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AGENDA ITEM 5

MEASURING PROGRESS TOWARD SDG TARGETS

Pietro Gennari

FAO Chief Statistician

Assessing Progress

With only less than 9 years to go, it is becoming urgent to gain a clearer picture of how countries are progressing towards the SDG targets. Many reports produced:

- UNSD Global SDG Report

- UN Agencies publish their flagship publications on SDG monitoring (e.g. SOFI)

- Countries publish VNRs and in some cases national SDG Reports

Assessing progress: The Problem

Leading regional/international agencies have adopted **different assessment approaches and tools.**

This has led to:

↳ Cases of inconsistent or contradictory results

    ↳ Uncertainty and confusion among users

Two different approaches of monitoring achievements toward the SDG targets:

o assessing the **current status**, as reflected by the latest available SDG data ("distance to the target")

o assessing the **future status**, whether the SDG target will be reached by 2030

Additional differences in:

o target specification (only a small fraction of SDG targets - about 30% - incorporate a clear numerical yardstick)

o methods to assess progress or the current status

o the level of analysis:

- Only Regional or National, Regional, and Global

- Single indicator or Group of indicators under a Target/Goal

Assessing progress: Overview of FAO's approach

1) Assesses both **current distance to the target** and **future trend**

2) For SDG indicators without a numerical target FAO does **NOT** set a "statistical" target:

- Current Status: estimates the empirical distribution and assigns to each country the corresponding position in the distribution (quintile)

- Future Status: estimates the actual growth and judge it according to the normative direction of the given SDG indicator

3) Geographical aggregation:

- Current Status: simple average (or median) (each country has an equal weight = 1) to be accompanied by measures of variability of the distribution of countries (range, interquartile range, etc.)

- Future Status: estimates done directly on regional time series (as being more accurate)

4) Goal aggregation:

- Current Status: FAO does NOT compute composite indexes (averaging does not solve problems of heterogeneity and redundancies between indicators under the same target/Goal)

- Future Status: FAO does NOT compute composite indexes (averaging does not solve problems of heterogeneity and redundancies between indicators)

Main differences with other International Organizations

Some organizations:

- Assess solely the future status (e.g. Eurostat)
- Set "statistical" targets in absence of targets explicitly set in the 2030 Agenda for Sustainable Development (e.g. OECD and SDSN)
- Focus only on the assessment at regional level (e.g. Eurostat and ESCAP)
- Use weighted averages in aggregating results of the assessment (current and/or future status) at regional level (e.g. OECD and SDSN)

FAO led the IAEG-SDG task force on the SDG Progress Chart, which aims to improve the consistency among international organizations of the methods for assessing progress towards the SDGs

Assessing the "current" status: monitoring the current level of achievement as described by the latest available data. Different approaches:

1. Given the distribution of the indicator by country, compare the Country value with those of other countries:
➢SDSN (2019): **relative distance wrt to the worst** value among countries
➢OECD (2019): **z-score** (distance to the target compared to variability of the "current" status)
➢FAO (2020): (**normalized**) **distance** to the target, wrt to the maximum distance (partly adopted in the 2020 UN progress Chart)

2. Assessment only at regional level, current situation compared to the baseline year:
➢UN ESCAP (2017): **baseline status index approach**. Proportion of the distance to the target already travelled from the baseline year to the latest year. Closer to an assessment of progress over time.

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Assessing the Current Status (2/3)

<u>Data needed</u>:

- Values of the SDG indicator for each country (*i*) in the current year (last available data point): x_{it}

- **Target** value of the generic SDG indicator: x^*

- UN ESCAP needs also the value of indicator for each region in the "**baseline**" year (t_0): x_{it_0}

<u>Major difficulties</u>:

SDG indicators without a numerical target. Different solutions:

- OECD, SDSN, UN ESCAP set a "statistical" target (Targets are set by policy-makers, not statisticians; Moreover, setting a target may not make sense for some indicators, e.g. 15.1.1 - Forest area as a % of land area)

- FAO: does **NOT** set a "statistical" target, just estimates the empirical distribution and assigns to each country the corresponding position in the distribution (quintile)

Major difficulties (cont.d):

Geographical Aggregation:

- OECD, SDSN: weighted average using country's population as weight (regional/global assessment influenced by most populous countries)
- FAO: simple average/median (each country has an equal weight = 1) accompanied by measures of variability (range, interquartile range, etc.)

Aggregation by Target/Goal:

- OECD, SDSN: simple average

- FAO: **NOT** done (averaging does not solve problems of heterogeneity and redundancies between indicators under the same target/Goal)

Assessing the "Future" Status (1/4)

- Eurostat (2019), SDSN (2019) and FAO compare **Actual growth vs Required growth** to reach the target in 2030:

$$R = \frac{actual\ growth}{required\ growth}$$

- SDSN assumes a <u>linear growth</u> model
- Eurostat and FAO (and the 2020 UN Progress Chart) adopt a <u>geometric growth</u> model
- Assessment based on a system of thresholds for the different values of R

Ratio of actual and required growth rate	SDSN Assessment category
$R \geq 1$	On track or maintaining SDG achievement
$0.50 < R \leq 1$	Moderately improving
$0 \leq R \leq 0.5$	Stagnating
$R < 0$	Decreasing

Ratio of actual and required growth rate	FAO's Assessment category
$R \geq 0.95$	On-track to achieve the target
$0.10 < R < 0.95$	On path but too slow to achieve the target
$-0.10 \leq R \leq 0.10$	No improvement (stagnation) since baseline year
$R < -0.10$	Deterioration/Movement away from the target

OECD (2019) carries out a statistical test to detect the presence of monotonic upward or downward trend over time

The test is based on the Spearman's rank correlation coefficient (r_i) (i.e. ranks instead of values, offer protection against outliers, nonparametric)

When the desired direction is "increase over time", the following rule is adopted:

Values of Spearman's rank correlation coefficient	Assessment category
$r_i < -0.20$ AND significant at 10% level	Country i moving away from the target
$-0.20 \leq r_i \leq +0.20$ OR NOT significant at 10% level	no trend identified for Country I
$r_i > +0.20$ AND significant at 10% level	Country i progressing toward the target

the 1st and 3rd categories should be inverted when the "normative" direction is "decrease over time".

Unfortunately the test may be unreliable in presence of serial correlation.

UN ESCAP (2017) also adopts a geometric growth model

The estimation of the <u>compound annual growth rate</u> is achieved by using a weighted geometric mean, with weights decreasing over time (higher weighs for more recent values)

The estimated annual growth rate is used to get a prediction of the indicator value in the year 2030. Then the forecasted 2030 value is compared to the target (*anticipated progress index*)

UN ESCAP approach uses all the data in the time series, giving more importance to most recent values, but is not applicable in the presence of missing values or too short time series

Forecasting approach:

- Fit a model => get 2030 forecasts => compare forecasts with the target
  - Linear trend models, ARIMA, …
  - Exponential Smoothing model ….

Problems:

- Requires relatively <u>long time series</u> (>=10 years, better longer time series)
- It is unlikely that the same model fits adequately to each country data or each indicator. For consistency purposes, international organizations are forced to use the simplest methods which can be applied to all countries and indicators

Models should behave better when fitted to regional/global aggregated time series (better in terms of signal-to-noise ratio)

<u>Data needed</u> by FAO, SDSN & Eurostat approaches (and 2020 UN SDG progress Chart):

a) Values of SDG indicator in the "current" year *t* (last available data point): x_{it}

b) value of indicator in the "**baseline**" year (t_0): x_{it_0}

c) **target** value of the generic SDG indicator: x^* (FAO and Eurostat only for indicators with an explicit numerical target)

<u>Data needed</u> by OECD and UN ESCAP (and forecasting-based approaches):

a) **<u>All</u>** data points in the time series, from the "baseline" (t_0) the "current" (*t*) year

b) **target** value (x^*) of the generic SDG indicator (only for UN ESCAP)

Difficulties in assessing trends (2/3)

SDG indicators without a numerical target. Different solutions:

- SDSN and UN ESCAP set a "statistical" target

- FAO and Eurostat: do **NOT** set a "statistical" target, just estimate the actual growth (numerator of R) and judge it according to the normative direction of the given SDG indicator

Example SDG 2.a.1 FAO

Criteria to judge the actual growth (CAGR)

Values of actual growth rate	Color	Assessment category
$CAGR_a > 0.01$	Dark green	Improvement since baseline-year (>>)
$0.005 < CAGR_a \leq 0.01$	Light green	Slight improvement since baseline-year (>)
$-0.005 \leq CAGR_a \leq 0.005$	yellow	No improvement since baseline-year (=)
$-0.01 \leq CAGR_a < -0.005$	Orange	Slight deterioration since baseline-year (<)
$CAGR_a < -0.01$	Red	Deterioration since baseline-year (<<)

- **OECD's approach does NOT require having a target!**

Geographical Aggregation:

- SDSN: weighted average using country's population as weight
- FAO: works directly on regional time series (as being more accurate) to estimate R or CAGR and provide measure of heterogeneity within the region
- OECD: summarizes progress at regional/global level by counting how many countries in the region show the same assessment (e.g. "moving away from the target").

Aggregation by Target/Goal:

- SDSN and Eurostat: simple average
- FAO: **NOT** done (averaging does not solve problems of heterogeneity and redundancies between indicators under the same target/Goal)
- OECD: summarizes progress at target/goal level by counting how many indicators show the same assessment (similar to the geographical aggregation)

General Problems: missing values, type of variables, ...

- Time series too short (mainly 4-5 data points): only basic methods based on estimation of actual/required growth are applicable (no models for forecasting, no test for trend detection, etc.)

- Data gaps:
  - If missing values are in the middle of the time series then the calculation of actual/required growth rates is NOT affected
  - If missing values are at the beginning or at the end of the time series then the assessment may not be comparable or may not be feasible
  - Not possible to calculate the regional aggregates

- Type of data: e.g. SDGs expressed as scores require ad hoc procedures (categorize possible combinations of scores and monitor change over time of the categories).

Proposed Recommendations

- Monitor both the current distance and the progress made towards the SDG targets is essential to understand if the country is on track to achieve the 2030 Agenda.

- Different assessment approaches are adopted leading to contradictory results and confusion among users: harmonization of assessment approaches is needed to compare results

- **Current distance to the target**: FAO recommends to compute the normalized distance to the target (wrt to the maximum distance)

- **Probability to achieve the target**: FAO recommends to compare Actual growth vs Required growth to reach the target in 2030 (geometric growth model)

- FAO uses a very simple growth model because of the data limitations and the need to adopt an harmonized approach across indicators: countries have the possibility to use more complex methods

- FAO does NOT recommend to aggregate indicators by target or goal by computing composite indexes

- FAO is ready to provide technical support to member countries to assess progress towards the SDG targets and to interpret the results.

Thank you
for your attention

pietro.gennari@fao.org