

## Challenges in Statistical Capacity Building in the Arab Countries

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### Abstract

Statistical capacity is the ability of countries to meet user needs for good quality official statistics which are produced by governments as a public good. Being an inseparable part of the broad development initiatives and also an indispensable tool for sound evidence based policy making; producing quality (i.e. accurate, reliable, comparable, timely and relevant) statistics can be accomplished through the adoption and implementation of internationally accepted standards. This, in fact, requires a significant capacity building among relevant stakeholders of the National Statistical System. Due to the changing nature of social practice and advancement of official statistics, statistical capacity building is a never-ending process and cycle. Taking 16 OIC Arab countries with available data into account, this paper focuses on the challenges faced by them from an indicator perspective in three levels for statistical capacity. From this end, countries in scope have been analysed concerning their performances in: (i) statistical methodology, (ii) source data, and (iii) periodicity and timeliness. Furthermore, the status of National Strategies for the Development of Statistics as a part of country development and poverty reduction policy in these countries has also been summarized. Last but not least, this paper gives a set of recommendations including effective technical assistance which are proposed for enhancing the statistical capacity development in the Arab region.

Keywords: Statistical capacity building, SCI, NSDS, Arab region

### 1. Introduction

Official statistics produced by National Statistical Offices (NSO) and international agencies are expected to provide information on all main parts of our daily life. In doing so, the NSOs face an increasing level of competition from various sources including commercial data vendors and unofficial statistics providers. To maintain their position in the market, the NSOs should continuously develop their capacities while adhering to the statistical quality standards of timeliness, accuracy, reliability, and relevance. For the National Statistical Offices (NSO) to remain relevant and reliable in this very dynamic environment, they need to enhance their capacity in all dimensions on a continuous basis. Leading considerable studies in the field of statistical capacity, the World Bank has developed a single indicator, known as Statistical Capacity Indicator (SCI), to measure the statistical capacities of developing countries. According to the World Bank, statistical capacity is defined as the ability of countries to meet user needs for good quality official statistics which are produced by governments as a public good (World Bank, 2013). Maintained by the World Bank, the SCI for 2012 provides an overview and measurement of the national statistical capacities of 146 developing countries of which 16 of them are OIC Countries in the Arab Region. In this respect, the data source we used does not provide information on the statistical capacities of the Gulf Cooperation Council (GCC) countries since they are classified as developed (high-income) countries. The SCI framework is comprised of three dimensions: Statistical Methodology; Source Data; and Periodicity and Timeliness. With a scale ranging from 0 to 100, these dimensions are then averaged to provide the overall SCI score (World Bank, 2012). Based on the 2009 and 2012 SCI scores of Algeria, Comoros, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Palestine, Somalia, Sudan, Syria, Tunisia, and Yemen, we analyse in this paper the dimension indicators and the possibility to construct country clusters based on the performances in the respective SCI dimensions. Furthermore, the status of National Strategies for the Development of Statistics in these countries has also been summarized. Based on the analyses carried out, this paper derives conclusions and policy implications for the 16 Arab countries to improve their statistical capacities.

## 2. Overall Statistical Capacity

The overall SCI score is the simple arithmetic average of the scores obtained from three SCI dimensions including statistical methodology, source data, and periodicity and timeliness. The score scale is between 0 and 100. A score of 100 indicates that a country meets all the criteria and has a perfect performance among the three SCI dimensions. The total number of developing countries for which an overall statistical capacity score exists is 146 of which 50 of them are OIC (16 OIC Countries are found in the Arab region). From 2009 to 2012, the average overall SCI scores increased by 2.6 (from 53.8 to 56.4), 0.9 (from 61.5 to 62.4), 1.6 (from 66.1 to 67.7), and 1.4 points (from 64.5 to 65.9) for the OIC Arab, OIC, Non-OIC, and All Countries group, respectively. The range of scores for all country groups shrank partly due to upwards trend in the minimum scores. In this respect, we measured the decrease in range of scores as 5 (from 65 to 60), 1.1 (from 68.9 to 67.8), 3.9 (from 66.1 to 62.2), and 4.4 points (from 72.2 to 67.8) for the OIC Arab, OIC, Non-OIC, and All Countries group, respectively. Besides the shrinking range of scores, we also observed that the median absolute deviation (the most typical deviation from the most typical score) narrowed by 1.1 (from 12.2 to 11.1), 3.3 (from 12.8 to 9.4), 1.1 (from 14.4 to 13.3), and 2.2 points (from 14.4 to 12.2) for the OIC, Non-OIC, and All Countries group, respectively. All these findings concerning the dispersion of overall SCI score data indicate that the variation in the scores of all country groups decreased from 2009 to 2012. In addition, the average overall SCI scores marked an increase for all country groups by 0.9 (from 61.5 to 62.4), 1.6 (66.1 to 67.7), and 1.4 points (from 64.5 to 65.9) for the OIC, Non-OIC, and All Countries group, respectively. Table 1 shows that when compared with the other groups, 50% of the OIC Arab Countries recorded a score increase (same percentage value as OIC Countries group), 6.3% of them had no score change (higher than the OIC Countries group) and 43.7% of them recorded a score decrease (lower than the OIC Countries group) in the same period.

Table 1 Percentage of Countries by Direction of Overall SCI Scores from 2009 to 2012

	<i>OIC Arab Countries</i>	<i>OIC Countries</i>	<i>Non-OIC Countries</i>	<i>All Countries</i>
<i>Score Decrease</i>	43.7%	48.0%	42.7%	44.5%
<i>No Change</i>	6.3%	2.0%	6.3%	4.8%
<i>Score Increase</i>	50.0%	50.0%	51.0%	50.7%

*Source:* Author's calculations; World Bank, BBSC

In 2012, the 5 OIC Arab Countries with the highest overall SCI scores were Egypt (87), Jordan (76), Palestine (73), Tunisia (71), and Morocco (70). As to the performance of the OIC Countries in the Arab region, Palestine recorded the highest overall SCI score increase with 34 points up, followed by Lebanon (18 points up), Iraq (9 points up), Djibouti (6 points up), Somalia (4 points up), Jordan, and Sudan (3 points up), and Libya (1 point up). There was no change in the overall SCI score of Algeria. The highest score decrease was recorded by Morocco with 11 points down, followed by Comoros (9 points down), Yemen (7 points down), Tunisia (4 points down), Mauritania, and Syria (2 points down), and Egypt (1 point down). In the following sections, we will look into the details of the three SCI dimension and construct country clusters based on the dimension scores given.

## 3. Statistical Methodology

Being the first dimension of the SCI, *statistical methodology* quantifies the extent that a country follows and implements internationally recommended statistical standards and methods. The frameworks and specifications used in compilation of macroeconomic statistics, social data reporting, and estimation practices are at the centre of the evaluation of each country's statistical practice. To score this dimension, ten criteria including national accounts, balance of payments, CPI, production index, external debt, import/export prices, government finance, reporting to UNESCO, vaccine reporting, and SDDS are equally weighted. Countries fulfilling all ten conditions can get a maximum total score of 100. However, it should be noted that only some statistical methodology indicators including *Balance of payments manual in use*, *External debt reporting status*, *Government finance accounting concept*, *Vaccine reporting to WHO*, and *IMF's SDDS* are directly related to statistical capacity aspects (Ngaruko, 2008). From 2009 to

2012, the range of statistical methodology scores for the OIC Arab Countries recorded a decrease of 20 points due to the decline in the maximum score from 100 in 2009 to 80 in 2012. While the decrease in the OIC Countries group was 10, no change was observed for the Non-OIC Countries and All Countries groups. Despite this decline, the average statistical methodology score of OIC Arab Countries group recorded a 6.3-point-increase from 41.9 in 2009 to 48.1 in 2012. The averages of OIC Countries, Non-OIC Countries and All Countries group also increased by 3 (from 46.4 to 49.4), 2.7 (from 56.4 to 59.1) and 2.8 points (from 52.9 to 55.8), respectively, in the same period. As to the performance of the OIC Arab Countries regarding statistical methodology dimension, Palestine had the highest increase with 70 points, Algeria, Djibouti, Iraq, Jordan, Lebanon, and Syria had score increases of 10 points, no score change was observed for Comoros, Egypt, Libya, Mauritania, Somalia, Sudan, and Yemen. The only two countries in the region with score decreases were Tunisia (10 points down) and Morocco (20 points down). The 5 OIC Countries with the highest statistical methodology scores in 2012 were Jordan, Morocco, and Palestine (80 points, each), and Egypt, and Tunisia (70 points, each).

In this section and in the upcoming sections of source data and periodicity & timeliness, we applied hierarchical agglomerative clustering (HAC) on the dimensional raw score data in 2012 to see if OIC Arab Countries with similar characteristics could be clustered in various groups. To carry out the analysis, we used freeware data mining software TANAGRA with version 1.4.48 (Rakotomalala, 2005). The HAC method results showed that the optimal number of clusters is 6 based on the highest gap obtained. Although partitioning into two clusters showed the highest gap value, it has been ignored. In order to assign the countries to respective HAC clusters, a group characterisation was applied on the HAC clusters. The clusters and cluster members for  $k=6$  are as follows: *Cluster #1* (Comoros, Mauritania, Somalia); *Cluster #2* (Jordan); *Cluster #3* (Egypt, Morocco, Palestine, Tunisia); *Cluster #4* (Iraq, Libya); *Cluster #5* (Djibouti, Sudan, Yemen); and *Cluster #6* (Algeria, Lebanon, Syria). When we focus on the five statistical methodology criteria directly related to statistical capacity aspects as stated by (Ngaruko, 2008), we observe that, except Somalia (SOM), all Cluster #1 countries performed good at *external debt* criterion but none of them got a score in *SDDS*. Except Cluster #1 countries, all other clusters performed good in *balance of payments* criterion. Cluster #2 countries achieved full scores in *balance of payments*, and *external debt* criteria. The criterion in which all Cluster #2 countries performed poorly was *government finance*. For Cluster #3 countries, the performance in *balance of payments*, *vaccine reporting* and *SDDS* was strong. Cluster #3 was also the only cluster whose members got a full score in *vaccine reporting* and *SDDS* criteria. *Balance of payments* was the only criterion in which all Cluster #4 countries got a full score. On the other hand; *government finance*, and *SDDS* were the criteria without a full score for all Cluster #4 countries. While *balance of payments* was the only criterion in which all Cluster #5 countries got a full score; *SDDS* was the criterion in which Cluster #5 countries could not get a score. Cluster #6 countries obtained full scores in *balance of payments*, and *external debt* criteria. Yet, none of the Cluster #6 countries achieved any scores in the *SDDS* criterion.

#### 4. Source Data

The source data is the second dimension of the SCI and reflects whether a country takes into consideration the internationally recommended periodicity in its data collection activities, and whether data from administrative systems are available and reliable for statistical estimation purposes. The periodicity of population and agricultural censuses, the periodicity of poverty and health related surveys, and completeness of vital registration system coverage are equally weighted in source data dimension to score the countries. Of those, only *completeness of vital registration system coverage* relates to the statistical capacity aspects of countries. The remaining four criteria focus on a country's statistical activities and outputs (Ngaruko, 2008). Countries satisfying all five conditions can get a maximum total score of 100. From 2009 to 2012, the range of source data scores for the OIC Arab Countries recorded a decrease of 10 points due to the increase in the minimum score from 10 in 2009 to 20 in 2012. While the decrease in the OIC Countries group was 10, no change was observed for the Non-OIC Countries and All Countries groups. As to the average source data scores, the OIC Arab

Countries group recorded a 0.6-point-decrease from 49.4 in 2009 to 48.8 in 2012. The averages of OIC Countries, Non-OIC Countries and All Countries group also decreased by 1.4 (from 59.8 to 58.4), 1.5 (from 65.8 to 64.3) and 1.4 points (from 63.8 to 62.4), respectively, in the same period. As to the performance of the OIC Arab Countries regarding source data dimension, Lebanon and Palestine had the highest increase with 30 points each, Djibouti and Iraq had score increases of 10 points, no score change was observed for Egypt, Jordan, Libya, Somalia, and Sudan. While Algeria, Comoros, Morocco, Tunisia, and Yemen recorded score decreases of 10 points, a decrease of 20 points was observed for Mauritania and Syria. The 6 OIC Countries with the highest source data scores in 2012 were Egypt (100), Palestine (80), Lebanon and Jordan (70, each), Iraq and Tunisia (60, each). The HAC method results showed that the optimal number of clusters is 4 based on the highest gap obtained. The clusters and cluster members for  $k=4$  are as follows: *Cluster #1* (Iraq, Lebanon, Mauritania, Somalia); *Cluster #2* (Algeria, Comoros, Djibouti, Libya, Sudan, Syria, Yemen); *Cluster #3* (Egypt); and *Cluster #4* (Jordan, Morocco, Palestine, Tunisia). When we focus on the only source data criterion directly related to statistical capacity aspect as stated by (Ngaruko, 2008), we observe that together with Cluster #4, Cluster #2 was one of the two clusters whose members did not get a score in the *completeness of vital registration system* criterion. Cluster #3 (Egypt) achieved full scores in the criterion of *completeness of vital registration system*. Cluster #3 was also the only cluster whose members successfully obtained full scores in the *completeness of vital registration system* criterion.

## 5. Periodicity and Timeliness

The third and last dimension of the SCI, periodicity and timeliness, focuses on the availability and periodicity of ten components; most of which are Millennium Development Goals (MDG) indicators. The periodicity and timeliness dimension tries to measure the extent to which data are made accessible to users through transformation of source data into timely statistical outputs. Periodicities of the indicators including income poverty, child malnutrition, child mortality, immunization, HIV/AIDS, maternal health, gender equality in education, primary completion, access to water, and GDP growth are the ten criteria used for calculating the periodicity and timeliness score of countries. Of those ten criteria, all of them relate to the statistical activities and outputs of countries, not their statistical capacity aspects (Ngaruko, 2008). Countries satisfying all of the ten conditions can get a maximum total score of 100. From 2009 to 2012, the range of periodicity and timeliness scores for the OIC Arab Countries recorded a decrease of 3.3 points due to the increase in the minimum score from 36.7 in 2009 to 40 in 2012. The decrease in the OIC, Non-OIC, and All Countries groups were 6.7, 28.3, and 18.3, respectively. As to the average periodicity and timeliness scores, the OIC Arab Countries group recorded a 2.3-point-increase from 70 in 2009 to 72.3 in 2012. The averages of OIC Countries, Non-OIC Countries and All Countries group also decreased by 1.2 (from 78.3 to 79.5), 3.6 (from 76.1 to 79.6) and 2.8 points (from 76.8 to 79.6), respectively, in the same period. As to the performance of the OIC Arab Countries regarding periodicity and timeliness dimension, Lebanon had the highest increase with 14 points, followed by Djibouti (13 points up), Somalia (12 points up), Sudan (10 points up), Iraq (7 points up), Syria (5 points up), Libya, and Palestine (3 points up, each). No score change was observed for Algeria and Jordan. The score decreases were observed for Djibouti (1 point down), Egypt, and Morocco (3 points down, each), Yemen (12 points down), and Comoros (17 points down). The 5 OIC Countries with the highest periodicity and timeliness scores in 2012 were Mauritania (93), Egypt (90), Tunisia (83), Morocco, and Algeria (80 points, each). The HAC method outputs showed that the optimal number of clusters is 4 based on the highest gap obtained. The clusters and cluster members for  $k=4$  are as follows: *Cluster #1* (Egypt, Jordan, Lebanon, Mauritania, Morocco, Tunisia); *Cluster #2* (Palestine); *Cluster #3* (Libya); and *Cluster #4* (Algeria, Comoros, Djibouti, Iraq, Somalia, Sudan, Syria, Yemen). It is noteworthy that none of the periodicity and timeliness indicators refer directly to statistical capacity aspects as stated by (Ngaruko, 2008). Thus, the cluster analysis we present for the periodicity and timeliness dimension considers the statistical activity and output aspects. Cluster #1 countries all achieved a full score in the indicators of *periodicity of mortality (under 5)*, *periodicity of measles immunization (under 1)*, *improved water source*, and as the only

cluster whose members all achieved full scores in *periodicity of GDP per capita growth*. Cluster #2 and #3 had only one member each, being Palestine and Libya, respectively. Palestine obtained full scores in *periodicity of mortality (under 5)*, *periodicity of attended births*, *Periodicity of gender equality in education*, and *improved water source* indicators. For the *periodicity of measles immunization (under 1)* indicator, Palestine did not get a score in 2012. As to Libya, full scores were achieved only in two indicators: *periodicity of mortality (under 5)* and *periodicity of measles immunization (under 1)*. In 2012, Libya could not get a score for *periodicity of income poverty*, *primary completion* and *improved water source* indicators. All Cluster #4 countries managed to get full scores in *periodicity of mortality (under 5)*, *periodicity of measles immunization (under 1)* and *improved water source* indicators. Cluster #4 countries also got full scores in the *periodicity of GDP growth* indicator in 2012.

## 6. Current State of National Strategies for the Development of Statistics in the OIC Arab Countries

As indicated by PARIS21 Secretariat, a National Strategy for the Development of Statistics (NSDS) enables developing countries to build a reliable statistical system that produces the data necessary to design, implement, and monitor national development policies and programmes. An NSDS also help countries meet their regional and international commitments with respect to statistics (PARIS21, 2013a). Reported by the PARIS21 Secretariat, the current state of NSDS in the OIC Arab Countries (15 countries, excluding Lebanon and GCC countries) can be summarised as follows (PARIS21, 2013b): (i) Countries currently implementing an NSDS: *Comoros, Djibouti, Mauritania, Jordan* (4 countries); (ii) Countries currently designing an NSDS or awaiting adoption: *Algeria, Iraq, Palestine* (3 countries); (iii) Countries with an expired NSDS or without an NSDS and currently planning one: *Morocco, Sudan, Syria, Yemen* (4 countries); and (iv) Countries without an NSDS or with an expired NSDS and not planning one: *Egypt, Libya, Somalia, Tunisia* (4 countries)

## 7. Conclusions and Recommendations

This paper used the statistical capacity indicator (SCI) developed by the World Bank which defined statistical capacity as the ability of countries to meet user needs for good quality *official statistics* which are produced by governments as a public good. The SCI is comprised of statistical methodology, source data, and periodicity and timeliness. On the one hand, the developers of the SCI claim the SCI provide an overview of the national statistical capacities, on the other hand, there are researchers like (Ngaruko, 2008) arguing that the SCI does not fully reflect the statistical capacities of countries (only 6 indicators under the SCI), instead the statistical activities and outputs mostly (19 indicators under the SCI). In this paper, we focused on the SCI performances of 16 OIC Arab Countries. The data source used (World Bank BBSC) does not provide information on the statistical capacities of the developed countries, thus the statistical capacities of GCC countries are not covered in here. When the performance in the overall SCI score in 2012 is considered, the group of 16 OIC Arab Countries was behind the average scores of the OIC, Non-OIC and All Countries groups. When we look in detail at the three SCI dimensions, the OIC Arab Countries on average performed weaker than the OIC, Non-OIC and All Countries groups. Regarding the performances of the individual OIC Arab Countries in 2012, Egypt took the lead in overall SCI, and source data scores. While the lead in statistical methodology was Jordan, the lead was Mauritania in periodicity and timeliness score in 2012. As to the adoption of NSDS, out of 15 OIC Arab Countries with available data; 4 countries currently implement an NSDS, 3 countries currently design an NSDS or await adoption, 4 countries have an expired NSDS or are without an NSDS and currently plan one, and 4 countries are without an NSDS or with an expired NSDS and do not plan one.

Given this state of affairs, the following recommendations are proposed for enhancing the statistical capacity development at the OIC Arab Countries level:

1. At the SCI dimension level, the following indicators require sound actions to enhance the statistical capacity of 16 OIC Countries in the Arab region: (i) Statistical Methodology (SDDS, and Government finance); and (ii) Source Data (Completeness of vital registration system).

2. The criteria listed in the following dimension clusters present a good cooperation opportunity between the 16 OIC Arab Countries with expertise in the respective criterion and those with need to strengthen their statistical capacity: (i) Statistical Methodology (Cluster #1: *Balance of payments*, and *SDDS*; Cluster #2: *Government finance*; Cluster #4: *Government finance*, and *SDDS*; Cluster #5 and #6: *SDDS*); and Source Data (Cluster #2 and #4: *Completeness of vital registration system*).
3. The NSOs of OIC Arab Countries should actively participate in the OIC Statistical Commission (OIC-StatCom) sessions and working groups regarding statistical capacity development issues. Apart from that, these NSOs with relevant expertise should keenly seek ways to become a member in the expert groups of UN Statistical Commission and other international statistical organisations to better voice and reflect their demands and needs.
4. As statistical capacity development cannot be thought separate from the human capital formation, the NSOs of OIC Arab Countries should work closely with the relevant OIC institutions and OIC-StatCom to strengthen their human resources by duly assessing their current situation and maintaining open channels with the aforementioned institutions to communicate their capacities and needs for enhancing their human capital. In this respect, the human capital formation efforts of OIC Arab Countries and OIC institutions should not only be restricted to the NSOs but also involve the citizens by encouraging the design of statistical outreach and awareness initiatives.
5. Based on the diminishing budgets of international organisations allocated for physical statistical capacity building programs, online delivery of these programs have emerged as a powerful way. Considering the fact that virtual statistical systems are more static and mature as a delivery platform, the Massive Open Online Courses (MOOC) can be used to experiment the content and delivery of the official statistical curricula in association with the efforts mentioned above. In this aspect, development of a MOOC module can be initiated by the Islamic Development Bank in close collaboration with the OIC-StatCom and with support from experts in the NSOs of OIC Arab Countries to act as a bridge between the experiences gained from the MOOC module and the to-be-established virtual statistical system at the OIC level. On top of the MOOC initiative, the traditional education techniques should also be diversified. In this perspective, interested OIC Arab Countries can pay study visits to other OIC Countries, such as the STIS of BPS–Statistics Indonesia.
6. To foster the statistical capacity, various universities in different OIC Arab Countries with a sufficient level of infrastructure should be supported in financial, technological and human resources to initiate post-graduate degree programmes in official statistics comprehending a mutually agreed common curricula with additional course topics specific to the needs of the country of establishment.
7. To properly assess the statistical capacities of the OIC Arab Countries, an OIC-StatCom Expert Group can study the feasibility to construct a more comprehensive SCI.

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