Department of Economic & Social Affairs

CDP Background Paper No. 20
ST/ESA/2014/CDP/20

September 2014

The likelihood of 24 Least Developed Countries graduating from the LDC category by 2020: an achievable goal?*

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ABSTRACT

This paper examines the prospects of achieving a main goal of the Istanbul Programme of Action—at least half of the LDCs to meet the graduation criteria by 2020. Based on two different sets of graduation criteria established by the CDP and current trends in socio-economic indicators of LDCs, the paper concludes that the goal is unlikely to be met even under an optimistic scenario. There are considerable uncertainties about the possible outcome, partly owing to the way in which the graduation criteria are established and partly owing to the difficulty of predicting future course of socio-economic development of LDCs.

JEL Classification: O10 (Economic development); F53 (International agreement and observance): F55 (International institutional arrangements)

Keywords: least development countries, Istanbul Programme of Action, graduation, GNI, human asset index, economic vulnerability index

* This paper is a revised version of a paper with the same title prepared for the Expert Group Meeting (EGM) on Refining Criteria for the Identification of LDCs, held in the UN Headquarters in New York, 26-27 November 2013. I am grateful to EGM participants for comments received as well as to Ana Cortez for many helpful suggestions on earlier drafts and to Matthias Bruckner for equally invaluable comments on an early draft and for making his data available. The views expressed herein are mine and do not necessarily reflect the views of the United Nations or the Committee for Development Policy.

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Tables

"We are committed to assisting the Least Developed Countries with an overarching goal of enabling half of them to meet the criteria for graduation through the eradication of poverty and the achievement of accelerated, sustained, inclusive and equitable growth and sustainable development." (Istanbul Declaration: Renewed and strengthened global partnership for the development of Least Developed Countries).

I Introduction

On 13 May 2011, member States of the United Nations adopted the Istanbul Declaration and Programme of Action (IPoA) for the Least Developed Countries for the Decade 2011—2020. In the Declaration, the member States stated, among other things, their commitment to collectively assisting the least developed countries (LDCs) so that at least half of them will become able to meet the graduation criteria by 2020. Istanbul marks the first time that the global community sets a quantitative goal on the number of LDCs to become eligible for graduation by a certain date. Setting quantitative development goals has become recognized as a useful yardstick to assess progress (or lack thereof) in the implementation of the strategies adopted at various UN summits and conferences, particularly since the Millennium Development Goals (MDGs) in 2000. Monitoring progress towards achieving the MDGs and their targets has the objective of assessing whether implementation is on track to realize the goals by 2015 and, if not, proposing additional interventions including the mobilization of additional resources to achieve the goals. The quantitative target in the IPoA is expected to play the same role. It facilitates monitoring and, if necessary, the strengthening of policy interventions.

The present paper attempts to assess the possibility of achieving the quantitative goal of having half of the LDCs becoming meeting graduation thresholds by 2020, as set in the Istanbul Declaration.[1] This assessment will take into account the graduation criteria set out by the Committee for Development Policy (CDP) and the recent trends taking place in the socio-economic development of the LDCs. As argued below, the likelihood of the graduation from the LDC category depends not only on the absolute progress in socio-economic status of a given LDC. It also depends on how the LDC fares in relation to a group of developing countries (the reference group), as the threshold for graduation –up to the 2012 triennial review of the list of LDCS- had been established in relation to this reference group both for the level of human asset and economic vulnerability. The reference group is composed of LDCs and other developing countries that have features somewhat similar to LDCs, but which did not meet the inclusion criteria, or declined to join the category (inclusion is subject to the country's agreement). The reference group composition thus changes overtime, making it further complicated to assess progress of LDCs in relation to the reference group.

The pace at which LDCs are found to meet the graduation criteria and are recommended for graduation seems to have accelerated in the new millennium. Three countries—Cape Verde, the Maldives and Samoa—graduated from the list of LDCs in 2007, 2011 and 2014, respectively In addition, Equatorial Guinea and Vanuatu are scheduled to graduate in 2017. Tuvalu has also been recommended for graduation, but the decision on the country's graduation has been deferred to July 2015. Furthermore, the CDP's 2012 triennial review found Angola and Kiribati eligible for graduation for the first time. In contrast, Botswana was the only country that graduated from the category of LDCs in the first 30 years since the category was established by the UN in 1971.

In view of the goal established in Istanbul, it is worth examining whether the recent trend of an increasing

1 A similar, but independent, attempt can be found in Guillaumont and Drabo (2013). The authors examine the graduation prospects mainly based on projected per-capita income growth.

number of LDCs graduating or becoming eligible for graduation will continue in the medium term. To do so, however, we need to address several methodological issues related to the current criteria that categorize countries as LDCs, which comprise gross national income (GNI) per capita, human asset index (HAI) and economic vulnerability index (EVI).

Section 2 will review the methodology that is employed by the CDP to identify LDCs and to make recommendations for graduation, and consider a few issues related to the graduation criteria. Additional technical details and information on the construction of the composite indices are available in the annex. Section 3 attempts to identify which LDCs could become eligible for graduation by 2020, under the current methodology and graduation criteria, based on—admittedly—rather crude assumptions of the rate of growth of GNI per capita and progress in health and education outcomes as well as possible trends related to economic vulnerability. As will be seen below, the number of low-income countries that comprise the reference group to identify LDCs is declining, and it has been increasingly difficult to define LDCs in relation to other countries as the reference group shrinks. One way to address this problem is to introduce absolute rather than relative thresholds for establishing HAI and EVI graduation eligibility. By using the same method developed in section 3, section 4 examine how the introduction of the new threshold changes the prospects of halving the number of LDCs by 20. Section 5 concludes.

II Methodology and Socio-Economic Variables for the Identification of Least Developed Countries and graduation criteria[2]

Least developed countries (LDCs) are understood as low-income countries with severe structural impediments to sustainable development. In 1971, at the request of the General Assembly, the Committee of Development Planning, the predecessor of the current CDP, in collaboration with other UN entities, identified for the first time the main problems LDCs faced. These conditions reflected in the low level of GDP per capita (which makes difficult to generate the necessary volume of savings to finance development), economies characterized by a low level of industrialization (low share of manufacturing to GDP and predominance of extractive industries and low productivity agriculture) and undeveloped human resources (low adult literacy rate).[3] Since then, the criteria used for identifying countries as LDCs have evolved, largely owing to the efforts of the Committee to refine the criteria as well as due to the increasing availability of accurate and timely data on socio-economic variables that could not be included or considered previously.

A. Construction of the indexes[4]

At present, the LDC criteria include the following three components:

- gross national income (GNI) per capita;
- human asset index (HAI); and,
- economic vulnerability index (EVI).[5]

The GNI is a stand-alone and widely used indicator. GNI per capita gives an indication of the amount of productive capacity and resources available in the country. It is expressed as a 3-year average and uses the Atlas method of the World Bank to convert national currencies into United States dollars.

2 This section is largely based on Committee for Development Policy (2011).

3 Committee for Development Planning (1971).

4 For details, see Committee for Development Policy (2011a).

5 In 1991, the Committee for Development Planning decided that countries with a population over 75 million should not be considered for inclusion in the LDC category. The countries with populations over 75 million that were admitted to the list of LDCs before 1991—Bangladesh and Ethiopia—have been allowed to stay in the list. Committee for Development Planning (1991).

The HAI and EVI are composites of several social and economic variables and aim to capture other important structural impediments to growth in the country: the level and quality of human assets and its economic vulnerability (exposure and resilience) to exogenous economic shocks and natural disasters. The two indexes are "standardized" by mathematical transformations as explained in the Annex. An index is a useful tool to convert a wide range of variables into a single measure and to make it possible to compare the development situations of countries or of a single country at different points in time. At the same time, these procedures make it more difficult to establish the extent to which changes in the component variables (raw values) affect HAI or EVI scores.

The HAI comprises 2 health-related and 2 education-related variables:

1. Health and Nutrition:
   a. the percentage of population that is undernourished (UNP), and
   b. (the rate of mortality for children aged five years and younger (so-called under 5 mortality rate) (U5M),
2. Education:
   a. the gross secondary school enrolment ratio (SSE) and
   b. the adult literacy rate (ALR).

Original (or raw) values are transformed into indices ranging from 0 to 100, using lower and upper bounds imposed on the roughly basis of the minimum and maximum values derived from a set of developing countries.[6] This procedure is required to remove outliers and the skewedness of the distribution, while preserving the ranking of countries in the distribution. Note that when a higher value of raw data corresponds to a lower human asset level—e.g., in case of the two health variables—a rank-reversing transformation is applied, so that a higher index number after conversion corresponds to a higher human asset level. HAI is the sum of 4 equally weighted indices, and the higher the value, the better the country situation is.

The EVI is designed to capture the relative risk of a country's development to exogenous shocks. It is comprised of two groups of variables, one intended to measure exposure (the exposure index) and is composed of 5 variables and the other the impact of the shock (the shock index) includes 3 variables:

1. Exposure index:
   a. population (POP) (1/8)
   b. remoteness (RMT) (1/8)
   c. merchandise export concentration (MEC) (1/16)
   d. share of agriculture, forestry and fisheries (AFF) (1/16)
   e. share of population in low elevated coastal zones (PLE) (1/8)
2. Shock index:
   a. instability of exports of goods and services (INE) (1/4)
   b. victims of natural disasters (VND) (1/8)
   c. instability of agricultural production (INA) (1/8)

As in the case of the HAI, original values are transformed into indexes ranging from 0 to 100. Again, lower or higher bounds are imposed to reduce the impact of outliers and skewness (see Annex). It should be noted that, for all variables included in EVI except for population, smaller values represent less vulnerable (i.e., more desirable) situations. Countries with large populations, on the other hand, are considered to be more resilient to shocks, thus the rank-reversing transformation being applied to reported population. The EVI is calculated as the sum of weighted indices, with the weights shown between parentheses above.[7]

6 Note that lower and upper bounds are not necessarily equal to the minimum and maximum values. For example, the upper bound for population is set at 100 million while the population of Bangladesh is over 150 million.

7 Note that the weights over the exposure and shock indices are equally distributed.

B. Meeting the criteria for graduation

Graduation eligibility is established by the CDP at the triennial review of the list of LDCs. A country is considered to be eligible for graduation from the LDC category if it meets the graduation thresholds of any two of the three criteria (GNI per capita, HAI and EVI), or if its GNI per capita is at least twice as high as the income-graduation threshold irrespective of levels of the other two indices—this is called income-only eligibility. Up to the 2012 triennial review, graduation and inclusion thresholds for EVI and HAI are set in relation to a reference group of developing countries;[8] that is, eligibility to graduation is established by the country's position in a rank distribution of the relevant indexes. Inclusion is also ascertained on the basis of the country position in the rank distribution. Thus, the size of the reference group, choice of countries included and their performance also matter for graduation and inclusion decisions.

At this point, a few observations are in order. First, within each composite index, substitution is possible among its various components to achieve a given level of HAI or EVI, and any pair of variables within a single index is perfect substitutes (within the imposed maximum and minimum bounds). Taking the HAI as an example; even if a country has a high child mortality rate, the HAI graduation threshold can be met if, say, the country has a very high secondary enrolment ratio (or a high adult literacy rate) which will offset the poor outcome in U5M rate. Naturally, a country can also meet the HAI graduation threshold with more balanced outcomes. This notwithstanding, it is important to stress that meeting the graduation threshold does not necessarily imply that the country has satisfactory outcomes in all aspects being measured by the composite indices. The same applies to the EVI and its components. However, it should be noted that all HAI components are highly correlated, whereas in case of the EVI correlation varies and is generally lower. Hence, all four indicators in HAI are likely to move in the same direction, perhaps with time lags. In sum, because HAI and EVI comprise of several indicators, different combinations of value of their respective components can lead to identical index values, and meeting the graduation threshold does not necessarily imply that the country is succeeding in all aspects being measured by the indices.

Second, and following up on the observations made above, a country meets graduation eligibility without being successful in all three criteria. In addition to the income-only eligibility, there are possible three combinations of criteria that will allow for a country to be eligible for graduation, GNI-EVI, GNI-HAI and EVI-HAI. For instance, some small-island developing States have been found eligible for graduation, based on high levels of GNI per capita and HAI (the GNI-HAI combination), while their EVI scores are far from the graduation threshold. This is not surprising, as generally the correlation between GNI and HAI is high, but low between GNI and EVI or HAI and EVI. Meanwhile, the income-only eligibility implies that meeting a certain level of GNI per-capita per se can "override" the country's performance in human assets and economic vulnerability and satisfy the graduation eligibility, if such income level is anticipated to be sustainable in the long run.

C. The 2012 triennial review

The 2012 triennial review is used as an example of how the three indexes and the reference group work to identify eligible LDCs for graduation. The review begins with an examination of the relevant socio-economic indicators of LDCs in the list (48 in the case of the 2012 triennial review). In addition to the 48 LDCs, any other developing country, whose per capita income in any of the 3 years in the period 2008—2010 (used to determine average incomes) was less than 20 per cent above the low-income threshold determined by the World Bank was included in the reference group for the 2012 review. Twelve developing countries satisfied that requirement. It should be noted that the selection criteria of the reference group and therefore the number of

8 The CDP introduced new refinements to the LDC criteria in 2014 while the paper was being written. For details, see section IV.

Table 1
Least developed coutnries that met graduation thresholds in the 2012 triennial review[a/]

GNI	HAI	EVI
Equatorial Guinea [b/c/]	Tuvalu[b/]	Nepal
Tuvalu[b/]	Kiribati	Guinea
Angola[b/]	Vanuatu[b/c/]	United Rep. of Tanzania
Vanuatu[b/c/]	São Tomé and Principe	
Timor-Leste	Myanmar	
Kiribati		
Bhutan		
Djibouti		
Sudan		

Source: Committee for Development Policy (2012), Report on the fourteenth session (12-16 March 2012), Economic and Social Council, Official Records, 2012, Supplement No. 13, p. 15.

Notes:
a Countries in bold were found eligible for graduation.
b Met the income-only eligibility for graduation.
c Already scheduled for graduation by the General Assembly of the United Nations.

countries included have changed from one triennial review to another. In the 2006 review, 50 LDCs plus 15 developing countries (low-income countries as per the World Bank classification) were included in the examination. In 2009, 49 LDCs and 11 non-LDCs whose per-capita incomes were below or equal to the threshold of low-income countries were included in the reference group.

As mentioned earlier, a country is considered to be eligible for graduation from the LDC category if it meets at least *two* out of the three criteria used for LDC identification, or if its GNI per capita is at least twice as high as the income-graduation threshold, irrespective of levels of the other two indices (i.e., income-only eligibility). The graduation threshold for the *income* criteria was set at $1,190 in 2012, 20 per cent above the threshold for inclusion to the LDC category, also defined by the 3-year average of the World Bank's low-income threshold. Nine (9) LDCs were found to be above the income threshold in the 2012 review.

The HAI threshold for graduation is set at 10 per cent above the inclusion threshold, which is, in turn, established by the HAI score corresponding to the *third quartile* in the ranking of the 60 countries in the reference group of the 2012 review.[9] Five (5) LDCs reached the HAI graduation threshold in the review. Lastly, the EVI threshold for graduation is established in the same manner as for the HAI, but the EVI number corresponds to the *first quartile* because larger EVI scores represent more vulnerable situations. In the 2012 review, only three (3) LDCs met the EVI graduation threshold. Table 1 shows the LDCs that met at least one of the graduation thresholds in the 2012 review.

D. The reference group: critical for establishing graduation eligibility

As explained previously, the HAI threshold for graduation is set at 10 per cent above the *third quartile* in the ranking of the countries in the reference group and the EVI threshold for graduation corresponds to 10 cent below the *first quartile*. The quartile rules with a relatively small number of countries in the reference group create a major hurdle for enabling half of the LDCs—24 countries—to meet the criteria for graduation by 2020, or at any year for that matter. First, this is because a country has to outperform at least

9 Note that the third-quartile rule is not strictly applied. It is adjusted in case the third quartile falls in HAI scores that are very close each other, so that the threshold falls between two HAI scores that have a relatively large difference.

75 per cent of the countries in the reference group to graduate. Second, perhaps more importantly in recent years, the reference group –which also includes all LDCs as a subset—is becoming small relative to the group of the LDCs. As seen above, the reference group was composed of 60 countries in 2012. This implies a quartile of 15 countries thus placing a cap to the number of countries that can potentially meet the graduation threshold. And the cap is well below the IPoA target (half of LDCs or 24 countries). Moreover, not to be forgotten is that the graduation threshold is set at 10 per cent above the level indicated by the top quartile, implying that fewer than 15 countries may eventually meet the graduation threshold for either EVI and HAI—even if it is assumed that the top quartile is composed of LDCs only.

One way to increase the number of LDCs that can meet the graduation thresholds is to change the quartile rule to a tertile or to median rule, for example. This may make sense if the gap between LDCs and the other developing countries in HAI or EVI is indeed closing and the difference in outcomes is not statistically significant, but it is not the case yet.

Another way to have more eligible LDCs is to increase the number of countries in the reference group. It is not an objective for this paper to examine possible choices of the reference group. But, as the number of low-income countries as defined by the World Bank is shrinking, the issue of the reference group will certainly re-emerge in the coming CDP triennial reviews. No matter what choice is made, it will have significant influence on the HAI and EVI graduation thresholds and thus on graduation eligibility.[10]

III Identifying LDCs that Would Graduate by 2020, Based on the GNI, HAI and EVI Thresholds

This section will examine how many LDCs are likely to become eligible for graduation by 2020, based on the recent trends in growth of GNI per capita and changes in HAI and EVI scores. The CDP will conduct two triennial reviews before the target year of 2020 (2015 and 2018). After these, the next review will be done in 2021. Data available at the time of the 2018 review will be from 2016 or earlier and, thus, will unlikely reflect data for the second half of the 2010s. It is perhaps more appropriate to examine how many LDCs will become eligible for graduation at the time of the 2021 triennial review, when data from the later 2010s will likely become available. The exercise below will be made based on predicted values and scores that will likely be reached by 2020 and become available at the time of the 2021 review. It should be understood that all indicators and indices are projected up to the year 2020 and evaluated at the 2021 triennial review.

A. Methodological observations and other caveats

The identification of countries that may be eligible for graduation in 2021 is surrounded by difficulties. There is uncertainty regarding the criteria and its methodology; both may change overtime as fine tuning of the criteria by the CDP in the past has indicated. There is also uncertainty regarding graduation rules (the quartile rule) and the size and composition of the reference group. For the purposes of this paper, the three graduation thresholds and the reference group of countries are assumed to be unchanged over the period considered here. Finally, there is uncertainty regarding the future values of the variables used in the criteria as some are more difficult to forecast than others.

The methodology used to identify countries as LDC makes it difficult to anticipate the number of countries that may meet graduation requirements by the 2021 triennial review. The fact that graduation thresholds are defined in relative terms implies that even if a country improves its socio-economic conditions in absolute terms, it may fail to meet the graduation threshold if the other countries included in the reference group improve faster. By the same token, a LDC can meet the graduation criteria if its

10 For the methodological changes and their impacts on vulnerability ranks, see Bruckner (2012).

socio-economic conditions do not improve or even deteriorate provided that this deterioration is not as fast as in the other countries in the reference group over a given period of time.

Besides the difficulties brought about by the way thresholds are defined, forecasting future trends in the three criteria is a complex exercise.[11] This is particularly so in the case of EVI, in part due to its shock component. EVI components such as instability of agricultural production, instability of exports of goods and services and victims of natural disasters are cases in point. These outcomes reflect not only policies to increase resilience, but also the magnitude and frequency of shocks (financial crises, commodity market collapses, hurricanes, earthquakes, etc.), which are tricky to predict. In this regard, it becomes difficult to forecast future trends on the basis of current and/or expected policies with a satisfactory degree of confidence, although some of the EVI components reflect long-term averages or trends based on 10 or 15 year periods and make the index more stable over time. In any case, the results from the exercise below should be taken with a great deal of caution while keeping in mind the caveats and uncertainties observed here.

B. GNI per capita

Table 2 shows average annual growth rates of real GNI per capita observed during the period 2000–2010 (far right column) and compares them with those necessary to reach two income thresholds for graduation (one requires meeting EVI or HAI threshold, the other—the income only eligibility—does not require so). The second column shows the necessary annual average growth rates to reach the threshold defined in the 2012 triennial review by 2020 ($1,190) and the third column the rates that would be necessary to reach the income-only graduation threshold—i.e., twice of the income threshold—by 2020 ($2,380).

Countries whose average annual growth rates observed during the period 2000–2010 are higher than the one necessary to reach a threshold income level are considered to be able to attain that income graduation threshold by 2020. They are shown on table 3. Seventeen LDCs are predicted to reach the 2012 graduation income threshold of $1,190 by 2020. Among these countries, Angola, Bhutan, Kiribati, São Tomé and Principe and Timor-Leste could graduate from the LDC category by reaching the income-only threshold level at $2,380.

Admittedly, simply extrapolating the average growth rates observed in the recent years to the future is a crude exercise, as it does not reflect the more recent slowdown of output growth in developed countries and in some major developing countries. In fact, the UN Department of Economic and Social Affairs predicts that "[d]espite improved global condition and reduced short-term risks [in 2013], the world economy continues to expand at a subdued pace", while the economies of the LDCs are expected to increase growth from 3.8 per cent to 5.8 per cent in 2013.[12]

Table 3 includes countries in both Africa and Asia, with diversified economic structures and different geological features. For instance, while Bhutan, São Tomé and Principe, and Solomon Islands have small populations, the other countries in the have larger populations, particularly Senegal and Zambia with more than 10 million populations. Angola, Bhutan, Sudan, Timor-Leste and Yemen are energy exporters; Zambia and Mauritania are mineral exporters while Lao, Myanmar and Senegal have more diversified economic activities.

Source: The Secretariat of the Committee for Development Policy.

Note: a/ Equatorial Guinea, Samoa, Tuvalu and Vanuatu have been found to be eligible for graduation by the CDP and thus are not included here.

b/ Threshold already met in 2012

11 Even well established and commonly used forecasting growth models are often less reliable in the case of LDCs due to data constraints (availability and quality).

12 United Nations (2013b).

Table 2

Average annual growth rate necessary to reach the graduation income threshold

Country	Average growth rate of GNI per capita necessary to reach the income threshold used in the 2012 review ($1,190) by 2020	Average growth rate of GNI per capita necessary to reach the income only threshold ($2,380) by 2020	Average growth rate of GNI per capita, 2000-2010
Afghanistan	12.8	20.9	12.7
Angola	a/	a/	8.0
Bangladesh	6.5	14.1	4.8
Benin	4.5	12.0	0.9
Bhutan	a/	3.4	5.5
Burkina Faso	8.9	16.7	2.5
Burundi	22.7	31.6	1.4
Cambodia	5.3	12.9	6.3
Central African Republic	10.3	18.2	-0.4
Chad	7.2	14.9	4.6
Comoros	5.1	12.6	5.6
Democratic Republic of the Congo	21.5	30.2	3.7
Djibouti	a/	6.8	1.6
Equatorial Guinea	a/	a/	14.5
Eritrea	15.0	23.3	-2.3
Ethiopia	13.2	21.4	5.7
Gambia	10.6	18.6	0.5
Guinea	12.2	20.2	0.5
Guinea-Bissau	8.1	15.8	34.0
Haiti	6.3	13.9	0.9
Kiribati	a/	2.1	18.0
Lao People's Democratic Republic	2.7	10.1	5.2
Lesotho	1.3	8.5	2.4
Liberia	20.1	28.8	17.8
Madagascar	11.1	19.0	0.0
Mali	7.8	15.5	2.4
Mauritania	1.9	9.2	1.5
Mozambique	11.0	18.9	5.6
Myanmar	5.4	13.0	12.0
Nepal	11.0	18.9	1.8
Niger	13.1	21.2	9.2
Rwanda	9.6	17.4	5.2
São Tomé and Principe	0.7	7.9	16.7
Senegal	1.1	8.4	1.3
Sierra Leone	13.6	21.7	11.0
Solomon Islands	1.6	8.9	3.1
Somalia	19.5	28.1	-5.0
South Sudan	4.7	12.2	n/a
Sudan	a/	7.0	4.2
Timor-Leste	a/	0.6	28.8
Togo	10.0	17.9	0.0
Tuvalu	a/	a/	25.4
Uganda	9.9	17.8	3.5
United Republic of Tanzania	9.1	17.0	3.8
Vanuatu	a/	a/	13.5
Yemen	1.6	8.8	1.6
Zambia	1.7	8.9	2.0

Source: The Secretary of the Committee for Development, based and its database and the World Bank, World Development Indicators, available at http://data.worldbank.org/data-catalog/world-development-indicators

Note: a/ Already met

Table 3
Countries that may meet the GNI graduation thresholds at the 2021 triennial review[a/]

$1,190 threshold	$2,380 income-only threshold
Angola[b/]	Angola[b/]
Bhutan[b/]	Bhutan
Cambodia	Kiribati
Comoros	São Tomé and Principe
Djibouti[b/]	Timor-Leste
Kiribati[b/]	
Lao PDR	
Lesotho	
Mauritania	
Myanmar	
São Tomé and Principe	
Senegal	
Solomon Islands	
Sudan[b/]	
Timor-Leste[b/]	
Yemen	
Zambia	

Source: The Secretariat of the Committee for Development Policy.

Note:
a/ Equatorial Guinea, Samoa, Tuvalu and Vanuatu have been found to be eligible for graduation by the CDP and thus are not included here.
b/ Threshold already met in 2012

C. Human Asset Index

The graduation threshold for HAI is defined in relative terms and corresponds to the third quartile in the ranking in the reference group. While progress in the absolute level of these health and education outcomes cannot be ignored in assessing the structural impediments for growth of LDCs, the analysis here is strictly based on the HAI graduation threshold to see how many LDCs can possibly become eligible for graduation by improving their relative scores to other countries in the reference group.

First, we consider how HAI rankings among the countries listed in table 4 have evolved over time. LDCs are ranked from the highest (i.e., the first place) to the lowest score (i.e., the last place), according to their HAI values for both 2006 and 2012. The rank correlation—i.e., to what extent the ranks between the two years correlate each other—is then calculated. The rank correlation between the 2 HAI rankings, y, is 0.947 with t-value 22.53. The correlation signals a strong positive correlation between the two—higher rankings in the 2006 review are very strongly correlated with higher rankings in the 2012 review and vice versa—and the covariance value ($y2$ =0.898) implies that the covariance between the 2 rankings is about 90 per cent as strong as it could possibly be.[13] Thus, while the HAI scores changed from one review to the other, no major changes in the HAI ranking materialized, largely because the scores improved in the same direction and were not large enough to change rank orders significantly.

It may not be surprising to find such strong rank correlation when considering the nature of the HAI components. They represent aspects of the health and education status, which do not exhibit large changes in the short- to medium term in a conflict-free country. Since the MDGs in 2000, three of the 4 HAI component variables—the percentage of undernourished population, under-5-mortality rate and adult literacy rate—have improved steadily in every

13 Perfect positive correlation would be y=1.

region in the developing world, though the pace of the progress are considered to be too slow to reach the targets set out in the MDGs in some regions. With fast population growth and more children in primary schools, the demand for secondary education is expected to increase. Among countries in sub-Saharan Africa, for example, about 75 per cent of children who complete primary education continue on to secondary school, through the transition rate from primary to secondary education ranges from 40 per cent in Angola, Mauritania and the United Republic of Tanzania to 98 per cent in Seychelles and Swaziland.[14]

HAI-based eligibility for graduation is established in relative terms and one needs to see how LDCs improved their health and educational status relative to the HAI graduation threshold. Since the threshold defined by a HAI score changes over time and what matters is not the country's HAI score per se, but rather how it fares in relation to the threshold. The ratio of a country's HAI score to the threshold suggests how far the country moves closer or away from the threshold. For this purpose, the HAI thresholds for both 2006 and 2012 are set to 100, and the original HAI score of each country is converted relative to the HAI graduation threshold thus defined—call it standardized HAI. Table 4 shows the results. A country with the standardized HAI of more than 100 meets the graduation threshold while a country with values lower than 100 does not. The difference between the country's score and 100 indicates the HAI gap. The last column of table 4 shows if the gap narrowed or widened during the period.

Among the 12 non-LDCs in the reference group (countries in bold), the gap narrowed for 9 countries and only Cameroon, Nigeria and Pakistan experienced widening gaps. Second, among the 17 LDCs that are identified in table 3 to meet the income threshold, 7 countries—Angola, Bhutan, Cambodia, Laos, Nepal, São Tomé and Principe and Senegal—managed to narrow the gap. Among the countries that met or were close to the HAI threshold in 2006 (i.e., countries with scores were close to or above 100) only Solomon Islands fell below the threshold in 2012, but stayed close to it. On the other hand, São Tomé and Principe, whose HAI score was marginally below the threshold in 2006, improved its score above the 2012 threshold. The rest of the countries that met the graduation threshold in 2006 continued to meet the threshold 6 years later.

Among the countries that significantly narrowed the gap, but not found eligible in the past, Bhutan, Cambodia and Madagascar will likely meet the HAI threshold if their advancements in health and educational status continue at the current pace (measured in the change in the gap). Beyond these countries, Nepal can meet the threshold if it accelerates its pace of the advancement and Lesotho and Solomon Islands are able to reach the threshold if they reverse the deteriorations in their HAI scores. Table 5 lists these countries, plus the countries that were already found to have met the threshold in the 2012 review.[15]

D. Economic Vulnerability Index

As in the case for HAI, the rank correlation between the 2 EVI rankings reported by the CDP in 2006 and 2012 is calculated. The correlation, *y*, is 0.693 with t-value 7.34. These values are lower than those calculated for the 2 HAI. The lower correlation appears to come from two sources. One is the nature of the component variables of EVI: they are expected to be sensitive to changes in the global economic conditions and occurrences of natural shocks, and EVI itself is expected to display period-to-period fluctuations. Not all countries in the reference group are affected by the same shock: commodity price slumps, for example, do not necessarily affect the exporters of manufactures, while not all countries are vulnerable to earthquakes or hurricanes. The other has to do with the fact that the CDP revised the components of EVI in 2012. The percentage of population living

14 United Nations (2012), p.18.

15 While not related to graduation, it should be noted that Equatorial Guinea and Kiribati experienced significant widening of the gap to the threshold.

Table 4
Standardized HAI scores relative to the graduation threshold, 2006 and 2012[a/b/]

	2006 Graduation threshold	2012 Graduation threshold	Changes between 2006 and 2012
Afghanistan	17.9	34.1	16.2
Angola	45.0	47.9	2.9
Bangladesh	78.3	82.8	4.5
Benin	62.4	62.3	-0.1
Bhutan	65.1	89.5	24.4
Burkina Faso	38.4	44.2	5.8
Burundi	31.4	31.5	0.1
Cambodia	71.9	87.8	15.9
Cameroon	73.0	69.0	-4.0
Central African Republic	42.7	32.7	-10.1
Chad	34.7	27.4	-7.4
Comoros	59.0	68.6	9.6
Côte d'Ivoire	64.1	66.4	2.3
Dem. People's Rep. Korea	109.8	125.9	16.1
Dem. Rep. of the Congo	33.1	32.9	-0.2
Djibouti	69.9	64.3	-5.6
Equatorial Guinea	86.9	65.2	-21.7
Eritrea	53.2	54.0	0.7
Ethiopia	41.6	42.7	1.1
Gambia	64.8	74.6	9.7
Ghana	87.8	106.3	18.5
Guinea	56.6	55.7	-0.9
Guinea-Bissau	40.1	51.8	11.8
Haiti	60.1	53.9	-6.2
India	92.3	92.8	0.5
Kenya	79.1	89.6	10.5
Kiribati	141.4	131.6	-9.7
Lao People's Democratic Republic	84.4	93.0	8.6
Lesotho	95.7	94.0	-1.7
Liberia	45.2	58.4	13.2
Madagascar	65.0	79.5	14.5
Malawi	63.4	66.9	3.5
Mali	33.6	45.7	12.1
Mauritania	72.4	71.3	-1.1
Mozambique	39.9	46.5	6.6
Myanmar	106.8	104.3	-2.6
Nepal	87.6	90.6	3.1
Nicaragua	109.0	115.1	6.1
Niger	19.9	36.8	16.9
Nigeria	78.1	74.0	-4.1
Pakistan	72.2	69.5	-2.7
Papua New Guinea	78.4	81.7	3.3
Rwanda	52.8	63.9	11.1
São Tomé and Principe	99.4	113.5	14.1
Senegal	60.6	71.3	10.7
Sierra Leone	24.5	37.6	13.1
Solomon Islands	110.4	98.6	-11.8
Somalia	8.4	2.1	-6.3

(cont'd)

(cont'd)			
	2006 Graduation threshold	2012 Graduation threshold	Changes between 2006 and 2012
Sudan	76.6	79.8	3.1
Tanzania, United Rep. of	51.3	60.8	9.5
Timor-Leste	86.5	72.9	-13.5
Togo	71.9	68.9	-3.0
Tuvalu	140.1	133.4	-6.7
Uganda	76.6	69.4	-7.3
Vanuatu, Republic of	103.2	117.7	14.6
Viet Nam	125.1	131.0	5.9
Yemen	75.5	79.3	3.8
Zambia	55.0	55.9	0.9
Zimbabwe	82.7	87.4	4.7

Source: The Secretariat of the Committee for Development Policy.

Notes:
a/ Both 2006 and 2012 HAI graduation thresholds are set to 100.
b/ Countries in bold are non-LDCs.

in low elevated coastal zones was introduced and the indicator for victims of natural disasters replaced the previous indicator for homelessness caused by natural disasters. Additionally, the weights attached to the component variables were changed, as well.[16]

To see the extent to which country's EVI rankings change over time and the magnitude that the revisions of the EVI components have on the rankings, two rank correlations between the 2009 (instead of 2006) and 2012 EVIs are calculated among the countries listed in table 6; one is the correlation between the two EVIs, based on the same set of the indicators employed in the 2012 triennial review—which we will call here the "hypothetical" 2009 EVI scores. Regrettably, 2006 EVI scores based on the set of the indicators employed in the 2012 review are not available. The other is the correlation between the EVIs as reported by the CDP in its triennial reviews in 2009 and 2012; that is, the two different sets of the indicators. The correlation of the former—using the hypothetical EVI scores for 2009—is 0.9431 (with t-value, 21.59) and the latter—using reported values—is 0.8301 (with t-value, 11.14). These results show the more significant impact of the revision of indicators on values of correlation between the two reviews than of changes in the indicators themselves.[17]

Table 5

Countries that may meet the HAI graduation threshold by the 2021 triennial review[a/]

Bhutan
Cambodia
Kiribati[a/]
Lesotho
Lao PDR
Madagascar
Myanmar[a/]
Nepal
São Tomé and Principe[a/]
Solomon Islands

Source: The Secretariat of the Committee for Development Policy.

Note: a/ HAI threshold already met at the 2012 Triennial review

It should be noted that the EVI rank correlation based on the set of the indicators employed in the 2012 review is slightly lower than HAI correlation between 2009 and 2012 (y = 0.9739, with t-value

16 For detail, see Committee for Development Policy (2011b), chapter III.

17 If 2012 EVIs are calculated, based on the set of indicators employed in the 2009 triennial review, the number of LDCs that meet the EVI graduation threshold in 2012 would be 6, instead of 3 countries that are reported in Committee for Development Policy (2012).

31.12). While the difference between the EVI and HAI rank correlations is marginal largely due to the short interval of time between the two reviews, EVI rankings among countries appear to display more changes over time than HAI rankings.

The above exercises suggest that any new attempts to fine-tune EVI indicators (and HAI, as well) could affect country's rankings and thus the eligibility for graduation. Needless to say, such attempts are required to better reflect new climate-related challenges many countries will experience in the near future. But revisions, as indicated earlier, can become additional sources of uncertainty for predicting potential candidates for graduation.

With these caveats in mind, we now look at possible evolution of EVI scores. The EVI threshold for graduation corresponds to 10 per cent *below the first quartile,* (instead of above the third quartile) in the ranking of in the reference group in 2012. As in the case of the HAI, the threshold thus depends on relative level of index that is composed of the 8 variables that are designed to capture economic vulnerabilities associated with exposure to the rest of the world and shocks.

Table 6 shows EVI scores of LDCs as percentage of the EVI graduation threshold for the 2006 and 2012 triennial reviews and the hypothetical 2009 EVI scores. A country with an EVI scores of lower *than* 100 meets the threshold and with greater than 100 does not; note that the lower the EVI score, the less vulnerable (or better) the country is. The portion of the score beyond 100—i.e. (a country's EVI score) *minus* 100—measures an EVI gap for the country. The last two columns of table 6 show if the gap narrowed or widen during 2006 and 2012, and 2009 and 2012, with negative numbers showing an improvement in EVI relative to the threshold.

The hypothetical 2009 and 2012 EVIs are compared first. Contrary to the case of HAI, the 12 non-LDCs in the reference group did not do well in improving economic vulnerability; only 3 of them—Cameroon, Côte d'lvoire and Papua New Guinea—managed to improve their EVI scores relative to the threshold. Second, 4 LDCs identified to meet the $1,190 income threshold—Bhutan, Lao PDR, Solomon Islands, and São Tomé and Principe—improved their relative EVI scores from their 2009 levels. Third, among the small island developing States, Samoa, Solomon Islands and Vanuatu improved their relative scores between 2009 and 2012 even though their EVI scores remained very high.[18] Fourth, among countries in sub-Saharan Africa, some LDCs made significant progress, but others experienced significant worsening of scores; no consistent patterns are detected in the direction of changes among them.

Among the countries that significantly narrowed the gap, but not found eligible in the past, Central African Republic, D.R. of Congo, Lao PDR, São Tomé and Principe, Togo and Yemen appear to have reasonable chances of meeting the EVI threshold by 2020, as long as they continue to keep making progress on this front . Nepal, which has been meeting the EVI threshold since the 2006 triennial review, is expected to continue to meet the threshold. On the other hand, Guinea and Tanzania, which met the threshold in the 2012 review, will miss the cut if their EVI scores continue to deteriorate at the pace observed between 2009 and 2012 (see table 7).

It should be stressed that many variables in EVI do not exhibit clear trend, and the extrapolations here are made based on the observation for a very short period of 3 years. Thus these predictions are not as robust as one would hope for. In fact, if one examines the changes in EVI scores from 2006 to 2012 as reported in the CDP Reports, some of the observations above are no longer valid (table 6). For example, Bhutan experienced deterioration of EVI scores. São Tomé and Principe and Yemen do not appear to have reasonable chances of meeting the EVI threshold, either. On the other hand, Guinea and Uganda appear to meet the threshold by 2020 as long as the improvements observed between 2006 and 2012 continue. In some cases, the direction of change differs between the two comparisons; Afghanistan,

18 Tuvalu marginally improved its EVI score in 2012 by 0.1, but the magnitude is too small to call it "improvement".

Table 6

Standardized EVI as percentage of the graduation threshold, 2006 and 2012[a/]

	2006 Graduation threshold	2009 Hypothetical graduation threshold	2012 Graduation threshold	Change between 2006 and 2012	Change between 2009 and 2012
Afghanistan	158.8	115.8	121.3	-37.4	5.5
Angola	114.3	158.6	160.3	46.0	1.7
Bangladesh	67.8	65.0	101.3	33.4	36.3
Benin	136.7	109.8	113.0	-23.7	3.2
Bhutan	122.7	151.2	138.1	15.4	-13.1
Burkina Faso	157.6	122.3	117.3	-40.2	-5.0
Burundi	137.7	175.5	178.6	40.9	3.1
Cambodia	87.0	139.7	157.7	70.7	18.0
Cameroon	133.7	86.9	73.0	-60.7	-13.9
Central African Republic	165.3	132.1	111.4	-53.9	-20.7
Chad	167.4	162.2	165.1	-2.3	2.9
Comoros	130.5	151.8	155.9	25.4	4.1
Côte d'Ivoire	88.2	79.8	65.3	-22.9	-14.4
Dem. Peo's Rep.Korea	105.8	142.9	149.1	43.4	6.2
Dem. Rep. of the Congo	112.2	115.5	110.6	-1.6	-4.9
Djibouti	158.3	135.1	144.7	-13.6	9.6
Equatorial Guinea	186.1	152.0	136.5	-49.5	-15.5
Eritrea	168.4	174.5	184.3	15.9	9.8
Ethiopia	103.5	88.2	104.6	1.1	16.5
Gambia	146.5	201.8	211.9	65.3	10.1
Ghana	109.2	89.5	89.5	-19.7	0.0
Guinea	91.0	80.7	89.4	-1.6	8.7
Guinea-Bissau	174.2	180.0	189.1	15.0	9.1
Haiti	149.5	140.5	147.9	-1.7	7.3
India	50.2	51.9	66.9	16.7	15.0
Kenya	63.8	50.5	83.0	19.2	32.5
Kiribati	221.8	221.3	256.2	34.5	34.9
Lao People's Democratic Republic	152.3	127.9	115.8	-36.5	-12.0
Lesotho	133.0	137.1	143.3	10.3	6.2
Liberia	178.8	194.3	190.5	11.7	-3.7
Madagascar	109.4	118.6	118.9	9.5	0.3
Malawi	128.5	154.6	162.3	33.8	7.7
Mali	112.2	115.2	114.9	2.8	-0.2
Mauritania	106.7	128.2	138.1	31.3	9.9
Mozambique	114.6	128.1	138.7	24.0	10.5
Myanmar	111.1	120.6	140.6	29.5	20.0
Nepal	98.5	88.0	86.8	-11.7	-1.2
Nicaragua	115.5	99.5	99.9	-15.7	0.3
Niger	131.6	115.3	120.7	-10.8	5.4
Nigeria	117.8	116.9	120.5	2.7	3.6
Pakistan	67.7	65.4	68.7	1.0	3.2
Papua New Guinea	116.2	128.9	119.6	3.5	-9.2
Rwanda	156.1	140.7	147.7	-8.4	7.0
São Tomé and Principe	153.0	156.9	144.0	-9.0	-12.9
Senegal	110.0	100.0	112.9	3.0	12.9
Sierra Leone	167.7	133.2	151.6	-16.2	18.4
Solomon Islands	149.7	173.8	172.6	22.9	-1.1
Somalia	180.0	154.9	156.6	-23.4	1.7

(cont'd)

(cont'd)

	2006 Graduation threshold	2009 Hypothetical graduation threshold	2012 Graduation threshold	Change between 2006 and 2012	Change between 2009 and 2012
Sudan	131.2	128.8	138.9	7.7	10.1
Tanzania, United Rep. of	89.8	77.6	89.7	-0.1	12.0
Timor-Leste	171.7	166.6	166.7	-5.0	0.1
Togo	120.5	117.3	110.5	-10.0	-6.8
Tuvalu	241.7	199.9	199.8	-41.9	-0.1
Uganda	124.8	112.5	113.2	-11.6	0.7
Vanuatu, Republic of	169.1	169.1	146.2	-22.9	-22.9
Viet Nam	94.1	60.1	96.6	2.5	36.4
Yemen	110.8	129.5	120.2	9.4	-9.2
Zambia	121.5	149.4	165.7	44.2	16.3
Zimbabwe	126.1	130.5	140.3	14.3	9.8

Source: The Secretariat of the Committee for Development Policy

Note: a/ Countries in bold are non-LDCs.

Bhutan, Guinea, Haiti and Liberia are among such cases. These discrepancies result from the facts that the time spans examined are different and, more importantly, the indicators employed in the 2012 review differ from those in the 2006 review.

E. Applying the criteria: consolidating the results

Table 8 summarizes the examinations so far. Besides Equatorial Guinea and Vanuatu, scheduled to graduate in 2017, and Tuvalu, already found eligible for graduation by the CDP in the 2012 review,[19] at most ten other LDCs—3 in Africa and 8 in Asia and the Pacific—are considered to have reasonable chances of becoming eligible for graduation. Angola (already meeting eligibility criteria in 2012) and Timor-Leste are anticipated to become eligible based on the $2,380 income-only criterion. São Tomé and Principe and Bhutan also meet the income-only criteria but satisfy other criteria as well. In fact, São Tomé and Principe will likely meet not only the income-only criteria but also EVI and HAI. Together with Lao PDR, these are the only countries in this group that will likely meet all three criteria.[20] Nepal appears to be the only LDC that can be eligible for graduation based solely on HAI and EVI scores, but not on the income criterion. The majority of the countries in

Table 7

Countries that may meet the EVI graduation threshold by the 2021 triennial review

Central African Republic
Congo, Democratic Republic of
Lao PDR
Nepal[a/]
São Tomé and Principe
Togo
Yemen
Countries no longer meeting EVI in 2021:
Guinea
Tanzania

Source: The Secretariat of the Committee for Development Policy.

Note: a/ Countries meeting the EVI graduation threshold in the 2012 triennial review.

19 As of this writing, the General Assembly has not yet taken note of the ECOSOC recommendation that Equatorial Guinea and Vanuatu graduate from the category of LDCs. If it approves it in 2013, the list of LDCs to be examined by the CDM will change only in 2018, but not in the 2015 review.

20 Incidentally, the country has a national plan to graduate from the LDC category by 2020.

Table 8
Countries that may become eligible for graduation by the 2021 triennial review[a/]

Income-only criteria ($2,380 threshold)	GNI-HAI criteria ($1,190 threshold)	GNI-EVI criteria ($1,190 threshold)	HAI-EVI criteria	GNI-HAI-EVI ($1,190 threshold)
Angola[b/]	Bhutan	Lao PDR	Lao PDR	Lao PDR
Bhutan	Cambodia	São Tomé and Principe	Nepal	São Tomé and Principe
Kiribati[b/]	Kiribati[b/]		São Tomé and Principe	
São Tomé and Principe	Lao PDR			
Timor-Leste	Lesotho			
	Myanmar			
	São Tomé and Principe			
	Solomon Islands			

Source: The Secretariat of the Committee for Development Policy.

Notes:

a/ Equatorial Guinea and Vanuatu are scheduled to graduate in 2017 and Tuvalu has already been found to be eligible for graduation by the CDP and thus are not included here.

b/ Met the graduation threshold in 2012

table 8 are predicted to become eligible on the basis of meeting either GNI-HAI thresholds together, or the income-only GNI threshold.

It is important to highlight that the predictions above do not take the quartile rule into consideration. Table 5 lists 10 LDCs that can possibly meet the HAI graduation threshold and table 7 indicates 9 LDCs that meet the EVI threshold, without taking into account some of the constraints imposed by the quartile rule. As explained before, the HAI (EVI) threshold are set at 10 per cent above (below) the inclusion thresholds, which are established by the HAI (EVI) score corresponding to the their quartile in the ranking of countries in the reference group. In the exercise above, the reference group has been fixed at 60 countries and the number of countries that meet the two thresholds is at most 15, including non-LDCs in the group. Therefore, at least some LDCs listed on table 5 are likely to miss the thresholds if non-LDCs in the reference group have better scores and continue to occupy positions in the top quartile.

In sum, at most 11 LDCs appear to have reasonable chances of becoming newly eligible countries for graduation by 2020, in addition to the 4 countries that have already been identified for graduation by the CDP. Among these new eligible countries, Angola, Kiribati (both met graduation thresholds in 2012), São Tomé and Principe and Timor-Leste are expected to be found eligible for graduation in the 2015 triennial review, provided that they maintain their GNI performance or their HAI scores do not deteriorate. Accordingly, Angola and Kiribati which were already found eligible for graduation in the 2012 review for the first time may be recommended for graduation by the CDP to the ECOSOC in the 2015 review. The rest of the newly eligible countries are expected to meet the graduation criteria in the 2018 or 2021 review for the first time.

With the 4 countries that have already been found eligible, total of 15 LDCs could satisfy the graduation criteria, on the basis of the very crude analysis made here. This implies that it is unlikely that the IPoA

goal of at least half of the LDCs be found eligible for graduation by 2020 will be achieved at present.

IV An Experiment: Graduation Based on Two Different Combinations of Income and HAI Criterion

As seen above, the CDP thresholds for LDC identification are a combination of "absolute" and "relative" measures; the income thresholds are fixed at constant levels of per-capita income in real terms over time (i.e., in absolute terms), while HAI and EVI thresholds are determined at the top quartile of the respective distribution of HAI or EVI scores (i.e., in relative terms).

The thresholds, however, can be determined by per-capita income level *relative* to income distribution among countries and by *absolute* levels of HAI and EVI The absolute income thresholds used by CDP are determined on the basis of the value used by the World Bank to define low-income countries. However, that value has been kept constant in real terms and thus it has not been catching up with growing real income levels of developed and developing countries and even those of LDCs. As a result, the number of low-income countries has been shrinking. Instead, the use of the thresholds defined by relative incomes could be considered in the (evolving) global context over time, as they would guarantee the resources to enjoy the minimal living conditions and amenities that are the standard elsewhere which also evolve and change over time.

HAI scores can be interpreted as representing levels of education obtained, dietary intake and health outcomes that bring about the kind of life that the average person of a particular country *can* lead and the choices and opportunities that are open to the person in leading that life, regardless of comparisons.[21] In theory, an absolute HAI threshold for graduation can be defined at minimal educational and health outcomes the average person in the country should enjoy.

EVI captures socio-economic vulnerability of a nation as a whole (not of an average person) to certain economic and non-economic shocks.. It should be noted that no consensus exists about up to what level of vulnerability as represented by EVI scores can be considered "acceptable" for achieving sustainable development of developing countries. For example, up to what level of diversification of production or exports should a country develop to reduce its exposures to external economic shocks? How about minimum population level that a country should have to avoid excessive economic vulnerabilities?

In addition to the acceptable level of each component of the EVI, we need to carefully examine economic interpretations about substitution among EVI-component variables to achieve a certain level of EVI, as in the case of HAI. A substitution among HAI-component variables is intuitively understandable, but such substitution does not translate into something intuitive in the case of EVI. In short, more theoretical and empirical scrutiny is necessary to establish absolute EVI threshold level for graduation (and inclusion). Because of these difficulties, , the section does not attempt to define an absolute level of EVI that identifies LDCs It will focus the analysis on HAI but, needless to say, this methodology can be applicable to EVI as well if the challenges surrounding the interpretation of having a minimum level of EVI for achieving sustainable development are put aside.

Table 9 lists all possible four combinations of absolute and relative GNI per capita and HAI thresholds. The approach used by the CDP until 2012, that is to say, fixed income level and relative HAI level was already discussed in the previous sessions and the analysis will not be repeated here. This section will review how the use of different thresholds of income and HAI can change perspectives of LDC graduation by 2020, based on the cases of:

i. relative-GNI per capita and absolute HAI combination which does not rely on either the World Bank definition of low-income countries or the

21 Lister, Ruth (2004), chapter 1.

distribution of HAI scores of a reference group, however defined;

ii. (ii) the graduation criteria proposed by the CDP in March 2014, and;

iii. (iii) the other possible combination – relative GNI per capita and relative HAI threshold – is not considered here, as it is a straightforward application of the cases of (i) and (ii) as long as the reference group remains the same in size and composition.[22]

Table 9
Four possible combinations of GNI-per capita and HAI; relative vs. absolute

	Absolute HAI threshold	Relative HAI threshold
Absolute GNI per capita	CDP criteria from the 2015 review onwards	CDP criteria used up to the 2012 review
Relative GNI per capita	Considered in this paper	Not considered here

Source: CDP Secretariat.

A. Graduation eligibility based on relative income threshold

According to the World Bank World Development Indicators, complemented by data from the United Nations Statistics Division, the 2008 – 2010 median per-capita income of all developing countries, measured by the Atlas method, was $5,641. The income graduation threshold level used in the 2012 triennial review ($1,190) was about 21 per cent of the median income level. The median current income grew on average at 10.9 per cent a year for the period 2000 – 2010[23]; it is necessary for the graduation threshold to grow at the same rate to maintain its relative level to median income. Applying this average rate of growth to the 2012 income graduation threshold generates a hypothetical graduation threshold of $3,349, which will be used for our hypothetical 2021 triennial review. It should be noted that this income level is much higher than the income-only threshold, $2,380, for which only 5 countries are projected to reach by the 2012 review (see table 3).

Out of the 5 countries, Angola, Kiribati, São Tomé and Principe and Timor-Leste are project to meet the $3,349 threshold. Per-capita income of Bhutan is project to be around $2,900. The income-only threshold, on the other hand, would be $6,698. Angola, Kiribati and Timor-Leste are project to meet the income-only threshold and become eligible for graudation before or by the 2021 review, provided that the growth rates they have experienced in recent years continue over the 2010s. Table 10 provides a summary. It is noted that the sets of countries that may become income eligible for graduation are smaller than those listed in table 3.

Table 10
Countries that may meet GNI graduation thresholds at the 2021 triennial review (thresholds defined relative to the medium per capita income of all developing countries)

$3,349 threshold	$6,698 income-only threshold
Angola	Angola
Kiribati	Kiribati
São Tomé and Principe	Timor-Leste
Timor-Leste	

Source: The Secretariat of the Committee for Development Policy.

B. Graduation eligibility based on absolute human asset score: some concerns and tentative results

Fixing an HAI score at a particular level as a graduation threshold poses a few substantive and technical problems. That is, what absolute level of HAI should be accepted as a minimal level of human resources (or capital) – captured by the four health and education

22 It should be noted that once the reference group is expanded to include a larger group of developing countries, a relative threshold level may need to be moved from the current quartile rule to a point where a country is considered to be "relatively free" from structural impediments to growth.

23 Per-capita mean incomes of developing countries and LDCs grew at 7.0 and 9.1 per cent, respectively.

variables – that is no longer considered to constitute structural impediment to sustainable growth and, thus, to become an HAI threshold for graduation? As long as an HAI threshold is defined in relative terms, a specific definition of acceptable levels of the four HAI components is not as problematic as in the absolute case (though not completely free from the problem). But once HAI threshold is defined at an absolute level, a question about what HAI level no longer constitutes a structural impediment to sustainable development becomes prominent.

As examined in section II, the four variables that comprise HAI are perfect substitutes (that is, HAI is a linear combination of the four), there are infinite numbers of combinations of the HAI-comprising variables that give a particular HAI score. For example, to achieve greater than the HAI score of 66 – the graduation threshold in 2012 --, the following ranges of the four variables are permissible to reach the score of 66 and greater;

$0 \leq$ (percentage of population that is undernourished) ≤ 86.6;

$0 \leq$ (under 5 mortality rate) ≤ 234.4;

$0 \leq$ (gross secondary school enrolment ratio) ≤ 100, and;

$0 \leq$ (adult literacy rate) ≤ 100.

The maximal value for undernourished population, for example, is obtained through equations (A2) and (A4) – (A7) in the appendix when it is assumed that the under-5 mortality rate takes the value of its lower bound (i.e. 10 per 1,000 live births) and gross secondary school enrolment ratio and adult literacy rate the values of their respective upper bound.[24] The maximal value for under-5 mortality rate and the minimal values for gross secondary school enrolment and adult literacy are obtained by the same fashion.[25]

24 For the lower and upper bound values, see appendix.

25 Note that the maximal and minimal permissible values are calculated without imposing the upper or lower bounds.

The maximal value of 86.6 shows that a county is to be judged to be HAI-eligible for graduation in absolute term even if 86.6 per cent of the population are undernourished when the other three variables take the best possible values. It should be noted that such high level of undernourished population is possible for a country eligible for graduation because of the perfect substitution permitted among the four components in HAI. The value for under-5 mortality rate is interpreted in the same way. For inequalities (3) and (4), gross secondary school enrolment ratio or adult literacy rate can take any value to reach the score of 66 or greater as long as the values of the other three variables are near their respective best possible values. This is a purely arithmetical result, though socio-economic considerations may question about the way that the HAI is constructed.

These are theoretical considerations and the actual ranges of values that HAI components took in the 2012 triennial review among the 6 LDCs that met the HAI graduation threshold were narrower;

$5.0 \leq$ (percentage of population that is undernourished) ≤ 20.0

$26.9 \leq$ (under 5 mortality rate) ≤ 76.3

$54.3 \leq$ (gross secondary school enrolment ratio) ≤ 85.6, and

$88.8 \leq$ (adult literacy rate) ≤ 98.8.

The values each component took vary somewhat widely even among only 6 countries, except the case of adult literacy. For example, the 20 per cent of the undernourished population in Myanmar (HAI eligible for graduation) is as high as those in Niger, Mali and Benin. This present paper does not aim at resolving these rather delicate issues, but merely wishes to point out the difficulties when HAI threshold for graduation is defined in absolute terms.

In any event, for the sake of completeness, the calculations below are made to see which LDCs will be able to reach a fixed HAI threshold for graduation eligibility by the 2021 triennial review. A difference between two HAIs recorded in the 2006 and 2012

triennial reviews is calculated and converted to an average annual change over the period. Then, the annual change thus obtained is assumed to continue over the 2010s and a cumulative change is added to the HAI score in the 2012 review.

A result is shown in table 11. When compared with table 5, where the countries that may meet the HAI graduation threshold defined in relative terms are listed, the number of eligible countries declined from 10 to 7, with Lesotho, Nepal and Solomon Islands now out of the list. But one should recall that these countries are included in table 5, not strictly because they are linearly projected to meet the threshold in the 2021 review, but because of their past or recent performances in improving HAI scores. Therefore, replacing the relative threshold by the absolute one does not drastically reduce the number of eligible countries, as compared with the case of the relative vs absolute GNIs.

Table 11

Countries that may meet the absolute HAI graduation threshold by the 2021 triennial review

Bhutan
Cambodia
Kiribati[a/]
Lao PDR
Madagascar
Myanmar[a/]
São Tomé and Principe[a/]

Source: The Secretariat of the Committee for Development Policy
Note: a/ HAI threshold already met at the 2012 Triennial review

C. Applying the hypothetical criteria; comparison with the current criteria

Table 12 compares lists of LDCs that may become eligible for graduation with the income-only or GNI-HAI criteria under the hypothetical criteria that is considered here. For comparison purposes, the countries that may be eligible for graduation under the current CDP criteria (examined in section III) are also included. Mainly because of the much higher level of income per capita needed to reach graduation threshold under the relative income approach, the number of LDCs that may become eligible for graduation shrinks to 4, in the case of the hypothetical criteria, from 11 in the current CDP criteria. Therefore, it is plausible to argue that these hypothetical criteria for graduation make it more difficult for LDCs to become eligible for graduation by the 2021 triennial review.

From the above, the following can the concluded; on the one hand, the relative income threshold helps to avoid the problem of having a shrinking reference country group but, on the other hand, it makes it more difficult to meet income thresholds for graduation. As for the relative vs. absolute HAI graduation threshold, the choice between the two alternatives does not seem to have greater implications for meeting graduation threshold. This is largely because, while the rates of "convergence" to the relative and

Table 12

Countries that may become eligible for graduation by the 2021 triennial review using both by the CDP criteria used up to the 2012 triennial review and the hypothetical criteria with relative income and absolute HAI thresholds

Absolute Income-only criteria ($2,380 threshold)[a/]	Absolute GNI- relative HAI criteria ($1,190 threshold)[a/]	Relative Income-only criteria ($6,698 threshold)	Relavite GNI-absolute HAI criteria ($3.349 threshold)
Angola	Bhutan	Angola	Kiribati
Bhutan	Cambodia	Kiribati	São Tomé
Kiribati	Kiribati	Timor-Leste	and Principe
São Tomé	Lao PDR		
and Principe	Lesotho		
Timor-Leste	Myanmar		
	São Tomé		
	and Principe		
	Solomon Islands		

Source: Table 8 and the Secretariat of the Committee for Development Policy

Note: a/ See table 8.

absolute levels of HAI are only slightly different from each other in many countries, and such small difference between the rates does not lead to significant difference between relative and absolute levels of HAI by the 2021 triennial review.

D. An update: Refinements introduced by the Committee for Development Policy: Absolute GNI per capita and absolute HAI

At its 2014 plenary meeting the Committee introduced some refinements in the way the criteria is calculated and decided to establish the inclusion and gradation thresholds for both HAI and EVI in absolute terms, while retaining the absolute threshold for income per capita. It also decided to apply these changes in the upcoming 2015 triennial review.[26]

Table 13

Countries that may become eligible for graduation by the 2021 triennial review by the new CDP criteria with absolute income and absolute HAI thresholds

Angola	Bhutan
Bhutan	Cambodia
Kiribati	Kiribati
São Tomé and Principe	Lao PDR
Timor-Leste	Lesotho
	Myanmar
	São Tomé and Principe

Source: CDP Secretariat

Compared with the previous CDP graduation criteria (i.e., absolute income per capita and relative HAI threshold), only Solomon Islands would fail to show up in the list of countries that may become eligible for graduation. Thus, despite the change in methodology and use of the absolute HAI threshold for establishing graduation eligibility, the list of countries that may become eligible for graduation does not appear to change much.

V Concluding Remarks

In a sense, it would be remarkable, from a historical perspective, for 10 LDCs to become newly eligible for graduation from the category of LDCs in the next 8 years under the current CDP graduation criteria up to the 2012 triennial review (between now and the 2021 triennial review); for the first 40 years or so since the category of LDCs has been established, only 7 countries have been recommended for graduation by the CDP and additional 2 countries have been found eligible once. This rather optimistic prediction is based on the better economic performance of many LDCs in the 2000s and the improvements in the health and education sectors since the Millennium Declaration in 2000.

The social and economic advances in the last decade are the reflection of development efforts by LDCs over several decades, together with the global and regional cooperation in supports for such endeavours by LDCs. The more concerted efforts since the Millennium Declaration have accelerated the advances in economic and social status. Many low-income countries "graduated" to middle- or even high-income country category, according to the World Bank, and health and educational status of many LDCs show significant advances, according to the UN MDGs Report.[27] But, despite their efforts over the long term and the rather optimistic prediction, the present paper points out, alas, that the IPoA goal of making at least half of the LDCs eligible for graduation by 2020 is unlikely to be achieved.

There are considerable uncertainties with regard to socio-economic developments of LDCs in the decade of the 2010s. The intrinsic vulnerability of economic activities, environment and geological nature of many LDCs, various aspects of which are captured by the EVI, are the major source of the uncertainty when predicting the future course of their development. The further slowdown of the global economy has become an additional source of the uncertainty, as well. The health and educational status of several

26 Committee for Development Policy (2014).

27 United Nations (2013a).

LDCs has steadily improved in absolute terms as well as relative to other developing countries, while it may take at least a few more decades for other LDCs to narrow the gap between them and other developing countries in health and education status.

Furthermore, as the number of low-income countries that comprise the reference group to identify LDCs is declining, it has been increasingly problematic to define LDCs in relation to other non-LDC countries. To circumvent the issue, the paper considered two cases. One was a hypothetical case with the relative GNI per capita and absolute HAI criteria, in which graduation threshold is free from the World Bank definition of low-income countries, and the problem associated with reference group is avoided. The other was with the new criteria proposed by the CDP in 2014, where an absolute criterion for both GNI and HAI will be introduced in the future. As a preliminary attempt, the paper tried to see how the introduction of these two combinations of income and HAI thresholds could change graduation perspectives from the list of LDCs.

Overall, having a relative income threshold is likely to reduce the number of LDCs that may become eligible for graduation by the 2021 triennial review, compared to what is predicted under the CDP criteria used up to the 2012 review. In the second case, in which both income and HAI thresholds are defined at the fixed levels, the number of LDCs that may become eligible for graduation does not appear to change drastically from the case with the CDP criteria up to the 2012 review.

The Istanbul Programme of Action invites LDCs and other stakeholders in the international community to implement various policies in the priority areas for action specified in the programme of action, such as productivity capacity, agriculture, trade, human and social development, crises and emerging challenges, mobilizing financial resources and institutions. As this paper shows, however, such policies will need to be implemented at an unprecedented scale and in an innovative way to achieve the goal by 2020.

The pace at which health and education improve should be accelerated in many LDCs. Pprogress with more financial and human resource inputs within the framework of the IPoA. Economic vulnerability of many LDCs should be reduced by a new spirit of cooperation and mutual accountability in the areas of economy and environment. In particular, the international cooperation needs to manage the growing interdependence of countries more efficiently to minimize global risks and supply the necessary global public goods for the benefit of all. Only with a global framework in place, the LDCs would be able to design and implement effective policies and interventions that aim at reducing economic vulnerability and strengthening their health and educational systems, therefore overcoming their major structural impediments to sustainable development.

Annex: Construction of the Indexes

Three criteria for identifying LDCs were first proposed by the Committee for Development Planning to the General Assembly in 1971. The Committee suggested a per capita gross domestic product (GDP) cut-off point, to be supplemented by two other criteria. The cut-off points used for the selection of LDCs were a $100 per capita GDP, a 20 per cent literacy rate and a 10 per cent share of manufacturing in GDP.

Since then, the criteria have evolved, largely reflecting the growing knowledge about the mechanism of economic growth in general, the nature of the structural impediments that prevent low-income countries from achieving sustained growth, and the improving availability of various data on socio-economic and environmental conditions of these countries. The growing knowledge and improved data make it possible for researchers and policymakers to perform rigorous examination about the state of the development of a country and to come up with more pinpoint policy recommendations. On the other hand, the introduction of the larger number of variables into consideration led to construction of indexes to

summarize them into a set of a few indicators, so as to make it easier for evaluation and comparison among countries. The indexes are, however, pure numbers and do not relate to a socio-economic state of development of the country in a way in which the layman can understand: for example, if the level of HAI of country X is 40 and the one of country Y 55, the latter country enjoys a higher state of human development, but what does the difference between 40 and 55 imply in a common sense? If an EVI of one country is 60 and twice as high as another country, in what sense does the former is twice more vulnerable than the latter one?

The purpose of this annex is to decompose the three indexes into the original socio-economic variables in order to examine the assumptions that are imbedded in the formulae in these indices.

Let GNI_{ij}, HAI_{it} and EVI_{it} be GNI per capita, HAI and EVI of country i and at time t when a triennial review is undertaken. Time t should be regarded as the latest year that the data are available at the time the review is made. Strictly speaking, because the latest year that the available data are collected differs among the variables and countries, date should be distinguished among the three indexes and countries. But, to avoid further complications, t is understood to refer to the latest date for each variable and country.[28]

The *gni* is defined as 3-year moving average of GNIs; that is;[29]

$$(A1) \quad gni_{it} = \frac{GNI_{i,t-2}+GNI_{i,t-1}+GNI_{it}}{3}.$$

Similarly, the *hai* and *evi* are defined as;

$$(A2) \quad hai_{it} = \frac{(pun_t + u5m_t) + (sse_t + alr_t)}{4}; \text{and,}$$

$$(A3)$$

$$evi_i = \left(\frac{pop_{it} + rmt_{it} + ple_{it}}{8} + \frac{mec_{it} + aff_{it}}{16}\right) + \left(\frac{ine_{it}}{4} + \frac{vnd_{it} + ina_{it}}{8}\right),$$

where lower case refers to an index derived from the transformation that is applied to the originally reported values (capital case) to make them standardized. Except gni, all other numbers take values between 0 and 100. The values 100 and 0 of the hai correspond to the theoretical best and worst human-asset situations, while the values 0 and 100 of the evi to the theoretical best (least vulnerable) and worst (most vulnerable) situations.

Here is how each of the original variables is standardized.[30] Note that the numbers in brackets (i.e. [ ]) are the upper and lower bounds used in the *Handbook* that are introduced to convert original values into within a range of 0 and 100 and, in some cases, to remove effects of extreme values (or outliers).31 Note that (1) when the original value is larger than the upper bound, it is assigned to be 0 for the variables used in HAI and population size and to be 100 for the other variables, and; (2) when the original value is smaller than the lower bound, it is assigned to be 100 for the first group of variables and to be 0 for the latter group. Below the subscripts *i* and *t* are omitted when no confusion arises.

HAI

- percentage of population that is undernourished (UNP)

$$unp = \frac{[65]-UNP}{[65]-[5]} \times 100$$

- mortality rate for children aged five years and younger per 1,000 live births (U5M)

$$u5m = \frac{[175]-U5M}{[175]-[10]} \times 100$$

- gross secondary school enrolment ratio (%) (SSE)

$$sse = \frac{SSE-[10]}{[100]-[10]} \times 100$$

28 Mathematically speaking, t should be denoted by t_{ij} for country i and variable j to distinguish different dates for different countries and variables.

29 See section II.A in the text for the definition of variables.

30 For detail on definition, data source and unit of measurements, see CDP (2011a).

31 Upper and lower bounds will change from one triennial review to another.

- adult literacy rate (ALR)

$$alr = \frac{ALR - [25]}{[100] - [25]} \times 100$$

The formula of HAI is completed if these four definitions are substituted into (A2).

EVI

- population (POP)

$$pop = \frac{ln[100,000,000] - ln(POP)}{ln[100,000,000] - ln[150,000]} \times 100$$

- remoteness (RMT):

Define max_d and min_d be the maximum and minimum economic distances in kilometer to the global market, respectively, and let d be a standardized distance index defined as;

$$d = \frac{ln(RMT) - ln(min_d)}{ln(max_d) - ln(min_d)}$$

Let d_L be a dummy for the landlockedness, that is; dL =1 when the country is landlocked and d_L = 0 otherwise. Then let

$$d^* = 0.85d + 0.15d_L$$ [32]

Finally, the remoteness employed in the EVI is defined as

$$rmt = \frac{d^* - [0.1]}{[0.9] - [0.1]} \times 100$$.

- Merchandize export concentration (MEC)

The concentration of merchandize export is measured by the Herfindahl-Hirschmann (HH) indices. Let x_j be the value of exports of commodity j, n the number of types of commodities that the country exports. Let x be the value of total exports of the country, i.e., $x = \sum_{j=1}^{n} x_j$.

The concentration is defined as:

$$MEC = \frac{\{\sum_{j=1}^{n} (\frac{x_j}{x})^2\}^{1/2} - (\frac{1}{n})^{1/2}}{1 - (\frac{1}{n})^{1/2}}$$

and

the standardized MEC used in the EVI is written as

$$mec = \frac{MEC - [0.1]}{[0.95] - [0.1]} \times 100$$.

Percentage share of agriculture, forestry and fisheries in gross domestic product (AFF)

$$aff = \frac{AFF - [1]}{[60] - [1]} \times 100$$.

Percentage share of population in low elevated coastal zones in total population (PLE)

$$ple = \frac{PLE - [0]}{[70] - [0]} \times 100$$.

- Instability of exports of goods and services (INE)

INE is defined as the standard error of the regression of a trend line for exports of goods and services of the country. Let *xt* be the index value of total exports at time t. The trend is estimated by;

32 Lesotho, a landlocked country, has the remoteness index of 98.62, the highest among the LDCs. If it is not landlocked, the index would have been reduced to 79.87, the value close to the one of Mozambique, a non-landlocked country and located in north-east of Lesotho.

$\ln x_t = \alpha + \beta \ln x_{t-1} + \gamma t + e_t$,[33] and INE by $INE = (\frac{\sum_{t=1}^{N} e_t^2}{N-1})^{1/2}$. Then the export instability employed in EVI is defined as;

$$ine = \frac{INE - [5]}{[35] - [5]} \times 100 .$$

- Share of the population that has been a victim of natural disaster (%) (VND)

$$vnd = \frac{ln(VND) - ln[0.005]}{ln[10] - ln[0.005]} \times 100 .$$

- Instability of agricultural production (INA)

It is defined in the same way as in the case of the instability of exports of goods and services, except x_t now refers to the agricultural production index.

When substituting these 8 definitions into (A3), one obtains the EVI formula.

With all these transformations, the original socio-economic variables are standardized and employed for HAI and EVI calculation. Table A.1 below shows values of the HAI and its HAI components for selected countries. Samoa is the only country in this list that graduated from the LDC category in 2014, while Myanmar reached the graduation threshold for HAI in the 2012 triennial review.

Except the proportion of undernourished in total population, the improving education and health status reflect higher HAI values. In particular, the secondary enrolment ratio and adult literacy rate appear strong indicators of higher HAI values. The proportion of undernourished persons, on the other hand, is known to be higher in South Asia, compared with other regions/countries with similar socio-economic conditions;[34] Bangladesh and Myanmar are no exception.

The health and education status of the highest scoring country, Samoa, surpasses many other developing countries, while that of Somalia, a country in conflict, does not guarantee even a minimum human and social security net for the majority of the population. For Somalia and the other countries in table A.1, it seems to be a long way to achieve the level of health and education status of Samoa. On the other hand, the difference between Myanmar and the rest of the countries with lower HAI values (except Somalia) is noticeable in adult literacy

Table A.1
Human Asset Index and its original components for select countries, 2012 triennial review

Country	Gross Secondary enrolment ratio (%) 2006-2011	Proportion of undernourished in total population	Under-5-mortality rate (per 1000) 2005-2010	Adult Literacy rate (%)	Human Assets Index
Somalia	8	62	174	19	1.4
Mali	38	12	193	26	30.2
Benin	37	12	136	42	41.1
Senegal	37	19	96	50	47.0
Bangladesh	49	26	61	56	54.7
Myanmar	54	20	73	92	68.8
Samoa	85	5	27	99	92.8

Source: CDP Secretariat data base.

33 γ is the trend.

34 See, for example, United Nations (2012).

rate and under-5 mortality rate, but not as much pronounced in the other 2 variables. Progress on child mortality is gaining momentum and accelerated in some regions, including sub-Saharan Africa, and the gap between Myanmar and the rest of the countries are expected to narrow. Adult illiteracy has not improved as much as hoped, largely because out-of-school adults have only limited opportunities to development literacy skills and the gap is expected to stay. Secondary enrolment ratio is expected to go up as the success in attending universal primary education in many parts of the world will naturally lead to higher demand for secondary education.

Turning to the EVI (see table A.2), Nepal and Tanzania met the EVI graduation threshold I the 2012 review while Kiribati has the highest EVI score among the reference countries (i.e., most vulnerable). Kiribati has the worst scores in many variables, but no discernible pattern is found among the rest of the countries, except in export concentration and, a lesser extent, export instability of goods and services. Nepal and Tanzania have lower (i.e. better) scores in many variables, with relatively less concentrated export items and stable agricultural and export performances. Because of their geographical locations, they experienced fewer victims from natural disasters and have fewer portions of their populations in low elevated areas.

Policies discussed and implemented in relation to the MDGs do not find strong relevance to improve the EVI. Policies related to achieving the MDGs are largely concerned with income poverty, health and education, and environment, but not much about economic or industrial development. It may be sufficient to note that the market-based approach to macroeconomic managements is likely to shift human and capital resources towards a sector or an industry with comparative advantage, making the economic structure more concentrated and more vulnerable to economic and natural shocks, while such approach could produce higher growth rates at least for a certain period.

References

Bruckner, Matthias (2012). "Climate change vulnerability and the identification of least developed countries", CDP Background Paper, No. 15 (June).

Committee for Development Planning (1971). Report of the Committee for Development Planning on its seventh session (22 March—1 April 1971), *Official Records of the Economic and Social Council*, 1971, Supplement No. 7.

___ (1991). Report of the Committee for Development Planning on its twenty seventh session (22-26 April 1991), *Official Records of the Economic and Social Council*, 1991, Supplement No. 11 (E/1991/32).

Committee for Development Policy (2011a). *Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures*, United Nations publication, sales No. E.07.II.A.9.

___ (2011b). Report of the Committee for Development Policy on the thirteenth session (21-25 March 2011). *Official Records of the Economic and Social Council*, Supplement, No. 13 (E/2011/33).

___ (2012). *Report of the Committee for Development Policy on the fourteenth session (12-16 March 2012), Official Records of the Economic and Social Council, Supplement No. 13 (E/2012/33).*

___ (2014). *Report of the Committee for Development Policy on the sixteenth session (24-28 March 2014)*, *Official Records of the Economic and Social Council Official Records*, supplement No. 33.

Guillaumont, Patrick and Alassane Drabo (2013). "Assessing the prospects of accelerated graduation of the least developed countries", Fondations pour les Études et Recherches sur le Déveoppement Intennational (FERDI), Working Paper No. 72 (June).

Lister, Ruth (2004). *Poverty*, Polity Press; Cambridge, UK.

United Nations (2012). *Millennium Development Goals Report 2012*, UN publication, sales No. E.12.I.4.

___ (2013a). *Millennium Development Goals Report 2013, United Nations publication, sales No. E.13.I.9.*

___ (2013b). *World Economic Situation and Prospects 2012: Update as of mid-2013*, United Nations.