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Tracking progress towards the SDGs: measuring the otherwise ambiguous progress

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Abstract

Progress assessment is an essential part of the follow-up and review process for implementation of the Sustainable Development Goals (SDGs). The lack of reliable aggregate statistics together with an absence of specific target values and standard methods for tracking progress are major obstacles for an effective progress assessment by the international statistical community. This paper describes the data and statistical challenges in assessing progress towards achieving the SDGs and proposes (1) a practical method for target setting and (2) two different measures for progress assessment. A method based on the concept of "champion area" provides objective and feasible target values that make optimum use of scarce data. Further to this, two measures are proposed for tracking progress towards achieving SDGs; one measures the gap between expected and targeted progress by 2030, and the other metric is based on the progress made since 2000 in relation to the progress needed during 2000 to 2030. Both approaches are forward looking and at the same time take into consideration past accomplishments/negligence.

Key words: Sustainable Development Goals (SDGs); Millennium Development Goals (MDGs); progress assessment; target value setting; progress gap; champion area; anticipated progress.

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I. Introduction

In order for successful follow-up and review of the implementation of the 2030 Agenda, efforts should now focus on developing robust standard measurement methods that are needed to help us understand where the world and its regions stand, how much progress has been made in the past and what it takes to collectively achieve the aspirational 17 Sustainable Development Goals (SDGs) by 2030. To date, however, there is no standard method available for regional or global SDG progress assessment.

Apart from availability of quality statistics at the country level, effectiveness of progress assessment at the regional and global levels depends on three factors; (i) producing accurate aggregate statistics at the regional/global levels; (ii) setting specific target values for the region or at the global level; (iii) applying a robust and standard method for tracking progress towards achieving the specified targets.

The SDG index and dashboard developed by the Sustainable Development Solutions Network (SDSN) provides a rigorous method for measuring SDGs baseline status at the country level. The index combines selected SDG indicators values into one metric that is primarily used for country ranking. It provides a starting point for countries to compare themselves with the rest of the world. However, the SDSN Index cannot be utilized for progress tracking. It cannot be benchmarked against target values and it is not goal specific. Moreover, the indicator thresholds are determined on the basis of expert opinions—an exercise that may not provide results for all countries/regions.

The main objective of this paper is to shed light on challenges regarding these three important aspects of progress assessment and also proposes practical solutions that may be adopted for tracking progress towards the SDGs. In particular, the paper proposes an approach for setting objective and feasible, yet aspirational, target values that make optimum use of available data. The paper also recommends two methods for tracking progress against the specific targets. One measures the *progress gap* towards the targets in the current development agenda and the other metric assesses progress made since a start point in the past (year 2000) and the progress gap in relation to the entire progress needed over the two consecutive global development agendas. The methods are applied to a set of SDG indicators and results are demonstrated for the Asia-Pacific region, but may be generalized to any other region or the world.

The main objectives of this paper are to shed light on challenges regarding the three abovementioned important aspects of progress assessment and to propose practical solutions for tracking progress towards the SDGs. In particular, in the absence of specific target values for nearly 70 percent of the SDG targets, the paper proposes an approach for setting objective and feasible, yet aspirational, target values that make optimum use of available data. The paper also recommends two methods for tracking progress against the specific targets. One measures the *progress gap* towards meeting the targets in the current development agenda, and the second metric assesses the current state of progress by establishing a link between the progress made since a fixed starting point and distance to the fixed target in the future. The methods are applied to a set of SDG indicators and results are demonstrated for the Asia-Pacific region, but may be generalized to any other region or the world.

II. Regional aggregates

The first step in tracking regional or global progress towards achieving goals and targets is to aggregate country level statistics to produce the sub-regional, regional and global aggregates of the corresponding indicators. The Economic and Social Commission for Asia and the Pacific (ESCAP), for instance, collects country level statistics from agencies who compile and disseminate statistics on development indicators. In relation to the MDG and, now, SDG indicators, these agencies, referred to as "custodian agencies" directly collect statistics from countries, and in some cases for various

reasons, generate estimates of country-level statistics or indicators. In almost all cases, agencies also provide aggregated indicator values at the regional and sub-regional levels and normally there are different aggregation methods and criteria adopted by various agencies. In addition to methodological diversity, different country classifications are often used by agencies that do not necessarily accord with classifications used by regional commissions such as ESCAP. Therefore, to meet the methodological consistency and, more importantly, to provide aggregate statistics on relevant country groupings as required by regional commissions, country level statistics from agencies are used to calculate regional and sub-regional aggregates.

One should note that the purpose and result of aggregation is that the group of units (e.g., countries comprising a region or a sub-region) for which values of the indicator are aggregated represent "one" population, area, economy, or ecosystem, depending on the type of parameter that the indicator measures. The aggregate value is then used as evidence to inform or evaluate policies formulated and actions undertaken that affect the target population (or area, economy, etc). Therefore, considering the representativeness of available statistics with regards to the target parameter is a key contributing factor to the accuracy of the aggregates. This concern is most pertinent to the Asia-Pacific region in which two (out of 58) countries are home to more than 65% of the population, four countries cover more than half of the region's land area and three economies produce more than 60% of the total GDP.

In light of the above considerations, the current statistical aggregation methods used by ESCAP statisticians to calculate aggregates at the regional and sub-regional levels apply the following principles:

(i) Ensure sufficient coverage of the data by putting a cut-off criterion for assessing if sufficient data are available. The cut off is currently as follows: for social indicators, the total population of the units providing the values to be aggregated is at least two thirds of the population of the Asia-Pacific region and, for economic indicators, the total GDP of the units providing the values to be aggregated is at least two thirds of total GDP.

(ii) For some indicators impute missing values with appropriate value (for example in the case of poverty it is considered zero for developed countries when data is missing).

(iii) Calculate the weighted average or sum of the indicator values over the group of units using an appropriate weighting variable—typically, one most correlated with the indicator variable.

In this aggregation method, the cut off criterion is applied to ensure representativeness of the data available and the weight factor aims for accuracy of the aggregate. Currently, two variables are used as the basis for the cut-off criteria: total population and GDP. In addition to the two cut-off variables, and depending on the type of indicator, variables such as different population groups (eg. by age, sex etc), land area, number of parliament seats, total import, and total export are used as weights. In the ideal situation and when data is available, for indicators that are expressed in proportion, the denominator variable should be used as the weight. Moreover, to be precise, variables used as cut-off and weights must be the same to ensure the highest representativeness.

Given the abovementioned principles it is clear that insufficient and infrequent country level data are major challenges in producing regional and global aggregates. Producers of such aggregates have had to extrapolate indicator values for the years with missing data.. The extrapolation methods are diverse, ranging from simple arithmetic averages to model based prediction methods. Bidarbakht Nia (2017)[1] summarizes these methods and proposes a time-related weighting system and demonstrates

[1]Available: http://www.unescap.org/sites/default/files/SD_Working_Paper_no4_Mar2017_Method_for_measuring_the_SDGs_progress.pdf [Accessed 27 March 2017]

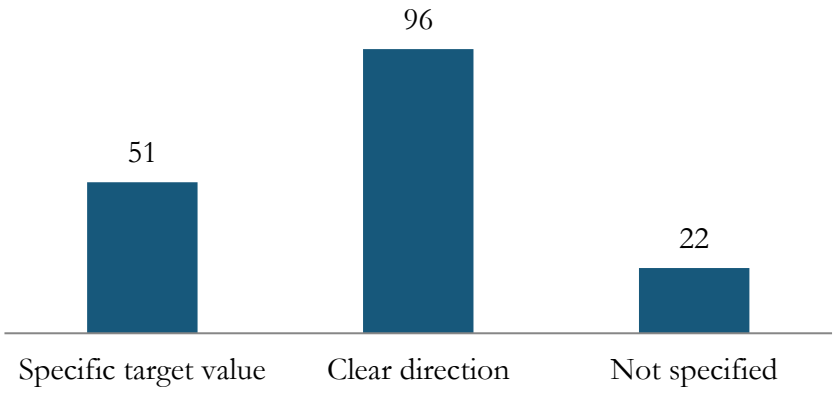
that when applied to Asia-Pacific development data provides more accurate estimates for missing data under certain assumptions compared to other weighting systems.

III. Target value setting

A. The problems

Lack of specific target values in the statement of goal targets creates a major challenge for assessing progress towards achieving the SDGs. Of the 169 SDG targets, only 30 percent specify—either explicitly or implicitly-- target values. In this paper, *explicit* targets refer to those with clearly specified numeric target values (absolute or relative) to be achieved by 2030 such as halving, doubling, 7 percent and so on. *Implicit* targets, on the other hand, are those stated in terms such as eradicate, universal access, maintain, end, and similar terms that can be translated into numerical target values of 0 or 100. The remaining 70 percent of the 169 targets indicate only a desirable direction of change by using terms such as decrease, increase, enhance, and promote in the target statement, or do not clearly specify the value or direction but propose actions to be taken. This latter group often contain terms such as correct, adopt, create, recognize, and regulate. Figure 1 summarizes the number of SDG targets falling in each of these three categories of targets.

Figure 1. Distribution of SDG targets by specificity of target values



In practice, even for those targets with specific target values, when more than one indicator is proposed, it is possible that some indicators do not directly measure the same parameter as identified in the target and therefore the target value cannot be applied to that indicator. Therefore, for monitoring purposes, one has to come up with target values at the indicator level and that leaves us with an even larger proportion of indicators for which target values need to be set.

B. Principles

Three important aspects have to be taken into consideration when setting target values for SDG progress assessment: data efficiency, objectivity, and feasibility.

- ***Data efficiency:*** Given data scarcity at the regional and global level due to lack of sufficient national data for producing regional and global aggregates, progress assessment methods have to make optimum use of existing data.
- ***Objectivity:*** Progress assessment methods have to provide clear measures of achievements that facilitate objective policy evaluation over time. Specific target values are essential for objective assessment.

- ***Feasibility:*** Related to objectivity is feasibility of achieving the target given the available resources and current situation of the region. It is important that regional target values are based on aspirational, but at the same time, realistic objectives. In other words, the region has to be able to achieve the targets such as through efficiently using affordable resources, among others.

The approach taken in the annual regional MDG reports for monitoring the MDGs in the Asia-Pacific region[2] was to estimate the trend for those indicators without specific target value and observe whether the indicator was changing in the "right" direction, "wrong" direction or if "no change" occurred, according to the desirable direction proposed in the respective target[3]. The three principles may be better understood by evaluating to what extent trend estimation satisfies the principles:

Data efficiency- Estimating trend requires a sufficient number (at least five) of data points at the regional level for a given indicator in order to facilitate estimation of turning points. It may have worked reasonably for the MDGs monitoring as proposed indicators were relatively few (60 compared to 230 indicators in SDGs) with mostly well-established methodologies and sufficient data available. Nonetheless, in the proposed indicator framework for the SDGs[4], for more than half of the indicators (tier II and III), there is either no internationally agreed methodology or very limited data available. Even for the tier I indicators where some data are available at the country level, for the Asia-Pacific region, where two countries are home to over 60 percent of the population, calculating regional aggregates is complex and very much depends on data availability for China and India. According to the ESCAP statistical database[5], for only less than 50 out of 230 SDG indicators, two aggregates for Asia-Pacific region can be calculated (in order to observe the change in indicator value). This level of data availability makes the trend estimation method inapplicable for many of the indicators without target values in SDG monitoring.

Objectivity- Trend estimation provides information only on direction of change; whether predicted trend is going in the right direction or not. This information, though helpful to assess progress or lack of it, does not provide enough evidence for understanding progress made and the progress required to meet the target. In other words, the trend estimation does not facilitate objective progress analysis and planning.

Feasibility- The trend estimation does not provide any target that is (proved to be) achievable. It only helps in identifying whether the direction of progress is on the right path or not.

C. The "Champion area" Approach to Target Setting

Given the three aforementioned principles, this paper proposes the "champion area" approach to target setting; that is, setting numeric values for SDG targets that optimizes use of available data and is based on what has been feasible in the past.

The main idea is to identify outstanding countries (top performers) in the region in terms of progress made as measured by the rate of change of a specified indicator and set the average rate of change of these top performing countries as the target rate of change for the entire region. If we imagine all the top performers as belonging to a hypothetical area and label it the "*champion area*" in the region, the area has made the fastest progress with regard to the specified indicator with the rate of change equal

[2] Regular reports produced since 2004 through a tripartite partnership between UNESCAP, ADB and UNDP to support the achievements of the MDGs.

[3] Available: http://www.unescap.org/resources/asia-pacific-regional-mdg-report-201112 [Accessed 24 March 2017]

[4] Available: http://unstats.un.org/sdgs/indicators/indicators-list/ [Accessed 24 March 2017]

[5] Available: http://www.unescap.org/stat/data [Accessed 04 May 2017]

to the average rate of change of the top performers. This average rate of change can then be considered as the target rate for the region as a whole. In other words, if the region as a whole can perform as well as its champion area in the next 15 years, we should expect the region to achieve the target[6]. Subsequently, the universal target value for the region can be obtained by applying the rate of change in the champion area to the regional aggregate in the base year. This approach addresses all three above factors by making the maximum use of data (only two data points needed to estimate rate of change at the country level), setting a numeric target value for objective monitoring and planning, and also assuring that the target is achievable given that the region can collectively perform as good as its champion area.

As proposed and applied, the champion area approach selects the *top five* performers of the region (nearly 10 percent of the countries in Asia-Pacific region) in order to avoid bias towards outliers. In some rare cases where either data quality is not verifiable or one or two countries have particular characteristics that make them different from the rest of the region, extreme values need to be dropped from consideration prior to identifying the top five performers.

The main challenge with the use of rate of change of top performing countries arises when dealing with two types of indicators:

(i) indicators for which sufficient data are not available to estimate the rate of change at the country level; and

(ii) indicators for which many countries in the region started from a very low level and have made significant progress in the past 15 years due to technological advancement and exploitation of untapped resources or a paradigm shift brought about by the MDGs so that the observed growth rate cannot be applied to the future. Examples of these indicators are: number of seats of parliament held by women; marine areas protected, or percentage of internet users,

For these types of indicators, a proposed *alternative* approach is to identify the top five performers based on the *latest available indicator value rather than the rate of change*. Then, the average value for the five countries with the largest or smallest values (depending on whether desirable change is increasing or decreasing respectively) is the indicator value for the champion area and used as the regional target value.

In summary, the steps for setting a target value for indicator *I* for which no target values are specified in the SDG target statements, results of which are shown in Table 1, are as follows:

Case 1. If at least two data points are available over the past 15 years for a number of countries that allow observing a diverse range of changes across the region, the earliest and the latest data available for the top five countries with the highest rate of change are used to calculate r:

> r *: Average annual rate of change over the five highest rates of increase/decrease in the indicator for the five best performing countries.*
>
> The r is calculated in two steps:
> Step one: estimate average annual growth rate for each country using the earliest and the latest indicator values using the geometric mean
>
> Step two: Take the geometric mean of the top five rates of change (after dropping outliers, if necessary).

[6] It is important to bear in mind that the hypothetical target may be challenging to achieve, but it is assumed that it would be feasible given necessary resources, as it has been achieved by the champion area.

Case 2. For indicators where there is no sufficient data available to estimate country level rates of change, the latest data for each country are used to calculate tv:

> tv: *Average over indicator values for the five countries with the largest or smallest values depending on whether desirable change is increasing or decreasing, respectively.*

The target value, *TV*, for the indicator is calculated as:

$$TV = \begin{cases} tv & Indicators\ of\ type\ (i)\ and\ (ii) \\ (1+r)^{15} \times I_{base} & other\ indicators \end{cases}$$

where I_{base} is the indicator value for the base year

When the indicator value for the base year (2015 in the context of SDGs) is not available, it can be estimated by applying an appropriate extrapolation method such as the method proposed by Bidarbakht Nia (2017)[7] summarized in Annex I. For a few indicators/countries with only one data point, the latest data (after 2010) is used as the base year value and then aggregation at the regional level was calculated and used for the regional value in the base year.

IV. Tracking progress

The SDGs are multidimensional in nature. Each dimension of a specific goal is addressed by one or more targets and in most of the cases a one-to-one correspondence between target and indicator exists[8]. Hence, in most cases, a single indicator can be used to assess progress towards achieving the target. Two approaches are proposed for tracking progress. The first approach tracks progress towards each dimension (i.e., target) of a goal by comparing predicted (expected) progress and the target value. This approach, referred to in this paper as *anticipated progress*, works because of the one-to-one linkage between indicators and targets.

The second approach combines information from all indicators (ie., all dimensions of the goal) under each goal to provide one numeric measure, an index, that measures overall progress towards the goal. Taking the view that commitment to attaining the SDGs is a continuation of the past global development commitment (the MDGs), this approach treats progress assessment as not only forward looking but also takes into account the past accomplishments/negligence. This approach, referred to as *baseline status index* in this paper, as it accounts for three phases of progress-- progress made since a specific start point in the past, unfinished work up to the present, and progress needed to achieve the goal in the future. A more detailed explanation for these two approaches for tracking progress towards SDGs is provided below.

A. Anticipated progress approach

The anticipated progress approach assesses progress towards achieving a goal by looking at progress towards achieving the individual targets associated with the goal. For a quantitative assessment of progress towards achieving a specified goal, this requires taking the indicator(s) associated with the goal targets and for each indicator, comparing the predicted (expected) progress against the targeted progress. In other words, by predicting the indicator value for the target year and benchmarking the predicted against the target value. Denoting target value by *TV*, *and* the predicted value of indicator *I*

[7] Available: http://www.unescap.org/sites/default/files/SD_Working_Paper_no4_Mar2017_Method_for_measuring_the_SDGs_progress.pdf [Accessed 24 March 2017]

[8] Nearly 80% of SDG targets have only one indicator: https://unstats.un.org/sdgs/metadata/.

for the target year by I_{target}, one can approximate the *progress gap*, *P*, as a percentage of progress required by

$$P = \frac{|TV - I_{target}|}{|TV - I_{base}|} \times 100$$

P is calculated only for indicators for which the predicted value of the indicator is not equal to or greater than the target value (for indicators that target is not expected to be achieved by 2030). Indicators for which the predicted value has reached or exceeded the target value the associated target is automatically considered as "will be achieved". For the rest of the indicators, P may be interpreted as the extra effort or acceleration needed in order to meet the target.

The value of P is between 0 and 100 if progress or no change is expected and greater than 100 if the indicator value is a 'regression' from the current level. Although the value of P (or $1 - P$ when regressed) is expressed in percentage, and can potentially be used as a basis for comparing indicators in terms of progress acceleration needed in order to achieve the target, for communication purposes indicators can be classified into predefined achievement levels, as follows: :

$$\begin{cases} P \leq 10 & (Will\ meet\ the\ target\ with\ current\ rate\ or\ minor\ extra\ effort) \\ 10 < P < 100 & (Need\ to\ enhance\ the\ current\ rate\ of\ progress\ to\ achieve\ the\ target) \\ P \geq 100 & (Regression\ or\ no\ progress\ expected) \end{cases}$$

Figure 3 shows an example of an SDG dashboard for Asia and the Pacific region based on 35 indicators for which prediction up to 2030 was possible (Refer to Annex II for details)[9].

The results of applying the anticipated progress approach in tracking regional progress for Asia and the Pacific countries demonstrates some of the key merits of the approach. It shows the progress needed on the different dimensions of each goal. It also provides a communication tool for visually illustrating progress towards complex and interlinked SDG targets. The dashboard is also informative in terms of data gaps for measuring progress under each goal.

It is to be noted that a limitation of the anticipated progress approach is that requires predicted values of indicators for the target year (2030); as indicated earlier in this paper, methods for generating regional aggregate values demand sufficient data points at the regional level. Second, it dismisses the progress made in the past in regards with the target. In particular, those indicators for which the region has started from a very low level and made significant progress but yet far from the target.

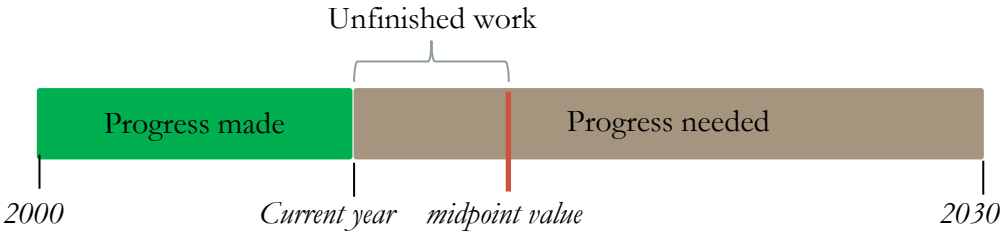
B. Baseline status index approach

The *baseline status index approach* assesses the *current* state of progress by creating a linkage between the progress made since a fixed starting point in the *past* and the distance to the fixed target value in the *future*. In the context of the SDGs commitment that put forward universal goals and targets to be achieved by the end of 2030 (the future), this approach views the year 2000 as an appropriate starting point (the past) as it was the first time that all nations collectively agreed on a set of universal goals and targets (the MDGs) and concentrated efforts on achieving those within the next 15 years. . Given a specified target value for an indicator, indicator values at the current and start years can be

[9] In the case of the Asia-Pacific region, currently data do not allow for 2030 prediction for any of the indicators under goal 13 and 14 and only for one indicator under a few other goals (5, 10, 11, 15, 16).

used to construct a metric that measures the "*progress made*" since the global development agenda was inaugurated (2000) in relation to the "*progress needed*" to achieve the targets by the end of the current agenda (2030). The distance between the current year value and the "midpoint" (2015) expected value also shows "*unfinished work*" since the universal development agenda was inaugurated. The concept behind the approach is pictured in Figure 2 below:

Figure 2. Representation of the baseline status index approach



Denoting indicator values of indicator *I* for the start year and current year by I_{st} and I_{cr}, respectively, and the target value by TV, then the size of the green bar (progress made) is:

$$I_{cr} - I_{st}$$

and that of the entire progress needed to be made over the period of the start point to the end of the current agenda (green bar and blue bar) is:

$$TV - I_{st}$$

Then, a measure of relative progress on the target associated with indicator *I* is[10]:

$$\frac{|I_{cr} - I_{st}|}{|TV - I_{st}|}$$

The multi-dimensionality of SDG goals are reflected in the associated targets and indicators. Assuming that targets are integral and inseparable parts of a whole with equal importance in explaining the dimension of a goal, in order to understand how much progress has been and is required to be made to achieve the goal, an index that combines the metrics for all indicators across all targets associated with the goal can be interpreted as "average progress made" and "average progress required" on a fixed scale. However, since these indicators can vary in mathematical nature and measurement scale, it is essential to normalize the indicators that would be combined to produce the index.

The *baseline status index* is thus computed, as follows:

(1) Setting the normalized values of indicator *I* at start and target at 0 and 10, respectively, the normalized value for the indicator at current year on the scale of 0 to 10 is be calculated as:

$$I_{cr}^{N} = \frac{|I_{cr} - I_{st}|}{|TV - I_{st}|} \times 10$$

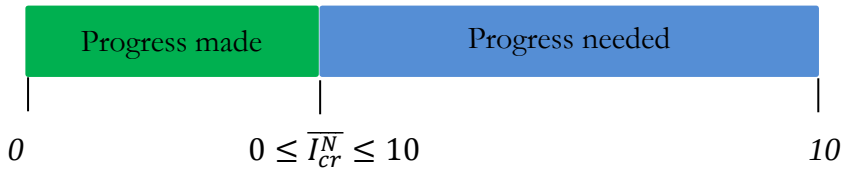
This expression is applied to capture regression with negative values.

[10] Taking the absolute value ensures that the index shows the right direction of change (positive when progressed and negative when regressed). However, when extreme changes occur (e.g., exceeding the target value or moving from a positive value to a negative), the value of I_{cr}^{N} may fall outside the range of [-10 , 10]. In these rare cases, the values I_{cr}^{N} are truncated to 10 when progress is made and -10 when regressed prior to averaging over goal areas.

(2) The baseline status index is the *average* over all normalized values of indicators associated with each goal, $\overline{I_{cr}^{N}}$.

This index has values between 0 and 10 if the region has progressed on average since the start point and has a negative value if the region has regressed. That is,

If progress made since start year:



If regressed since start year:

Figure 4 depicts a snapshot of the Asia-Pacific progress on SDGs achievement based on the baseline status index. The application uses 50 indicators (detailed in Annex II) across 16 goals[11] for which regional aggregates for the start year (2000) and 2015 were available. Each bar shows the value of $\overline{I_{cr}^{N}}$ on the horizontal axis for the respective goal. The green part of each bar shows average progress made since 2000 and the blue part is the progress required to meet the target by 2030. The distance from the furthest left point on the blue bar and midpoint value (value 5 on horizontal axis) can be interpreted as unfinished work since 2000. In other words, if the region as a whole aims to achieve the targets by 2030 with the same rate of progress throughout the 30 year period, the index value at midpoint (2015) is expected to be 5 on the scale of 0 to 10.

In the ideal situation where data is available on all indicators under each goal, the index should provide a robust measure of overall progress that is comparable across all 17 goals. This is not the case for the current application of the approach to measuring regional progress as regional data are available for only less than 25% of the proposed SDG indicators-- with variable coverage across the 17 goals. For some goals there is hardly any data available while for a few goals most of the targets could be represented in the summary index. Therefore, the results of the current application of this approach needs to be interpreted with caution and awareness about data gaps. In particular, one has to be aware that for those goals represented with one or few indicators only, the results may be very sensitive to removing or adding new indicators.

[11] Goal 17 is not included in this snapshot.

Table 1. Regional target values for 2030 for selected SDG indicators without specific values in the official target

Goal	Indicator	2015	Target value (T)	Champion's rate
01	General government health expenditure/% of government expenditure	13.4	30.3	2.3
01	Population living below the national poverty line/% of population	16.6	8.3*	
01	Public expenditure on education/% of total government expenditure	12.4	23.5	1.9
02	Agriculture orientation index	0.4	1.6	4.2
03	Alcohol per capita consumption/Litres per annum	4.8	2.4	0.5
03	Health worker density and distribution/ Physicians Per 10,000 population	12.0	30.0	2.5
05	Seats held by women in national parliaments and local governments /% of seats	18.1	30.9*	
06	Total freshwater withdrawal / % of total renewable water per annum	24.0	16.8	0.7
07	Renewable energy production, total/% of TPES	11.4	27.5	2.4
07	Total primary energy supply (TPES)/Kg of oil equivalent per 1,000 dollars GDP (2011 PPP)	140.9	55.0	0.4
08	Growth rate of GDP per employed person/% change per annum	6.3	10.1*	
08	Unemployment rate, total/% of labour force	4.8	2.5	0.5
09	Carbon dioxide (CO2) emissions (UNSD) /Grams per 1 dollar GDP (2011 PPP)	382.0	175.7	0.5
09	GDP by activity: Manufacturing/% of value added	23.8	40	1.7
09	Gross domestic expenditure on research and development/% of GDP	2.2	3.1	1.4
10	Growth rates in per capita real survey mean consumption or income, bottom 40% (%)	5.5	7.7*	
10	Labour share of GDP/% of GDP	57.4	69.5	1.2
11	Annual mean concentration of PM10 in cities /Micrograms per m3	101.1	21*	
11	Municipal waste collected /Kg per capita served	117.5	614*	
12	Domestic material consumption intensity/Kg per 1 US dollar (2005 GDP)	2.7	1.1	0.4
12	Material Footprint total by type/Kg per 1 US dollar (2005 GDP)	2.4	1.4	0.6
14	Marine areas protected /% of marine areas	29.3	35*	
15	Natural Forest area/% of land area	27.4	30.4	1.1
16	Intentional homicide/Per 100,000 population	2.7	0.7	0.2
17	Fixed-broadband equal to or above 10 Mbit/s subscriptions/Per 100 population	6.2	33	5.3
17	Internet users/% of population	37.5	86.5*	
17	Personal remittances received/% of GDP	1.0	5.5	5.8
17	Total revenue/% of GDP	16.1	29.8	1.9

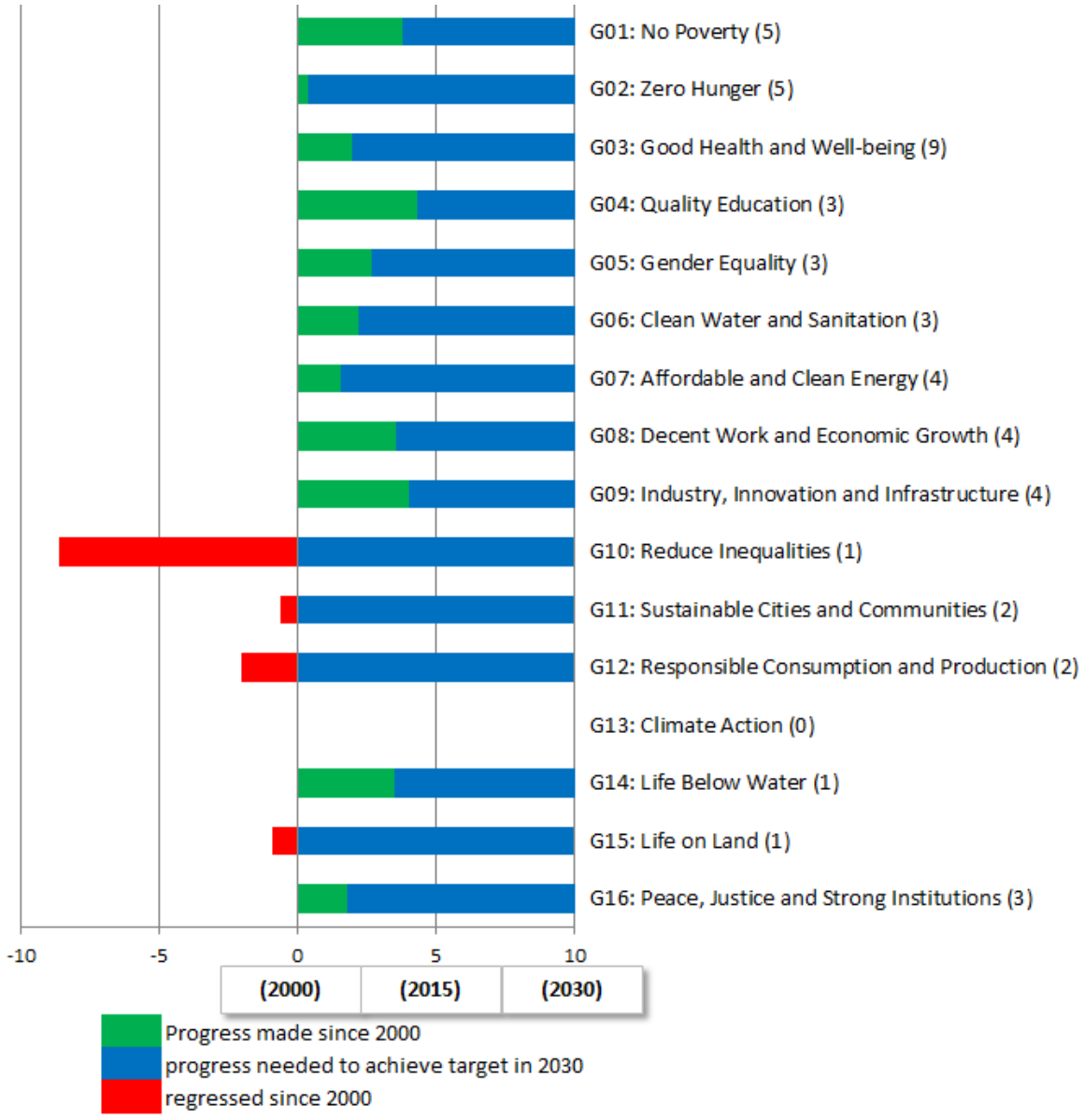
* Type (i) and (ii) indicators for which the average over top performers was used instead of champion's rate of change

Figure 3. SDG dashboard for Asia-Pacific region by goal and focus area

Goal	Focus area							
1	Employed poor	International poverty	Expenditure on education	Expenditure on Health				
2	Undernourishment	Agriculture investment						
3	Maternal mortality	Under-5 mortality	Neonatal mortality	Tuberculosis	Family planning	Adolescent fertility	Malaria	Health workers
4	Organized learning (primary)	Teachers' training (primary)						
5	Women in parliaments							
6	Improved water	Improved sanitation						
7	Clean fuels and technology	Energy supply	Renewable energy					
8	Unemployment	GDP growth	GDP per emloyed					
9	Mobile-cellular	Manufacturing% in GDP	R&D investment	CO2 emission				
10	Labour share of GDP							
11	Urban slum							
12	Material Footprint	Material consumption						
13	N A							
14	N A							
15	Natural Forest area							
16	Intentional Homicide							

	Will meet the target with current rate or minor extra effort
	Need to enhance the current rate of progress to achieve target
	Regression or no progress expected during 2015 to 2030

Figure 4. SDG snapshot for Asia-Pacific region based on its baseline status



Number in parenthesis indicates number of indicators used to calculate index

Annex I: Time-related weights for extrapolation

This method proposes that the importance of the indicator values used for extrapolation should be proportional to their recency, i.e. how recent the data are. The weighted extrapolation method is making optimum use of time, as the only auxiliary variable available, in now casting and predicting future values of development indicators by introducing time-related weights that improves the predictive power of the model.

Suppose that n data points are available on indicator I for a given country/region over a period of T years and we are interested in extrapolating the indicator value to the year t_{n+a} (a=1,2,..).

$T = t_n - t_1$ where t_n and t_1 are the latest and the earliest years, respectively, for which data on indicator I are available respectively. The time-related weights are proposed to work as a multiplier that inflates the rate of change in each period proportional to its temporal distance to the target year (t_{n+a}). The time-related weight for the i^{th} observation for given country/region is proposed as:

$$w_i = \frac{(t_{n+a} - t_1)}{(t_{n+a} - t_i)} \quad (i = 1,2,..n)$$

With this weighting factor, more recent values are given greater weight in the estimation[12].

[12]Available:http://www.unescap.org/sites/default/files/SD_Working_Paper_no4_Mar2017_Method_for_measuring_the_SDGs_progress.pdf [Accessed 24 March 2017]

Annex II- List of SDG indicators used for tracking progress in Asia-Pacific region

Goal	Indicator	Start point	2015	2030	Target	P
1	General government health expenditure	13.2	13.4	16.4	30.3	82.0
1	Population living below the national poverty line	35.3	16.6		8.3	
1	Population living in poverty at $1.90 a day in 2011 PPP	32.0	7.8	2.1	0.0	26
1	Public expenditure on education	14.0	12.4	13.2	23.5	92.9
1	Share of extremely poor living on less than US$1.90 a day in total employment, total	22.9	8.9	0.7	0.0	7.5
2	Agriculture orientation index	0.3	0.4	0.5	1.6	86.5
2	Children under 5 overweight	3.3	6.1		0.0	
2	Children under 5 stunting	38.7	24.1		0.0	
2	Children under 5 wasting	11.0	7.6		0.0	
2	Prevalence of undernourishment	17.7	12.1	7.8	0.0	64
3	Adolescent fertility rate	34.9	30.0	25.4	0.0	84.9
3	Alcohol per capita consumption	4.5	4.8		2.4	
3	Demand for family planning satisfied with modern methods	83.5	81.7	87.8	100.0	67.0
3	Health worker density and distribution (Physicians)	9.0	12.0	18.0	30.0	66.7
3	Malaria incidence rate	98.4	59	35	0.0	59
3	Maternal mortality	251.8	187.6	59.5	70.0	8.9
3	Neonatal mortality rate	33.6	27.0	12.6	12.0	3.9
3	Tuberculosis incidence rate	167.7	154.6	120.0	0.0	77.6
3	Under-five mortality rate	67.9	41.8	20.1	25.0	0.0
4	Minimum organized teacher training, primary education, total	79.4	87.0	90.0	100.0	76.9
4	Participation rate in organized learning (one year before the official primary entry age), total	62.5	82.0	85.0	100.0	83.3
4	Proportion of schools with access to electricity, primary level	26.6	56.5		100.0	
5	Percentage of Women aged 20 to 24 years who were first married or in union before ages 18	47.0	34.8		0.0	
5	Physical, sexual or psychological violence of ever-partnered women	34.0	25.0		0.0	
5	Seats held by women in national parliaments and local governments	13.1	18.1	25.8	30.9	39.7
6	Access to improved sanitation	52.0	55.3	74.4	100.0	57.4
6	Access to improved water sources	82.2	86.5	96.5	100.0	26.1
6	Total freshwater withdrawal	28.0	24.0		16.8	

Goal	Indicator	Start point	2015	2030	Target	P
7	Access to electricity (SE4All)	81.4	89.4		100.0	
7	Proportion of population with primary reliance on clean fuels and technology	39.7	49.5	61.2	100.0	76.9
7	Renewable energy production, total	15.0	11.4	7.9	27.5	121.9
7	Total primary energy supply (TPES)	179.7	140.9	107.2	55.0	60.7
8	Average annual GDP per capita (2005 US dollars) growth rate	3.5	5.0	5.0	7.0	103.6
8	Growth rate of GDP per employed person	2.4	6.3	5.0	10.1	136.0
8	Proportion of adults (15 years and older) with an account at a bank	48.8	66.3		100.0	
8	Unemployment rate, total	5.1	4.8	4.2	2.5	72.5
9	Carbon dioxide (CO_2) emissions	442.2	382.0	321.0	175.7	70.4
9	GDP by activity: Manufacturing	15.7	25.4	29.4	42.1	75.9
9	Gross domestic expenditure on research and development	1.9	2.2	4.0	3.1	83.0
9	Population covered by a mobile-cellular network	43.2	90.2	99.9	100.0	1.1
10	Labour share of GDP	61.1	53.9	52.5	69.5	120.7
11	Annual mean concentration of PM10 in cities	76.0	101.1		21.0	
11	Urban slum population	39.9	26.5	16.0	0.0	60.2
12	Domestic material consumption intensity	2.5	2.7	3.1	1.1	125.1
12	Material Footprint total by type	2.2	2.4	3.0	1.4	164.6
14	Marine areas protected	26.2	29.3		35.0	
15	Natural forest area	27.7	27.4	27.2	30.4	108.3
16	Domestic (less than 10% foreign ownership)	20.0	24.0		0.0	
16	Intentional homicide	3.3	2.7	2.3	0.7	81
16	Unsentenced detainees (Pre-trial)	57.7	27.5		0.0	