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Natural capital as Inclusive wealth for Malaysia: A review

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ABSTRACT

Natural capital used to indicate the contribution of natural resources for economic and social well beings of a country. Inclusive wealth gives emphasize on all capitals for ensuring sustainability and improvement of human well-being. The country is one of the most resource-rich countries in the world has sufficient preserve of valuable natural capital such as fresh water, forest reserve, agriculture land, fisheries, fossil fuel and mineral resources. The aim of this paper is to provide essential background information regarding the natural capital of Malaysia. The paper also identifies the potentials of natural capital for the country's well-beings. The study used secondary sources to attain the objectives. Malaysia has highest amount total wealth ($ 46,688 per capita) and natural capital ($ 9,103 per capita) within the ASEAN countries. The study reveals that Malaysia can attract huge foreign investment to develop the mineral resources. The total production and treatment capacity of water are increasing year by year to meet the excess demand of freshwater. Forest resources provide a wide variety of social, economic and environmental benefits for Malaysia. Total fishing productions are 1732.38 thousand tons in 2008 with total value of RM 6717.30 million. Agriculture land can reduce unemployment and give focus on poverty eradication between the rural people. There are several steps and initiatives may be taken to explore and utilize the natural capital in sustainable manner and ensure well-beings in Malaysia. These are to formulate and implement proper policy, take government program to ensure maximum benefits from natural capital, ensure government directly involved in productive activities and distribution of natural capital, highly encourage the private sector involvement in natural capital for sustainable utilization and people well-being and develop the partnerships between all related stockholders. Finally, partnerships will enhance the positive impacts from natural capital as well as socio-economic well-beings.

INTRODUCTION

The term 'natural capital' is recently used to indicate the contribution of natural resources for economic and social well beings. The term has a direct controversy with standard economic theory which sees no significant difference between man-made and natural production input. Here 'natural' indicating biophysical laws where 'capital' indicating market capitalism laws. This contradiction between market and biophysical contexts are contributing to the literature of sustainable development proposed by the environmental economists [6,22]. The term also includes capacity for waste represented such as atmosphere's capacity to absorb pollution; life support functions for environment like as biological diversity and ozone layer and environmental aspects such as landscape [17].

Natural capital relates with the discussion of sustainability. In sustainable development, 'natural capital' is frequently refers as a principle for sustainability. Natural capital normally tries to enhance strong sustainability. This concept is usefulness to the academicians and researchers for empirical studies and policy analysis [8]. Pearce and Turner [22] suggested that maintaining natural capital stock is requirement for analyzing sustainability. There are two ways of measuring 'natural capital'. Firstly, measure the physical amount of 'natural capital', and valuing this 'capital' in monetary terms. Natural capital stock measurements are facing two problems. Firstly, correct measure of amount of the natural resources. Secondly, apply the appropriate value of these amounts of resources [21].

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Inclusive wealth gives emphasize on all capitals for ensuring sustainability and improvement of human well-being. In this wealth, population growth rate is an important variable for determining any country's sustainability track. This wealth gives investment guidelines to the national policy-makers as well as international organizations [26]. Study finding [20]. shows that natural capital highlights the strength of inclusive wealth as a leading indicator of national sustainability.

Inclusive wealth suggests policy-makers for measuring the assets which are available in the economy with a comprehensive accounting tool. In inclusive wealth, natural capital represents as important resources that can contribute for building of other capital assets such as manufactured, education and health capital. Natural capital is central key point to understand inclusive wealth. Moreover, natural capital constitutes, on average, about 30 percent of national wealth estimates for the developed country. Furthermore, natural capital play significant role for adopting portfolio management approach to wealth which are necessary for achieving sustainable development [20].

Malaysia is one of the 12 mega-biodiversity countries of the world. The other countries sharing with the same status are Indonesia, Colombia, Brazil, China, Madagascar, Costa Rica, Peru, Venezuela, Australia, Mexico and Ecuador. Malaysia has taken integrated approach to preserve the biodiversity conservation [9]. The country is highly rich in natural and environmental resources and contributes about 75% of the world biological diversity. Malaysia was the world's largest producer and exporter of tin, tropical timber, natural rubber and palm oil during most of the period 1970-80 [7]. The country is one of the most resource-rich countries in the world has sufficient preserve of valuable natural capital such as fresh water, forest reserve, agriculture land, fisheries, fossil fuel and mineral resources. These natural capitals may be important resources for measuring total wealth, GNI per capita and net saving per capita of Malaysia. Moreover, these capitals are contributing in creating employment opportunities, poverty alleviation and economic advancement of the country. The aim of this paper is to provide essential background information regarding the natural capital of Malaysia. The paper also identifies the potentials of natural capital for the country's well-beings.

METHODS AND MATERIALS

The study used secondary sources such as policies, acts, data and regulations from relevant Ministries and Agencies of the Malaysian Government. Relevant published materials such as research reports, articles, books, annual reports as well as information providing websites were also reviewed in order to accumulate secondary data.

Inclusive wealth:

The inclusive wealth approach is firstly suggested by Arrow *et al*. [1]. They focused wealth from the flows of stocks and imposed a sustainability condition on the based on present values of consumption flows of assets. Therefore, the issues of efficiency and sustainability of wealth are separate and interrogated independently. The innovation of inclusive wealth concept is avoiding assumption of optimization in place of resource allocation mechanism. This concept predicts consumption flows of assets, present capital stocks and social welfare and determine the future function in the economy [5].

Table 1: Total wealth ($ per capita and percentage shares), 2000

Income group	Natural capital	Produced capital	Intangible capital	Total wealth	Natural capital share	Produced capital share	Intangible capital share
Low-income countries	1,925	1,174	4,434	7,532	26%	16%	58%
Middle-income countries	3,496	5,347	18,773	27,616	13%	19%	68%
High-income countries	9,531	76,193	353,339	439,063	2%	17%	80%
World	4,011	16,850	74,998	95,860	4%	18%	78%

Source: World Bank, 2006

Table-1 shows the total wealth of world in terms of per capita and percentage shares for the year 2000.The highest amount of wealth ($ 439,063 per capita) are remaining in high-income countries. In middle-income countries is occupied $ 27,616 per capita of wealth which consists of natural capital (13%), produced capital (19%) and intangible capital (68%). In terms of share, highest number natural capital is situated in low-income countries.

Natural capital:

The term 'natural capital' was popularized in environmental aspect after published the book "Economics of Natural Resources and the Environment" by Pearce and Turner on 1990. They pointed that the natural resource

stock should be held constant over time. They developed their concept through standard economic arguments to the stock of natural capital. In this connection, International Society for Ecological Economics arranged biannual conference in Stockholm under the heading "Investing in Natural Capital. The Ecological Economics Approach to Sustainability" for better understanding and searching the scope of natural capital for sustainable use and ensuring human well-being [10].

Table 2: Natural capital ($ per capita), 2000

Income group	Subsoil assets	Timber resources	NTFR	Protected Areas	Cropland	Pastureland	Total natural capital
Low-income countries	325	109	48	111	1,143	189	1,925
Middle-income countries	1,089	169	120	129	1,583	407	3,496
High-income countries	3,825	747	183	1,215	2,008	1,552	9,531
World	1,302	252	104	322	1,496	536	4,011

Source: World Bank, 2006

Table-2 represents the natural capital of world in terms of per capita for the year 2000. The highest amount of natural capital ($ 9,531 per capita) are capturing by high-income countries. In middle-income countries, highest amount natural capital is cropland ($ 1,583 per capita) and subsoil assets ($ 1,089 per capita).

RESULTS AND DISCUSSION

Malaysia has highest amount total wealth ($ 46,688 per capita) and natural capital ($ 9,103 per capita) within the ASEAN countries (Table-3).

Table 3: Wealth Estimates for selected ASEAN countries, 2000 ($ per capita)

Country	Natural capital	Produced capital+ urban land	Intangible capital	Total wealth
Malaysia	9,103	13,065	24,520	46,688
Indonesia	3,472	2,382	8,015	13,869
Philippines	1,549	2,673	15,129	19,351
Thailand	3,936	7,624	24,294	35,854
Singapore	-	79,011	173,595	252,607

Source: World Bank, 2006

Table-4 highlights the natural capital estimates for selected ASEAN countries in terms of per capita for the year 2000. Malaysia has highest amount natural capital in subsoil assets ($ 6,922 per capita) followed by cropland ($ 1,369 per capita) and timber resources ($ 438 per capita). Indonesia is posing same scenario in natural capital estimation with Malaysia. On the other hand, Philippine and Thailand have highest amount natural capital in cropland.

Table 4: Natural Capital Estimates for selected ASEAN countries, 2000 ($ per capita)

Country	Subsoil assets	Timber resources	NTFR	Protected area	Cropland	Pastureland	Total Natural capital
Malaysia	6,922	438	188	161	1,369	24	9,103
Indonesia	1,549	346	115	167	1,245	50	3,472
Philippines	30	90	17	59	1,308	45	1,549
Thailand	469	92	55	855	2,370	96	3,936

Source: World Bank, 2006

Table-5 shows the change in wealth per capita for selected ASEAN countries in terms of per capita for the year 2000. Malaysia ($ 3,554 per capita) has second largest GNI in ASEAN countries after Singapore ($ 22,968 per capita). The population growth is high in Malaysia (2.4%) among the ASEAN countries. Adjusted net saving per capita of Malaysia is $ 767, followed by Singapore is $ 8,258.

Table 5: Change in Wealth per capita for selected ASEAN countries, 2000 ($ per capita)

Country	GNI per capita	% Population growth rate	Adjusted net saving per capita	Change in wealth per capita
Malaysia	3,554	2.4	767	227
Indonesia	675	1.3	20	-56
Philippines	1,033	2.3	211	114
Thailand	1,989	0.8	351	259
Singapore	22,968	1.7	8,258	6,949

Source: World Bank, 2006

Table 6: Major Mineral production in Malaysia, 2001-2007

Minerals (,000 tones)	2001	2002	2003	2004	2005	2006	2007
Tin	5.0	4.2	3.4	2.7	2.9	2.4	2.2
Iron	270.5	404.3	590.0	663.7	949.0	667.1	802.0
Coal	545.8	352.5	174.8	389.2	789.4	901.8	1,063.1
Gold (gm)	3985	4289	4739	4221	4250	3497	2913
Bauxite	64.2	40.0	5.7	2.0	4.7	91.8	156.8
Limestone	30,978	15,158	33,397	19,967	20,373	21,164	20,948
Silica	567.0	447.4	533.6	631	542	512	719

Source: Malaysia, 2008

Malaysia has mentionable amount of mineral resources such as; tin, iron, coal, gold, bauxite, limestone and silica. Table-6 presents the major mineral production in Malaysia for the year 2001-2007. Among the mineral resources, iron, coal, gold, bauxite and silica production are increasing year by year. On the other hand, tin and limestone production are showing in balance position. Small mineral-rich countries like Kuwait and Brunei have built their development strategies by diversified portfolios of foreign investment. From this viewpoint, Malaysia can attract huge foreign investment to develop the country. Sachs and Warner [25] have proposed that huge earnings from mineral resources can lead to involve exchange rate overvaluation in non-mineral and other economic sectors. Sufficient stock of mineral resources can encourage governments to formulate industrial policies to ensure development activities. The impact of mineral resources depends on how government revenues are used. The mineral-rich countries have strong central-level governance reforms activities, efficient and transparent public expenditure maintenance system [18]. Mineral resources can create employment opportunities, reduce poverty and ensure regional development; all of these have positive and potential effects on sustainable livelihood of local communities in Malaysia. The federal and local governments can work with the local communities for economic diversification and ensure benefit sharing from the mineral resources.

Table 7: Water production in Malaysia, 2007-2011(Million liters per day)

	2007	2008	2009	2010	2011
Total production	12,827	13,213	13,495	14,110	14,564
Treatment plant capacity	15,738	15,891	16,403	16,779	17,421
Supply from rivers	12,007	12,418	12,398	12,516	12,746
Supply of groundwater	185	195	185	204	223

Source: Malaysia, 2012

About 95% of water source comes from inland rivers in Malaysia. The water demands are increasing sharply for industrialization, infrastructures and urban uses towards its vision 2020. Malaysia has preserved current water resources to improve the water quality for maintaining water demands (Muyibi *et al*., 2008). Table-7 shows the water production in Malaysia for the year 2007-2011. The total production and treatment capacity of water are increasing year by year due to meet the excess demand of freshwater. Moreover, to meet the rising demand, water supply from river and ground level also increasing year by year. Water production and storage are important for Malaysia, because rainfall is not spread during the year and on average 10 percent of annual rainfall is available for human use without storage [11]. Irrigation is the largest single use of water resources in Malaysia. It is an essential regional issue more than in national level that primarily used in rice-growing purpose in the country wide. Irrigation has a significant impact on the ecosystem of an area as well as industrial and domestic uses of water. Favorable water quality and sufficient water are ensuring ecological soundness, preserve flora and fauna, Support ecological habitats and protect wildlife resources. The water bodies are rich biological resources and treasure of fishery resources which provide diverse freshwater habitats and ecology in Malaysia. Furthermore, fresh water is maintaining economic, environmental and social well-being for the local people which ensure the sustainable development in an area.

Table 8: Forest Land use in Malaysia, 2009 (Million Hectares)

Region	Permanent Reserved Forest	National parks, wildlife & bird sanctuaries	Conversion Forest	Total Land Area
Peninsular Malaysia	4.92	0.58	0.39	13.18
Sabah	3.60	0.27	0.43	7.48
Sarawak	6.00	0.50	1.56	12.32
Total	14.52	1.35	2.38	32.98

Source: Malaysia, 2010; Sabah, 2010; Sarawak 2010

Table-8 reveals the forest land use in Malaysia in 2009. Malaysia has 14.52 million hectares of permanent reserved forest and 2.38 million hectares as conversion forest. Meanwhile, national parks, wildlife and bird

sanctuaries cover an area of 1.35 million hectares. Meanwhile, highest amount (6 mill hectares) permanent forest located in Sarawak followed by Peninsular Malaysia and Sabah has captured 4.92 million hectares and 3.60 million hectares respectively. Forest resources provide a wide variety of social, economic and environmental benefits for Malaysia. They play significant role for supporting the poor in reducing their economic and environmental vulnerability and shocks as well as reducing poverty. They provide important sources of employment opportunity, food, energy, medicines and construction materials. Forest resources can maintain cultural identity, aesthetic value and spiritual enrichment of indigenous and forest-depended communities. Malaysia is one of the top tropical timber producer countries in the world. The country earns mentionable amount foreign currency in every year by exporting timber. In 2010, the country earned about RM (RM3= USD1) 20 billion from this sector which is 3.2% of total export earnings. The country has developed forest based tourism activities such as jungle tracking, walking, sightseeing and jungle staying program to attract the foreign tourists as well as local visitors. The forests are includes natural eco-systems, diversification of the local flora and fauna, natural conservation. Forests areas covered by cultivated fields, meadows, pastures, recreational and other types reserves [4]. Moreover, forest resources can contribute in protecting biodiversity and preserving natural environment including improving the air quality, protection of water resources, ecosystem and biological diversity. Malaysian forests are most species-rich which preserving all kinds of ecosystem such as wetland ecosystem, mangrove and rainforests ecosystem [2]. The recreational forest areas of scenic beauty comprise about 0.05% of the total forest reserve in Malaysia. Recreational forests of Malaysia attract a large number of visitors from home and abroad in every year [3].

Table 9: Fisheries production and value in Malaysia, 2003-2008

Year	Marine (Thousand tons)	Aquaculture (Thousand tons)	Total production (Thousand tons)	Total value (RM million)
2003	1283.26	196.87	1480.13	5185.92
2004	1331.65	202.22	1533.87	5370.46
2005	1209.60	207.22	1416.82	5213.53
2006	1379.77	212.03	1591.80	6231.07
2007	1381.37	268.51	1649.88	6394.84
2008	1450.44	281.94	1732.38	6717.30

Source: Malaysia, 2009

Table-9 represents the fisheries production and value in Malaysia for the year 2003-2008. The fishing production and total value are increasing year by year. Marine fishing is the main source for fisheries production in Malaysia. In 2003, total fishing production were 1480.13 thousand tons and it reached 1732.38 thousand tons in 2008 and total value were RM 6717.30 million. Moreover, fish production from marine and aquaculture were 1450.44 tons and 281.94 tons respectively in 2008. Malaysia's fishing industry has positioned among the 10 to 15 largest in the world. This sector is important socio-economic issue related to poverty and unemployment. Fisheries resources are renewable. This resource is accountable for 3% of GDP in 1986 [11]. Malaysia earned mentionable amount foreign exchange by exporting fisheries commodities. This sector contributes in food supply of country. It is important source of animal protein for the poor people in the coastal areas.

Table 10: Agriculture Land use in Malaysia (, 000 hectares)

Region	Horticulture area	Permanent crops	Cash crop	Total land
Peninsular Malaysia (2006)	355.29	4410.42	437.78	5203.50
Sabah (1970)	32.00	200.00	82.00	314.00
Sarawak (1991)	46.82	247.67	3707.59	4002.08

Source: Malaysia, 2008a

Table-10 shows the agriculture land use in Malaysia. In 2006, Peninsular Malaysia used 355.29 thousand hectares, 4410.42 thousand hectares and 437.78 thousand hectares agriculture land for horticulture, permanent crops and cash crop respectively. Sabah used 32 thousand hectares, 200 thousand hectares and 82 thousand hectares agriculture land for horticulture, permanent crops and cash crop respectively in 1970. Moreover, Sarawak used 46.82 thousand hectares, 247.67 thousand hectares and 3707.59 thousand hectares agriculture land for horticulture, permanent crops and cash crop respectively in 1991. Malaysian agriculture lands are an essential input for the production of rubber, palm oil and other agricultural commodities. Most of the agricultural land in this country is in perennial crops. These crops protect the soil better and need fewer nutrients than annual crops. Moreover, Malaysian tree crop plantations are considered as one of the most suitable forms of agriculture in the humid tropics [27]. Agriculture land can reduce unemployment and give focus on poverty eradication between the rural people. This is also utilizing in productive resource, manufacturing, service and other public sector.

Conclusion:

Natural capital is important resources in inclusive wealth of Malaysia. Inclusive wealth ensure significant role of natural capital for achieving sustainable development. Natural capital remained as principal source of revenue for the federal and state government. The mineral resources can attract foreign investment for successful exploration and development of this sector. Forest resources have potential prospect for sustained flows of timber rents and economic benefits. Agriculture land is economically viable by overcoming land fragmentation and other institutional barriers. Fisheries are potential resource for maximize economic yield level and commercial benefits. Water resources fulfill the daily needs of urban and rural areas and enhance the socio-economic well beings. There are several steps and initiatives may be taken to explore and utilize the natural capital in sustainable manner and ensure well-beings in Malaysia. Firstly, formulate and implement proper policy for sustainable use of natural capital. Secondly, take government program to ensure maximum benefits from natural capital. Thirdly, the government directly involved in productive activities and distribution of natural capital. Fourthly, highly encourage the private sector involvement in natural capital for sustainable utilization and people well-being. Finally, develop the partnerships between donor agencies, federal and state governments, companies and the beneficiary communities for natural capital development in sustainable manner. Partnerships between all concerned stakeholders are needed to enhance the positive impacts from natural capital as well as socio-economic well-beings.

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