A New Framework for the UNFCCC

Common but Differentiated Responsibilities among Non-Annex I Countries

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The United Nations Framework Convention on Climate Change has classified countries into two groups: Annex I countries and Non-Annex I countries for the purpose of taking on Common but Differentiated Responsibilities. While the ACs have not quite led the efforts in combating climate change, the world has started looking for a different negotiation framework. Though the role of ACs is paramount, this paper suggests a new framework that defines CBDR among NACs, consistent with UNFCCC principles. The framework suggested here covers per capita emissions, total emissions and carbon dioxide intensity.

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1 Background and Introduction

The 17th Conference of the Parties or COP 17 of the United Nations Framework Convention on Climate Change (UNFCCC) saw further realignment of countries on the global climate change issue. The European Union (EU) offered to enter into a second Kyoto commitment period provided there is an agreement to work towards a new deal which binds all countries. The end result was an agreement to create a second Kyoto commitment period and the "Durban Platform for Enhanced Action", which will replace the "Bali Roadmap" process.

The global climate negotiations have covered a long journey since the UNFCCC was painstakingly formulated in 1992. Despite the controversies, the UNFCCC has ensured the participation of a large number of countries in discussing a serious issue concerning the world today (Parikh and Parikh 2004). The Copenhagen Accord followed by Cancun point to the need for introducing some rules and guidelines of engagement for developing countries.

One of the critical roadblocks in climate negotiations is that many of the Annex I countries (ACs) are concerned that while their per capita emissions are going down, the emissions of Non-Annex I countries (NACs) are increasing. For example, Sweden and France have lower per capita emissions than Saudi Arabia, South Korea or Malaysia. Thus, it is imperative that NACs should also be brought under the principle of Common but Differentiated Responsibilities (CBDR). Though the responsibility of the ACs remains based more on their very high historical emissions, a separate differentiation criteria for NACs is also required. Not enough thought has been given to how the CBDR principle should be applied to various NACs based on their emissions profile, their socio-economic characteristics including population, gross domestic product (GDP), etc. The equity principle among NACs is equally important now. Any new framework for climate negotiations should be consistent with UNFCCC's principle of CBDR, even among developing countries, as a great deal of effort and resources have been invested over the years to create the UNFCCC framework, to continue the negotiation process within that framework.

Unfortunately, many simplistic approaches to include countries with "high total emissions" among NACs have been under discussion, which is not only inadequate but inefficient and iniquitous. Ad hoc approaches are taken, for example, involving only India, China or NACs in the top 10 or top 20 countries in

the world or, recently, the BASIC group consisting of Brazil, South Africa, India and China (Webster 2010). The grouping of BASIC countries in Copenhagen, although bringing together major emitters among NACs, ignores the difference in emission patterns among those countries. For example, the emission patterns of China and India are very different (James 2010; Massetti 2011). Moreover, most of these initiatives do not conform to the principles laid down in the UNFCCC, as they exclude a large number of developing countries from the negotiation table. Can an approach based on only total emissions succeed among the NACs, if countries with high emission growth, high per capita emissions or with high carbon intensities (CO_2/GDP) are left out? J Parikh (2007) has shown how many of the NACs have higher per capita and total emissions than developed countries but are not large or top 20 emitters. Their emissions cumulatively grow at a rapid rate. For example, Iran, South Korea and Saudi Arabia combined equal the total emissions of India, and they have high intensity and emissions growth. Why then exclude them and expect India, with its low per capita emissions and lower CO_2 intensities, to take the responsibility of reduction. Thus, criteria are needed to include these countries.

The UNFCCC implicitly differentiates countries according to per capita GDP which is related to emissions per capita, by exclusion as well as inclusion. That is, China and India with low per capita emissions and GDP were excluded in 1990 but small developed countries with high per capita emissions and GDP such as the Netherlands, Belgium and Luxembourg were included in the list of ACs. Thus, even among developing countries, per capita emissions or GDP should be the variable for the CBDR principle.

However, after nearly 20 years, we need more criteria to define CBDR. In addition to per capita emissions, total emissions should also be considered while defining CBDR. A third criterion is CO_2 emissions per unit of GDP. But it is important to understand that although all the three criteria are necessary, the impact of total emissions is more as it shows the direct contribution to the world's stock of greenhouse gases (GHGs). These three principles not only recognise prosperity or poverty among them but also prudence versus profligacy which is especially relevant as we look ahead two decades from now. Therefore, any new proposal differentiating NACs would have to meet the following criteria:

(1) The proposal should be consistent with UNFCCC provisions, in letter and in spirit, especially of CBDR.

(2) It should be based on objective and quantitative criteria directly related to emissions.

(3) It should be transparent so that each country can see where it stands year after year.

(4) It should be fair to all and perceived as fair.

(5) Some conditions of homogeneity of groups are also desirable so that countries with similar sociocultural and economic characteristics or national circumstances are in the same group. For example, the UNFCCC left out oil exporting countries but included the entire group of countries belonging to the Organisation for Economic and Co-operation and Development (OECD), regardless of size. This will also ensure homogeneity among countries within the same trade groups. The groups can be geographic, for example, south Asia or North America.

2 Other Approaches

There are countless approaches to bring all countries into the framework of emission reduction. Though the present paper discusses differentiation of responsibilities among NACs, provided the responsibility of ACs remains supreme, a few approaches to bind other countries have also been discussed in this section.

Jansen et al (2001) provide a framework within which sector-based classification can be used for national target setting. The approach is called the Multi-Sector Convergence (MSC) approach. Its major distinguishing characteristics are: (i) it is based on the distinction of different sectors within the national economy; (ii) the MSC base model prescribes to the theory that the amount of per capita emission assignments will ultimately converge to the same level for all countries; and (iii) additional allowances may be conceded to countries facing specific circumstances that warrant higher emission needs than countries with more favourable specific emission mitigating circumstances, all other factors being the same. The MSC approach includes four stages: distinction of different sectors, setting of global sector emission norms, determination of national emission mitigation targets, and inclusion of allowance factors.

Sawa (2008) discussed how the sectoral approach can be used for assigning responsibility. Individual sectors were categorised according to features into three groups of sectors for negotiations. The first group of sectors comprises energy-intensive industries exposed to international trade and leakage issues (Group I). The second group includes what are basically domestic sectors such as electricity and road transport for which benchmarks (generation efficiency, vehicle fuel efficiency, etc) and best practices can be relatively easily identified, but which are susceptible to resource availability, geographic and natural factors, and domestic policies and measures (renewable, introduction rate, traffic measures, etc), and thus need to be unilaterally adjusted with government policies and measures (Group II). The third group of sectors consists mainly of household and commercial sectors, or sectors that encompass a wide range of technologies (Group III). The emission reduction targets for all countries were based on the individual targets of the three sectors of the country.

Hermann E Ott et al (2007, 2008) suggest a framework where NACs are divided into four groups based on homogeneous national circumstances. The first two groups are the Newly Industrialised Countries (NICs) and the Rapidly Industrialising Developing Countries (RIDCs). The second two groups are the Least Developed Countries (LDCs) and other Developing Countries (DCs), the latter consisting of countries not part of the first three groups. The grouping of the countries was done on the basis of an index constructed using GHG emissions per GDP from energy use, GHG emissions per capita, cumulative CO_2 from energy use per capita from 1990 onwards divided by the number of years summed, and GDP per capita in purchasing power parity.

J Parikh (2008) discusses a three-tier system for climate negotiation based on per capita emissions with global per capita

average as the criteria for classifying countries. The three-tier system is consistent with the UNFCCC as all countries are included according to a rule-based framework. The basis of classifying the countries was per capita CO_2 emissions. The NACs were classified into two groups: Above Global Average (AGA) and Below Global Average (BGA) countries where the benchmark was chosen to be global average per capita emissions. It was observed that the AGA countries also have a very high growth rate of CO_2 emissions and some of the countries emit more total CO_2 than ACs. The approach does not expect AGA countries to join ACs; rather a separate tier is envisaged for them. A different policy approach was suggested for AGA countries as their CO_2 emissions grow at a faster rate than other countries.

In this paper, we build upon this framework but modify it by introducing two additional variables, total CO_2 emissions and CO_2 per unit of GDP. The NACs are further divided into three groups and a new group of countries is shown which have comparable emissions or emissions growth similar to ACs. The paper shows the significance of these countries in future negotiations and their capability and responsibility in dealing with climate change issues. We do believe that carbon accumulation (stock) and even current emissions of ACs are more important than the annual emissions of NACs. Unless ACs led in taking action, the NACs may not do so enthusiastically. However, many have started taking action. But among the latter, BGA countries contribute a lot less. The fact that we are discussing the latter is only because the UNFCCC has already clearly indicated that the main responsibility lies with ACs but the emissions of the NACs is not yet debated.

3 A Review of Global Emissions since 1990

Justification for new criteria and groups becomes more obvious once we review both past and current data. In this section, we review current and past CO_2 emissions[1] of various groups of countries based on the previous classification of AGA and BGA countries.

Table 1 shows that the total emissions of ACs have reached the 1990 level in 2008. The emissions are increasing at a very high rate for NACs. Most of the increase is contributed by the AGA countries,[2] especially China. The total emissions of the NACs have exceeded the total emissions of the ACs. This may be attributed to a faster rate of growth of AGA countries as their CO_2 emissions has more than doubled during this period.

Table 1: Emissions and Number of Countries of Three Groups

Category	Total No of Countries		CO_2 Emissions (Mt)	
	1990	2008	1990	2008
Annex I	39	39	13,908	13,908
Non-Annex I	94	96	6,427	14,360
AGA	28	28	3,978	9,749
BGA	66	68	2,449	4,612
World	133	135	20,335	28,268

Source: Tabulated by authors using data from IEA (2010).

Table 2: GDP Intensity and Per Capita Emissions

Countries/Year	CO_2/GDP (PPP)		CO_2 Per Capita	
	1990	2008	1990	2008
Annex I	0.62	0.42	11.83	10.91
Non-Annex I	0.59	0.47	1.63	2.78
AGA	0.93	0.61	2.81	5.82
BGA	0.37	0.32	1.00	1.32
World	0.61	0.45	3.98	4.39

Source: Tabulated by authors using data from IEA (2010).

Table 2 shows declining CO_2 intensity for all groups of countries, but higher intensity for AGA countries in all the years considered in the study. The per capita emissions of ACs have fallen. The per capita emissions of AGA countries have increased at a much faster rate than the BGA countries. Since the CO_2 intensity of AGA countries is more, the total emissions will also increase at a faster rate for this group of countries with economic development.

4 Methodology of Grouping Countries according to CBDR

We are considering only CO_2 emissions as reliable data available for all countries. Also, it is more closely linked to GDP growth and dependence on fossil fuels is strong. On the other hand, chlorofluorocarbons (CFCs) would reduce with time due to the Montreal Protocol and available and accessible technologies. Some sources of methane emissions will go down with time, for example, gas flaming and paddy cultivation, and some may increase, for example, livestock emissions. We restrict our analysis to countries with 1 million tonnes (Mt) or more of CO_2 emissions. Thus, 134 out of 194 countries are included. It is necessary that simple rules and criteria are used to define groups to ensure transparency and clarity. The methodology we have used in this paper is as follows:

(1) Define the essential criteria for determining CBDR based on UNFCCC principles primarily based on CO_2 emissions. Assigning benchmarks for each criterion.

(2) Award one star to each country which exceeds one criterion and define groups based on who gets three, two, one and zero stars respectively. Observe the countries according to stars and anomalies based on any other significant criteria. Introduce any other criteria for anomalies.

(3) Define final groups and again observe them for CBDR to see emerging patterns.

4.1 Defining Criteria and Benchmarks

Three simple criteria are used to classify developing countries into three groups. Each criterion has a benchmark. The rationale behind the criteria and the benchmarks are explained as follows:

(i) Per capita carbon dioxide emissions (PCCE): PCCE shows emissions at an individual level for a country. It reflects income levels, the types of energy resources and technologies available for individuals in a country. It indicates the level of fossil fuel consumption and energy saving technologies used by the country on average. Access to alternate energy resources like hydro, nuclear and biofuels will reduce per capita emissions. The global average of per capita emission is taken as the benchmark. This is in line with the three-tier negotiation framework suggested by Parikh (2007) where 31 out of 96 NACs were shown to exceed the benchmark. The countries with highest per capita emissions are the oil producing countries. Other countries like China, South Africa and Malaysia are also above the benchmark. However, large countries like India and Brazil have quite low levels.

(ii) Total carbon dioxide emissions (TCE): TCE is an important criterion for grouping countries. TCE shows absolute emissions of countries without taking into account the geographic size and socio-economic characteristics of countries. The criterion shows the size of the country's emission as a proportion of global emissions. The benchmark taken for this criterion is 0.001% of global CO_2 emissions or 30 million tonnes. Again, 41 out of 96

NACs exceed the benchmark. The countries at the top are the big countries like China, India and Saudi Arabia.

(iii) Carbon emissions GDP intensity (CGI): The carbon emissions emitted per unit GDP (CGI) captures the efficiency of the economy including production and consumption technologies. Are the manufacturing sector, mining, domestic and agricultural sectors using greener technologies? Are the processes of production and consumption sustainable? The benchmark is taken as 0.4 MT/dollars (2000 PPP) for classifying the countries into high and low carbon emissions GDP intensity and 41 out of 96 NACs exceed the benchmark. In this criterion too, the countries at the top are oil producing countries.

4.2 Awarding Stars and Defining Groups for CBDR

We award one star to all countries that exceed each benchmark defined for the three criteria. That is, they can have three, two, one or zero stars. The higher the number of stars, higher is the responsibility. The countries were classified into three groups on the basis of the stars and one additional criterion. Table 3 shows the classification.

Table 3: The Classification of Countries in Groups

Countries	Characteristics
Group A	Three stars + developing countries who are among top 20 emitters in the world
Group B	One and two stars
Group C	Zero star

The characteristics of the three groups of countries are as follows (see also Appendix Tables 1, 2 and 3, pp 71, 72):

Group A: This group consists of countries with three stars. These countries have both the responsibility and the capability of reducing their emissions along with the ACs. In addition, those countries that are among the top 20 global emitters are also included. We observe that Group A countries are further divided into four categories based on geographical and socio-economic similarities:

(i) East Asian countries: These countries are China, Taipei, Korea and Malaysia. They are fast growing Asian economies with reasonably high per capita emissions and emission intensity. They form the major portion of the emissions from Group A countries. All of them have a high level of per capita GDP.

(ii) Oil producing countries: These countries have very high per capita emissions and emission intensity. Most of them are small in size for population and even area. Their oil production is for high domestic consumption, but mostly for the benefit of the rest of the world.

(iii) Restructuring economies: The countries in this category are Kazakhstan, Serbia, Turkmenistan, Uzbekistan and South Africa. These countries also have very high per capita emissions and emission intensities. They are in the restructuring phase of their economy. Exchange rates fluctuate considerably, often with a dual exchange rate, which might affect GDP and GDP-related indicators.

(iv) Countries among the top 20 global economies: This is a special category of developing countries based on GDP (PPP). These countries are included as they have higher capabilities due to high GDP, and higher technological abilities compared to other developing countries. Due recognition may be given to these features. China, which falls under this category of Group A countries, is the highest emitter in the world.

Group B: This group consists of all the remaining countries with one or two stars. The socio-economic and geographical characteristics of this group of countries may be similar to some countries in Group A but their emissions patterns are different from Group A countries. These countries might have responsibility towards reduction at a later stage; at present, the Group B countries need a weaker commitment to reduce emissions than Group A countries.

Group C: This group consists of countries with zero stars. They are mostly small countries with almost negligible amount of emissions. These countries with their low level of total emissions, per capita emission, carbon intensity and economic growth have lower responsibility towards emission reduction, until later.

As we look at results, we can see alternative possibilities: to merge groups B and C, or to merge countries with two stars in Group A, and with one star in Group C.

5 Discussion of Results

In 2008, the Group A countries had 85% share of the total CO_2 emissions among the NACs, as seen from Table 4. The share of CO_2 emissions and GDP has increased for Group A countries whereas the share of population has declined. The share of CO_2 emissions and GDP has declined for countries in Groups B and C but the share of population has increased. Groups B and C are still not major contributors to global emissions. In fact, their shares are falling in GDP and emissions but not population.

Table 4: Non-Annex I Per Cent Shares of Three Groups

	Countries		1990			2008		
	1990	2008	Population	GDP	CO_2	Population	GDP	CO_2
Group A	21	21	68	69	80	65	77	85
Group B	37	37	22	23	17	23	18	13
Group C	38	38	10	7	3	12	5	2

Source: Tabulated by authors using data from IEA (2010).

Table 5: Emission Indicators for Three Groups of NACs

	CO_2 Per Capita		CO_2/GDP (PPP)		GDP Per Capita in Dollars	
	1990	2008	1990	2008	1990	2008
Group A	1.92	3.65	0.68	0.52	2,806	6,967
Group B	1.32	1.61	0.43	0.35	3,061	4,601
Group C	0.44	0.41	0.24	0.17	1,820	2,451

Source: Tabulated by authors using data from IEA (2010).

Table 5 shows a major increase in per capita emissions and total emissions of Group A countries. The per capita emissions of Group A have almost doubled whereas the figures have increased marginally for Group B and have more or less stayed constant for Group C. The CO_2 intensities of all the three groups have fallen during this period. The per capita GDP has also increased considerably for Group A countries when compared to Groups B and C.

Table 6: Growth in Emissions, GDP and Population (Increase over 1990)

	Increase (1990-2008)		
	CO_2	GDP	Population
Group A	2.4	3.1	1.3
Group B	1.7	2.1	1.4
Group C	1.4	2.0	1.5

Source: Tabulated by authors using data from IEA (2010).

The increase in CO_2 emissions is 2.4 times for Group A compared to 1.7 and 1.4 times for Groups B and C respectively. Table 6 shows that the increase in CO_2 and GDP is very high for Group A as

compared to Group B and Group C. The increase in population is lowest for Group A. Thus the rate of growth of emissions and GDP is highest for the Group A countries whereas it is very less for Group B, especially Group C.

5.1 Comparison with Other Groups under Discussion

Currently, a number of groups are being discussed under various criteria. Table 7 shows five alternative ways to group developing countries using various other initiatives. Forums like BASIC, G-20 and – top 20 emitters, although they include all the large CO_2 emitting NACs, ignore the basic principles necessary for defining CBDR.

Table 7: Comparison of the Present Four Tier (including Annex I) Scheme with Other Groups Discussed

Countries	Number of Countries	World Share		Non-Annex I share	
		Cumulative Emissions (1990-2008)	CO_2 Emissions (2008)	Cumulative Emissions (1990-2008)	CO_2 Emissions (2008)
Non-Annex I	94	42	49	100	100
Group A	21	35	43	83	86
Top 20 developing emitters in the world	9	30	38	71	78
G-20 developing	9	29	37	69	76
BASIC	4	23	31	55	63

Source: Tabulated by authors using data from IEA (2010).

The Group A countries based on the above classification represent the highest share of global emissions, both cumulative and current. It accounts for 35% of global cumulative CO_2 emissions from 1990 to 2008 and 43% of CO_2 emissions in 2008. Moreover, it contributes more than 80% of the cumulative and current emissions of NACs respectively and it is formed using the same principles that UNFCCC adopted while dividing the world into ACs and NACs without abruptly switching criteria – turning exclusively to total emissions.

The results show that the Group A countries among the NACs are the fast growing developing or already developed economies as can be seen by the GDP (PPP) and per capita GDP (PPP). They account for more than a quarter of the global emissions whereas Groups B and C together account for only 6% of global emissions (Table 4). The trend since 1990 shows that the Group A countries are expected to grow faster and contribute more to emissions. The focus should be on these 22 countries along with the ACs to share the burden of emissions reduction through mitigation and adaptation techniques. The countries with three stars have the responsibility as well as the capability to reduce emissions. However, the five countries in Group A mainly due to the size of their emissions should reduce it based on capability criteria.

One can argue about the reasons for not dealing with only nine countries in the top 20 emitters list instead of the 21 countries of Group A that account for 38% of the world's emissions rather than 43%. It is because Group A is based on fair principles based on equity without which negotiations cannot move forward or collapse later. It also lays down future course of action, indicating by when the other countries enter Group A.

If we have to judge the differentiated responsibilities and capabilities of these NACs a larger classification done logically (as is done here) is necessary. In addition, the study of the different categories of countries within Group A is a good way of assigning responsibility based on capability and responsibility mechanisms.

6 Concluding Remarks

The UNFCCC has given the world a fair platform where most of the countries have come together and are working towards a solution to climate change. Twenty years after Rio, ACs have not lived up to the promise they made. However, it is still expected that NACs may need to play a greater role than they have in the past. How do we distinguish among the developing countries to formulate a framework for CBDR?

The suggested framework includes three criteria and adheres to the framework of CBDR and differentiates among the NACs on the basis of: (a) Per capita emissions, (b) total emissions, and (c) CO_2 intensity. Benchmarks for each are set as: (i) Per capita global emissions; (ii) 0.001% (30 Mt) of total emissions; and (iii) 0.4 Mt per dollar (2000 PPP). The countries which exceed one benchmark are given one star. The countries which have three stars and the large countries have to share the common responsibility of emission reduction along with the ACs. The 22 countries defined as Group A account for 86% of NACs emissions and 79% of NACs GDP respectively. Their emissions may rise as they are fast growing developing countries. Thus, it is important for these countries to commit to emission reduction, although less than the ACs. The equity principle, emphasised in the UNFCCC, needs to be established among the NACs. The CBDR among NACs is an issue that requires urgent attention. The debate over equity principles among NACs will soon manifest itself and some analysis needs to be underway.

Appendix Table 1: Group A (Exceeding three benchmarks + top 20 emitters)

Countries	CO_2 Emission (Mt)	GDP (Billion Dollars)	GDP (PPP) (Billion Dollars)	Population (Billion)	CO_2 Per Capita (Kg)	CO_2/GDP (PPP) (Kg/ dollar)	GDP Per Capita (2000$ PPP) (Kg/dollar)
East Asia							
Chinese Taipei	264	417	637	23	11.53	0.41	27,795
Korea	501	751	1,139	49	10.31	0.44	23,441
Malaysia	181	139	304	27	6.7	0.6	11,254
Oil exporting							
Islamic Rep of Iran	505	160	585	72	7.02	0.86	8,131
Kuwait	70	67	76	3	25.48	0.91	27,900
Libyan Arab Jamahiriya	45	53	72	6	7.14	0.62	11,466
Qatar	54	38	34	1	42.08	1.6	26,367
Saudi Arabia	389	252	376	25	15.79	1.04	15,243
Trinidad and Tobago	38	15	21	1	28.4	1.81	15,726
United Arab Emirates	147	123	122	4	32.76	1.2	27,198
Venezuela	146	167	199	28	5.21	0.73	7,126
Restructuring economy							
Kazakhstan	202	37	132	16	12.86	1.53	8,406
Serbia	49	14	51	7	6.69	0.96	6,950
Turkmenistan	47	9	46	5	9.41	1.02	9,202
Uzbekistan	115	23	62	27	4.21	1.87	2,253
South Africa	337	183	532	49	6.93	0.63	10,923
Total	9,598	5,051	15,192	1,669	7.21	0.91	7,904
Countries that are among the top 20 economies of the world							
China	6,508	2,603	10,804	1,326	4.91	0.6	8,150
Indonesia	385	247	898	228	1.69	0.43	3,933
Mexico	408	769	1,193	107	3.83	0.34	11,191
Brazil	365	854	1,648	192	1.9	0.22	8,584
India	1,428	826	4,310	1,140	1.25	0.33	3,781
Total	2,760	3,091	8,670	1,707	1.62	0.32	5,079
Group A Total	12,184	7,746	23,240	3,336	3.65	0.52	6,967

NOTES

1 We only consider CO_2 emissions as the other GHG are not as directly related to GDP and have erratic trends or declining chlorofluorocarbons (CFC) trends.

2 The countries are grouped on the basis of 2008 per capita CO_2 emissions and kept in the same group for the year 1990. Thus the per capita emissions for AGA countries in 1990 are less than the global average.

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Appendix Table 2: Group B (Exceeding one or two benchmarks)

Countries	CO_2 Emission (Mt)	GDP (Billion Dollars)	GDP (PPP) (Billion Dollars)	Population (Billion)	CO_2 Per Capita (Kg)	CO_2/GDP (PPP) (Kg/dollar)	GDP Per Capita (2000$ PPP) (Kg/dollar)
Thailand	230	178	564	67	3.41	0.41	8,371
Egypt	174	145	346	82	2.13	0.50	4,241
Argentina	174	395	621	40	4.36	0.28	15,568
Pakistan	134	113	399	166	0.81	0.34	2,401
Vietnam	103	56	283	86	1.19	0.36	3,288
Iraq	97	23	31	28	3.45	3.11	11,09
Algeria	88	75	223	34	2.56	0.40	6,488
Chile	73	105	198	17	4.35	0.37	11,823
Philippines	72	111	446	90	0.80	0.16	4,931
DPR of Korea	69	74	312	160	0.43	0.22	1,953
Israel	63	160	189	7	8.63	0.33	25,908
Colombia	60	134	399	45	1.35	0.15	8,970
Syrian Arab Republic	54	27	75	21	2.56	0.72	3,547
Nigeria	52	74	169	151	0.35	0.31	1,118
Bangladesh	46	12	41	24	1.95	1.14	1,712
Singapore	44	135	138	5	9.15	0.32	28,620
Hong Kong	42	241	250	7	6.05	0.17	35,807
Morocco	42	55	167	31	1.35	0.25	5,346
Oman	35	31	48	3	12.53	0.73	17,148
Peru	35	84	194	29	1.21	0.18	6,724
Azerbaijan	29	18	70	9	3.38	0.42	8,054
Ecuador	26	24	59	13	1.92	0.44	4,354
Bahrain	22	13	17	1	29.07	1.30	22,302
Yemen	22	13	20	23	0.95	1.09	871
Bosnia and Herzegovina	20	8	34	4	5.17	0.57	9,092
Jordan	18	14	33	6	3.12	0.55	5,646
Lebanon	15	24	23	4	3.67	0.66	5,523
Bolivia	13	11	27	10	1.33	0.48	2,777
Jamaica	12	10	12	3	4.43	1.01	4,401
FYR of Macedonia	9	4	15	2	4.42	0.60	7,400
Zimbabwe	9	5	20	12	0.71	0.44	1,610
Cyprus	8	12	18	1	9.52	0.43	22,402
Brunei Darussalam	8	7	8	0	18.89	0.91	20,685
Republic of Moldova	7	2	9	4	1.95	0.77	2,531
Kyrgyzstan	6	2	11	5	1.12	0.55	2,016
Malta	3	4	8	0	6.33	0.33	19,078
Gibraltar	1	1	1	0	17.86	0.53	33,536
Total	1,915	2,402	5,479	1,191	1.61	0.35	4,601

Appendix Table 3: Group C (Exceeding no benchmark)

Countries	CO_2 Emission (Mt)	GDP (Billion Dollars)	GDP (PPP) (Billion Dollars)	Population (Billion)	CO_2 Per Capita (Kg)	CO_2/GDP (PPP) (Kg/dollar)	GDP Per Capita (2000$ PPP) (Kg/dollar)
Cuba	30.5	44	101	11.25	2.71	0.30	8,939
Tunisia	20.7	29	88	10.33	2.00	0.24	8,524
Dominican Republic	19.6	36	102	9.84	1.99	0.19	10,369
Sri Lanka	12.2	24	99	20.16	0.61	0.12	4,894
Sudan	12.1	22	88	41.35	0.29	0.14	2,133
Myanmar	11.7	19	116	49.19	0.24	0.10	2,356
Angola	10.6	24	54	18.02	0.59	0.20	3,008
Guatemala	10.6	26	61	13.68	0.78	0.17	4,470
Kenya	8.6	18	45	38.53	0.22	0.19	1,157
Honduras	7.8	11	33	7.24	1.08	0.24	4,491
Uruguay	7.6	29	41	3.33	2.28	0.18	12,443
Ghana	7.3	8	59	23.35	0.31	0.12	2,507
Ethiopia	6.8	15	102	80.71	0.08	0.07	1,258
Costa Rica	6.6	24	47	4.53	1.46	0.14	10,457
Côte d'Ivoire	6.5	11	28	20.59	0.32	0.23	1,351
Panama	6.5	19	29	3.40	1.91	0.22	8,577
El Salvador	5.8	16	36	6.13	0.95	0.16	5,883
United Rep of Tanzania	5.8	15	30	42.48	0.14	0.19	704
Armenia	5.3	5	18	3.08	1.71	0.29	5,934
Senegal	5.1	6	22	12.21	0.42	0.23	1,790
Georgia	4.7	5	17	4.36	1.08	0.28	3,862
Botswana	4.5	8	20	1.91	2.37	0.23	10,531
Cameroon	4.3	13	37	18.90	0.23	0.12	1,966
Nicaragua	4.1	5	20	5.68	0.72	0.20	3,536
Albania	3.9	6	17	3.14	1.24	0.22	5,557
Namibia	3.9	6	18	2.11	1.84	0.21	8,724
Paraguay	3.7	9	30	6.23	0.59	0.12	4,781
Benin	3.3	3	10	8.66	0.38	0.34	1,118
Nepal	3.3	7	43	28.58	0.12	0.08	1,508
Gabon	3.0	6	9	1.45	2.07	0.34	6,102
Tajikistan	3.0	2	9	6.84	0.44	0.35	1,249
Dem Rep of Congo	2.8	6	44	64.21	0.04	0.06	689
Haiti	2.3	4	13	9.78	0.24	0.17	1,370
Mozambique	1.9	8	30	21.78	0.09	0.06	1,382
Zambia	1.6	5	13	12.62	0.13	0.13	1,006
Congo	1.5	4	5	3.62	0.41	0.30	1,366
Togo	1.1	2	9	6.46	0.17	0.13	1,343
Eritrea	0.5	1	4	5.00	0.10	0.12	846
Total	261	502	1,546	631	0.41	0.17	2,451