Enhancing Statistical Capacities of OIC Member Countries to Achieve Sustainable Development Goals: The Role of SESRIC

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Abstract
The strengthening of the National Statistical Systems (NSS), specifically of the National Statistical Offices (NSOs), by improving their capacities is required to monitor and report the achievements for the 169 targets under the 17 Sustainable Development Goals (SDGs). In this paper, the authors analyse the performance of Organisation of Islamic Cooperation (OIC) countries with available data against the Statistical Capacity Indicator (SCI) scores between 2009 and 2015 to exhibit SCI dimension criteria with room for development and assign the countries under clusters based on hierarchical agglomerative clustering (HAC) algorithm. The authors also highlight the role of the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), an OIC subsidiary organ, in contributing to the efforts of its member countries by carrying out initiatives and thematic projects in the area of statistics in close collaboration with the regional and international agencies to bring about synergies for overcoming the "data gap" problem and achieving good quality official statistics. The authors finally show that the SESRIC can act as a valuable partner of the Committee for the Coordination of Statistical Activities (CCSA) in the whole OIC region by facilitating the monitoring and reporting mechanisms of SDGs.

Keywords: SDGs, National Statistical Systems, SCI, Statistical Capacity Building, International Organizations

1. Introduction

The term "statistics" belongs to a class of case in which its terminological meaning shifts in course of time because the referent human activity denoted by a term undergoes a significant transformation (Nalimov, 1981). We also encounter that statistics has its roots in the idea of "the state of things". The word itself comes from the ancient Latin term statisticum collegium, meaning "a lecture on the state of affairs". Eventually, this evolved into the Italian word

statista, meaning "statesman", and the German word Statistik, meaning "collection of data involving the State" (Diaz, 2007).

What was earlier described as "a branch of political knowledge" (Zimmermann, 1787) has become to be the main ingredient of evidence-based decision making. Many contemporary authors describe statistics as "the practice of collecting and analysing quantitative data that described certain material conditions of a state" (Nalimov, 1981). According to him, the varying definitions given to the term "statistics" reflect the two histories: the social practice and the advances in the mathematical formalism.

However, both the social practice of statistics, which has been demarcated significantly to the extent of the role played by the civil society (Gökçek and Hanioğlu, 1993), and the advances in the mathematical formalism of statistics require a certain level of capacity. During the implementation of the Millennium Development Goals, the Marrakech Action Plan for Statistics (2004), Dakar Declaration on the Development of Statistics (2009), and Busan Action Plan for Statistics (2011) all underlined the need to make sustainable improvements in national statistical capacity and international statistics. The interdependent nature of these actions are expected to make improvements in national statistical systems that will then lead to improved international statistics, in return for a more effective international system supporting the improvement of national statistics (World Bank, 2004).

What is valid for statistics as a term with semantic shifts throughout time is also valid for statistical capacity as a term due to different meanings assigned to it by different stakeholders in line with their purposes (Kiregyera, 2015). Due to its wider adoption, we use in this paper World Bank's (2015a) definition which considers statistical capacity as a nation's ability to collect, analyze, and disseminate high-quality data about its population and economy.

While there are various methodologies available in the literature to measure statistical capacity, the Statistical Capacity Indicator (SCI) developed by the World Bank is widely used to assess the statistical capacity across the countries. The SCI provides an overview of the national statistical capacities of 145 countries.

Established in 1969, the Organisation of Islamic Cooperation (OIC) is the second largest inter-governmental organisation after the United Nations, with 57 member states spread over four continents. The paper elucidates the progress of the OIC member countries in their statistical capacity building efforts as a group vis-à-vis the SCI scores between 2009 and 2015 in comparison with those of the non-OIC developing countries, high income countries, and all countries groups with available data. The paper also highlights the initiatives of the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), an OIC subsidiary organ, concerning its many contributions in the improvement of statistical capacities of OIC member countries. The paper is concluded with the possible roles that can be shouldered by SESRIC in facilitating the monitoring and reporting mechanisms of SDGs at the regional level.

2. Materials and Methods

2.1. Dataset

The dataset used for the analysis in this paper is provided by the World Bank (2015b) through its Data on Statistical Capacity Portal. The portal provides statistical capacity data (statistical methodology (SM), source data (SD), and periodicity and timeliness (PT) dimensions including data on individual dimension components together with overall SCI scores) of 145 countries (of which 50 are OIC member countries, 83 are non-OIC developing countries (DEV), 12 are high income countries (HIC)) from 2004 to 2015. World Bank (2015c) can be referred to on the structuring of SCI diagnostic framework and scoring mechanism. The SCI can be used by the countries for self-assessment, performance monitoring and evaluation; and strengthening of own reporting of statistical activities. The development partners may also use the SCI to help include statistical capacity issues in policy dialogue; identify, monitor and evaluate projects; and monitor regional and global trends in statistical capacity (Fantom and Watanabe, 2008). The analysis timeframe was limited to 2009 (start year with the maximum number of OIC member countries with available data) and 2015 only.

2.2. Exploratory Data Analysis

The scores for overall SCI, dimensions of SM, DS, and PT were explored using descriptive statistics. Based on work of (Rakotomalala, 2008), we also applied hierarchical agglomerative clustering (HAC) on the dimensional raw score data (matrix sizes of 50 x 10 for each of SM and PT dimension, and 50 x 5 for SD dimension) for year 2015. The agglomerative approach has been selected to consider the performances of each country on its own and then combine them into clusters that maximize within-cluster similarity and between-cluster difference, as determined by a distance metric. (Ahlquist and Breunig, 2009). To carry out the analysis, we used freeware data mining software TANAGRA with version 1.4.50 (Rakotomalala, 2005).

3. Results

3.1. Descriptive Statistics

The overall SCI score together with SM, SD, and PT dimension score data by country groups are summarized in Tables 1–4. While the overall SCI score mean together with the SM score mean for all groups showed progress from 2009 to 2015, the SD and PT score means deteriorated for all groups in the same period. Only the 2015 PT dimension mean of the OIC was higher than the other groups.

When we look at the performance of OIC member countries as a group based on the number of countries with full scores under SM, SD, and PT dimensions, the following criteria require sound actions to enhance the statistical capacity of OIC member countries:

- SM: Government Finance accounting concept, Import and Export Price Indexes, Industrial Production Index, and Special Data Dissemination Standard (SDDS);
- SD: Health surveys, Poverty surveys, and Vital Registration; and
- PT: Child malnutrition (prevalence of underweight children under five), Gender equality in education (gross enrolment rate of girls to boys in primary and secondary education), Income Poverty, and Primary completion rate.

Table 1. Data summaries for overall SCI scores, by country group, 2009 vs. 2015[1]

	SCI, 2009						SCI, 2015						Percentage of Countries with		
	Min	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Min*	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Increase*	*No Change*	*Decrease*
OIC	24.44	53.06	61.67	*62.31*	76.94	94.44	20.00	53.06	65.56	*63.42*	74.72	91.11	46.00%	8.00%	46.00%
DEV	32.22	53.61	67.78	*65.43*	76.67	95.56	27.78	52.22	68.89	*66.33*	78.89	95.56	56.25%	7.50%	36.25%
HIC	32.22	62.22	85.00	*73.89*	87.50	92.22	42.22	56.94	83.89	*74.91*	88.33	95.56	41.67%	8.33%	50.00%
WORLD	24.44	53.33	65.56	*65.05*	79.17	95.56	20.00	53.33	66.67	*66.04*	78.89	95.56	51.41%	7.75%	40.85%

Table 2. Data summaries for SM dimension, by country group, 2009 vs. 2015

	SM, 2009						SM, 2015						Percentage of Countries with		
	Min	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Min*	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Increase*	*No Change*	*Decrease*
OIC	0.00	30.00	40.00	*46.40*	62.50	100.00	0.00	40.00	50.00	*52.00*	70.00	90.00	56.00%	20.00%	24.00%
DEV	10.00	40.00	50.00	*53.38*	70.00	100.00	20.00	40.00	50.00	*57.23*	80.00	100.00	45.00%	32.50%	22.50%
HIC	10.00	60.00	75.00	*66.67*	87.50	100.00	40.00	52.50	80.00	*75.00*	90.00	100.00	58.33%	25.00%	16.67%
WORLD	0.00	30.00	50.00	*52.04*	70.00	100.00	0.00	40.00	50.00	*56.90*	80.00	100.00	50.00%	27.46%	22.54%

Table 3. Data summaries for SD dimension, by country group, 2009 vs. 2015

	SD, 2009						SD, 2015						Percentage of Countries with		
	Min	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Min*	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Increase*	*No Change*	*Decrease*
OIC	10.00	47.50	60.00	*60.60*	80.00	100.00	10.00	37.50	60.00	*58.80*	80.00	100.00	28.00%	30.00%	42.00%
DEV	0.00	50.00	70.00	*64.38*	80.00	100.00	0.00	40.00	70.00	*64.10*	80.00	100.00	31.25%	40.00%	28.75%
HIC	20.00	62.50	80.00	*75.00*	87.50	100.00	20.00	60.00	80.00	*72.50*	95.00	100.00	8.33%	66.67%	25.00%
WORLD	0.00	50.00	70.00	*63.94*	80.00	100.00	0.00	40.00	70.00	*62.97*	80.00	100.00	28.17%	38.73%	33.10%

Table 4. Data summaries for PT dimension, by country group, 2009 vs. 2015

	PT, 2009						PT, 2015						Percentage of Countries with		
	Min	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Min*	*Q1*	*Median*	*Mean*	*Q3*	*Max*	*Increase*	*No Change*	*Decrease*
OIC	46.67	73.33	83.33	*79.93*	90.00	100.00	36.67	73.33	81.67	*79.47*	90.00	96.67	36.00%	16.00%	48.00%
DEV	50.00	66.67	83.33	*78.54*	90.00	100.00	10.00	66.67	80.00	*77.67*	86.67	100.00	48.75%	13.75%	37.50%
HIC	53.33	64.17	85.00	*80.00*	95.83	100.00	50.00	64.17	81.67	*77.22*	89.17	96.67	25.00%	33.33%	41.67%
WORLD	46.67	69.17	83.33	*79.15*	90.00	100.00	10.00	70.00	80.00	*78.25*	86.67	100.00	42.25%	16.20%	41.55%

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[1] OIC: Organisation of Islamic Cooperation Countries Group   DEV: Non-OIC Developing Countries Group
  HIC: High Income Countries Group   WORLD: All Countries Group

3.3. HAC Results

The HAC algorithm results showed that the optimal number of clusters is 3 for SM, 4 for SD and 6 for PT dimensions based on the highest gap obtained. Tables 5–7 gives the HAC clusters and cluster members (each K-means cluster assigned by the algorithm is separated with ";") for k_{SM}=3, k_{SD}=4, and k_{PT}=6. Country clusters and the respective sub-groups as per each K-means cluster can act as reference beneficiary country sets for implementation of statistical capacity building initiatives for related SM, SD, and PT criteria.

Table 5. SM membership, by cluster k_{SM} = 3, 2015

Cluster No	Cluster Members
1	*Kyrgyzstan, Malaysia; Pakistan; Egypt, Indonesia, Kazakhstan, Morocco, Tunisia, Palestine; Jordan, Turkey*
2	*Somalia*
3	*Azerbaijan, Benin, Burkina Faso, Syria, Togo; Cameroon, Djibouti, Gabon, Sudan; Comoros, Guinea, Libya, Mali; Afghanistan, Maldives; Bangladesh, Guinea-Bissau, Iraq, Suriname, Turkmenistan; Algeria, Senegal; Chad, Cote d'Ivoire, Lebanon, Sierra Leone, Uganda; Albania, Niger; Iran, Mozambique, Tajikistan; Gambia, Guyana, Mauritania, Yemen; Nigeria, Uzbekistan*

Table 6. SD membership, by cluster k_{SD} = 4, 2015

Cluster No	Cluster Members
1	*Comoros, Gambia, Mozambique; Algeria, Gabon, Guinea-Bissau, Guyana, Sudan, Turkmenistan, Yemen; Cameroon, Cote d'Ivoire; Guinea, Mauritania, Sierra Leone; Djibouti, Libya, Syria*
2	*Afghanistan, Iraq, Lebanon, Pakistan, Somalia, Uzbekistan;*
3	*Chad; Burkina Faso, Jordan; Togo, Tunisia; Bangladesh, Benin, Indonesia, Mali, Morocco, Niger, Nigeria, Senegal, Tajikistan, Uganda*
4	*Iran, Malaysia, Suriname, Palestine; Azerbaijan, Kyrgyzstan, Maldives, Turkey; Albania, Egypt, Kazakhstan*

Table 7. PT membership, by cluster k_{PT} = 6, 2015

Cluster No	Cluster Members
1	*Libya, Turkmenistan*
2	*Palestine*
3	*Guinea, Kazakhstan, Togo; Cote d'Ivoire, Nigeria, Senegal; Turkey; Indonesia, Kyrgyzstan, Tajikistan; Mauritania; Bangladesh, Cameroon, Sierra Leone; Burkina Faso, Egypt, Mozambique, Pakistan*
4	*Albania, Iraq, Maldives; Comoros, Jordan*
5	*Gambia; Benin, Iran, Mali; Afghanistan, Gabon, Sudan; Djibouti, Guyana; Malaysia; Guinea-Bissau; Algeria, Morocco; Lebanon, Uzbekistan, Azerbaijan; Chad, Niger, Uganda*
6	*Suriname, Syria, Tunisia, Yemen; Somalia*

4. **The Role of SESRIC in Enhancing Statistical Capacities of OIC Member Countries to Achieve Sustainable Development Goals**

In March 2016, the 47th Session of the United Nations Statistical Commission (UNSC) agreed to the indicators for the SDGs. The indicators are an indispensable part of the SDGs as they facilitate our understanding of what we need to measure and how successful we are to meet the targets and goals as defined in September 2015 by the UN General Assembly. In this sense, the indicators may act as an effective conduit to operationalise the 169 under the 17 goals. Yet, bringing about an indicator framework on its own is not sufficient as the countries should have the appropriate level of capacity to feed data in to the monitoring and reporting mechanism to measure the progress recorded. Against this background, the roles of the international organisations in leveraging the statistical capacities and capabilities of their respective member countries gain more importance if the SDGs are to be achieved by 2030.

In accordance with their designated mandates and the resources they are provided with, scope and depth of activities the international organizations conduct vary. Within the framework of its mandate, SESRIC tries to enhance the National Statistical Systems (NSSs) of the OIC member countries through combining resources from both its member countries and international organisations.

In these efforts, the Statistical Capacity Building (StatCaB) Programme for the National Statistical Offices (NSOs) of the OIC member countries should be mentioned as it is a wide scope capacity development project based on a South-South cooperation approach. The StatCaB is essentially a twinning programme whereby the countries are matched according to their needs and capacities. The StatCaB programme was initiated in early 2007 and so far, over 160 activities have been conducted. From the beneficiary side, 44 OIC member countries have benefitted. The activities carried out under the StatCaB Programme have been contributed by 17 OIC member countries and 12 regional and international organisations.

In addition to capacity building, SESRIC also facilitates building of platforms and networks in the area of statistics. Acting as the Secretariat of the OIC Statistical Commission, SESRIC

organizes the annual sessions of OIC-StatCom since 2011 together with Islamic Development Bank (IDB). The Commission serves a platform for sharing experiences and best practices on initiatives that can help member countries become more effective and efficient in improving their NSSs to a further level. In these sessions, the NSOs of the OIC countries find an opportunity to exchange their views and to ignite mechanisms towards enhancing fruitful cooperation on statistical activities. Additionally, they also have the opportunity to directly contribute in the multi-annual work plan of SESRIC in the field of statistics by shaping the Strategic Vision Document of the OIC-StatCom through their feedback.

Despite being a young initiative, OIC-StatCom has also successfully established strong communication channels between the international organizations and member countries in the area of statistics through actively seeking ways and means to initiate new projects with WHO on Tobacco Questions for Surveys (TQS) through support provided by CDC and CDC-F, with Eurostat and UNSD on "Peer Review for NSOs of OIC Member Countries (OIC-Peer)" to facilitate a South-South monitoring and evaluation mechanism to enhance the accountability and credibility of the NSSs and to reassure stakeholders about the quality of statistics produced, with IDB and OPHI on improving member countries capacities in multi-dimensional measurement of poverty, and with UNWTO on tourism satellite accounts for the Central Asia and South Asia regions of the OIC.

Besides collaborating with the other international agencies to have synergies and avoid duplication of efforts, SESRIC has also initiated the Islamic banking and finance statistics project aiming at developing a comprehensive database of Islamic financial industry. According to IDB (2015), Islamic finance can contribute to, among others, ending poverty (SDG-1), achieving food security (SDG-2), ensuring healthy lives (SDG-3), and promoting a peaceful and inclusive society (SDG-16). It also shows that innovative Islamic finance instruments, such as sukuk (Islamic bonds), can be used to mobilise resources to finance water and sanitation projects (SDG-6) and sustainable and affordable energy (SDG-7), and to build resilient infrastructure (SDG-9) and shelter (SDG-11) This project aims to raise awareness of sector players in the OIC countries towards the needs of standardized indicators and

methodology in the collection of Islamic financial industry data and the needs to integrate the Islamic financial industry statistics into the NSSs. Due to the magnitude of the project and the expertise required to achieve it, SESRIC shall be a bridge between the national data producers and the international expertise agencies to furnish a sound methodology needed for the database.

The 46th Session of UNSC recognised the need for modernising and strengthening the national, regional and global statistical systems, acknowledged the progress achieved through various regional and national initiatives for the modernisation of official statistics, and supported the implementation of the proposed Transformative Agenda for Official Statistics (UNSD, 2015). To support the efforts in achieving the SDGs by 2030, SESRIC also partners with the UNSD and UNESCWA to host the Arab Conferences on a Transformative Agenda for Official Statistics and to actively contribute to the efforts of its member countries in modernising their NSSs.

5. References

Ahlquist, J. S., Breunig, C. (2009), Country Clustering in Comparative Political Economy, MPIfG Discussion Paper 09/5, Max-Planck-Institut für Gesellschaftsforschung, Köln.

Diaz, G. (2007), Encyclopaedia of Statistics, Global Media, Delhi, India.

Fantom, N. and Watanabe, N. (2008), A "Bulletin Board" System for Monitoring Statistical Capacity, http://www.paris21.org/sites/default/files/3358.ppt

Göçek, F. M. and Hanioğlu, M. Ş. (1993), Western Knowledge, Imperial Control, and the Use of Statistics in the Ottoman Empire, Center for Research on Social Organization Working Paper Series, No. 500, Department of Sociology, University of Michigan.

Islamic Development Bank (IDB). (2015), The Role of Islamic Finance in Achieving Sustainable Development Goals, http://www.g7g20.com/pdfs/Role-of-IF-in-Achieving-SDGs.pdf

Kiregyera, B. (2015), The Emerging Data Revolution in Africa: Strengthening the Statistics, Policy and Decision-Making Chain, AFRICAN SUN MeDIA, Stellenbosch, South Africa.

Nalimov, V. V. (1981), In the Labyrinths of Language: A Mathematician's Journey, ISI Press, PA, USA.

Rakotomalala, R. (2005), TANAGRA: Un logiciel gratuit pour l'enseignement et la recherche. Actes de EGC'2005, RNTI-E-3, 2, pp. 697-702.

Rakotomalala, R. (2008), Tanagra - Data Mining Tutorials: Clustering, http://eric.univ-lyon2.fr/~ricco/tanagra/fichiers/enHAC_IRIS.pdf

United Nations Statistics Division (UNSD). (2015), Transformative Agenda for Official Statistics: A collaborative initiative for the modernisation and integration of statistics, http://unstats.un.org/unsd/nationalaccount/workshops/2015/gabon/BD/2CODG_EN.pdf

World Bank. (2004), Marrakech Action Plan for Statistics, http://siteresources.worldbank.org/SCBEXTERNAL/Resources/MarrakechActionPlanforStatistics.pdf?resourceurlname=MarrakechActionPlanforStatistics.pdf

World Bank. (2015a), World Development Indicators 2015, World Bank Publications, Washington, DC, USA.

World Bank. (2015b), Statistical Capacity Indicators, http://databank.worldbank.org/data/reports.aspx?source=Statistical-capacity-indicators

World Bank. (2015c), Note on the Statistical Capacity Indicator, http://datatopics.worldbank.org/statisticalcapacity/files/Note.pdf

Zimmermann, E. A. W. (1787), A Political Survey of the Present State of Europe, C. Dilly, London, UK.