PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

THE INTEGRATED GREEN ECONOMY MODELLING FRAMEWORK

TECHNICAL DOCUMENT

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Cover Photo

A farmer from Kipilat village planting a tree in Anabkoi. © UN Environment/Riccardo Gangale/2012

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LIST OF ACRONYMS

ANPA	Agenzia Nationale per la Protezione dell'Ambiente
CGE	Computable General Equilibrium model
EGSS	Environmental Goods and Services Sector
GE	Green Economy
GEPAs	Green Economy Policy Assessments
GER	Green Economy Report
GTAP	Global Trade Analysis Project
HS	Harmonized System
IDE-JETRO	Institute of Developing Economics, Japan External Trade Organization
IGEM	Integrated Green Economy Modelling framework
INEGI	Instituto National de Estadistica y Geografia
IO	Input-Output model
ISIC	International Standard Industrial Classification System
NSIC	National Standard Industrial Classification System
MRIO	Multi-Regional Input-Output model
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
PRODESEN	Programa de Desarrollo del Sistema Eléctrico Nacional
SAM	Social-Accounting Matrix
SD	Systemic Dynamics model
SEMARNAT	Secretaria de Medio Ambiente y Recursos Naturales
UNDP	United Nations Development Programme
UN ENVIRONMENT	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WIOD	World Input-Output Database
WIOT	World Input-Output Table

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EXECUTIVE SUMMARY

Under the Partnership for Action on Green Economy (PAGE), UN Environment collaborated with modelling experts from around the globe to develop the Integrated Green Economy Modelling (IGEM) framework that aims to better respond to countries' needs in terms of analysing the cross- sectoral impacts of Green Economy (GE) policies, so as to incorporate some of the lessons learned from the application of existent modelling tools, such as the T21 model. Therefore, the IGEM framework is designed to serve three purposes: (1) it builds on UN ENVIRONMENT's past country experience with modelling green economy policies to answer increasingly complex requests from governments; (2) it supports the endowment of countries with solid quantitative tools to inform the design and implementation of green economy policies; and (3) it advances the process of implementing and monitoring some of the Sustainable Development Goals (SDGs), adopted in September 2015.

The IGEM framework presents a methodology on how to integrate three of the main modelling techniques used for green economy policy assessment to refine impact analysis of green policies and investments in the economy. It presents the linkages between a system dynamics (SD) model and a computable general equilibrium (CGE) model, building on input- output and social accounting matrix (IO-SAM) models. The goal of the first version policy questions. "Greening" includes modifications to the conventional models to analyse the impact on sectors that are related to the production and use of environmentally friendly goods and services, and it also includes the use of disaggregated data on these sectors. This implies making green sectors explicit and distinguishing them from other sectors which are defined based on conventional technologies and practices, as well as modifying some of the main interrelations of the model variables to better capture the impacts of green economy policies (policies inducing low carbon and resource efficient outcomes, among others).

In particular, a green IO-SAM model is featured by explicitly distinguishing the green sectors from other sectors which utilize conventional (high-carbon, less resource efficient) technologies and practices. A standard CGE model may be transformed into a "green" CGE model either by using input data on green sectors coming from the expanded IO-SAM; and/or by making specific modifications to the conventional CGE model to reflect the use of environmentally efficient technologies. These two approaches can be integrated. The System Dynamics (SD) model component of the IGEM framework can be best thought of as a SD model designed to focus on green policy analysis and to work in concert with the green CGE and green IO-SAM models. To do so, a green version of the SD model will develop the sector