Methodological Basis of the Comparative Evaluation of Inclusiveness Level of Economic Development

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Abstract: The article is devoted to the methodological basis of comparative assessment of the level of inclusion of economic development in different areas and regions. The article focuses on the methodological problems of analyzing, evaluating, and raising the level of inclusiveness of economic development. The importance of raising the level of inclusion in the context of new development trends in society and the economy is interpreted. The need for a new look at the scientific and theoretical basics of economic development are emphasized. Available studies on inclusive development issues are analyzed. Indicators and sub-indices characterizing the inclusive development of the society are proposed. An analysis of international scientific research on the problems of inclusive development was conducted. As the increase in the inclusion of the economy leads to an increase in the Gross Domestic Product (GDP), the urgency of developing its prospects is justified. Ratings of advanced countries on inclusive economic development indices were analyzed. Indicators of inclusive development of international economic organizations have been identified and based on them, relevant improvements have been made and additions have been made. Indicators and sub-indices characterizing the inclusive development of society are offered. The evaluation of inclusive development at the international level is analyzed. The methodological basis of the evaluation of the inclusiveness level is explained and a technique is developed. Key efficiency indicators for inclusive growth and development have been identified. The country's National Inclusive Development Index (NII) is proposed as a dependency on sub-indices that reflect several areas. Subindices and indicators forming the level of inclusion of national economic development have been proposed. The scientific-methodological approach proposed for the assessment of inclusion at the national level is presented in the form of algorithms and conceptual stages. Assessment of the level of national inclusion is offered as Level I - inclusion at the national, social, or macro-level; Level II - inclusion of regional or individual cities and regions; Level III - intersectoral or sectorial inclusion; Level IV - inclusion in the private sector, non-governmental structures; Level V - inclusion in non-governmental and public administration; Level VI - inclusion in the micro or enterprises, production level; Level VII - in several sub-levels as individual inclusion in homes and families. National and international evaluation of the inclusive society and economic development is studied. The main factors of inclusive development of Azerbaijan's economy such as GDP per capita, labor productivity, expected healthy life length, employment level, Gini index of income, poverty level, Gini index of wealth, monthly household income, net savings, carbon capacity, public debt to GDP indicators such as ratio, demographic load ratio have been developed. The importance of the use of inclusion technologies was highlighted and reported on. It was noted that the effective platform for increasing the inclusion of the information society has many opportunities. It was noted that the globally implemented "Internet of Things" (IoT), Cloud computing, soft-computing, Big Data technologies, and components of the 4.0 Industrial Revolution will create additional opportunities for joint effective activities of citizens in society, increasing the level of inclusion.

Keywords: economic growth; inclusiveness of economic development; National Inclusive Development Index; inclusiveness level and index; 4.0 Industrial Revolution; Internet of Things (IoT); inclusiveness indicators; inclusiveness evaluation; inclusiveness problems.

Introduction

The main development trends of modern countries are focused on the formation of information and knowledge economy (Presidency of the Republic of Azerbaijan, 2012; 2014). The interests of all citizens, specifically those who need more material and physical protection, should be taken into account in shaping the knowledge society and economy. The knowledge-based economy depends on the activity of each member of the society. Educated, sophisticated and skilled citizens can be more beneficial for the development, prosperity, and wellbeing of a country. It is important to use the most up-to-date innovative technologies in raising the level of inclusiveness in the

development of society (Jonasson, Lauring, & Guttormsen, 2018). To manage this process, its measurement, evaluation, including the exploration of its problems and development of methodological basis are very topical and vital.

Therefore, the presented article focuses primarily on the level of inclusion of society and economic development. Its content, significance, and existing approaches in this area were commented on. The methodological basis of the process has been proposed to assess and manage the level of inclusion.

Problem statement

The inclusiveness of society and economy may refer to the opportunity of the society members, especially those with certain physical defects, to work, study, act, participate in management processes, get normal wages, live regularly, get medical aid, protect herself/himself, and be integrated into society (Simakova & Kazimirsky, 2018). These complex issues may be solved separately in the following directions: inclusive education, inclusive science, inclusive medicine, inclusive culture, inclusive literature, inclusive media (mass media), inclusive sport, and so on (Meskhi, Ponomareva, & Ugnich, 2019). Each sector may also have its specifications, technologies, technical tools, and mechanisms.

Additionally, a specific problem is solved depending on the degree of inclusiveness of the related area. The inclusiveness of the field depends on the overall inclusiveness of the economy and society. Inclusiveness of the economy leads to an increase in the inclusiveness in real economic spheres, as well as an increase in the Gross Domestic Product (GDP). However, the institutional mechanisms, inclusive frameworks, inclusive infrastructure, inclusive management tools are developed and adopted at the state level. They have a positive impact on individual, enterprise, regional and sectorial inclusive governance processes and increase the overall inclusiveness of the society (Borner, et al. 2018).

Analysis, evaluation, and increase of the level of inclusiveness of the current national economic development in the country can be solved in several stages and aspects. Primarily, new development tendencies and trends in the economy should be analyzed in the inclusive aspect. The importance of the inclusive development of society and economy interacting with those trends should be substantiated. The essence of regional-sectorial, national and international assessment of the level of inclusive development of society and economy should be interpreted. The indicators required for evaluation should be identified. These indicators should be grouped, and corresponding sub-indices should be developed. At the same time, the factors affecting the level of inclusiveness of economic development should be explored.

Recommendations for enhancing the inclusiveness in prospective studies should be developed and the measures to ensure its security should be identified. In addition, cyber security trends and technologies of an inclusive economy should be explored. At the same time, relevant key technologies for information security in the sectors of the inclusive digital economy should be specified.

A new look at the scientific and theoretical basics of economic development should be developed taking into consideration the above-mentioned aspects. As a result of the analysis of the studies on inclusive development issues, a favorable business environment for an inclusive society should be created. The formation of a digital innovation environment in the inclusive development of society should be explored. To form a national inclusive growth index in Azerbaijan, an appropriate methodology taking into account the development features of the modern economy should be developed. The factors affecting the level of inclusiveness should be explored and relevant recommendations should be developed. In the research process, the issues considered using the system approach and analysis methods must be interrelated with each other.

It should be noted that although many issues need to be addressed, the search for solutions to some of them will continue in future research. In this article, more attention has been paid to the conceptual formulation of the problem and its general directions of solution.

Research design and methodology

The article considers the inclusion of economic development as an object of research. The subject of research included the comparative assessment of the level of inclusion and the development of appropriate tools for the development of its methodological basis. It takes into account international economic development trends, the requirements of high and modern ICT technologies, the main trends of the 4.0 Industrial Revolution. Developed as an alternative to Gross Domestic Product, the Inclusive Development Index is a key tool in the economic development of countries for modern policy. A system of multi-level indicators and sub-indices characterizing the inclusive development of society has been developed. Relevant indicators and sub-indices are calculated using decision-making in multi-criteria conditions, economic and mathematical modeling, econometric methods, mathematical statistics, economic analysis, and other research methods. New indices and sub-indices are calculated using averages, expert assessments, weight coefficients, and relevant econometric statistical methods. Systematic analysis, correlation, and regression analysis, mathematical-statistical and econometric modeling methods, expert assessment method, measurement theory, fuzzy set theory, and ICT tools are applied for the development of multilevel indicators, subindexes, and hierarchical indicators for comparative assessment of the level of inclusion of economic development.

The National Inclusive Development Index (NDI) is presented in the form of sub-indices that reflect several areas. The research process proposes subindexes and indicators that affect the level of inclusion of national economic development. Since the value of all sub-indices varies in (0, 100), their formation based on primary indicators is also based on the relevant rule. In subsequent clarifications, the weight coefficients of the impact of the relevant sub-indices on the overall index are calculated through expert assessments.

Results

The proposed recommendations, the National Inclusive Development Index, and sub-indices can make a significant contribution to the comparative assessment of the level of inclusion of economic development. The proposed National Inclusive Development Index, sub-indices, and hierarchical system of indicators will create additional opportunities to increase efficiency in the new economic management. The results of the assessments can be considered a new approach and methodology for a comparative assessment of the inclusion level of economic development in the country. The proposed methodology, methods, National Inclusive Development Indices will create conditions for achieving significant results in increasing the efficiency of the country's economy on a global scale. Increasing the inclusion of the economy will create ample opportunities to increase the Gross Domestic Product.

Added-value

A new approach has been attempted, taking into account national and regional specifics, for a comparative assessment of the level of inclusion of economic development and the development of its methodological basis. A multi-level system of indicators characterizing the level of inclusion of economic development, the National Inclusive Development Index, has been proposed. Subindices and indicators forming the level of inclusion of national economic development have been proposed. According to the proposed methodology, recommendations have been developed based on relevant expert assessments at the regional and sectoral levels of the national economy.

Analysis of research works on inclusive development problems

Assessing the level of inclusion of society, as well as the economy, is a tool to identify the management factors of the sector. This problem is very complex and can be analyzed from many different perspectives. The works of many researchers in this field are found. Here we have briefly considered it necessary to pay attention to the issues considered by some of them. We mainly tried to analyze the articles on the scientific-theoretical bases and technological features of inclusive development.

Pouw and Gupta (2017a) state that inclusive development is viewed by many researchers as a synthesis of social aspects with economic growth based on political approaches. However, inclusive development can be seen as a general public policy aimed at social welfare, the formation

of natural ecosystem services, and the involvement of the citizens interested in economic development. Gupta and Pouw (2017b) prioritize the multidisciplinary approaches to inclusive development and estimates that social-ecological inclusiveness should focus on fair legal protection in relation to socio-economic and natural resources more.

Haugen (2018) studies a social struggle as a source of development. Gupta and Vegelin (2016) interpret the interactions of inclusive growth and sustainable development goals. Pouw and Bruijne (2015) describe the importance of strategic management for inclusive development and their relationships. Pyke (2018) studies the serious impacts of innovations, such as robotics, automation, 3D-publishing, nanotechnology, and new materials, on labor productivity.

Many studies have explored the regional aspects and problems of inclusive development. Songping and Azhong (2018) introduce inclusive green growth as a sustainable development tool that promotes economic development, social justice, and environmental protection. The author examines the key factors affecting inclusive green growth. Caizhi, Ling, and Yanting (2018) develop a system of indicators for measuring inclusive growth from various aspects (housing, potential, development, freedom, opportunities) in 11 provinces and cities of China. Erbiao (2016) dedicated his research to the inclusive strategy of development in China and its impact on the regions. Aoyama and Parthasarathy (2018) show that, nowadays, inclusive development, as a hybrid field, generates an experimental platform for the cooperation between commercial and non-profit organizations. Andersen, Dahl, and Dannemand (2017) estimate the use of predictive information to make innovation systems more inclusive. Daniels, Ustyuzhantseva, and Yao (2017) highlight the role of innovations and support of the government for inclusive development in BRICS countries. Cichowicz and Rollnik-Sadowska (2018)'s study is devoted to the problems of inclusive economic growth in Central and Eastern European countries, like Bulgaria, Croatia, Estonia, Hungary, Poland, Romania, and so forth. Asongu and Asongu's (2018)'s study investigates comparatively the paid services in inclusive development using mobile phones. Boon-Kwee, et al. (2016) examines the role of regional coordination mechanisms in the development of inclusive innovations in South-East Asia and identifies some aspects of their improvement.

The problems of inclusive development are often investigated both generally and in separate areas and regions. The inclusive development of the consumer cooperative system of Ukraine is studied by Kartseva and Remnova (2017). Bogolib (2016) analyzes the sustainability of inclusive development of Ukrainian regions in the conditions of economic crisis. Cherkasov and Zhdanov (2018) devote studies to the development factors of the industry in the inclusive society and economy in Russia. They propose methodological guidelines for determining the development factors of the industry of Russia. Sharafutdinov, et al. (2018) devoted to the analysis of the inclusive growth index in Russia, points out that theoretical foundations of such development are based on both the work of foreign scientists and the evaluation methods and recommendations of the World Economic Forum (WEF), World Bank. The article estimates inclusive development to be one of the key priorities of the world community, including the United Nations (UN). Thousands of scholars, public and civil organizations focus on this field. Therefore, it can be assumed that appropriate steps should be taken to develop a national strategy for inclusive development in the country.

Need for the evaluation of inclusiveness

Increasing inclusiveness is not a social burden, but a tool of generating value. This process is regarded not as an additional social burden of the states, but as a labor resource planned to be launched, i.e., as a new productive force. In this sense, the poor layer of the population should be regarded as a new value, not as a social burden. Because there were such people as L. Beethoven, S.Hoking, F.Ruzvelt, L.Pontryagin, S.Stallone, K. Tsiolkovski, and N.Ostrovski who historically rendered unprecedented services to mankind. All of them provided some invaluable contributions to our science, culture, education, and statehood, although they have some major physical defects. They have created and done the work that millions of healthy people could not do.

A generalized indicator of measuring the level of inclusive development represents not only economic growth, but also its sustainability, durability, sociality, and technological capabilities. In many cases, based on such indices, it is evident that the country's resources are poorly exploited. Even though the US is ranked 9th for GDP per capita, it is ranked the 23rd for its inclusive growth index. Sometimes such cases may also be contrary. In other words, the level of inclusiveness

exceeds even the economic growth. Indeed, among the developing countries, Azerbaijan is ranked the 26th for inclusive growth; however, for economic opportunities, it is ranked the 3rd. It confirms that the state is concerned with solving the problems of social, ecological, and other strategically important issues more than its economic opportunities.

For many years, the development of society and the state has been estimated by its GDP and GDP per capita. Time has changed and new priorities have emerged. In addition to the economic power of the state, its social status, ecological state, robustness, and sustainability must also be assessed. Therefore, the level of development of society should be assessed on multi-criteria rather than on only one criterion. In addition to economic development in the society, the issues such as social responsibility, opinions of the citizens to labor and workplace, the fair distribution of income, and the use of resource-saving technologies should be explored. Effective socially-oriented management should be preferred. Social harmony in society should be formed. An inclusive society should have an inclusive economy. Society and the economy should be managed through a socially-oriented approach and technology. To enable each individual to work and earn normal wages, first of all, appropriate labor tools, working conditions, production, and service areas should be set up to achieve the realization of individual capacity. Everyone's right to generate value regardless of his/her physical condition should be able recognized and realized. Only in this case, the economy will be further developed due to the value created by those people.

Historically, the greatest danger to the capitalist society has been the accumulation of wealth and property in the hands of a certain group of people - businessmen and capitalists. In many aspects, this problem is manifested in most social and political systems. When transiting from capitalism to socialism, the property of the wealthy people was nationalized making all the population poor. In capitalism, certain groups of people are rapidly becoming wealthy, and most of the population is becoming even poorer. All of these reaffirm that the inclusiveness in public-political systems is not fully taken into account. Industrial, post-industrial, information, virtual, network, internet, financial, and knowledge-rich areas characterize the different aspects of the economy. Nonetheless, entirety, it does not represent its basic principles and does not cover its ultimate goal, creative signs of the system, its specific tools and components.

The analysis shows that there is a close correlation between the inclusiveness of society and the level of its informatization. Davos World Economic Forum Inclusive Development Index has a direct link with the International Telecommunication Union Information Society Index. It is also specified in the calculations carried out by countries in separate periods. The mutual comparative analysis of relevant indices proves it once again.

Inclusive development indicators of international economic organizations

In accordance with the UN recommendations, inclusive development has been specified in the main documents on many economic and inclusive economic growth issues of several organizations as the International Monetary Fund, the Organization for Economic Co-operation and Development (OECD), European Bank for Reconstruction and Development (EBRD), World Bank. These problems have been repeatedly discussed in their main working bodies (International Monetary Fund). At present, decisions on relevant national and regional levels are made taking into account the inclusive growth indicators:
- ➢ at the UN level (economic and environmental accounting system, human capacity development index);
- ➢ at ECO (Economic Co-operation Organization) level (welfare index);
- ➢ at the World Davos Economic Forum level (Global Competitiveness Index, Inclusive Development Index).

The national strategies of many countries are based on agreed indicators for sustainable development. Creating a green economy for everyone is a fundamental principle for inclusive economics.

The Inclusive Growth Index (IGI), developed as an alternative to GDP, more clearly describes the economic development of the countries for the modern policy. According to the international methodology, the country's economy is divided into two parts: based on the data provided by the developed and developing countries in 2018, assessments of the individual countries are given on the principle of traffic lights (poor-red, medium-yellow, good-green). The countries are ranked in

two groups individually for the formation of an inclusive growth index applied by the World Economic Forum as an alternative to GDP in 2017.

In accordance with the international methodology developed by the World Economic Forum, the essence of the Inclusive Growth Index is composed of three main sub-indices (The Inclusive Development Index, 2018). These sub-indices are based on the other 12 sub-indicators (Figure 1). The first sub-index is called "Growth and Development", the second - "Inclusiveness", and the third - "Intergenerational Equity and Sustainability." They shape the inclusiveness rate of the developed and developing economies. The sub-indices in the reports are formed based on various sub-indicators as GDP per capita, labor productivity, healthy life, employment, Gini coefficient, poverty, net earnings, and so forth. The Growth and Development sub-index is calculated based on the indicators of living standards of the population as GDP per capita, 2) population employment, 3) labor productivity, etc. The Inclusiveness sub-index is shaped based on the 1) population's stratification, 2) poverty, 3) distribution of income in the individual and household.

According to the World Economic Forum methodology, the Gini coefficient varies from 0 to 100. When the coefficient is 0, the equality among the population is considered to be the highest. Whereas if this figure reaches 100, inequality is considered to be the highest. This index indicates the fair distribution of income between individuals and households.

The third sub-index "Sustainability" of the Inclusive Growth Index is based on 1) state debt and 2) dependency sub-indicators. Various liabilities included in the state debt include deposits, credits, loans, and insurance. The dependency sub-indicator represents the calculation of the contribution of the economically active and non-active population to the economy. The high sub-index shows a large proportion of the economically inactive population. In other words, the social provision requires high social protection and health expenditures, and negatively affects the generation of additional value.
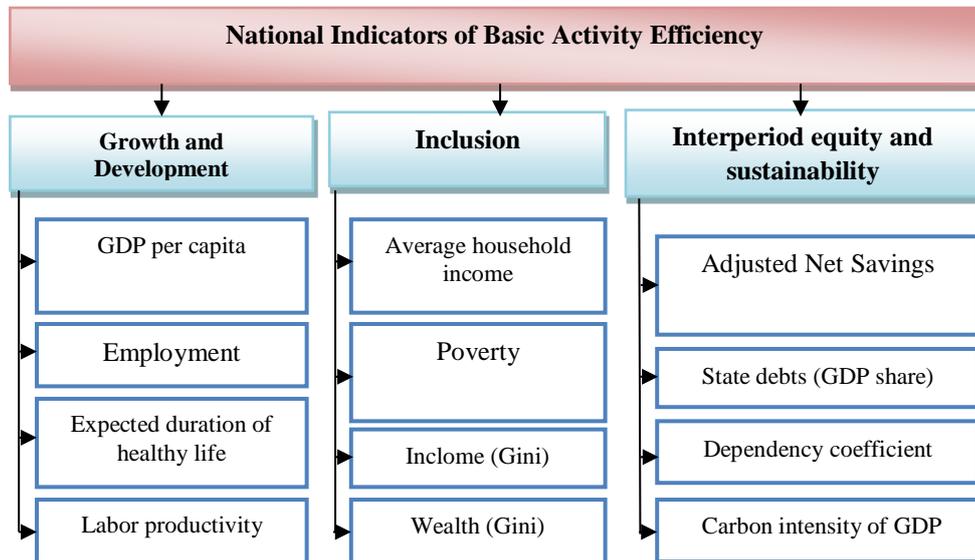

Figure 1. Key efficiency indicators of inclusive growth and development
(Compiled based on World Economic Forum materials, 2018)

National methodological basis for regional-sectoral assessment of inclusiveness level

The inclusiveness of society, as well as the economy, is in the constant focus of the state. To regulate it, it should be assessed. Assessment can be performed in international, national, regional, and sectoral aspects. Comparative assessments suggest that countries/states should be divided into two groups rather than two, as recommended by the World Economic Forum and the assessment should be performed separately. The first group should include the most developed and countries (30) with the highest GDP. The second group includes medium-developed countries, and the third group includes less developed countries. The level of national inclusiveness can be evaluated at several sub-levels and aspects:

- ❖ *Level I –inclusiveness at state, social or macro level;*
- ❖ *level II - regional inclusiveness or inclusiveness of individual cities and regions;*
- ❖ *Level III - inter-sectorial or are all-inclusiveness;*

❖ *Level IV - inclusiveness in the private sector, non-governmental structures;*
❖ *Level V - inclusiveness in non-public and public administration;*
❖ *Level VI - inclusiveness at micro-or enterprise-level;*
❖ *Level VII - individual inclusiveness at homes, in families.*

In several cases, various indicators and official statistics are available at these levels. However, they do not fully cover the process and do not allow a complex assessment of inclusiveness. Therefore, there is a need for a new system comprising a certain final sub-index representing the modern economic policy at each level, and the sub-indicators and indicators shaping that sub-index. In this regard, the Institute of Information Technology of Azerbaijan National Academy of Sciences (ANAS) researches in this field (Aliyev, 2018, 2019).

The essence of the methodological approach we offer to the general evaluation of inclusiveness at the national level is based on the following conceptual stages, blocks, and algorithms.
1. Level I is formed as a result of assessments received at Level II and Level III.

2. Inclusiveness at Level II and Level III is assessed alternately and independently at the relevant regional or sectoral level.

3. Assessments at Levels IV-VII are of local significance and performed at separate organizations, enterprises, firms, companies, managerial structures, houses, and farms. At the same time, assessments at these levels play a role of an initial database for other levels.

4. Assessments at Levels IV-VII are based on official statistics, survey materials, results of scientific experimental research, and results of processing of internal information resources of various structures. Here, the reviewed and analyzed data can be different and composition depending on the situation.

5. Level I offers the National Inclusive Development Index (NIDI) of a society, state, and government as a function of sub-indices that represent several aspects. The draft specifies this function as linear (Figure 2).
In other words, Mİİ = F(Aİ, Tİ, Yİ, SV, TV) = $a_1 \cdot$Aİ$+a_2 \cdot$Tİ$+a_3 \cdot$Yİ$+a_4 \cdot$SV$+a_5 \cdot$TV$+a_6 \cdot$HV

6. Here, Aİ is the "Sustainable green economy" sub-index characterizing the most important indicators (P_{11} - GDP, P_{12} - labor productivity and economic growth, P_{13} - inflation rate, P_{14} - GDP per capita, P_{15} - public debt per capita, P_{16} – investments on main capital) of the economy.
Aİ = $F_1(P_{11}, P_{12}, P_{13}, P_{14}, P_{15}, P_{16})$ = $F_1(P_{11}, ..., P_{16})$

7. Tİ is "Sustainable green economy" sub-index indicating the level of informatization and Information Society (P_{21}), e-Government and e-Services (P_{22}), Institutionalism (P_{23}), Innovation and Innovative Environment (P_{24}), Science and Education (P_{25}), Knowledge and Technology (P_{26}).
Tİ = $F_2(P_{21}, P_{22}, P_{23}, P_{24}, P_{25}, P_{26})$ = $F_2(P_{21}, ..., P_{26})$

8. Yİ is the "Innovative Cognitive Economy" sub-index characterizing the level of greening the economy (P_{31}), green cognition and thinking styles in society (P_{32}), the volume of environmental investments (P_{33}), use of alternative energy sources (P_{34}), economical resource utilization technologies (P_{35}), natural resource potential (P_{36}).
Yİ = $F_3(P_{31}, P_{32}, P_{33}, P_{34}, P_{35}, P_{36})$ = $F_3(P_{31}, ..., P_{36})$

9. SV is "Fair Social Economy" sub-index characterizing an effective application of social protection mechanisms in society (P_{41}), integration of people with disabilities into society – their employment and education (P_{42}), employment and social insurance (P_{43}), unemployment, and poverty level (P_{44}), material wellbeing of elderly and children (P_{45}), fair distribution of income (P_{46}).
SV = $F_4(P_{41}, P_{42}, P_{43}, P_{44}, P_{45}, P_{46})$ = $F_4(P_{41}, ..., P_{46})$.

10. TV is "Guaranteed healthy economy" sub-index indicating an average longevity of society members (P_{51}), health level (P_{52}), access to treatment (P_{53}), investments in healthcare improvement (P_{54}), health infrastructure and health insurance (P_{55}), material and psychological support to the population with disabilities (P_{56}).
TV = $F_5(P_{51}, P_{52}, P_{53}, P_{54}, P_{55}, P_{56})$ = $F_5(P_{51}, ..., P_{56})$

11. HV is "Humanitarian Tolerance of Society" sub-index indicating humanist attitude towards the national minorities, foreign citizens, refugees, and displaced people (P_{61}), tolerant attitude to the people with physical disabilities in the real world, and their active involvement in society (P_{62}), attitude to the people with physical disabilities in fiction, art and culture (P_{63}), (positive and negative) attitude to the people with physical disabilities and socially vulnerable people in the online environment, including social networks and mass media (P_{64}), material and financial support of society to the people with physical disabilities and socially vulnerable people (P_{65}), representation of persons with disabilities in science, technology, culture and arts v(P_{66}).

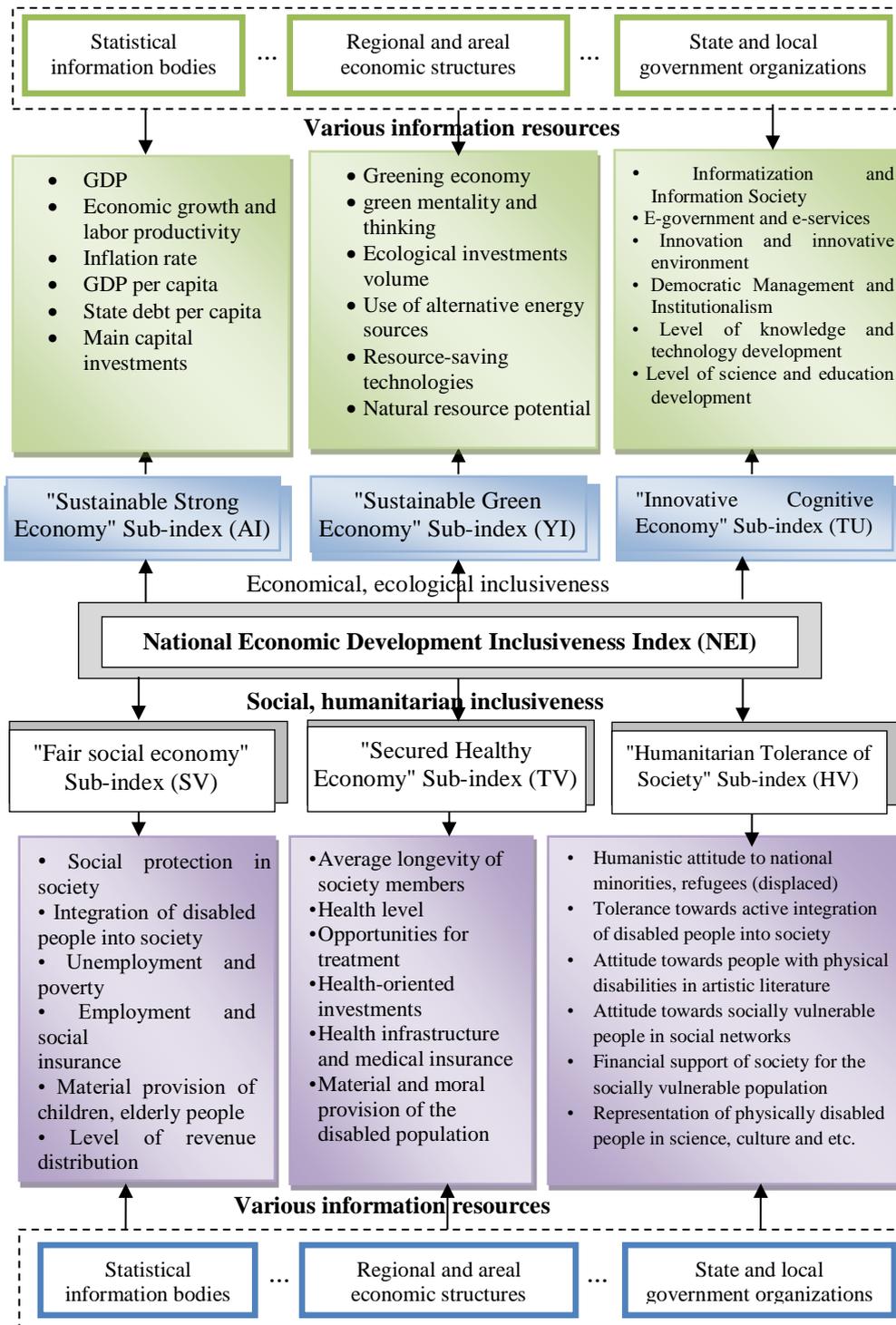TV = F6(P_{61}, P_{62}, P_{63}, P_{64}, P_{65}, P_{66}) = F6(P_{61}, ..., P_{66})

Figure 2. Sub-indices and indicators shaping the inclusiveness level of the national economic development (proposed by the author)

12. a_1, a_2, a_3, a_4, a_5, a_6 - are the coefficients corresponding to the variables of the linear function at the outset. In subsequent clarifications, they can be considered as the weight ratios of the impact of the corresponding sub-index to common index (MII) through expert estimates. It is assumed that the least of the coefficients are equal to 1. Thus, if each sub-index may vary in the range of [0, 100], then the MII also will take the value within this interval.

$$\text{Mİİ} = \left(a_1 \cdot \text{Aİ} + a_2 \cdot \text{Tİ} + a_3 \cdot \text{Yİ} + a_4 \text{SV} + a_5 \cdot \text{TV} + a_6 \cdot \text{HV}\right) / \left(a_1 + a_2 + a_3 + a_4 + a_5 + a_6\right)$$

13. Thus, it can be assumed that the calculation of the MII depends on the values of separate sub-indices. Therefore, to demonstrate the calculation of each sub-index in both regional and sectorial aspects, the followings should also be accepted:

$S_i (i = 1,2,...,s)$ represents the i-th $(i = \overline{1, s})$ field or inter-field sphere.

$R_j (j = 1,2,...,r)$ represents the j-th $(j = \overline{1, r})$ region or interregional territory. In other words,

it is estimated that the society, country, and economy consist of s number of $S_i (i = \overline{1, s})$ fields and

r number of $j = \overline{(1, r)}$ R_j regional sections.

14. Assume that: Rİ_j represents inclusiveness index of the j-th region.

Sİ_i represents inclusiveness index of the i-th field.

hr_j–denotes the specific weight of the j-th region at the country scale: $0 \le \sum_j hr_j = 1$

hs_i- denotes the specific weight of the i-th field at the country scale: $0 \le \sum_i hs_i = 1$

15. The index number of the separate minimum values of hr_j and hs_i can be defined as follows:

$$\min_j hr_j = hr_{j_o}, j_o \in [1,r] \qquad\qquad \min_i hs_i = hs_{i_o}, i_o \in [1,s]$$

Afterwards, the final MII is found according to the found index numbers:

$$\text{Mİİ} = \sum_j \frac{hr_j}{hr_{j_o}} \cdot \text{Rİ}_j \text{ or } \text{Mİİ} = \sum_i \frac{hs_i}{hs_{i_o}} \cdot \text{Sİ}_i$$

In both cases, the calculation and evaluation of sub-indices should be based on similar techniques and socio-economic, environmental-technological, medical-psychological indicators.

16. Since all sub-indices vary within (0, 100), their formulation is based on a similar procedure as above mentioned one. In other words, the indicators generating the sub-index are ranked according to the data provided by the compared countries. That is, the value of the corresponding indicator per country is divided by the sum of the values of all countries for that indicator, and since the information received ranged within (0, 1), it can be determined within (0, 100) as in the previous case. Specifically, as we have already seen, if the *l*-th indicator is shaping the *k*-th sub-index $P_{kl} \in [0,100], (k = \overline{1,6}, \ l = \overline{1,6})$, and b_{kl} is the impact weight of that indicator on the general index, and the condition $b_{kl} \ge 1$ is provided

$$F_k(P_{k1},...,P_{k6}) = \frac{\sum_l b_{kl} \cdot P_{kl}}{\sum_l b_{kl}}$$

If P_{kl}^n is the value of the indicator $(n = \overline{1, N})$ R_{kl} corresponding to the *n*-th country, these values can be ranked based on the known information. Then, we can define a number (Q_{kl}^n) within [0, 100] against P_{kl}.

$$P_{kl}^n \to Q_{kl}^n = \frac{P_{kl}^n}{\sum_n P_{kl}^n} \cdot 100, \text{ as it is seen } Q_{kl}^n \in [0,100].$$

17. The value of inclusiveness sub-indices ($Sİ_i$, $Rİ_j$) on regions and fields as $Sİ_i$ and $Rİ_j$ varies within (0, 100), and they are formed (calculated or determined) based on similar procedures on the abovementioned rule.

In the prospective studies, it is planned to expand the scope of indicators in the evaluation of inclusiveness by using the indicators such as Competitiveness Sub-index, ICT Development Sub-index, Entrepreneurship Sub-index, Business Environment sub-index, Institutionalism Sub-Index, Innovation Sub-index, Knowledge Sub-index, Gini Coefficient Sub-index.

Formation of the National Inclusive Growth Index in Azerbaijan

According to the World Economic Forum report (The Inclusive Development Index, 2018), Azerbaijan is ranked the 3rd among developing countries for its inclusive growth economy and is characterized by a positive five-year trend (Table 1).

Table 1. Key indicators of the inclusive development of the Azerbaijani economy

№	Name of indicators	Value	Five-year trend
1	GDP per capita	11099	0,0
2	Labor productivity	45832	0,0
3	Expected healthy lifetime	63,4	2,4
4	Employment rate	59,7	−0,3
5	Gini Index on Revenues	43,9	0,7
6	Poverty rate	0,3	0,0
7	Gini Index on the Wealth	82,6	−10,5
8	Monthly income per household	17,1	−0,1
9	Net fees index	9,3	−3,2
10	Carbon capacity	213,5	−13,8
11	State Debt ratio in GDP	17,0	5,3
12	Demographic load coefficient	45,1	5,0

Note. It is based on Table (The Inclusive Development Index, 2018).

The evaluation of the inclusiveness level of the regional development in Azerbaijan is of great importance from the scientific, practical, and management aspects. In this regard, the evaluation methodology proposed by World Economic Forum is implemented at several stages. At the first stage, a system of indicators for economic, environmental, and social components of inclusiveness grouped into 3 blocks is formed. At the second stage, statistical information on the proposed or selected regions on the indicators is collected. At the next calculation stage, the rating of the regions (highest value rated first, subsequent rated second, etc.) on the indicators is calculated. Relevant rating scores on indicators are summed to get a complex value of the region. The ranking is performed according to the received final ratings - the lowest value ranked first. Relevant analyzes are conducted according to these ranks and the inclusiveness of the regions is comparably assessed.

Economic indicators block of the above methodology include: 1) total product per capita, 2) labor productivity index - total product per one employee over a period of time, 3) investment share in key capital, and 4) share of high technology and scientific products in total product.

Social indicators block include: 1) employment of population aged 15-70, 2) average life expectancy, 3) monthly income per capita, and 4) demographic load coefficient per 1,000 people.

Environmental indicators include: 1) share of renewable environmental resources, 2) share of environmental protection expenditures in the total product, 3) intensity of waste per total product unit, and 4) generation of electricity.

It should be noted that, although the economic growth characterized by macroeconomic indicators, such as GDP, National Income (Nİ), affects the way people live, it cannot reduce the inequality in society and poverty. Therefore, if the model of economic growth has not been developed inclusively, it will take a few hundred years to provide the least-secured 1 billion population with 10% income.

International assessment of inclusiveness of the development in Azerbaijan

According to the World Economic Forum report for 2018, Azerbaijan is rated the third for the "Inclusive Development Index", which is considered to be the authoritative index, among the developing countries (Table 2). Ranking Azerbaijan third for the inclusiveness index confirms the social well-being of the country compared to other countries and the success of socio-economic reforms in recent years.

Table 2. Inclusive Economic Development (IED) Indices of Advanced Countries

Position in the selected group No	Economies of advanced countries	Value of IED in the selected group	Position in the selected group No	Economies of developing countries	Value of IED in the selected group
1	Norway	6.08	1	Lithuania	4.86
2	Iceland	6.07	2	Hungary	4.74
3	Luxembourg	6.07	3	Azerbaijan	4.69
4	Switzerland	6.05	4	Latvia	4.67
5	Denmark	5.81	5	Poland	4.61
6	Sweden	5.76	6	Panama	4.54
7	The Netherlands	5.61	7	Croatia	4.48
8	Ireland	5.44	8	Uruguay	4.46
9	Australia	5.36	9	Chile	4.44
10	Austria	5.35	10	Romania	4.43

Note. It is based on Table (Aliyev, 2018; Aliyev, 2019).

According to the "Growth and Development" sub-index, Azerbaijan scored 28.6 points on the Gini coefficient of revenue distribution amongst people. The Poverty Indicator shows what percent of the country's population earns less than 3 USD. Azerbaijan is referred to as a middle-income country in this report. According to this indicator, Azerbaijan takes high positions within Commonwealth of Independent States (CIS) countries. Azerbaijan is highly rated in the report based on the coefficient of state debt to GDP. Azerbaijan is a leader in CIS and region for this indicator. The country has strategic currency reserves. The economically active population of Azerbaijan covers the total number of employed and unemployed people. The international index is based on the number of economically active population aged 15-64 and their share per 100 people.

The dependency sub-indicator, which shows the percent of the active population capable of earning, Azerbaijan is estimated at 40.9 percent. Azerbaijan leaves behind Latvia, Poland, Croatia, Romania, Bulgaria, and Macedonia by 0.2 - 0.5%, neighboring Russia – by 0.49%, Turkey – by 0.43%, Georgia – by 0.7%, Iran –by 0.61%, and Armenia - by 1.03% in the ranking of countries such as. The analysis of inclusiveness indices once again confirms the inclusiveness of society and the economy both at the international and national levels.

Technologies and measures to increase inclusiveness

To increase the inclusiveness of society, inclusive strategic concepts, projects, and programs covering relevant areas should be implemented. It is necessary to develop remote and virtual forms of education, inclusive scientific activities, participation in citizen science projects, and to develop socio-technological infrastructure. ICT platforms, such as e-science, e-education, e-government, e-parliament, e-business, e-banking, e-commerce, etc. should be formed based on the will of the members of society. They should be integrated with global world systems as essential components of information and knowledge society.

In society, the need for an inclusive labor force generates a relevant inclusive labor market. The development of inclusive sports (Paralympic games), music, culture, education, health, and law

shapes the inclusive legal basis of the society and creates inclusive bases for society and the state as a whole. Consequently, an inclusive government exists, and inclusive society emerges.

Leading experts (Kalstels et al.) support the concept of network societies, virtual societies, and states and believe all are neighbors with one another in the virtual space, and therefore, those with hostile intrusions might be from everywhere. Thus, the management of the state in the virtual space, online governance is of great importance. In this case, the concept of e-government is transformed into the concept of an e-national state. E-citizens of e-government with new qualities are formed. In the new environment, a new national education system should be established, taking into account both real and virtual capacities. The international legal system should be based on new mechanisms. Political management should be performed on online platforms based on new technologies (E-voting).

 The communication and communicative environment, which enhances through ICT, creates great opportunities for improving the level of inclusiveness. Mobile phones, computers, and websites generate a new productive force as new types of work tools anytime and anywhere. They produce new values and support economic development. In this process, the workers with physical limitations can play an important role. Such cases become increasingly massive and common in the world labor market. Unquestionably, such cases were not possible before. This problem could only be solved in the context of an information and knowledge society based on ICT and innovative technologies.

Globally applied IoT, Cloud computing, Soft Computing, Big Data technologies, and IV Industrial revolution components will create additional opportunities for the increased cooperation of the citizens and their inclusiveness in the community.

Multidisciplinary studies should be conducted in the relevant fields to support inclusive aspects of public administration policies in the country. Along with the international assessments, regional, national, and local assessments should also be implemented. By improving the statistical indicators, inclusiveness in various areas of society can be calculated. A segment of e-government based on inclusive ideas can be established. The problems of provision of the inclusiveness of economy should be identified and solutions should be found. In this regard, international practices should be explored, and recommendations should be put forward. Inclusive tools for people with disabilities should be expanded. Inclusive psychology should be developed. Relevant ICTs should be developed for those with hearing, sight, or movement difficulties. The standardized sign language tools, smart hand stick-navigators, headphones, self-rolled carriages, and so on should be manufactured as necessary and their technical and technological capacities should be rapidly developed.

Inclusive awareness and encouragement work in society should be carried out in more efficient ways. There should be a communication environment between individuals with physical disabilities and the public authorities. Standardized sign language should be adopted. The ways to solve linguistic problems should be found. People's physical defects (dumbness, deafness, stuttering, disability, cowardice, humpbacks, harelip, obesity, fatness, stupidity, dullness, clumsiness, crooked mouth, long-nosed, etc.) should not be a mockery. The literary works illustrating such cases with laughter should be prohibited and condemned. Inclusive Olympiads, as Paralympics games, on mathematics, physics, chemistry, should be organized.

Information society as an effective platform for increasing inclusiveness

The information society has many opportunities to enhance inclusiveness. E-government can provide indispensable services to increase inclusiveness. In the Information Society, where E-government is established, the concentration is not the same as in the society of industry. Creating great values and making profits in the field of material production is not realistic. However, in the information society, it is easy to become a billionaire in the field of non-material production. Comparison of famous industrial capitalist Rockefeller with Bill Gates, the creator of Windows, or with the creators of the giant companies as Google, Facebook, Twitter, YouTube, and amazon.com proves it. They are also of great importance as the tools for increasing inclusiveness. In the newly formed information environment, capitalism principles are even more stringent. Large capital is accumulated in the hands of a small number of people. Favorable conditions are created for social

injustice in society. Therefore, the development of the information society should base on inclusive ideas and cover broader populations.

Note that 7 billion people over the world are forced to change their PC, laptop, phone, and software every 2 years, and have to buy new antivirus and antispam programs, then, obviously, all the population of the planet will depend on a group of companies. Such a situation is undesirable. In the industrial society, such kind of hypermarket could never be formed.

Corporate managers and company executives used to suffer from a lack of (insufficient) information, whereas, nowadays, there are difficulties due to the abundance of information. The process of decision-making is becoming more and more difficult in the extreme abundance of information. Therefore, Big Data Analytics technologies are being applied in the e-government environment. Data centers, situations, and information centers have been created in most major managerial structures. Modern cognitive technologies and artificial intelligence are being applied in the process of decision-making. The use of drones and self-controlling vehicles creates the potential for increasing the level of inclusiveness of society.

Findings

The recommendations made, the proposed National Inclusive Development Index, and sub-indices can make an important contribution to the comparative assessment of the level of inclusion of economic development. The proposed system of indices and indicators forming the level of inclusion of national economic development, key efficiency indicators of inclusive growth and development will create additional opportunities to increase efficiency in the new economic management and achieve better results. The results of the assessments can be considered a new approach and methodology for assessing the level of inclusion of high-tech economy, economic development in the country. The proposed methodology will create conditions for achieving significant results in increasing the efficiency of the country's economy on a global scale.

Conclusion

One of the ways out of the critical situations in the economic science, including information and knowledge economy sectors, is conducting multidisciplinary research in the economy. Finding common parts of the same or different economic theories, and their synthesis can also be one of the development trends. More precisely, integrated economic theories can lead to better results in the reality. This depends on the inclusiveness of society and the economy.

The inclusion of society, as well as the economy, acquires new content in modern economic conditions. In the new information and knowledge economy conditions, in the modern era of the widespread use of the components of the 4.0 Industrial Revolution, there are considerable opportunities to increase the level of inclusion.

Modern society and relevant economies should be developed by increasing the level of inclusiveness. Assessments and analyzes should be performed to balance the level of inclusiveness. Relevant analysis indicators and methodologies should be developed. The factors affecting the level of inclusiveness should be comprehensively explored. Innovative technologies affecting the level of inclusiveness should be applied more widely. Security of material and spiritual resources, technologies, and systems of an inclusive economy can only be achieved through a systematic approach. Here, in the legislative aspect, both administrative mechanisms and institutional effective measures, as well as relevant modern technical tools and technologies have to be used.

Although the evaluations based on the methodology offered by the international organizations are significant, they cannot fully reveal the real economic processes. Therefore, different methodologies, which take into account the different aspects of the economy and society and the developmental characteristics, need to be developed.

The basis of the proposed new methodology proposed in this direction is, first of all, comparisons based on the new analysis grouping of countries. The next advantage is the expansion of both the scope and functional content of the indices that make up the National Inclusive Development

Index. In addition, in general, along with the novelty of the next sub-indices, many indicators, are their review, evaluation, and comparison at the most diverse macro, sectorial, intersectoral, micro-management levels.

The methodology proposed in this paper was experimentally tested. Future studies are planned to develop relevant computer models based on this methodology and to implement them in accordance with real international statistics. Conducting relevant studies and taking measures across the country will provide a great opportunity for the disclosure of great potential for raising the level of inclusiveness of society at the state level.

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