accounting

Pacific island government have stated their intention to be climate change leaders in promoting the need for international commitments to reduce emissions and halt climate change.

The SEEA provides a framework for monitoring emissions by industrial classification. This allows national and international stakeholders to see the pollution levels of different from industries (for example, emissions manufacturing versus agriculture). In countries with high levels of emissions this information is useful for developing mechanisms for curbing the emissions of certain industries. In the Pacific, the information could be used to develop policy to reduce emissions. The Pacific could use emission accounts as a platform for demonstrating the global need for better emissions accounting and responsibility.

"Recognizing our unique vulnerability to climate change, the predicted catastrophic impacts on the security and livelihoods of our people, and the significant benefits that come with our transition to renewable, clean and sustainable energy sources, we, the Leaders of the Pacific Islands Forum, confirm our climate leadership"[10]

A few points for discussion

There is growing regional interest in developing alternative macro- economic measures of development, such as 'Green GDP'.

The SEEA framework offers guidance on compiling green growth aggregates and indicators. The compilation of green growth indicators often relies on the availability of data across a wide spectrum of natural resources since "green economy" is a cross cutting issue.

Biodiversity, land resources and ecosystems have economic and social value.

The SEEA includes guidance on land accounting and there is an experimental framework for ecosystems. This experimental accounting framework could be very useful in the Pacific as it brings together GIS information and assessments of ecosystem quality. Biodiversity and ecosystems provide vital social, cultural and regulatory services. This topic will be addressed in a future ESCAP Pacific Office brief.

Tracking environmental protection expenditure by government is necessary to demonstrate the commitment of government for the environment. There are many transactions related to the environment that go unnoticed (for example, related to subsidies, permits, donations, and many others).

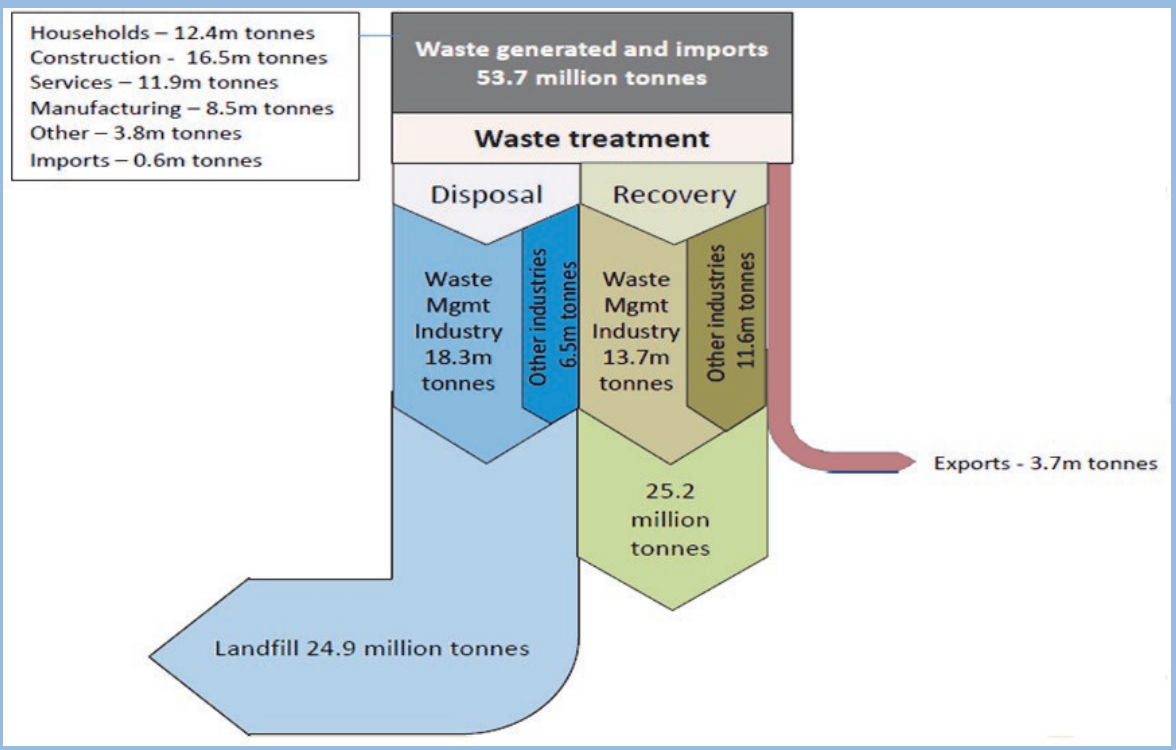
The SEEA provides a standard method for monitoring government expenditure. Additionally, expenditure on environmental protection, climate change and "greening" is often not obvious in the government finance statistics. Using the SEEA to harmonize the collection of government expenditure on the environment could add value to the Government finance statistics.

The compilation of national statistics should be aligned with national priorities and coordinated by the national statistical office.

The SEEA consists of (1) the Central Framework which focuses on the measurement of the relationship between the economy and the environment, and (2) the SEEA Experimental Ecosystem Accounting which measures the conditions of the ecosystems, ecosystem services and the capacity of the ecosystem to continue to provide ecosystem services.

The compilation of statistics has resource implications and thus countries should develop their statistical system to fill key information gaps that are relevant in their national context. Decisions on which SEEA modules should be compiled must be made at the national level.

Figure 5. Waste accounts example from Australian Bureau of Statistics



The above figure is an example of the type of information contained in a waste account.
Source: Australian Bureau of Statistics, Experimental Waste Account, 2013

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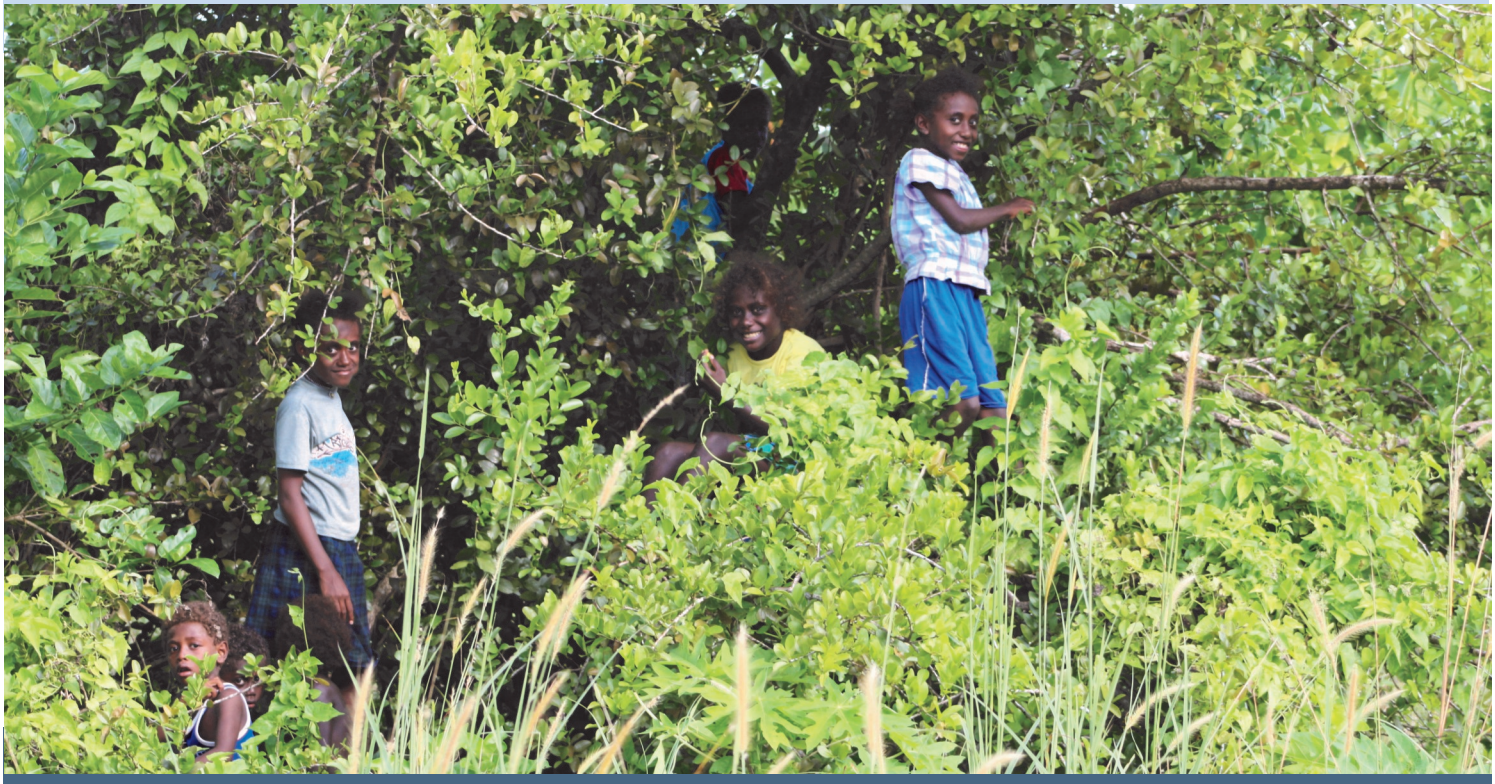

About UNESCAP Pacific Office

We work with Pacific island countries to promote sustainable development through:

a. conducting research on economic and social issues relevant to policy makers;
b. promoting regional cooperation and sharing knowledge and good practices;
c. providing regional policy advisory services;
d. building institutional capacity through training workshops; and
e. assisting policy implementation through pilot projects.

ESCAP Pacific Office policy briefs aim to take stock of current issues that face Pacific island policy-makers in their quest to achieve the sustainable development of their countries.

Author: Jillian Campbell, Statistician ESCAP Pacific Office, under the guidance of David Smith and Iosefa Maiava of the ESCAP Pacific Office and peer reviewed by UNSD and ESCAP Statistics Division.

UNITED NATIONS ESCAP
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Kadavu House, Level 5
414 Victoria Parade
Suva
Republic of Fiji