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Discounting GDP for Pollution, Waste Generation and Natural Resources Depletion: A Comparative Analysis of Selected High, Middle and Low Income Countries

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ABSTRACT

GDP represents the monetary value of all final goods and services produced and traded within the domestic territory of a country in a given period. It shows the size of the economy but it does not reflect the economic loss of natural resource depletion and the cost of undisposed waste generation in the process of production and consumption. This paper attempts to make a comparative analysis of discounted GDP to integrate the cost of pollution, waste generation and natural resources depletion across high-income, middle-income and low-income countries with the help of a general calculation methodology developed by Stjepanovic, Tomic and Skare (2017). The study uses secondary data compiled from the World Development Indicators (WDI) dataset for the years 2000 to 2020. A sample of 35 countries out of 193 member countries of the UN is further classified into high, middle and low-income groups. The analysis shows that there is a small gap between the discounted GDP and GDP in high-income countries than the middle and low-income countries. The results also provide inputs for further discussion and debates on green growth and environmental sustainability.

Keywords: Discounting GDP, sustainable development, green growth

JEL Classification Code: E 01

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I. INTRODUCTION

The concept of sustainable development is gradually becoming more popular in many countries of the world including India where society recognises the importance of accounting for the so-called gifts of nature as contributors to economic development. The speed of extraction of natural resources is continuously increasing because of economic growth but the natural resources are also getting exhausted. It is this speed, at which we are exhausting our natural resources, is that is alarming (Mohanty, 2014). There is an urgent need to maintain accounts of such resources. GDP represents the monetary value of all final goods and services produced and traded within the domestic territory of a country in a given period. But, the loss of natural resources is not included in the calculation of GDP. So, it cannot reflect the economic loss of natural resources and the uses of natural resources by people. It shows the size of the economy but ignores the environmental externalities and the cost of environmental depletion. GDP doesn't measure sustainable growth, it may not be a good measure of social welfare. Hence, there is concern that a lot of focus on economic growth manifested through the GDP growth rate could encourage faster natural resource depletion. According to Max-Neef, "Increase the economic growth brings about an improvement in the quality of life up to a point, beyond that point more economic growth of a country may worsen the quality of life." If we calculate the environmental cost and negative externalities and include it as a cost element then the actual GDP may be different from what we account for through income, expenditure and value-added methods. This way, the accounted GDP is discounted for environmental costs and we call it discounted GDP (Nordhaus & Tobin, 1972).

There are several alternatives to GDP, including green NNP, index of sustainable economic welfare (ISEW), genuine progress indicator (GPI) and discounted GDP etc. These indicators are important for the measurement of sustainable development but for all practical purposes depending on the data availability and user preferences. This paper attempts to use an indicator called 'discounted GDP' to quantify the cost of ecological and environmental degradation. GDP counts the units of market value that is cars, legal services and so on, but natural resources are not pre-packaged in this way. So, discounted GDP is the one, which holds the market value of natural resources. Discounted GDP is related to the environmental ecosystems and environmental information. It provides a better idea for the utilisation of environmental resources and also gives ideas to develop environment-friendly technology. It may be recognised as one of the regulatory measures to avoid environmental loss. Discounted GDP plays an important role to stop environmental problems and it also reflects the achievements of sustainable development in any country.

Discounted GDP also influence the country's attitude to meet social and environmental responsibility issues. Sometimes it has been referred to as 'resource accounting' or 'environmental accounting'. Nowadays, the concept of discounted GDP is widely applied in both developed and developing countries. Norway, China, Netherlands, and France were the early adopters of

environmental accounting or green accounting. Discounted GDP reflects the true level of economic development in any region and also provides a better idea to the local government for the adjustment of economic development activities in sustainable ways. The primary aim of this study is to make a comparative analysis of discounted GDP across high, middle and low-income countries.

The System of Environmental and Economic Accounting (SEEA) was introduced in the year 1993, by the UN and the World Bank. In recent years, the System of Environmental and Economic Accounting (SEEA) has been adopted to compute the discounted GDP in response to the imperfection of GDP as the conventional way of accounting ignores the economic costs of natural resources depletion and environmental degradation. As a solution to meet the requirements of sustainable development and to keep track of what we are foregoing to achieve the so-called remarkable growth, governments should actively pursue accounting systems that factor in the environmental issues. Discounted GDP is defined as the remaining gross domestic product after subtracting the value of environmental degradation cost. Discounted GDP is also required to know the benefits of ecological contribution for economic development and to raise environmental awareness among policymakers and people regarding costs related to the environment. One of the most amazing attempts to assess discounted GDP was in China. They included the cost of air, water, solid waste pollution and different natural resource depletion as well as social cost in their evaluation. Data unavailability is an important problem for the calculation of discounted GDP, especially for developing countries. The most common approach to estimating discounted GDP is to subtract natural resource depletion cost minus environmental degradation cost from GDP (Vaghefi et al., 2015).

II. REVIEW OF LITERATURE

We have undertaken a review of relevant literature on the concept, computation and implications of environmental cost-discounted GDP. We present the review of literature under three thematic heads such as needs of discounted GDP, comparative study of discounted GDP and methodological aspects related to discounted GDP.

Needs for green GDP

Discounted GDP is less than GDP, and the production process of an economy negatively affects environmental resources. So, there is a need to implement discounted GDP to indicate the negative impacts on the environment (Yusuf and Alisjahbana, 2003; Yu et al., 2019; Sidjabat and Apsari, 2020). If the gap between traditional GDP and discounted GDP becomes wider, it indicates that natural resource depletion and pollution increased. If real GDP is positive and discounted GDP is negative it means that economic losses due to natural capital depletion and environmental damages are greater. GDP fails to consider the depletion of natural resources and pollution costs. Whereas discounted GDP gives the value of environmental depletion cost and adjusted GDP to reflect the environmental cost (Gundimeda et al., 2004; Boyd, 2006; Mahmud, Ahammad and Islam, 2013; Vaghefi, Aziz and Siwar, 2015). China's state environmental agency attempted to implement green national accounting of GDP to publicise the environmental-related cost of economic activities. Discounted GDP is the one that makes environmental sustainability and

suggests that policymakers make environmental-related policies (Li and Lang, 2010). To calculate environmental depletion cost the implementation of discounted GDP is required. It does not only measure China's economic growth but also measures how to protect and enhance environmental and social welfare. Now the importance of environmental sustainability in China has been increasing because of the calculation and implementation of discounted GDP (Rauch and Chi, 2010). Discounted GDP is a better auditing method for environmental degradation costs. It may audit by the process of GDP minus environmental depletion cost or natural resources consumption cost (Tian and Wu, 2015). Green GDP is very essential, especially for developing countries. Which are characterised by high population growth and pressure on natural resources. So, green GDP may be dealing with a serious extent of environmental challenges (Fengju, 2013; Unnithan and Somasundaram, 2019). Increasing GDP by recklessly using natural resources creates environmental depletion. In China, the implementation of discounted GDP is necessary for measuring the actual growth rate of GDP and it also quantifies the amount of environmental depletion and degradation cost. Discounted GDP has a significant impact on environmental protection and the conservation of natural resources (Qi, Huang and Ji, 2021). In developing countries like India, there is a twin problem of economic development and saving the environment. The World Bank estimate that around 34000 corer were lost by India due to environmental consequences. So, the implementation of discounted GDP is very necessary for sustainable development in India (Unnithan and Somasundaram, 2019). Free market operations are continuously worsening the environment in China. So, the environmental challenges are confronting serious in China. The computation of discounted GDP is more defensible to estimate the large extent of environmental challenges. Discounted GDP also serve as a starting point in formulating strategies for environmental challenges (Yin, 2008). Green GDP is an important indicator for measuring the benefits arise from free goods provided by the nature. Green GDP should never be equated with the social benefits of nature, it describes nature's value. Green GDP measures the non-market value of ecological contribution to welfare (Boyd, 2006). Green GDP is a method that quantifies the environmental degradation cost and obtains environmental benefits. It provides information about the environment and it will also help the managers for evaluating, operating, controlling and protecting the environment. Discounted GDP can also raise awareness about the environment among governments and policymakers who tend to concentrate on economic development as well as environmental sustainability (Rounaghi, 2019). Green accounting is not so easy in developing countries like India because it requires proper data and also requires a specific area. So, the extension of SNA (System of National Accounting) can be useful for sustainable national income accounting and removing the current environmental problems. Greening the national accounts is useful both for the economy and the environment (Rout, 2010). The traditional measure of national accounts focuses mainly on goods and services that are bought and sold in the market and ignores the non-market services provided by nature. This ignorance leads to the loss and degradation of natural resources. So, green accounting is required to protect the environment and it can also uphold the green image of the manufacturing companies. It is also

necessary for both sustainable development and environmental-related policy formulation (Mahmud, Ahammad and Islam, 2013). The mineral resources (iron ore, bauxite and manganese) of India have declined tremendously from 1995 to 2015 because of economic growth. So, environmental accounting is essential to require for the preservation of natural resources (Dash and Pradhan). The use of renewable energy and biofuel may lead to the green growth of an economy. These two types of resources are the appropriate solution to replace fossil fuel gas and prevent air pollution. Fossil fuel has a negative impact on discounted GDP whereas biofuel and renewable energy have a positive impact on discounted GDP and environmental sustainability (Kalataripor and Alamdarlo, 2021).

Comparative study of green GDP across countries

Discounted GDP is an alternative measure for environmental sustainability. It is quantifying the cost of ecological and environmental degradation. Discounted GDP shows the actual growth rate of a nation. In developed countries, there is a small gap between GDP and discounted GDP than in developing and underdeveloped nations (Stjepanovic, Tomic and Skare, 2019). Traditional GDP measures economic growth without considering environmental degradation cost. The technique of discounted GDP gives a clear view of environmental degradation. South Asian countries increased their GDP without any kind of environmental damage which leads to a greater increase in discounted GDP (Islam and Asad, 2021). A study made by Wang in China found that there is a nonlinear relationship between green GDP and openness (Wang, 2011)

The methodological aspects related to green GDP

Discounted GDP = GDP – (KtCO2 × PCDM) – (Twaste × 74 kWh × Pelect) – (GNI/100 × %NRD)

This is the general calculation method to measure the gap between GDP and discounted GDP among developed, developing and underdeveloped countries (Stjepanovic, Tomic and Skare, 2017; Stjepanovic, Tomic and Skare, 2019; Sidjabat and Apsari, 2019). Discounted GDP = GDP – Cost resources – Cost environment + Save resource-environment

This method is used to find out the actual growth of GDP and quantify the amount of environmental depletion cost (Qi, Huang and Ji, 2021).

Discounted GDP is the one that measures the actual growth rate of a country and also measures the environmental degradation cost. Reviewing some articles, we found that a few studies have been conducted on the country-wise analysis of discounted GDP. So, our study focuses on discounted GDP analysis in India and some other countries.

III. DATA AND METHODS

We have taken secondary data from World Development Indicator (WDI) since, the year 2000. A sample of 35 countries out of 193 member countries of the UN is taken and divided into three groups such as high, middle and low-income groups. The selection of countries is based on GDP, and PPP (Constant International Dollar, 2017). We have selected 10 countries from high-income groups such as (the United States, Japan, Germany, France, the UK, Italy, Canada, Spain, Saudi Arabia, and Australia) and 16 countries from middle-income groups (China, India, Russia, Indonesia, Brazil, Turkey, Mexico, Egypt,

Thailand, Pakistan, Nigeria, Argentina, Bangladesh, Vietnam, South Africa, Kazakhstan) and 9 countries from low-income groups (Ethiopia, Sudan, Guinea, Congo, Afghanistan, Burkina Faso, Mali, Madagascar, Mozambique).

GDP refers to the sum of gross value added by resident producers in one economy plus any product taxes minus any subsidies not included in the value of the products. It has been calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources (WDI). For this study, we have taken GDP, and PPP (Current International Dollar). Carbon dioxide emissions (CO2) expressed as kilo tonnes are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during the consumption of solid, liquid and gas fuels and gas flaring (WDI). Total commercial and industrial waste is presented in tonnes and its data have been taken from the World development indicator (WDI) published by World Bank. Industrial waste refers to the waste produced by industrial activities which includes any materials that are rendered useless during the manufacturing process and commercial waste consists of waste from premises used mainly for trade or business. GNI, PPP (Current US$) is the sum of value added by all resident producers plus any product taxes (minus subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad (WDI). Finally, the variable adjusted savings of natural resource depletion (NRD) as the percentage of GNI, per country. Natural resource depletion is the sum of energy depletion, mineral depletion and net forest depletion. Net forest depletion is calculated as the product of unit resource rents and the excess of Roundwood harvest over natural growth (WDI). Mineral depletion is the ratio of the value of the stock of mineral resources to the remaining reserve lifetime (capped at 25 years). It covers tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate. Energy depletion is the ratio of the value of the stock of energy resources to the remaining reserve lifetime (capped at 25 years). It covers coal, crude oil, and natural gas (WDI).

We have used a general calculation methodology to calculate discounted GDP for pollution, waste generation and natural resources depletion across selected countries. Which was developed by Stjepanovic, Tomic and Skare-2017.

$$\text{Discounted GDP} = GDP - E_1 - E_2 - E_3$$

Where the first, second and third subtraction represents-

- E_1 = (CO_2kt * PCDM), CO_2 emission in kilo tonnes is multiplied with PCDM. PCDM is the average volume weighted price for carbon in PPP for different countries updated as per the state and trends of carbon pricing report by World Bank (Capoor & Ambrosi, 2007). PCDM (Price for clean development mechanism) = $ 11.07 per tonnes this price are same for all the selected countries.
- E_2 = (Twaste * 74kWh * Price of electricity), Twaste (Total commercial and industrial waste) is presented in tonnes. In order to evaluate the opportunity cost related to waste problems, waste to energy conversion principle is used. 74kWh (kilowatts hours) of energy in one tone of

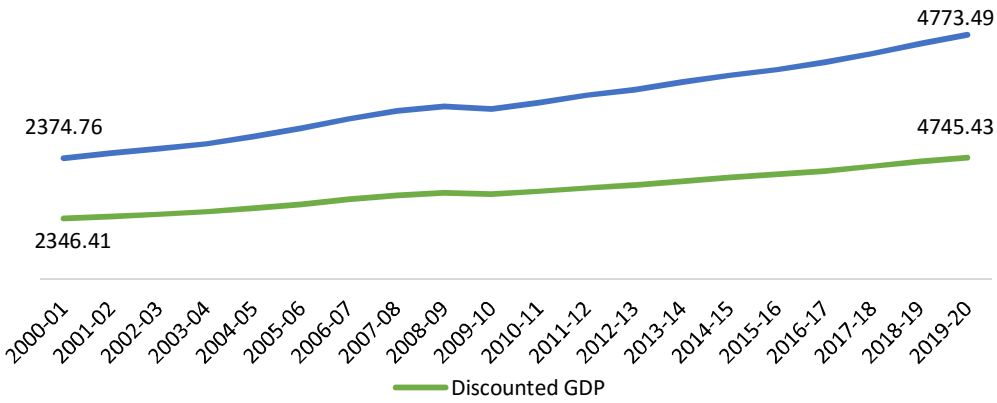
waste present an amount of electrical energy that can be obtained from waste (according to Australian energy regulator, 2015: and Waste to energy in Denmark, 2006). The price of electricity is taken in $ (dollars) for household consumption purposes of selected countries.

- . E_3 = (GNI/100 * %NRD), natural resources depletion (NRD) = Net Forest depletion + Energy depletion + Mineral depletion. In WDI data set, natural resources depletion of above types as percentage of GNI per country. So, the value of (GNI/100 × % NRD) is the actual value of NRD.

IV RESULTS AND ANALYSIS

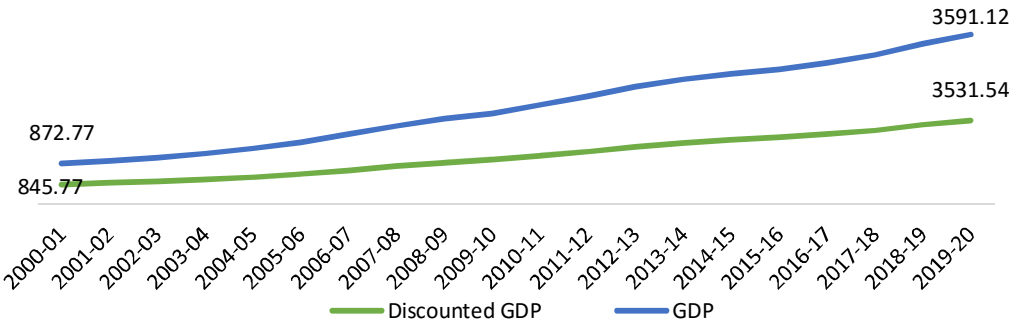
Discounted GDP is defined as the remaining of gross domestic products after subtracting the value of environmental degradation cost. This figure shows that, the percentage gap between GDP and discounting GDP from 2000-01 to 2019-20 of high-income countries is very less than both the middle-income and low-income countries. So, the gap between GDP and discounting GDP becomes wider. It implies that the high income countries are more aware about their environment.

Figure 1: Average of GDP and discounted GDP (in billion dollar) for high income countries.



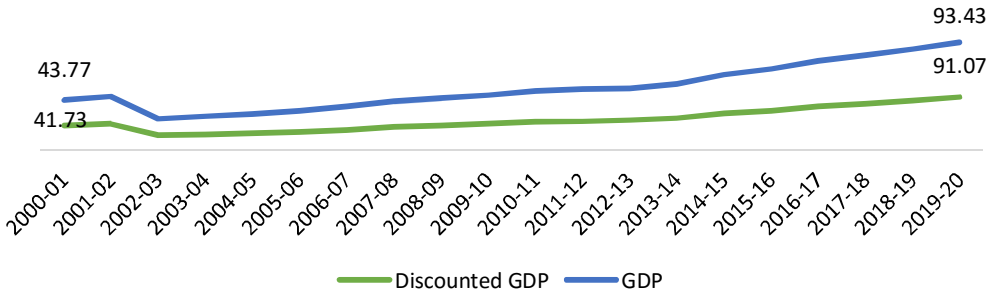
Source: Computation from table 1

Figure 2: Average of GDP and discounted GDP (in billion dollar) for middle income countries



Source: Computation from table 2

Figure 3: Average of GDP and discounted GDP (in billion dollar) for low income countries

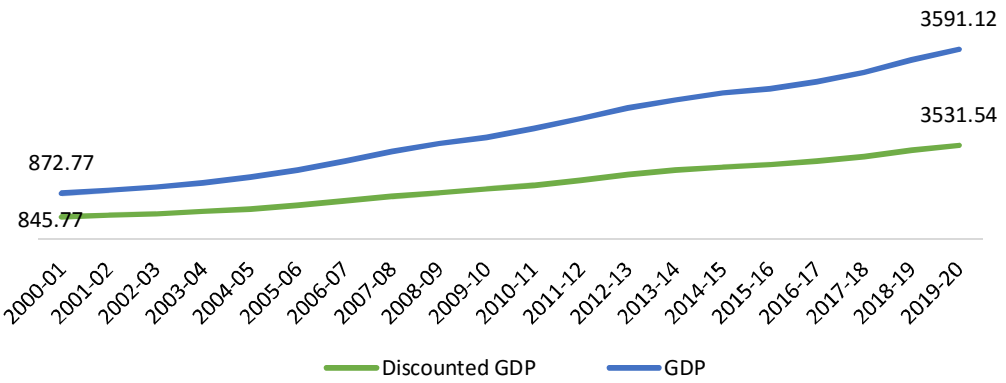


Source: Computation from table 3

Figure 2, shows that the percentage gap between GDP and discounted GDP in middle income countries has been declining. So, it indicates that the middle income countries are some-what aware about their environment.

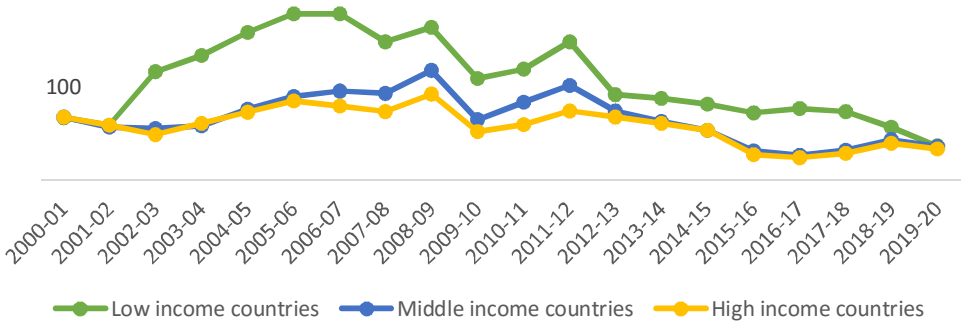
Figure-3 shows that the trends between GDP and discounted GDP in low income countries from 2000-01-2019-20. The percentage gap between GDP and discounted GDP is more in low income countries. So, it implies that the low income countries are depleting more natural resources because for their economic growth.

Figure 4: Average of GDP and discounted GDP (in billion dollar) for middle income countries



Source: Computation from table 4

Figure 5: Index of deviation of GDP and discounted GDP (2000=100) in low, middle and high income countries



Source: Computation from table 5

Figure-4 shows that, the percentage gap between GDP and discounted GDP of India has been declining. So, it implies that Indian people are some-what aware about the environmental protection.

Figure 5 shows that, the deviation between GDP and discounting GDP in all the three categories of countries from the year 2000-01 to 2019-20. In low income countries the deviation between GDP and discounted GDP are higher than the middle and high income countries. Because of the low income countries are trying to develop. So, they are depleting more natural resources for their economic growth so the deviation between GDP and discounted GDP are higher than other two categories of countries. As we also see the deviation between GDP and discounted GDP have declined slowly from 2012-13 to till the end because of the low income countries are somewhat-aware about their environment. In middle income countries the deviation between GDP and discounted GDP are slightly higher than the high income countries because of the middle income countries are on the path of development and also they are aware about their environment. The deviation between GDP and discounting GDP in high income countries are less than in both the middle and low income countries because the high income countries have already reached at the stage of development. So, they are more aware about their environment and also they are may be using eco-friendly technology now. As we also see the deviation between GDP and discounting GDP have sharply declined in all the three categories of countries during the year 2008-09 because of the financial crisis.

V. KEY FINDINGS

- There is a small gap between the discounted GDP and GDP in high income countries. Since, the high-income countries have already reached at the stage of development, they are more aware about their environment thereby using eco-friendly technology now.
- The gap between GDP and discounted GDP in low income countries is more. So, it implies that the low income countries are depleting more natural resources in order to increase their economic growth.
- In middle income countries the gap between GDP and discounted GDP has been declining. So, it indicates that the middle income countries are some-what aware about their environment.
- The study also found that the contribution of middle income countries in CO_2 emission is more as compared to high and low income countries.

- ❖ Forest depletion caused by low income countries is more than that of high and middle income countries.

VI. CONCLUSION

Environmental accounting is an important measure for assessing the real economic growth of a nation. GDP measures the economic growth but ignores the environmental degradation cost. The gap between GDP and discounted GDP serve as a signal for the importance of environmental effects. Discounted GDP cannot reflects the improvement of national output. However, we see it could encourage further discussion and debates on green growth and to bridge the gap of lack of data availability and methodological improvements regarding the environmental aspects along with the economic growth.

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VIII TABLES USED

Table-1: Average of GDP and Discounted GDP (in billion dollar) for High income Countries.

Years	Discounted GDP	GDP	% Difference
2000-01	2346.41	2374.76	1%
2001-02	2438.39	2463.94	1%
2002-03	2526.58	2548.67	1%
2003-04	2622.85	2651.40	1%
2004-05	2768.86	2805.09	1%
2005-06	2914.01	2958.63	2%
2006-07	3104.64	3149.08	1%
2007-08	3261.77	3304.70	1%
2008-09	3341.91	3397.67	2%
2009-10	3294.62	3325.22	1%
2010-11	3418.39	3454.76	1%
2011-12	3554.15	3601.67	1%
2012-13	3673.80	3718.16	1%
2013-14	3820.23	3861.81	1%
2014-15	3954.35	3992.03	1%
2015-16	4074.32	4094.03	0%
2016-17	4213.36	4231.26	0%
2017-18	4389.81	4411.96	1%
2018-19	4579.96	4612.17	1%
2019-20	4745.43	4773.49	1%

Source: Author's calculation of discounted GDP from WDI data set, 2020-21

Table-2: Average of GDP and Discounted GDP (in billion USD) for Middle income countries.

Year	Discounted GDP	GDP	% Difference
2000-01	845.77	872.77	3%
2001-02	904.64	928.86	3%
2002-03	965.66	990.77	3%
2003-04	1049.93	1078.88	3%
2004-05	1151.66	1193.66	4%
2005-06	1273.83	1328.83	4%
2006-07	1438.04	1504.48	4%
2007-08	1612.48	1684.91	4%
2008-09	1745.19	1845.18	5%
2009-10	1880.70	1938.35	3%
2010-11	2041.15	2122.64	4%
2011-12	2215.37	2323.99	5%
2012-13	2418.66	2504.44	3%
2013-14	2581.13	2658.12	3%
2014-15	2707.63	2775.60	2%

2015-16	2806.67	2847.43	1%
2016-17	2935.70	2971.85	1%
2017-18	3105.81	3152.34	1%
2018-19	3333.26	3400.53	2%
2019-20	3531.54	3591.12	2%

Source: Author's calculation of discounted GDP from WDI data set, 2020-21

Table-3: Average of GDP and Discounted GDP (in billion dollar) for low income countries.

Year	Discounted GDP	GDP	% Difference
2000-01	41.73	43.77	5%
2001-02	45.11	47.02	4%
2002-03	25.72	27.98	8%
2003-04	27.27	30.07	9%
2004-05	29.09	32.69	11%
2005-06	31.61	36.10	12%
2006-07	34.74	39.68	12%
2007-08	39.17	43.69	10%
2008-09	41.70	47.09	11%
2009-10	45.06	48.77	8%
2010-11	48.40	52.78	8%
2011-12	49.63	55.37	10%
2012-13	51.02	54.47	6%
2013-14	54.77	58.31	6%
2014-15	62.62	66.37	6%
2015-16	67.57	71.13	5%
2016-17	74.41	78.58	5%
2017-18	79.20	83.45	5%
2018-19	84.76	88.25	4%
2019-20	91.07	93.43	3%

Source: Author's calculation of discounted GDP from WDI data set, 2020-21

Table-4: GDP and Discounted GDP (in billion dollar) for India.

Year	Discounted GDP	GDP	% Difference
2000-01	2182.85	2214.21	1%
2001-02	2343.80	2371.93	1%
2002-03	2470.79	2501.11	1%
2003-04	2716.24	2747.80	1%
2004-05	3003.71	3045.34	1%
2005-06	3330.10	3389.02	2%

2006-07	3696.84	3773.02	2%
2007-08	4073.57	4171.19	2%
2008-09	4241.93	4383.58	3%
2009-10	4689.95	4764.25	2%
2010-11	5118.32	5229.33	2%
2011-12	5480.18	5618.38	2%
2012-13	6039.09	6153.16	2%
2013-14	6366.02	6477.52	2%
2014-15	6690.41	6781.02	1%
2015-16	7101.30	7159.80	1%
2016-17	7674.60	7735.00	1%
2017-18	8209.81	8276.93	1%
2018-19	8940.87	9029.38	1%
2019-20	9468.85	9562.01	1%

Source: Author's calculation of discounted GDP from WDI data set, 2020-21.

Table-5: Index of deviation of GDP and discounted GDP (2000=100) in low, middle and high income countries

Years	Low income countries	Middle income countries	High income countries
2000-01	100	100	100
2001-02	87	84	87
2002-03	173	82	73
2003-04	200	87	90
2004-05	237	114	109
2005-06	267	134	127
2006-07	267	143	119
2007-08	222	139	109
2008-09	246	175	138
2009-10	163	96	77
2010-11	178	124	88
2011-12	222	151	111
2012-13	136	111	100
2013-14	130	94	90
2014-15	121	79	79
2015-16	108	46	40
2016-17	114	39	36
2017-18	109	48	42
2018-19	85	64	59
2019-20	54	54	49

Source: Author's calculation from WDI data set, 2020-21

Table-6: Progress towards Green Accounting between 2000-01 and 2019-20 Of Selected Countries

Country name	GDP, PPP (in billion dollar) in 2000-01	Discounted GDP, PPP (in billion dollar) in 2000-01	GDP, PPP (in billion dollar) in 2019-20	Discounted GDP, PPP (in billion dollar) in 2019-20	Discounted GDP as % of Actual GDP in 2000-01	Discounted GDP as % of Actual GDP in 2019-20	Progress towards Green Accounting between 2000-01 and 2019-20
Afghanistan	190	189	82	82	99.26	99.66	0.40
Burkina Faso	11	10	46	44	91.21	96.46	5.75
Congo, Dem. Rep.	21	21	99	94	97.48	94.91	-2.64
Ethiopia	32	27	260	249	84.33	96.01	13.84
Guinea	10	10	34	33	95.74	96.17	0.45
Mali	12	11	48	47	88.49	98.57	11.40
Madagascar	20	20	46	45	99.76	99.82	0.07
Mozambique	8	8	41	40	99.88	99.43	-0.45
Sudan	89	80	186	185	90.39	99.14	9.68
China	3688	3616	23444	23269	98.05	99.25	1.23
India	2214	2183	9562	9469	98.58	99.03	0.45
Russian Federation	1001	908	4284	3976	90.74	92.82	2.29
Indonesia	1003	930	3332	3272	92.65	98.20	5.99
Brazil	1584	1559	3248	3184	98.45	98.05	-0.40
Turkey	609	607	2278	2275	99.65	99.89	0.24
Mexico	1097	1071	2610	2565	97.61	98.30	0.70
Egypt, Arab Rep.	399	374	1231	1185	93.74	96.28	2.71
Thailand	460	454	1339	1319	98.79	98.51	-0.28
Pakistan	374	370	1060	1051	99.07	99.08	0.00
Nigeria	282	250	1076	1030	88.70	95.79	8.00
Argentina	428	420	1034	1017	97.94	98.41	0.49
Bangladesh	170	169	808	804	99.49	99.51	0.01
Vietnam	159	150	808	801	94.52	99.13	4.88
South Africa	382	376	837	819	98.46	97.87	-0.60
Kazakhstan	115	96	509	467	83.36	91.86	10.19
United States	10252	10148	21433	21360	98.98	99.66	0.68
Japan	3461	3446	5416	5414	99.59	99.96	0.37
Germany	2237	2231	4677	4675	99.71	99.96	0.25
France	1590	1587	3337	3337	99.82	99.99	0.17
United Kingdom	1560	1543	3297	3279	98.92	99.43	0.52
Italy	1542	1539	2685	2683	99.76	99.94	0.18
Canada	901	880	1905	1895	97.66	99.51	1.89
Spain	876	874	1988	1987	99.82	99.99	0.17
Saudi Arabia	824	721	1677	1538	87.53	91.71	4.77
Australia	505	495	1320	1286	98.14	97.47	-0.68

Source: Author's calculation from WDI data set, 2020-21