Green Economy and Sustainable Consumption and Production (SCP) in the Philippines

(Anthony) Shun Fung Chiu

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Abstract: This paper assesses the potential towards a Green Economy (GE) in the Philippines. Through basic available statistics, an overview of the state of the country's socioeconomic profile, status of the natural resource base, and the impacts economic development on the environment is discussed. In terms of resource utilization, material flow accounts of the country show that there is no decoupling of economic growth with resource use. Moreover, economic development and the continuous demands of the population have resulted in atmospheric emissions, waste generation and water pollution. Water and energy demand are forecasted to increase in the next decades. While legislation to protect and manage the ENR is in place, these have yet to demonstrate nationwide potential in supporting a GE.

A SWOT analysis identifies numerous means by which GE can be achieved such as innovative yet indigenous approaches to agricultural development and resource management to strengthen the agriculture and industrial sectors; renewable energy R&D in an archipelagic country, as well as achieving economy of scale in refuse-derived resources and waste prevention. In conclusion, this report provides recommendations on policy, capacity building, partnerships and further works towards sustainable consumption and production (SCP), and GE in the Philippines:
1. Delinking the resource use and impact generation from economic growth through green industry in the context of green economy
2. Mainstreaming SCP in the context of climate change scenario, poverty eradication and emerging global issues
3. Up-scaling green industry action programs in the context of green economy
4. Capacity building
5. Establishing partnerships in scientific works
6. Studying resource use intensity data collection for priority sectors
7. Facilitating a behavioral change of consumption patterns

1   Background

UNEP defines green economy as "an economy that results in *improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.*" Green economy reshapes and refocuses policies, investments and spending towards a range of sectors, namely, agriculture, buildings, energy, forest, manufacturing, tourism, transport, waste and water. The UNEP launched the Green Economy Initiative (GEI) in 2008 to encourage investment in green sectors. To deliver a substantial share of public and private investment in green sectors, sustainable consumption and production (SCP) is critical. Interventions towards SCP are designed to contribute to the decoupling of growth in production and consumption of goods and services from resource depletion and environmental degradation.

The Philippines has been affected by the global financial crisis. Having lost more than 40,000 jobs and with 2009 GDP dropping to around 1%, the country is facing a number of challenges moving forward. Development has to address economic and social needs, and consider the environmental capacity of the country in light of the rapid depletion of natural resources and heightened pollution of water bodies and the atmosphere.

2   Macro-economic Profile of the Philippines

Economic growth of the country has been fairly consistent in the past years with the exception of 2008 where the impacts of the global financial crisis have been translated into a slowing down of the GDP growth rate at less than 4% and 2009 at roughly 1% (Table 1). The economy recovered in 2010 owing to the performance of the services sector as it continues to grow, contributing to more than 50% of the GDP and employment in recent years. The industry sector posted positive growth in 2010 and also contributes significantly to investments in the country, while the agriculture sector remains weak, growing at an average of 2.1% in the past five years.

Table1: Philippines economic and social indicators, as of May 2011

Indicators	2006	2007	2008	2009	2010
GDP (million PhP, current prices)[1]	6,031,164	6,648,619	7,409,370	7,678,918	8,513,037
GDP (growth %, constant 2000 prices) [1]	5.3	7.1	3.7	1.1	7.3
Agriculture	3.8	4.9	3.1	0.0	-0.5
Industry	4.5	6.8	4.9	-0.9	12.1
Services	6.5	8.1	3.1	2.8	7.1
GNI per capita (US$, current rate) [2]	1,310	1,510	1,770	1,860	2,050
GNI per capita, PPP (current international $)[3]	3,220	3,490	3,670	3,670	3,930
Gini coefficient[4]	0.46	-	-	0.45	-
Employment rate (%, January of each year)[5]	91.9	92.2	92.6	92.3	92.7
Underemployment (%, January of each year) [5]	21.3	21.5	18.9	18.2	19.7
CPI (2000=100)[6]	137.9	141.8	155.0	160.0	166.1

Inflation rate (%)[6]	6.2	2.8	9.3	3.2	3.8
Investment (million PhP)[7,8]	357,003	385,804	464,221	314,114	-
Local (%)	53.5	44.5	60.6	61.2	-
Foreign (%)	46.5	55.5	39.4	38.8	-

Source: [1](NSCB, 2011a);[2](The World Bank, 2011a); [3](The World Bank, 2011b);[4(NSCB, 2011b)]; [5](NSCB, 2011c);[6(NSCB, 2011d)];[7](DTI, 2010a); [8](DTI, 2010b)

The services sector is a key driver of economic growth, contributing more than 50% of the GDP from 2006 to 2010 and generating 51% employment (Figure 1). In terms of investments, the industry sector attracts the most funds even though it employs the least, and generates less than the GDP from services sector. Agriculture, on the other hand, contributes the least to GDP and investment, while employing about a third of the labor force.
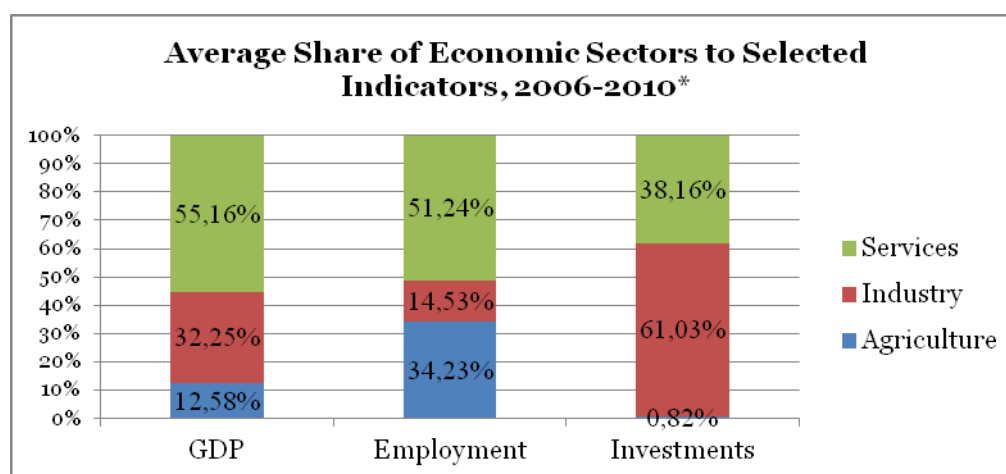

Figure 1: Average percentage share of economic sectors to GDP, employment and investments, 2006-2010

*Investments data reflect average for four years only, 2006-2009.
Source: (NSCB, 2011a), (NSCB, 2011c), (DTI, 2010a)

On a subsector level, manufacturing, agriculture and fishing, and trade and repair of motor vehicles, motorcycles, personal and household goods contribute the highest to the GDP (Table 2). The construction sector reported the highest average growth rate from 2006-2010 as it continually keeps up with the building demands, followed by mining and quarrying. While it is not specified in the table, the tourism sector posted an average growth rate of 8.21% from 2004-2009 contributing an average of 6.12% to GDP and 9.68% to national employment (NEDA, 2011).

Table 2: Average percentage GNI share and growth rate of economic subsectors, 2006-2010

Sector	Average % GDP share	Average growth rate (%)
1. AGRICULTURE	12.55	2.1
a. Agriculture and fishing	12.48	2.2
b. Forestry	0.08	-7.7

2. INDUSTRY SECTOR	32.25	5.0
a. Mining & Quarrying	1.04	8.9
b. Manufacturing	22.51	3.7
c. Construction	5.18	10.5
d. Electricity, Gas and Water Supply	3.52	4.9
3. SERVICE SECTOR	55.20	4.9
a. Transportation, Storage and Comm.	7.93	5.6
b. Trade and Repair of Motor Vehicles, Motorcycles, Personal and Household Goods	16.64	3.5
c. Financial Intermediation	6.32	5.1
d. Other subsectors*	24.30	5.7

Note: Calculated from (NSCB, 2011a)

*Real estate, public administration and defense, other services

Directing the development of the country since last year is the approved Philippine Development Plan 2011–2016 (PDP). Among the visions of the government is to realize an expansion of the economy through the development of the people's skills and energies "as well as the responsible harnessing of our natural resources." In particular, "inclusive urban developments where people of varying income levels are integrated in productive, healthy and safe communities" and "a government that will encourage sustainable use of resources to benefit the present and future generations" are said to be the way to move forward. Furthermore, the PDP recognizesthe environment as one of the key sectors that can mobilize this vision.

The PDP emphasizes the need for high inclusive growth that is sustained enough for it to translate into jobs creation, and for the majority of the population to experience it and to effectively reduce poverty levels. The PDP identifies lack of investments on infrastructure development, major gaps and lapses in governance (weak institutions and governance failures), inadequate levels of human development, and poor and degraded state of environment and natural resources (ENR) as the reason why growth in the country has failed to be inclusive, that is, low and narrow growth.

Among the ten-point agenda of the present administration and the specific goals that will address these gaps and that relates to the economy and the environment are as follows (NEDA, 2011):
1. Competitive industry and services sectors
    a. Create a better business environment to encourage investments
    b. Improve productivity and efficiency of the industry and services sector in terms of enhanced investments, and increased revenues
2. Competitive and sustainable agriculture and fisheries sector
    a. Improved food security and increased incomes with emphasis on productivity and production
    b. Increase resilience of the sector to climate change risks
    c. Enhance policy environment and governance
3. Accelerating infrastructure (transport; water; energy; information and communications technology (ICT); social – solid and toxic and hazardous wastes management, housing, health, and education) development
4. Conservation, protection and enhancement of the ENR
    a. Improve conservation, protection and rehabilitation of natural resources through sustainable use of ENR and integrated management

    b. Improve environmental quality for a cleaner and healthier environment through green jobs and greening of the industry, implementation of environmental regulations

    c. Enhance resilience of natural systems and improve adaptive capacities of communities to cope with environmental hazards including climate-related risks

3   Philippine Resource Base

Vast land and water resources of the Philippines provide ecosystem services to the population and the necessary raw materials for economic activities. Table categorizes the natural resources of the country to facilitate discussion.

Table3: Philippines main resources and subcategories

Land	Agriculture	Minerals	Energy	Water
Forest land	Forestry	Precious metals	Fossil fuels	Surface water
A&D land	Crops	Base metals	Renewable energy	Groundwater
	Fisheries	Non-metallic minerals		
	Livestock			
	Poultry			

The status of the main resources of the country is summarized, as follows:

1. Land. The Philippines has a total land area of 300,000 km^2. From 70% (21 million ha) in 1990, forest cover is now at 17.3% (5.4 million ha). The country's per capita forest area is at 0.081 ha (at projected population of 94.001 million), far from the global average per capita forest cover of 0.6 ha in 2010.

2. Agriculture. Fisheries and crops drive the growth in the agriculture sector, while forestry posted a negative average growth rate in the past five years. Despite the growth posted by these two sectors, climate catastrophes/ bad weather conditions have impacted their economic value. Land productivity of the country is less than other neighboring countries.

3. Minerals.Around 9 million ha (30%) of the total land area of the Philippines are potential sites for mineral deposits. Gold, copper and nickel are the abundant metallic minerals, while limestone, limestone marble, aggregate, shale and silica for non-metallic minerals. The highest production volume in base metals is nickel, while cement had the highest output among non-metallic minerals.

4. Energy. The country relies mostly on fossil fuels for its energy requirements. Fossil fuels account for 74% of the gross power generated in 2010, up from 64% in 2002; whiletotal energy generation increased from 48,467 GWh to 67,743 GWh. Wind and solar energy production of the country is currently at 1% of the total demand.

5. Water. Aggregated groundwater reserve is estimated at 50,000 km^2 with 20.2 billion m^3 potential. However, the per capita renewable water availability of the Philippines is 5,552.7 m^3/yr in 2007 that is below the world average of 8,349.4

m^3/yr and the second lowest in Southeast Asia. Annual water withdrawal in 2007 was at 6% of the total renewable water available.

Legislations to protect and manage the environment and natural resources (ENR) of the country exist which receives around 6.6% of the total budget in 2011. In comparison, the European Union allocates 42.5% of its budget to management of ENR, whereas Viet Nam and Malaysia apportions 25.2% and 4.17% of its budget for the environment, respectively (Table 4).

Table 4: Budget Allocation for Management of Environment and Natural Resources

Country/ Group	Budget (Billion USD)	% of Total Budget	Per Capita Spending on ENR (USD)
European Union		42.5	
Viet Nam	6.3	25.2	108.6
Malaysia	2.98	4.17	71.91
Philippines	1.7	6.63	18.02

Source: General Appropriations Act of 2011, (Vietnam Congress Passes 2011 Budget Plan),(Razak, 2010), (Financial Programming and Budget, 2011), (Vietnews, 2010)

Management of ENR is essential as raw materials are required for economic development and ecosystem services are critical to the rural population which heavily relies on the environment for livelihood and daily subsistence.However, economic development has resulted in a number of impacts on the environment of the country:

1. Greenhouse gas (GHG) emissions. Total GHG emission in 1994 is 100,740.12 Gg CO2e and 21,767.41 Gg CO2e in 2000. Energy and agriculture sectors both increased its emissions. The decrease is attributed to the substantialhectares of upland farms, tree plantations and grasslands that were not accounted for in the 1994 inventory (Table 5).

Table 5: Philippines GHG emission, 1994 and 2000

Sector	1994[1]	2000[2]	2008 (Projected)[1]
Energy	50,040.33	69,667.24	122,344
Industrial Processes	10,602.93	8,609.78	20,500
Agriculture	33,128.57	37,002.69	20,177
LUCF	-126.49	-105,111.37	4,492
Waste	7,094.78	11,599.07	9,644
Total (Gg CO$_2$e)	**100,740.12**	**21,767.41**	**195,091**

[1]GEF & UNDP, 1999   [2]CCC, 2010

2. Atmospheric emissions. Particulate matter with aerodynamic diameter of 10 microns (PM$_{10}$) and ozone (O$_3$) were identified as the pollutants of concern in Metro Manila (MM), and the transport sector is a significant contributor to particulate matter pollution in the region. Onlytwo out of ten monitoring stations in MM were able to record values below the TSP guideline value of 90μm/NCM for 1 year averaging time.

3. Waste. The per capita waste generation per day in the country is 0.30 kg in rural areas and 0.50 kg in urban areas with the exception of the National Capital Region (NCR) at 0.71 kg. Total waste generated nationwide per year is estimated at 12.15 million tons in 2007 and NCR contributed 24% to waste generated.
4. Water. Less than 50% of the water bodies of the country passed the prescribed criteria for dissolved oxygen and biological oxygen demand, and only 20% of the water bodies classified for drinking passed the total suspended solid requirement.Coastal waters also appear to be prone to fecal coliform contamination.

In terms of resource utilization, material flow accounting (MFA) was calculated in the present paper. Results show that GDP growth equates to increasing resource utilization. There is no decoupling of economic growth with resource use. Per capita domestic material input (DMI) has been increasing since 2000 (Figure 2), alongside with the increase in usage of energy carries like coal and oil. On the other hand, DMI per GDP shows signs that the consumption of raw materials is becoming more efficient (Figure 3).
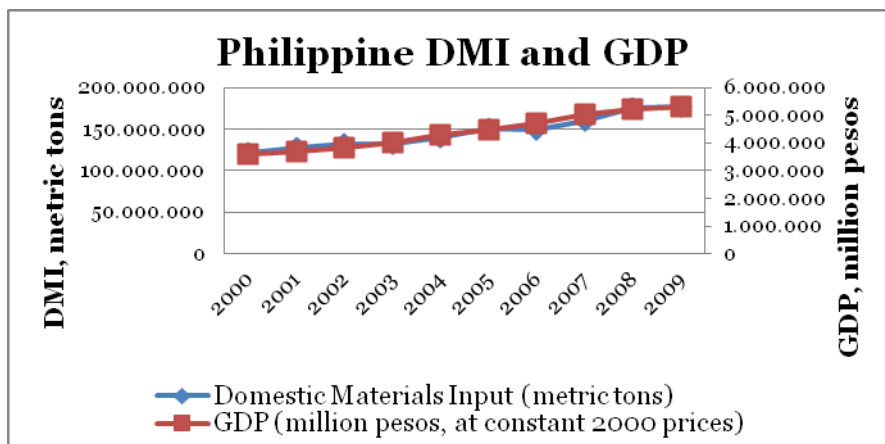

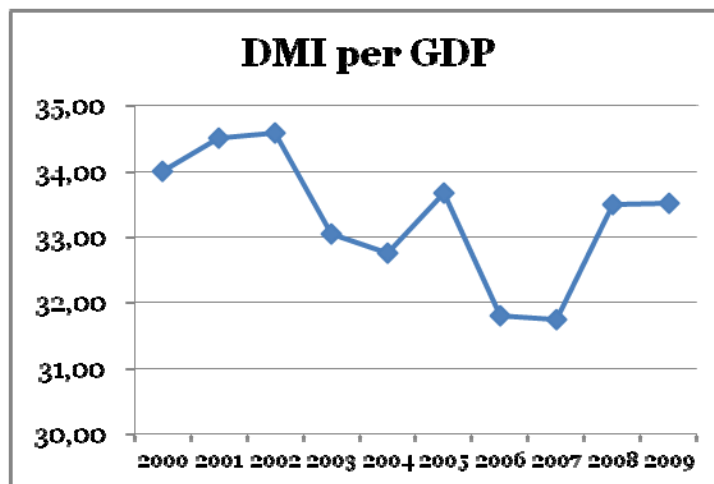Figure 2: Philippine DMI and GDP trend, 2000-2009

Figure 3: DMI per GDP(MT per million PhP) of the Philippines, 2000-2009

The results of the present MFA also show that coal is a major contributor to the country's Total Material Requirements. These findings should be cautioned by the fact that the data is largely incomplete and therefore the MFA calculation is partial at its current form.

The MFA can caution the development path of the country considering that the forecast of water and energy demand in the country will increase in the next decade. Water demand is estimated to more than double in a span of 30 years for MM alone (Table 6), while a 17 GW additional capacity from 2009 to 2030 is needed to meet the energy needs of the country (Figure 4).

Table 6: Water demand in major cities of the Philippines, m3 per year

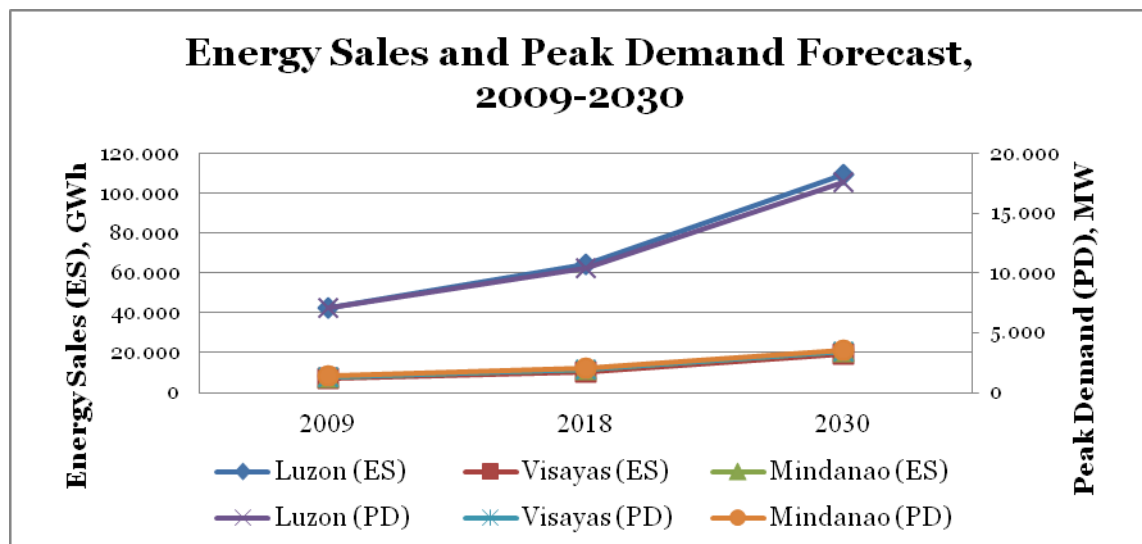| City	1995	2025	Groundwater Availability	Surplus/ (Deficit) (%)	
				1995	**2025**
Metro Manila	1,068	2,883	191	(82)	(93)
Metro Cebu	59	342	60	2	(82)
Davao	50	153	84	69	(45)
Baguio City	12	87	15	21	(83)
Angeles City	11	31	137	1,148	343
Bacolod City	37	111	103	179	(7)
Iloilo City	9	47	80	788	70
Cagayan de Oro City	29	98	34	18	(65)
Zamboanga City	28	203	54	92	(73)

Source: (ADB, 2009)

Figure 4: Energy sales and peak demand forecast for Luzon, Visayas and Mindanao, 2009-2030
Source: (DOE, n.d.)

Rapid depletion of natural resources has implications on the poor population dependent on it and on how it will meet the future needs of the population in general. The agriculture sector in particular is dependent on the services provided by the ecosystem. Around two thirds of the rural poor households are dependent on agriculture, and about 44,000 families rely on forestry and hunting for income. The continued degradation of ENR could cause major increases in poverty incidence (Figure 5) and depth as the livelihood of the communities dependent on natural resources is compromised.
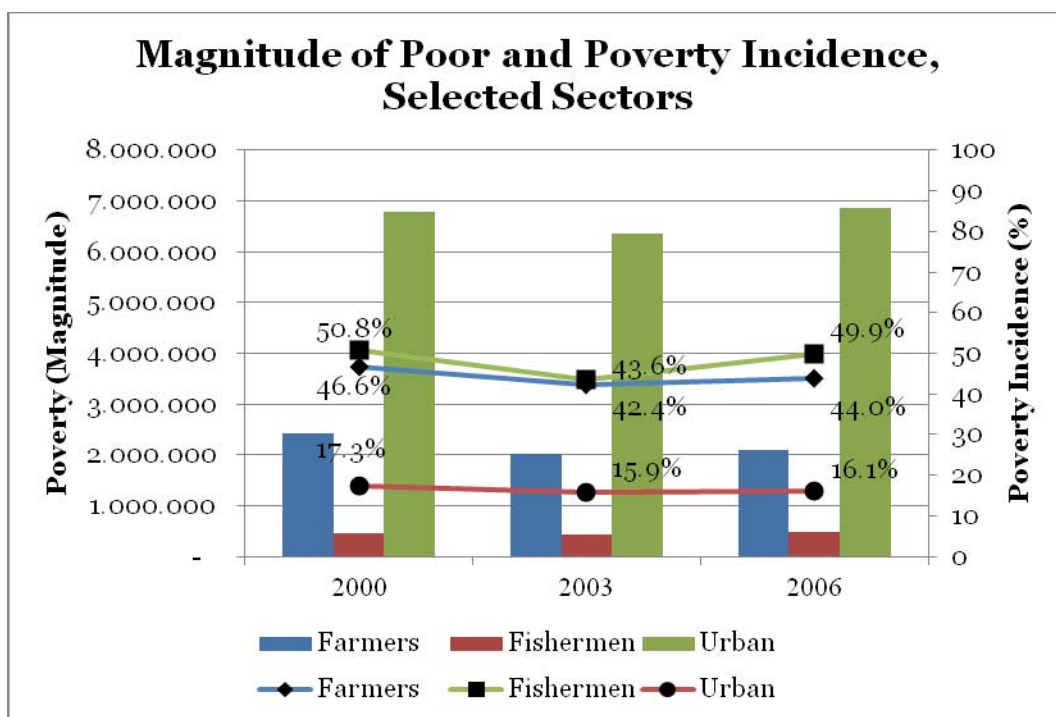
Figure 5: Magnitude of poor population and poverty incidence among farmers, fishermen and urban sector
Source: (NSCB, 2009)

4   SCP and Green Economy Challenges & Opportunities

Table 7 presents the SWOT matrix of the current brown economy of the country and its potential in transitioning to a GE. Brief discussion of each aspect follows in the subsections.

Table 7: SWOT matrix

Strength	Weakness
1. Initiatives in establishing and promoting SCP are present 2. Efforts to strengthen the institutional framework for management of ENR are being undertaken 3. Services sector sustains the economy despite financial crisis and low growth posted by agriculture sector 4. Renewable Energy (RE) law, Biofuels Act and Climate Change Act are timely legislations that can help decrease reliance on fossil fuels	1. Reliance on fossil fuels affects the economy, continues to increase GHG emissions, and burdens the public 2. Monitoring of environmental quality has been sporadic/ intermittent due to lack of manpower and functional equipment 3. Poor performance of agriculture sector a. Fisheries lack diversity b. Crop production extremely affected by climate c. Land productivity is low 4. Social indicators have been stagnant (e.g. employment and Gini coefficient)

	5. Business environment and political situation affect amount of foreign investments
Opportunity	**Threat**
1. Raw materials can catalyze agricultural and industrial growth provided a proper development framework 2. Efficient agricultural sector can reduce food importation 3. Green jobs can emerge from a solid implementation of reforms and promoting investments in green industry 4. R&D in energy, in particular renewable sources, in an archipelagic country can redirect the current reliance on fossil fuels 5. RA 9003 has the potential to reduce the waste stream as it supports the 3Rs and has roots in life cycle concept	1. Unsustainable agricultural practice can be a deterrent towards achieving the goals of promoting agribusiness 2. Impacts of environmental degradation to the poor may not be easily countered 3. Services sector diverts the output of manufacturing-based skilled human resource 4. There is a sign of imbalance in investments going into the different economic sectors 5. Profits from foreign investments in extractive and pollutive industries could benefit source of investment more than the local and affected community

While significant progress has been made legislatively on ENR management, these have yet to demonstrate nationwide potential in supporting a GE. The country still relies mainly of fossil fuels for energy, agriculture sector appears to be impacted by weather disturbances, and environmental quality remains bleak. Given the state of the country, opportunities exist as raw materials can be utilized sustainably in various economic sectors; 3R theme of waste management can potentially reduce waste stream; and green jobs can emerge from R&D and investments in green industry and energy management.

5   A Vision for a Resource Efficient and Green Economy

Table 8 summarizes a vision for resource efficient and green economy for the Philippines. Discussions and recommendations from the SCP and Green Economy capacity building workshop conducted in September 2011 are included.

Table 8: A vision for the Philippine economy

Sector/ PDP 2011-2016 Goal	Status	Vision/ SCP Strategy
Industry and services – improve productivity and efficiency through enhanced investments, and increase revenue from exports, tourism and entrepreneurship	- Lack of delinking economic growth from resource use - Industry received an average of 64%, while the share of services is at 35% of total investments from 2005 to 2009 - On the average, the industry and services sector grew by 5.0% and 5.6% in the last five years; construction, and mining and	- Eco-industrial development - Resource efficient and cleaner production to achieve delinking - Environmental management systems - Strengthen enforcement of environmental impact statement system - Valuation of environmental services

	quarrying posted the highest growth - Tourism grew by 8.21% from 2004 to 2009, employing 9.68% of workforce	- Ecotourism - Green investments, business and industry - Green jobs and services
Agriculture and fisheries a. Food security (productivity and production) b. Climate change resilience c. Enhance policy environment and governance	- Negligible investments in the agriculture sector (<1%) - No growth reported in the past two years - Climate catastrophes and weather conditions adversely affect the sector - Land productivity is low - Declining productivity from municipal fisheries; increasing share from aquaculture - Massive population relies on ecosystem services for livelihood	- Increase land productivity - Mainstreaming climate change resilience in agriculture - Research and development on indigenous resources

Sector/ PDP 2011-2016 Goal	Status	Vision/ SCP Strategy
Infrastructure – accelerate development of infrastructure: transport; water; energy; ICT; solid, toxic and hazardous waste management; housing; health; and education	- Only 10% of the waste generated daily in MM is composted or recycled - Informal settlers abound in urban areas	- Climate change resilient infrastructure and housing - Sustainable transportation systems - Green finance - Green/ sustainable energy - Green buildings & climate smart infrastructure - 3R (Reduce, Reuse, Recycle) - Environmental education - Develop ICT for data collection and management systems
ENR a. Sustainable use and management of ENR b. Improve environmental quality c. Resilience by natural systems to environmental hazards and adaptation to climate change	- Pollution and resource depletion are apparent from economic and social activities - ENR policies exist - Energy and water demand forecast may help guide or shape a framework for its sustainable use and provision - Massive population relies on ecosystem services for livelihood	- Ecosystem preservation as carbon sink and enhanced ecosystem services - Strengthen environmental law implementation on the national and local level - Market-based instruments toprevent pollution environmental protection, Green finance - Eco-town/Sustainable community - Climate vulnerability assessment

6   Recommendation

In consideration of the scenario of the country, the following summarizes this report's recommendations in working towards a green economy:

1. *Partnerships - Delinking the resource use and impact generation from economic growth through green industry in the context of green economy*

   The current consumption and production pattern based on national DMI shows no delinking of resource use and economic growth. It is recommended to craft and mainstream sustainable consumption and production (SCP) strategies in the use/consumption of natural resources towards economic growth.

   Clear sustainability targets with indicators (e.g., resource use intensity, emissions, green public procurement) should be identified at both at the national and local levels. Enforced with models and examples, these targets should be properly communicated and identified to the stakeholders.

   DOST, DTI, DENR and other relevant agencies' programs should identify the SCP key success factors (KSF) through benchmarking with Asia Pacific regional neighbors. A knowledge-bank initiated by DOST, DTI and DENR can enhance the access of industries to the best practices. Global SCP framework and international platform should be utilized and adopted to serve the local needs.

   Fostering partnerships through scientific data sharing, South-South collaboration, indigenous resource R&D, and other measures should be encouraged to acquire the benefits of disseminating and operationalizing these strategic initiatives.

2. *Policy - Mainstreaming SCP in the context of climate change scenario, poverty eradication and emerging global issues*

   Mainstreaming SCP in the context of climate change strategies is a necessity which should be initiated through strengthening inter-agency cooperation and coordination.SCP indicators and criteria should also align with the long term economic plan of NEDA in order for budget to be allotted for the enforcement of ENR management and protection policies.

   The health of the ecosystem must be considered as a key asset to the livelihood of the communities' dependent on ecosystem services, as well as to eco-tourism. It also provides a resilient property to various economic and social impacts due to the climate change scenario.

   In addition, translating the policies, programs and initiatives of the public and private sector on green management and technology into investments will create a momentum for green jobs generation and attract moreinvestors, emphasizing to them the viability of such investment for sustainable economic growth.

3. *Capacity Building - Up-scaling green industry action programs in the context of green economy*

   It is recommended to continue promoting two components, namely: greening the industry and promoting green industry. Priority sectors such as high-energy utilizing, high-carbon emitting and highly polluting industries, as well as industries topping the GDP generation, should be priority for partnership targets. Greening industries through resource efficient and cleaner production (RECP) with emphasis on the cross cutting issues of water and energy should be aligned along three aspects:

- o Resource use reduction through eco-design of goods and services through application of lifecycle thinking
- o Resource use intensity reduction through adaptation and adoption of environmentally sound technology/ technology transfer (EST/TT) and technique in the production processes
- o Minimization of pollutant generation at the end of the pipe through preventive thinking at product-, plant- and system-level optimization

Up-scaling the activities in this arena include eco-industrial development (eco-zone, park, estate; eco-town models by Japan and the Climate Change Commission), life cycle thinking, programmatic environmental management system, green public procurement and ecotourism among others.

Enhancing the capacity and knowledge of those involved in the planning and policy making bodies of the government can help build and define a more structured and focused development path.

4. *Further Work – Partnerships in Scientific Works, Studying resource use intensity data for priority sectors*

Conducting a more detailed analysis of the economic subsectors discussed in the findings, namely, agriculture and fisheries, mining and quarrying and manufacturing is critical. Undertaking comparative studies of resources per unit GDP or resources per unit capita and resources in terms of its subgroups such as land, agriculture, mineral, energy and water is recommended to evaluate the status of each resource which will shape development priorities.Although sustainable production patterns are often presented as the most important need for economies, there is an equal need to promote sustainable consumption patterns. This is relevant both for individual consumption decision of citizens,and also for corporate and public consumption decisions.

Civil society and education agencies could play the key role. Government should encourage and empower these valuable sectors as partners in the promotion and implementation of SCP programs, including the eco-label, public green procurement, extended producer responsibility, environmental technology verification, and others. These programs are currently coordinated by lead agencies: DENR, DTI, DAP, DOST. These efforts should be continued and monitored with sustainability indicators.

Acknowledgement

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