Toward a Children-Youth Development Index (CYDI):

A tool for assessing the effectiveness of Demographic Dividend Policies in the West and Central Africa Region

1. Background

The strong pledge of African leaders to harness the Demographic Dividend (DD) has triggered the necessity of constructing a children-youth index that highlights the countries' progress towards achieving this commitment. This index will seek through time to follow and monitor how well development policies incorporate the way children and young people gain access to education, health, nutrition, employment and other opportunities.

Similar indices have already been set up by various countries: rich, emergent and poor ones (e.g. Commonwealth Youth Development Index). These indices incorporate more or less some common variables. And among those variables, we could highlight: access to education, health and well-being, and, employment and opportunities. Other more questionable variables are political and civil participation that capture the interest of international institutions for their youth-oriented development policies.

In this project, we affirm that much more needs to be done to make a youth development index operational, in terms of its ability to properly reflect reality and to help visualize and effectively monitor youth policies in Africa. More specifically, we are trying to build a more realistic tool that could help measure and monitor youth development in West and Central Africa (WCAR) in a sufficiently plausible and consistent manner. Thus, the index we propose encompasses areas and variables that better reflect the concerns of young people in Africa. Indeed, an indicator of children and youth development that is comprehensive, comparable, African in scope and timely is much needed for monitoring the progress towards reaping the DD benefices.

2. Methodology

2.1. General approach

Our index takes largely advantage from the recommendations of the "Commonwealth Youth Development Index National and Regional Toolkit". It utilizes the Analytic Hierarchy Process (AHP) and the banding method in a new way that allows to produce steady, realistic and better-looking children and youth development indices for countries that was qualified by the data availability in the Western and Central African region (WCAR). We pretend that our index is highly efficient to monitor the youth development issue, in static and dynamic as well.

To common domains as education, health and well-being, employment and opportunities, the study adds family, reproductive health, and nutrition as sufficiently independent domains. We do not include political participation as a major dimension in assessing the well-being of young people. In the region of our focus, other parameters seem also relevant.

We rather include family as a very relevant domain that **weighs in** the children development evaluation. By family, we mean the fact for the young of living or not with their parents.

The second specificity of our index is to consider that young age between 0 and 24. In general, their no consensus on ages that should be included in the Youth interval. To give an example, the Commonwealth index defines as youth those whose ages are between 15 and 29. The youth age interval is very Depending of the kind of studies that are conducted. In our study, we specify the youth age to be between 0 to 24. The development issue from 15 to 24 is largely dependent on how young people has spent their lives between 0 to 14. This lead to disaggregates the youth index into three indices: the children, the adolescent, and the youth development indices.

2.2. The children-youth development index and sub-indices formula

Our approach is first to determine the sub-indices on the basis of the weights assigned to the different variables. The weights are determined using the Analytic Hierarchy Process technique. For the sub-indices the following formula is adopted:

$$I_i = \sum_{j=1}^{n} P_{ij} X_{ij} \quad \text{where} \quad \sum_{i=1}^{n} P_{ij} = 1 \text{ and } i = \ children,\ adolescent,\ adult$$

The Children-Youth Development Index will be constructed using the three sub-indices corresponding to the three age groups. The composite index is then constructed as follows:

$$I = \sum_{i=1}^{3} \omega_i I_i \text{ where } \sum_{i=1}^{3} \omega_i = 1$$

2.3. Data normalization

The normalization of the variables entering in the construction of the 4 indices proceeds as follows:

Whenever the variable entering the index has a positive connotation (gross rate enrollment, completion rate ...), we use direct linear extrapolation, known in the literature as the banding technique to normalize it, i.e., assign it a value from 0 to 1.

The following formula is adopted for a direct extrapolation:

$x(cv) = \dfrac{cv - m}{M - m}$ where $x(m) = 0$ et x(M)=1 and cv is the current value of the variable that has to be normalized. m and M, the two extreme values for each variable, are respectively the lowest and the highest value. $x(cv)$ is the linearly normalized value, comprised between 0 and 1.

It should be noted that m and M are determined in the following ways:

Whenever it is possible to have the data of a variable beyond the countries of our field of analysis, we look for the extrema values in the data of the broader set of countries.

If the data of a variable is not available beyond our given set of countries, then we construct our extrema--using the available dataset for each variable—in the following manner:

$$m = mimimum\ value\ for\ the\ \text{var}iable - \frac{corresponding\ s\tan dard\ deviation}{4}$$

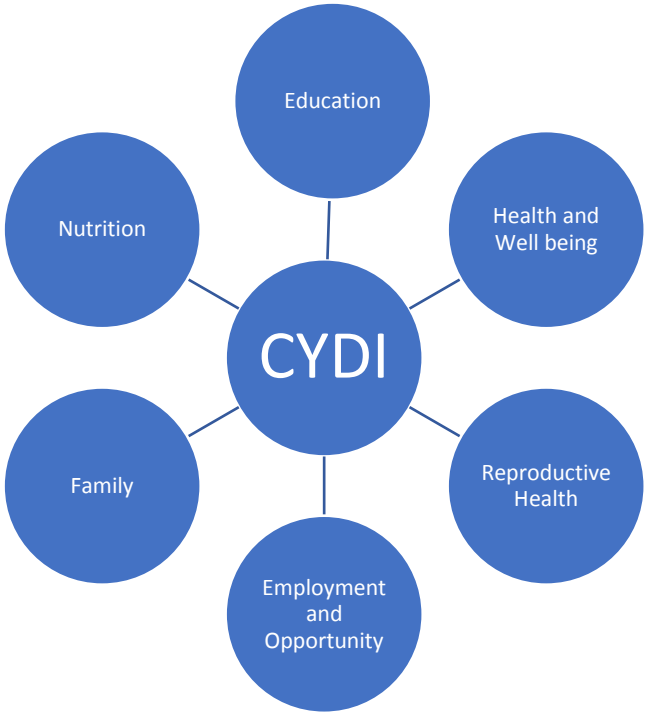
$$M = mimimum\ value\ for\ the\ \text{var}iable + \frac{corresponding\ s\tan dard\ deviation}{4}$$

Preliminary computation reveals that not choosing right extrema implies high volatility of the youth indices in dynamic.

If the variable entering the index has a negative connotation as it is for the HIV, and the stunted children rate, preliminary normalization shows that a linear extrapolation on the basis of this formula – $x(cv) = \frac{cv - M}{m - M}$ where $x(m) = 1$ and x(M)=0 – will amplify their contribution in the generated index. Hence, applying linear extrapolation to negatively connected variables leads to high youth development index. We found that it is possible to scale down all the indices of all countries in such a way they are more realistic, without altering the order or the dynamic evolution of the youth development index over the time.

2.4. Domains, Variables and Weights

In practice, building the Youth Development Index requires a careful review of the areas to be included in the construction of the index. Each area entering in the YDI construction is selected based on its importance and ability to impact youth development. There is a wide range of multidimensional factors that can influence a person's life from birth to adulthood. For the WCAR countries, selection has at most been made on 6 areas that could relevantly contribute to the youth development: Education, health, reproductive health, nutrition, family, and work and opportunities, as in the following figure:



3. Results

First, there is the classification of countries according to the three age groups. At this stage, it is also possible to examine countries' ranking by field (health, education, etc.).

In fact, a country's performance in each area will help to better identify the factors that influence the children and youth development index.

In a second stage, the general ranking of countries is given on the basis of the Children-Youth Development Index (CYDI).