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FOREWORD to
INSIGHTS INTO REGIONAL DEVELOPMENT
2019 Volume 1, Number 4 (December)

Dear readers,

Crisis Management and challenges on Business Continuity planning for strengthening national and regional resilience capabilities are increasingly complex. Spain has implemented National Critical Infrastructure Protection system according to EU guidelines, and this brings several lessons learned, which can be useful for international allied countries and partners.

Cooperation under common framework of NATO membership means a great chance for performing an international Critical Infrastructure network, like secured logistics, transport installations and streams in energy and data flows. In particular, this international cooperation in the field of Critical Infrastructure Protection needs authorized nodes for bringing together forwarding thinking. *Insights into Regional Development* journal helps to bridge various stakeholders, like international organizations, governmental bodies, public institutions, private companies, academia and social entities, with the best scientific parameters.

May this initiative contribute for our common development!

With my respectful greetings,

A handwritten signature in blue ink, appearing to read 'R. J. de Espona'.

Dr. Rafael José de Espona
Honorary Consul of the Republic of Lithuania
Spain

**Publisher**<http://jssidoi.org/esc/home>

PUBLIC POLICY FOR HOUSING DEVELOPMENT: A CASE STUDY ON HOUSING DEVELOPMENT IN SEMARANG REGENCY - INDONESIA*

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Abstract. This study aims to describe the implementation of public policy from the perspective of Dye's theory of spatial planning for housing in Semarang Regency. The primary data used in this study were obtained from ten informants as the representatives of each business activity who proposed location permits for housing activities. While the secondary data were obtained from the Public Works Office of Semarang Regency. The results show that there were ten investment activity plans for housing in Semarang Regency, whose proposals were not approved initially by the relevant agencies because they were not in accordance with the provisions of spatial planning. This study provide evidence from ten informants there are eight cases as follows space utilization through a land consolidation program, space utilization in a wide & river border area, space utilization in vacant spatial planning area, space utilization for communities affected by railroad project, space utilization in spatial planning area of crop farming, space utilization with a housing certificate status, space utilization in plantation planning area, and space utilization in the vacant spatial planning area adjacent to the border of other city administration area. However, after being considered by the government in terms of public policy, the ten location permits were issued with certain conditions. Thus, it could be concluded that the public policy was essentially designed by the government to guarantee and fulfill the needs of the community in conducting investment activities such as housing developers.

Keywords: spatial planning; public policy; housing development

Reference to this paper should be made as follows: Sasongko, G., Hunga, I.A.R., Julana, A.S.N. Wahyudi, Y., Paulus Leliak, P., Huruta, A.D. 2019. Public policy for housing development: a case study on housing development in Semarang Regency – Indonesia. *Insights into Regional Development*, 1(3), 280-300. [https://doi.org/10.9770/ird.2019.1.4\(1\)](https://doi.org/10.9770/ird.2019.1.4(1))

JEL Classifications: J68, R14, R21, R58

1. Introduction

Globalization as a phenomenon has spread and it brings influences and a variety of impacts on human life in almost all countries, including Indonesia. These changes require the readiness of all national components to deal with it. Currently, Indonesia's economic development is showing an increasing trend along with the growth of the

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Asia Pacific region as the center of the world economic growth, where Indonesia is one of the main epicenters in the Southeast Asia region. This momentum requires a well-planned development concept. This also shows the importance of spatial planning so that the development of economic development areas, agriculture, forest conservation and residential areas is well planned.

The growth of Indonesia's population is increasing every year, but it is not followed by an increase in land for housing. Houses are a primary human need. As explained in Law Number 11 of 2011 concerning Housing and Settlement Areas, houses are buildings that function as livable shelter, family building facilities, reflection of the dignity of the inhabitants, and assets for their owners. In the Law, it is also explained that the implementation of housing and settlements includes planning, development, utilization and control activities, including institutional development, funding and financing systems, and the role of coordinated and integrated communities.

Livable shelters are the basic needs of all humans. However, at the moment, there are still many people who are unable to meet those needs. There is a total of 3.4 million non-livable shelters nationwide, where the growth of housing needs is 800.000 per year, and the number of housing needs or backlogs nationwide is 7.6 million (Ministry of Public Works and Housing, 2019). Furthermore, based on home ownership or residential buildings in Indonesia, it was mentioned that of 59.836.906 families, only 46.709.340 had their own houses, while the rest did not have their own houses or they were in a rent or contract status, hitchhikers and others (Ministry of Public Works and Housing, 2017). The number of housing backlog for people in Central Java Province is still quite high. The backlog, in terms of ownership and occupancy, is different. The Central Java Housing and Settlement Service Office noted that the backlog was divided into ownership of 705.000 housing units, while in terms of occupancy, there were 503.000 housing units spread across 35 regencies or cities (People's Housing and Settlement Areas Agency, 2018). Based on the PBDT (Pemukahiran Basis Data Terpadu, Integrated Data Base Update), there were non-livable houses of 39.984 units with a priority of 30.731 units located in poor population areas in Semarang Regency (Central Bureau of Statistics, 2018). The authors predict that the causes of housing and settlement problems in Semarang Regency are (1) the development of urban functions centered on certain regions; (2) limited availability of residential land at affordable prices; (3) there are still many people who build residential areas in the areas of plantations, agriculture and even the ones prone to natural disasters; (4) lack of control over the direction of the development of housing and settlement areas; (5) increasing slum area and (6) there is no institution of regional-based housing and settlement development integrated with the Regional Spatial Planning.

Semarang Regency also faces a polemic related to public policy and spatial planning. The problem that always arises in the last five years (2014 until 2018) is the overlap of space for one interest in the interests of the other. This happened because of differences in perceptions between the government and the community to a region. However, the facts show that spatial plans are sometimes more likely to side with capital owners or investors. Spatial planning policy is part of the issue where it is related to investment in housing development and there are many licensing requests for housing construction in Semarang Regency. However, referring to the Semarang Regency spatial pattern map in Appendix VI of Regional Regulation Number 6 of 2011, it happens that the location requested is designated as an area for plantation or crop farming. This request was initially not approved, but in the end the permit could be given as recommended by the Spatial Planning Coordinating Board of Semarang Regency. At least, there are 10 (ten) housing activities with such cases (Public Works Agency, 2018). This study refers to previous studies such as those conducted by Seo and Kwon (2017), Antczak (2017), Cesarski (2017), Ogrodowczyk (2015), Musa, Amirudin, Sofield, and Musa (2015), Davy (2014), Cooke and Moon (2015), Cazacova, Erdelhun, Saymanlier, Cazacova, and Ulbar (2010), and Castañeda and Guerrero (2018) which focus on public policy and housing development. Furthermore, this study also refers to studies by McCord et al. (2014), Janssen-Jansen and Lloyd (2012), Holmes (2013), Gerber and Hartmann (2017) which focus on land use policies and ownership rights and researches by Saifullah (2016) and Nasriaty (2016) which focus on spatial planning and settlement development policies. Most of the previous studies explained the role of public policy and the development of housing areas and only a few reviewed policies on spatial planning (control), land use

(utilization), and ownership rights in the process of sustainable development. This study is important to describe and explain the implementation of public policy from the perspective of Dye's (2002) theory of spatial planning for housing development in Semarang Regency.

2. Theoretical background and literature review

Public policy involves three main components: society, political system, and public policy. Dye (2002) illustrates their relation in Figure 1 below.

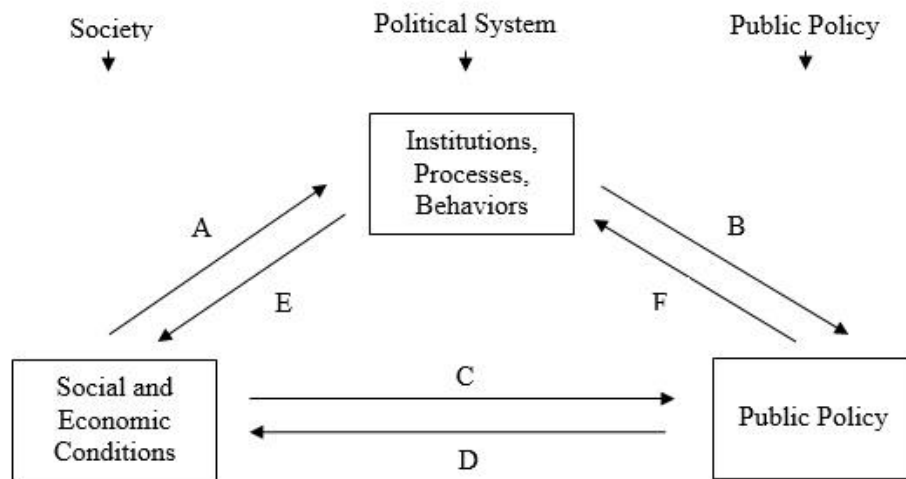


Fig. 1. Sources of Policy: Causes and Consequences
Source: Dye (2002)

Figure 1 describes that the socio-economic conditions of the community include welfare (income), inflation, recession, unemployment, education level, environmental quality, poverty, racial groups, religion and ethnicity, life expectancy, inequality and discrimination. Institutions, processes, and behaviors in the political system include federalism, separation of powers, balance of power, party systems, interest groups, voting behavior, bureaucracy, power structures, congresses, presidents, and courts. Public policies resulting from the condition of the community responded to and processed in the political system can be civil rights, education policies, welfare policies, health care policies, criminal justice, taxation, expenditure and budget deficits, defense policies, and regulations. While the arrows shown by line A, B, C, D, E, and F in the figure show the influence of one component on the other components. The Dye policy triangle can also be used to picturize how public policy in Indonesia is designed and implemented. In Indonesia, the determined public policy is influenced by the socio-economic conditions of the community, both with regard to the level of education, community income, poverty, quality of life, and competitiveness. Indonesian institutional and political systems influence and are influenced by the socio-economic conditions of the Indonesian people. The institutions are very complicated such as the legal, economic, political, and cultural systems.

Literature on public policy and land use for housing has been examined in various parts of the world including Indonesia. In Poland, Antczak (2017) proved that urban areas offered important opportunities for economic development and expand access to basic services such as health, education and housing. Cities in Poland had also noticed the greening of the cities (parks, roads, and areas in residentials, tombs and forests) in the period of 2004

until 2015. However, the country still faces obstacles such as uncontrolled urban expansion, poor management and a lack of spatial urban planning systems.

Castañeda and Guerrero (2018) used 79 development indicators from 177 countries to prove that public policy was designed by the government to accelerate economic development. However, the implementation of public policy was faced by obstacles such as natural disasters or political turmoil regularly. This condition prevented the use of resources for infrastructure development (roads, housing and etc.) and labor reform. On the other hand, the dualism between the resilience of policies and policy priorities was also an obstacle to economic development.

In North Cyprus, Cazacova, Erdelhun, Saymanlier, Cazacova, and Ulbar (2010) proved that these days, there had been an increase in the need for housing in urban areas. This indicates that there were attempts to improve the quality of life in urban areas. Improving the quality of life was implemented through the planning and development of residential areas by considering the social and spatial aspects. Public policies taken by the relevant government had considered the advantages and disadvantages aspects of the development of residential areas. This was intended to get a win-win solution for meeting community needs and sustainable development.

In Poland, Ciesarski (2017) showed that housing and settlement policies were one of the solutions for people in the urban area. The policy was able to facilitate the existing social, political, economic and ecological relations. This condition ultimately supported the concept of fair housing and sustainable development.

In Australia, Cooke and Moon (2015) revealed that market-based instruments (MBI) became the supporting public policy in dealing with land conversion issues. The developer had the responsibility to pay costs for damages ecologically. On the other hand, this policy was also able to support conservation activities in residential areas.

In Germany, Davy (2014) proved that public policy regarding land use was able to facilitate the issue of land use for housing. This condition was intended to make the land use to start with planning on the positive and negative impacts of developing residential areas.

In Switzerland, Gerber and Hartmann (2017) showed that the land use policies for housing development could guarantee property rights of every community. On the other hand, this policy was also able to control the allocation of land for housing development projects.

In Queensland, Holmes (2013) found that property rights were still a serious problem in the country. In fact, issuing land certificates to build housing often led to problems with environmental management. Therefore, land use policy was an alternative to reconcile the issue.

In Netherlands, United Kingdom and Ireland, Janssen-Jansen and Lloyd (2012) proved that public policies often produced negative effects on land and property rights. As a result, the economic conditions, political priorities and cuts in public spending had created dysfunctional land and property ownership. Therefore, the use of a strategy to reduce the supply of land and property was such a horrible way to overcome market failures.

In the UK, McCord et al. (2014) revealed that the policy of urban green open space had a positive and significant impact on the selling price of property (housing and apartments). This was supported by the existence of land use planning that involved all stakeholders in property taxation.

In Nigeria, Musa, Amirudin, Sofield, and Musa (2015) found that the political, economic and social dimensions influenced the success of public housing projects in developing countries. Thus, the development of a

comprehensive model could help housing policy makers, consultants, developers, contractors and other stakeholders for the planning and development of public housing programs.

In Poland, Ogradowczyk (2015) revealed that the collapse of the regime of socialism produced a major transformation in housing development policies. This was supported by the existence of a separate institution (local government) that regulated the housing development. This means that the state did not participate directly in the process of housing development.

In Vietnam, Seo and Kwon (2017) proved that migration was a driving factor for urban growth. However, housing shortages were becoming a serious problem in urban areas. The Vietnamese government encouraged partnerships with communities and the private sector to provide various types of housing stock. The type of row house in a residential area was highly favored by the majority of the population. However, the preference for apartments was also in demand for future planning. This phenomenon shows that the government must be wise in considering the development of affordable houses in each city.

In Indonesia, Saifullah (2016) showed that spatial planning policies were highly needed in the settlement development process. This was supported by the existence of a river boundary protection policy through a river border spatial planning policy as a protected area. However, due to the lack of a Spatial Detail Plan (Rencana Detail Tata Ruang, RDTR), a strongly layered bureaucracy in the process of implementing policies and ignorance of building regulations in river border areas became a major obstacle in the development of settlements. Furthermore, Nasriaty (2016) proved that the implementation of spatial planning policies had involved target groups and introduced procedure policies through socialization. However, the implementation of the Spatial Planning policy in North Mamuju Regency did not run optimally. This condition was supported by the existence of content policy in terms of inadequate resources, both in terms of quality and quantity.

Previous studies show variations in the implementation of land use policies for housing. This is also supported by the use of methods or modeling that are quite varied in each study. For this reason, the study aims at understanding the importance of a public policy perspective in the process of land use permit proposals for housing development.

3. Methodology

This study used a qualitative approach with a case study strategy (Yin, 2003). Semarang Regency has a very favorable geographical location, including: (1) being close to Semarang City as the Capital City of Central Java Province, (2) located on the golden triangle trajectory of trade in Central: Yogyakarta, Solo and Semarang, which is already famous for the slogan "Joglo Semar", (3) having easy access in the form of Semarang-Solo Toll Road which facilitates the transportation of goods from production centers to seaports and airports; and (4) having competitive advantages in the form of land availability and market prices for activities investment, although it is necessary to pay attention to the Semarang Regency Regional Regulation Number 6 of 2011 concerning the existing Spatial Planning (Regional Development Planning Agency, 2017). The types of data used in this study were primary and secondary data. The primary data was obtained from ten prospective informants who were investors or company representatives. The determination of ten informants was based on the consideration that they experienced and were involved in the process of discussing housing area development permits. Furthermore, the secondary data were obtained from the reports of the One Stop Investment Service and Integrated Services, Public Works Agency, and Regional Development Planning Research Agency of Semarang Regency. The collected data was then analyzed by descriptive analysis techniques.

4. Results and Discussion

4.1. Investment Development in Semarang Regency

The interesting thing about Semarang Regency was that there was a significant investment development. This was evidenced from the development of the project and the value of investments invested in Semarang Regency from 2010 to 2018 which can be seen in Table 1 below.

Table 1. Development of Investment Values during 2010 until 2018

| Year | Investment Per Year | Investment Value |
|------|-----------------------|-----------------------|
| 2010 | 345.166.000.000 | 345.166.000.000 |
| 2011 | 236.372.000.000 | 581.538.000.000 |
| 2012 | 259.929.000.000 | 841.467.000.000 |
| 2013 | 371.048.000.000 | 1.212.515.000.000 |
| 2014 | 1.735.125.000.000 | 2.947.640.000.000 |
| 2015 | 404.612.000.000 | 3.352.252.000.000 |
| 2016 | 295.601.000.000 | 3.647.853.000.000 |
| 2017 | 1.003.811.167.000.000 | 1.007.459.020.000.000 |
| 2018 | 1.776.873.386.586.000 | 2.784.332.406.586.000 |

Source: One Stop Investment Service and Integrated Services Agency (2018)

Table 1 shows the realization of the investment value in domestic investment (*Penanaman Modal Dalam Negeri*, PMDN) or foreign investment (*Penanaman Modal Asing*, PMA) in Semarang Regency in 2018 whose performance exceeds the target of IDR 1.776.883 billion of the target set at IDR 396,69 billion or 447.92%. The achievement of investment value looks quite large compared to the achievement of the total investment value in 2017 of IDR 1.003.811 billion. This indicates that there is an increase in the percentage of the total investment value of 77.01%.

4.2. Space Utilization Through a Land Consolidation Program

The use of space as a housing location of Mr. MR was located in Nyatnyono Village, West Ungaran District, Semarang Regency covering an area of $\pm 6.643 \text{ m}^2$. Initially, this activity plan did not get permit from the government to carry out the housing construction. This is in line with what was stated by Mr. MR as the permit applicant:

"I plan to develop residentials through Land Consolidation activities in Nyatnyono Village, which consists of two locations covering $\pm 3.957 \text{ m}^2$ and $\pm 2.686 \text{ m}^2$. According to the information I got from the related office, it turns out that the location is included in the plantation planning area. Actually, this location is directly adjacent to the location of previous land consolidation activities. Later, this is probably going to get the attention of the Semarang Regency government."

From Mr. MR's description, it is illustrated that this housing activity did not get permit for its construction because it was not in accordance with the spatial regulations in Semarang Regency, where the location was not in the allocation of settlements but in the plantation planning area. The following Figure 2 is the location of the spatial utilization plan.

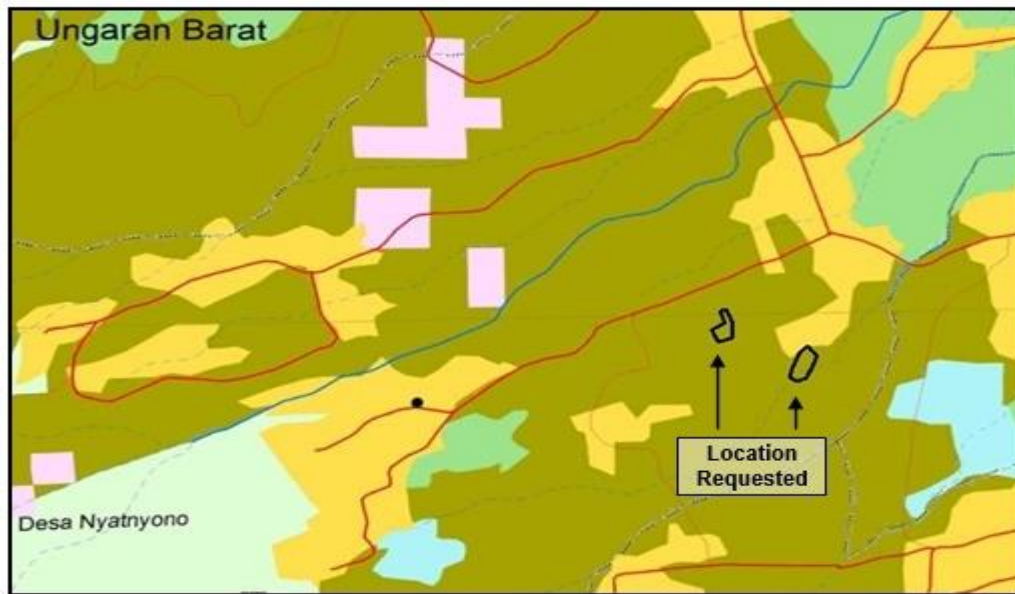


Fig. 2. Spatial Map of the Housing Plan Location Through A Land Consolidation Program

Source: Public Works Agency (2018)

Note:

Dark Green: plantation area
 Light Green: crop farming area
 Yellow: rural settlement area
 Orange: urban residential area

In terms of public policy, the Semarang Regency government decided to provide recommendations for the proposal with three considerations: (1) based on article 63 letter a. of Regional Regulation Number 6 Year 2011 which regulates the general provisions of zoning regulations for plantation Planning areas, it is stated that the use of space for settlements of local communities with low density is allowed on land with slopes of less than 25% (twenty five per hundred) and on an expanse of lands integrated with existing settlements; (2) the location has been integrated with the location of the previous land consolidation activities and the planning of rural settlements; and (3) the housing plan is a land consolidation activity for the local community, with a low density (large plot area) and meeting the needs of public facilities. Cazacova et al. (2010), Musa et al. (2015) and Cesarski (2017) proved that the development of housing areas needed to pay attention to social and spatial aspects. Public policies taken by the relevant government had considered aspects of the strengths and weaknesses of developing residential areas (Davy, 2014; Holmes, 2013; McCord et al., 2014). The main objective was to utilize the land optimally, balanced and sustainably (Cazacova et al., 2010; Davy, 2014; Holmes, 2013; McCord et al., 2014). This was intended to get a win-win solution for meeting community needs and sustainable development (Davy, 2014; Dye, 2002; McCord et al., 2014; Nasriaty, 2016). In Semarang Regency, the land consolidation policies and activities were carried out by the National Land Agency which aimed to accelerate the land registration process (Gerber & Hartmann, 2017; Holmes, 2013; Janssen-Jansen & Lloyd, 2012). However, several cases often clashed with spatial provisions. This indicated that the land consolidation was still an important issue that needed to be resolved by the government wisely.

4.3. Space Utilization in Wide & River Border Area

The use of space for housing development activities phase II was proposed by KSP Ltd, covering an area of $\pm 70,000 \text{ m}^2$, an expanse of land located in the area of Sidomulyo and Kalirejo Subdistrict, East Ungaran District, Semarang Regency. This location blended with the phase I housing that had been previously issued. Actually, the proposed location was in accordance with the spatial planning included in the urban settlement area. However, the Semarang Regency government thought that it was necessary to reconsider the submission of its licensing proposal in order to meet the environmental, social and economic aspects. This was confirmed by Mr. K as the manager of the company.

"Our location is planned for the development of phase I housing that is already underway, and all of it is included in the planning of urban settlements, so that it is actually in accordance with spatial regulations, although indeed, the existing conditions show that they are rice fields and limited by rivers. In addition, we still have to work on the phase I permit for housing development related to the prevention of flooding or overflow of rivers around the site, as well as the social approach of the community. The 7 Ha area could be the first and biggest land for filing a housing permit in Semarang Regency, so it needs some technical and non-technical considerations".

According to Mr. K, it is illustrated that this housing expansion activity needed further study and consideration because the existing conditions of the location were rice fields and technical engineering was needed to prevent flooding, not only in accordance with the existing spatial allocation. The following is the location of the space utilization plan that can be seen in Figure 3.

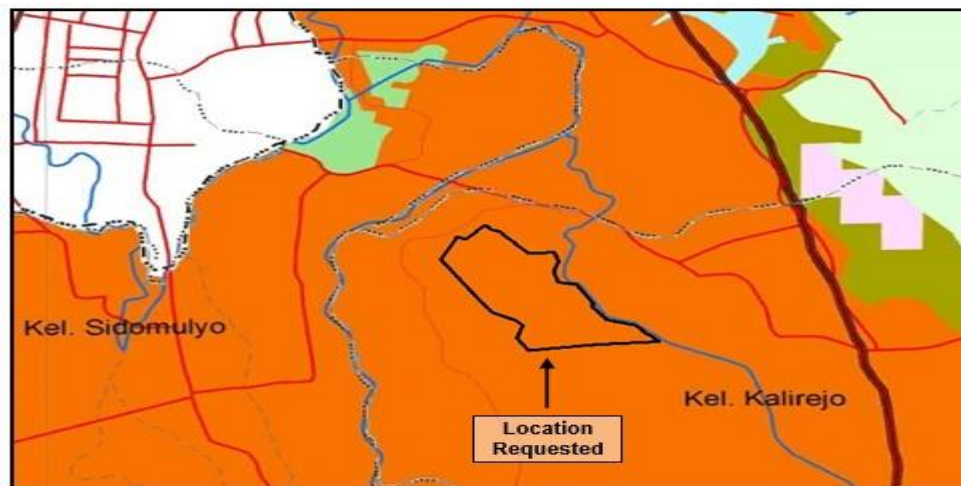


Fig. 3. Spatial Map Housing Plan Location with Wide and River Border Area
Source: Public Works Agency (2018)

According to a study by members of the Semarang Regency spatial planning coordination body, the recommendation for a phase II housing location permit could be given with the following considerations: (1) the location should be located in the area of urban settlement planning; (2) based on the provisions of Article 69 letter a. of Regional Regulation Number 6 of 2011, which regulates the general provisions of zoning regulations for urban settlement planning areas that urban and rural residential areas must be safe, comfortable and productive, and supported by housing facilities and infrastructure; and (3) phase housing II must fulfill the obligation to build

a retention pond and river channel arrangement as a flood prevention effort and to fulfill the needs of public facilities. Cazacova et al. (2010) and Antczak (2017) proved that urban areas offered important opportunities for economic development and expansion of access to basic services such as health, education and housing. However, there were still problems faced such as uncontrolled urban expansion, poor management and a lack of spatial urban planning systems (Castañeda & Guerrero, 2018; Ogrodowczyk, 2015; Saifullah, 2016; Seo & Kwon, 2017). In Semarang Regency, river boundary protection policies were regulated through river border spatial planning policies as protected areas. However, due to the lack of a Spatial Detail Plan (*Rencana Detail Tata Ruang*, RDTR), a highly layered bureaucracy in the process of implementing policies and ignorance of building regulations in river border areas became a major obstacle in the development of settlements. Thus, public policy must be designed to eliminate or reduce the inconvenience and displeasure of individuals and community groups (Dye, 2002).

4.4. Space Utilization in Vacant Spatial Planning Area

The use of space as a housing location was proposed by Mr. QA, located in Gedangan Village, Tuntang District, Semarang Regency, covering an area of $\pm 2.660 \text{ m}^2$. Initially, this housing development plan did not get a permit from the government, because based on the space pattern of Regional Regulation number 6 in 2011, the location was in the vacant allocation area. This is in line with what was stated by Mr. QA as the permit applicant.

"From the information on the spatial plan obtained, our location is included in the vacant planning area, so the Semarang Regency government does not give permit for this housing establishment. However, our location is close to the border between Semarang Regency and Salatiga City. The existing condition of the location in question is located in the dominant area with plantations in the area of Semarang Regency and predominantly with settlements in the Salatiga City area".

From the explanation above, Mr. QA illustrated that this housing development plan did not get permit to operate because it clashed with spatial regulations in Semarang Regency (included in the vacant allocation area). Figure 4 presents the location of the space utilization plan.



Fig. 4. Spatial Map of Housing Plan Location in Vacant Spatial Planning Area
Source: Public Works Agency (2018)

Based on the consideration of members of the Semarang Regency spatial planning coordinating body, a housing development could be given recommendations with the following considerations: (1) the closest allotment area to

the intended location is the plantation planning area and in accordance with Semarang Regency Regional Regulation Number 6 of 2011; (2) to pay attention to the Semarang Regency Regulation Number 6 of 2011 article 63 which regulates the general provisions of zoning regulations for plantation planning areas, stating that: (a) space utilization for low density local community settlements is allowed on land with slopes of less than 25% and on an expanse of land that blends with existing settlements; (b) construction of supporting facilities and infrastructure for plantations including agritourism is only permitted on land with slopes of less than 25%; (c) plantation cultivation is directed at productive types of annual plants by considering environmental conservation aspects; (d) the provisions for the prohibition of the conversion of plantation land into non-agricultural cultivated land must refer to legislation; (3) the permit for utilization of space is only for residential homes, with the following requirements: (a) settlement plans integrated with existing settlements and no physical barriers (fences) can only be used for individual purposes or built naturally, not built by the developer or not real estate, or not in the form of clusters; (b) intended for people who live around the location in one District; (c) the Building Base Coefficient (*Koefisien Dasar Bangunan*, KDB) is permitted at a maximum of 30% of the land area; (d) does not change or maintain the dominance of the function of the area as an plantation planning area; (e) does not cause negative environmental and social impacts in the future and (4) the implementation of spatial utilization must pay attention to the Land Technical Considerations (*Pertimbangan Teknis Pertanahan*, PTP) of the Semarang Regency Land Office and the applicable regulations regarding building and environment. Cesarski (2017); Cooke and Moon (2015); McCord et al. (2014); Davy (2014); Holmes (2013) and Nasriaty (2016) proved that housing and settlement policies were one of the solutions addressing ecological and conservation issues. According to Dye (2002), public policy was able to help housing policy makers, consultants, developers, contractors, and other stakeholders in housing program planning and development. In Semarang Regency, the arrangement of building area was regulated through regional regulations. However, the supervision of the building area built by the community had not been carried out optimally. This could cause natural water infiltration to be hampered, so that the efforts intended for water infiltration would experience a few obstacles.

4.5. Space Utilization for Communities Affected by Railroad Project

There was a space utilization planned for residentials for residents affected by the Tuntang - Kedungjati railroad reactivation project. The area proposed by Mr. AM was located in Bringin Village, Bringin District, Semarang Regency covering an area of $\pm 13.100 \text{ m}^2$. Initially, the plan to establish this housing did not get permit from the government, because the location was in the area of the water infiltration planning area. This is in line with what was stated by Mr. AM as the permit applicant.

"We plan to help residents whose land is affected by the railroad reactivation project, so that they can immediately get a replacement for a residence, not far from the previous location. Unfortunately, according to the information from the related agency, it turns out that the location is in a water infiltration area. We ask for a consideration by the Semarang Regency Government so that our proposal can be approved".

According to Mr. AM, it was illustrated that the planned housing activity did not get a permit because the location was not in accordance with the spatial planning. The following is the location of space utilization which can be seen in Figure 5.

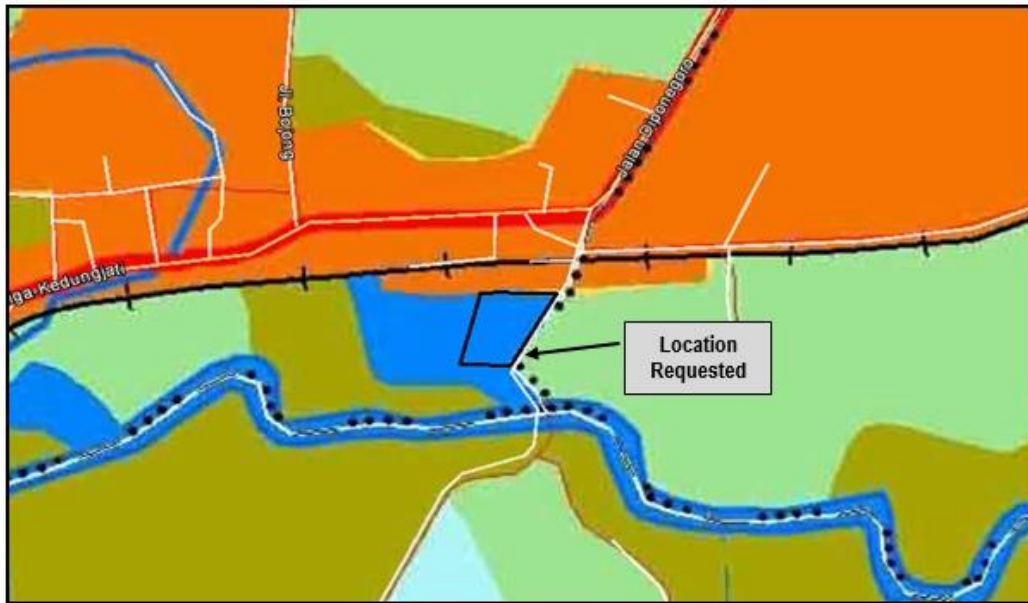


Fig. 5. Spatial Map of Housing Plan Location for Communities Affected in the Railroad Project
 Source: Public Works Agency (2018)

Based on the considerations of members of the Semarang Regency spatial planning coordinating body, plans for housing activities could be given recommendations with the following considerations: (1) the applicant is a railway-reactivation-project-affected person (*Warga Terkena Proyek*, WTP); (2) the certificates owned have the status of Property Rights (*Hak Milik*); (3) plotting of water infiltration in the spatial pattern of Regional Regulation number 6 of 2011 in the location in question is irrational because it is adjacent to the river; (4) space utilization is only for residential houses as needed and (5) maximum land area that can be built is only 500 m². Seo and Kwon (2017), Cesarski (2017), Ogrodowczyk (2015), and Davy (2014) proved that housing shortages were a serious problem in urban areas. The government also encouraged partnerships with communities and the private sector to provide various types of housing (Musa et al., 2015; Seo & Kwon, 2017). This phenomenon showed that the government must be wise in considering the development of affordable housing in each city. Public policy was not just a decision that produced separate activities. However, it was seen as a long series of interconnected activities. It was not solely related to what the government could or could not do, but it involved a number of activities related to the public interest (Dye, 2002). Furthermore, the determined public policies were influenced by socio-economic conditions such as level of education, community income, poverty, quality of life, and competitiveness (Antczak, 2017; Cazacova et al., 2010; Cesarski, 2017; Musa et al., 2015). In Semarang Regency, the interests of the wider community remained an important consideration in making land use policy for housing. The process of implementing spatial planning policies was carried out through socialization and approaches to the community (Nasriaty, 2016).

4.6. Space Utilization in Spatial Planning Area of Crop Farming

The use of space for the housing plan was proposed by Mrs. SB, located in the Genuk Village, West Ungaran District, Semarang Regency, covering an area of ± 1.594 m². Initially, this housing development plan did not get permit from the government. Below is a statement by Mrs. SB as a housing developer.

"The location we are proposing is, indeed, in the area of crop farming allocation. However, based on the Regional Regulation I read for the general provisions of zonation of crop farming

areas, it was stated that the use of space for local residents with low density is allowed in irrigated rice fields on an expanse of land integrated with existing settlements. In line with that, our location is the rice fields that are not irrigated and are an expanse of land integrated with 2 (two) locations with issued Permits for Changing Agricultural Land Use to Non-Agricultural (drying permits), which are currently being used for housing that I am developing. Therefore, considering some of these things, we humbly ask the government to provide a policy, so that our permits may be approved”.

According to Mrs. SB, it was illustrated that the planned housing activities did not get permit to operate because the location was not in accordance with the spatial planning, which should be located in the area of settlement allocation, but the location turned out to be located in the allocation area for crop farming. The following Figure 6 is the location of space utilization.



Fig. 6. Spatial Map of Housing Plan Location in Spatial Planning of Crop Farming
Source: Public Works Agency (2018)

Based on the study of members of the Semarang Regency spatial planning coordinating body, it was concluded that the location was not recommended for housing, but only for public facilities and green open space (*Ruang Terbuka Hijau*, RTH) of housing that had been previously built. This is based on several considerations as follows: (1) for spatial control purpose and preventing the growth of settlements continuously with the reason attached to existing settlements which results in reduced crop farming areas; (2) to pay attention to Article 5 paragraph (2) letter b. of Semarang Regency Regulation Number 6 of 2011 which states that one of the maintenance strategies and the realization of the sustainability of functions and carrying capacity of the environment is by maintaining the function and water infiltration area in all regions and (3) to pay attention to Article 25 of Semarang Regency Regulation Number 6 of 2011 states that West Ungaran District is included in Water Infiltration Areas. Antczak (2017), Cooke and Moon (2015) and McCord et al. (2014) showed that space utilization policies needed to pay attention to urban greening aspects such as parks, streets, green areas in housing, tombs and forests. This policy was believed to be able to support conservation efforts in residential areas. The policy of urban green open space had a positive and significant impact on the selling prices of properties such as housing and apartments (McCord et al., 2014). Therefore, the land use planning needed to involve all stakeholders (McCord et al., 2014; Musa et al., 2015; Seo & Kwon, 2017). Thus, public policy involved a number of activities

involving various parties to produce decisions related to the public interest (Dye, 2002). In Semarang Regency, the land use activities had been regulated provided that there was an obligation to provide green open space of at least 40 % of the land area. The determination of these rules was written in the regional regulations which during the preparation had involved various stakeholders.

4.7. Space Utilization with A Housing Certificate Status

Space utilization for housing development plans proposed by HBS Ltd was located in Leyangan Village, East Ungaran District, Semarang Regency with an area of $\pm 9.910 \text{ m}^2$. Initially, the location request for this housing did not get permit from the government. This is in line with what was stated by Mr. H as a housing developer.

"The location of the housing plan we proposed is partly in the area of plantation planning and partly in the allocation area of crop farming, and it is necessary to get a consideration from the Semarang Regency government. Reading the Regional Regulation number 6 of 2011 concerning zoning provisions for allotment areas for crop farming and plantation planning areas, as far as I know, the use of space for local settlements with low density is permitted. In addition, the certificate of land I have has a Property Right status and housing status of I D and II D".

From the explanation above, Mr. H illustrated that the proposal for the location of the housing did not get a permit because the location was not in accordance with the spatial planning. The following Figure 7 is the location of space utilization.



Fig. 7. Spatial Map of Housing Plan Location on Plantation Allocation Areas with Housing Certificate Status
Source: Public Works Agency (2018)

Based on a study of members of the Semarang Regency spatial planning coordinating body, the proposal could be given recommendations for housing supported with supporting facilities and infrastructure, based on several considerations as follows: (1) the Zoning Provisions for plantation planning areas in Article 63 of Regional Regulation Number 6 of 2011 concerning the SPATIAL PLANS of Semarang Regency in 2011-2031 states that permissible activities are the use of space for local residents with low density and the construction of facilities and infrastructure supporting plantations including agritourism is only allowed on land with slopes of less than 25%

and on an expanse of land integrated with existing settlements; (2) the Zoning Provisions for allotment of crops farming in Article 61 of Regional Regulation Number 6 of 2011 concerning the Spatial Plans of Semarang Regency in 2011-2031 states that permissible activities are the use of space for local residents with low density and the construction of supporting facilities and infrastructure for agriculture including agritourism are only permitted in irrigated rice fields on an expanse of land integrated with the existing settlements; (3) certificates owned consist of 3 certificates with class II D and 1 certificate with class I D; (4) according to the information from the Semarang Regency Land Office, certificates with class I D and II D can be used for housing; (5) restrictions on activities are only at the intended location in accordance with HM (Property Right) certificate Number 1968, 1812, 1850 and 1851 covering an area of $\pm 9.910 \text{ m}^2$ without disrupting farming and plantation activities and (6) to pay attention to the applicable regulations regarding building and environment. Gerber and Hartmann (2017); Holmes (2013) and Janssen-Jansen and Lloyd (2012) proved that the land use policies for housing development could guarantee property rights of each community. Furthermore, this policy was also able to control land allocation for housing development projects (Davy, 2014; Gerber & Hartmann, 2017; Holmes, 2013). In fact, issuing land certificates to build houses often experienced problems with environmental management (Holmes, 2013; Janssen-Jansen & Lloyd, 2012). However, the land use policy was such an alternative to reconcile the issue. In Semarang Regency, the regional regulations governing spatial and regional plans had not been based on field maps and land certificates, so that the state documents, such as the land certificates, were an important consideration in the process of permitting space utilization. Thus, public policy was a number of actions by a person, group or government that provided obstacles as well as opportunities to achieve goals and objectives (Dye, 2002).

4.8. Space Utilization in Plantation Planning Area

Space utilization for housing development plans proposed by Mr. SHD was located in Kalongan Village, East Ungaran District and it was an area of 7.139 m^2 (in a property right status). This location was in a plantation planning area. Initially, the proposal for housing construction did not get permit from the government. Mr. SHD as a housing developer stated that:

"According to the current regional regulations, our housing development plans are in the plantation planning area. Therefore, there needs to be a study and consideration from the local government. Even though we previously had a Property Right certificate, we really hope that the proposal can be approved".

Based on the explanation, Mr. SHD illustrated that the proposal for the planned housing development did not get a permit because the location was not in accordance with the spatial planning. The following Figure 8 is the location of space utilization.

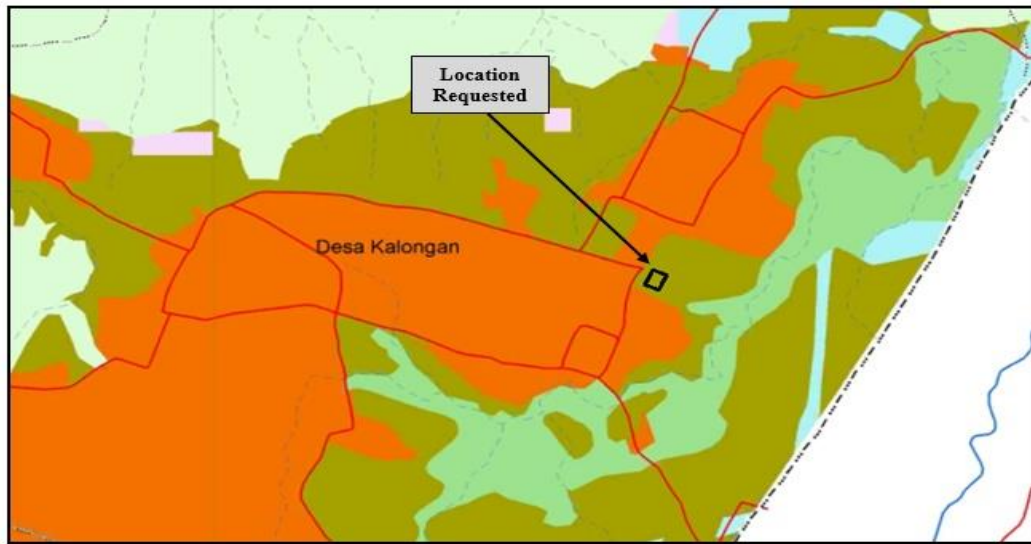


Fig. 8. Spatial Map of Housing Plan Location in Plantation Planning Area

Source: Public Works Agency (2018)

The same thing was also experienced by Mrs. DW whose location was in Kalongan Village, East Ungaran District and it was an area of 12.048 m² (in a Property Right status). This location was in the plantation planning area. Initially, the proposal for housing construction did not get permit from the government. This is in line with what was stated by Mrs. DW as a housing developer.

"Based on the information on the spatial plan we proposed, the plan for our housing location is in the plantation planning area. The Semarang District Government may need to review and consider a number of things. I have great hope for the fulfillment of this request for we also have the Property Right certificates of class II D".

Based on the explanation of Mrs. DW, it was illustrated that the proposal for the planned housing development did not get a permit because the location was not in accordance with the spatial planning. Figure 9 presents the location of space utilization.

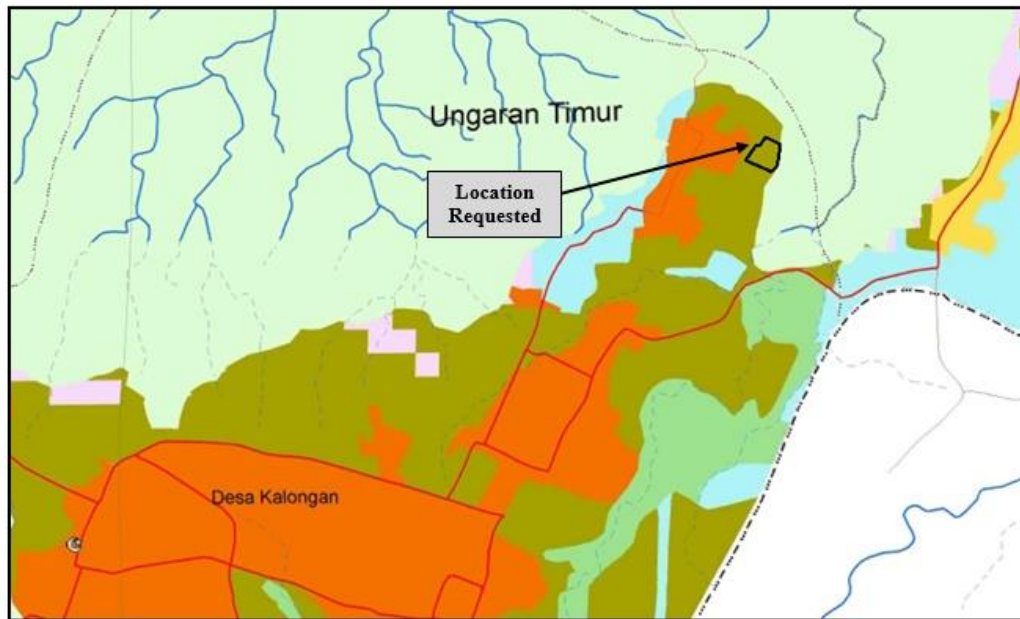


Fig. 9. Spatial Map of Housing Plan Location in Plantation Planning Area

Source: Public Works Agency (2018)

Likewise, there was also a request for location permit from Mr. HM which was located in Candirejo Village, Tuntang Sub-district with a land area of 3.555 m² (in a property right status). This location was in the area of plantation planning ($\pm 85\%$) and rural settlement areas ($\pm 15\%$). Initially, the proposal for housing construction did not get permit from the government. The following is a statement by Mr. HM as a housing developer.

"According to the current regional regulations, our housing development plan is located on a land which is mostly located in the area of plantation planning area and its small portion is in the area of the rural settlement. Normatively, for housing activities, those that are in accordance with the provisions of spatial planning are probably only those that are located in the planning area of rural settlements. Therefore, we hope that there will be studies and considerations from the regional government so that our proposal can be fully approved".

From Mr. HM's description, it was illustrated that the proposal for the housing development plan did not get a permit because the location was mostly not in accordance with the spatial planning. The following Figure 10 is the location of space utilization.

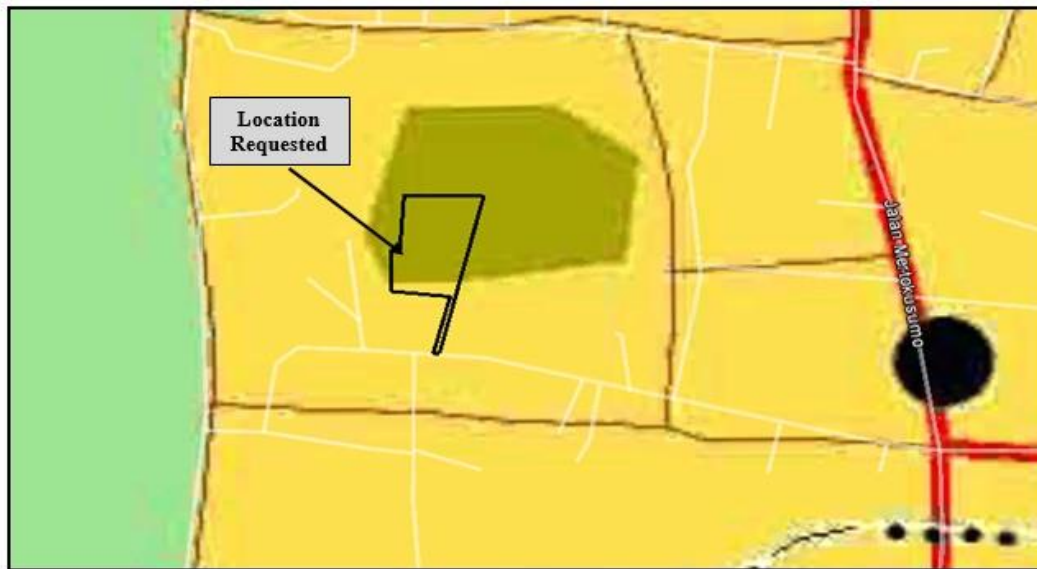


Fig. 10. Spatial Map of Housing Plan Location in the Allocation Area of Plantation and Settlement

Source: Public Works Agency (2018)

According to the consideration of members of the Semarang Regency spatial planning coordinating body, the proposal for a location for housing could be given recommendations by considering that: (1) land status should be in the form of class II D (housing) of Property Right; (2) physical conditions should be in the form of plantations adjacent to existing settlements with land slopes of 8-25% and 15-25%; (3) space utilization for housing is supported with facilities and infrastructure to support the development of urban areas in the East Ungaran District; (4) restrictions on activities are only at the intended location and in accordance with the Property Rights certificate by not interfering with the surrounding plantation activities and (5) to pay attention to the applicable regulations regarding the building and environment. Slightly different from Mr. SHD and Mrs. DW, the proposal for location for Mr. HM's housing could be given a recommendation by considering that the existing conditions should be in the form of plantation and integrated with existing settlements, with a slope of 0-8%. Castañeda and Guerrero (2018), Antczak (2017) and Cazacova et al. (2010) proved that public policy was designed to accelerate economic development and expand access to basic services for the community. However, the implementation of public policies often faced obstacles such as uncontrolled urban expansion, poor management, lack of spatial urban planning systems, and lack of guarantees of community property rights (Antczak, 2017; Gerber & Hartmann, 2017; Holmes, 2013; Janssen- Jansen & Lloyd, 2012). Not all public problems could be a policy problem, only those which could move many people to come to think about and find solutions to the problems they faced. To make public policy to be able to solve public problems, the public problems must be transformed into policy issues. Thus, agenda setting activities were the main requirement for making public problems a policy problem (Dye, 2002). In Semarang Regency, the policy of space utilization for settlements was directed to the eastern region (East Ungaran) to avoid water infiltration areas, most of which were in the western region (West Ungaran). This had been scheduled or stated in the Semarang district midterm development plan of 2016 until 2021.

4.9. Space Utilization in The Vacant Spatial Planning Area Adjacent to The Border of Other City Administration Area

Location proposal for housing activity plan by Mr. JM was located in Candirejo Village, Tuntang District with a land area of 2.313 m² (in a Property Right status and a letter C village). This location was in the vacant allotment area, so that consideration was needed by the regional government whether the process could be continued or not.

Initially, the proposal for housing construction did not get permit from the government. Below is a statement by Mr. JM as a housing developer.

"We obtained information from the relevant agencies that the planned location of the housing that I will build is in the vacant allotment area based on the map of the spatial pattern in the current Regional Regulation. The location is, indeed, adjacent to the administrative area of Salatiga city. Then, I try to get consideration from the local government so that our proposal can be approved".

According to Mr. JM, it was illustrated that the proposal for the housing development plan did not get a permit because it was not in accordance with the spatial regulation, which was included in the vacant allotment area. The following Figure 11 is the space utilization location.

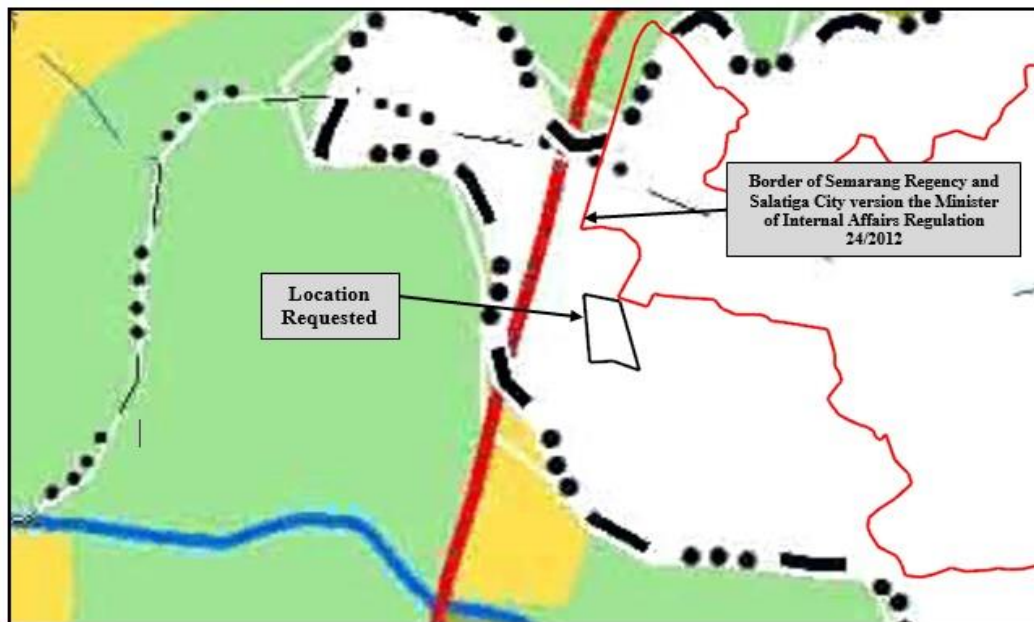


Fig. 11. Spatial Map of Housing Plan Location in the Vacant Spatial Planning Area Close to the Borders of Other City Administration Area
Source: Public Works Agency (2018)

According to a review of members of the Semarang Regency spatial planning coordinating body, the proposals could be given recommendations by considering that: (1) it is in accordance with the delineation of territorial boundaries in Minister of Internal Affairs Regulation (*Permendagri*) Number 24 of 2012 concerning the Administrative Territory Boundary between Salatiga City and Semarang Regency that the overall location of the request is in the administrative area of Semarang Regency; (2) the land is in a status of Property Rights and a C village (certificate from the Land Office of Semarang Regency) with an area of 2.313 m²; (3) the physical condition should be in the form of a yard integrated in a residential environment with a slope of 0-8%; (4) the space utilization for housing is supported with supporting facilities and infrastructure for settlements; (5) restrictions on activities are only at the intended location and in accordance with the Property Rights and a C village covering an area of \pm 2.313 m² and (6) to pay attention to the applicable regulations regarding the building and environment. Cesarski (2017); Davy (2014) and Musa et al. (2015) proved that the political, economic and social dimensions influenced the success of public housing projects in developing countries. In other words, housing and settlement policies were able to facilitate the existing social, political, economic and ecological

relations (Janssen-Jansen & Lloyd, 2012; Cesarski, 2017; Davy, 2014; Musa et al., 2015). Public policy should allow the government to do many things for all community groups. This means that the government could help with their interests and solve the problems they faced (Dye, 2002). If there were spatial issues related to the administration of other cities, the Semarang Regency government would coordinate with the Central Geospatial Information Agency. This indicated that coordination was very important in order to produce beneficial decisions.

Conclusions

Public policy should be made intentionally, because it aims to realize a certain goal. The same thing happened in Semarang Regency, where public policy was used to mediate spatial issues. There were ten proposals for land use permits which were initially not approved. However, the existence of public policy with certain conditions issued by the Semarang Regency government made the ten land use permit proposals approved by the government. Requests for land use permits were submitted by ten housing developers namely Mr. MR, Mr. K, Mr. QA, Mr. AM, Mrs. SB, Mr. H, Mr. SHD, Mrs. DW, Mr. HM, and Mr. JM. This study provide evidence from ten informants there are eight cases as follows space utilization through a land consolidation program, space utilization in a wide & river border area, space utilization in vacant spatial planning area, space utilization for communities affected by railroad project, space utilization in spatial planning area of crop farming, space utilization with a housing certificate status, space utilization in plantation planning area, and space utilization in the vacant spatial planning area adjacent to the border of other city administration area. However, after being considered by the government in terms of public policy, the ten location permits were issued with certain conditions. Thus, it could be concluded that the public policy was essentially designed by the government to guarantee and fulfill the needs of the community in conducting investment activities such as housing developers.

Some of the limitations are the alleged emergence of transaction and negotiation costs, guarantees and settlement of transactions through the market economy. This is based on the assumption that the actors in the institution have a purpose or motive for self-interest while still working behind the government structure (Dye, 2002). In addition, the informants were only based on ten land use location permits that were initially not approved, but the existence of public policies made the ten location permits approved by the government. Future research should be directed at examining the Dye's theory in regulating national housing development. Therefore, further studies need to examine public policy and institutional economics related to spatial planning.

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**Publisher**<http://jssidoi.org/esc/home>**WATER SECURITY AND SUSTAINABLE DEVELOPMENT*****Zineb Moumen ¹, Najiba El Amrani El Idrissi ², Manuela Tvaronavičienė ³, Abderrahim Lahrach ⁴**^{1,4} *Georesources & Environment Laboratory, Faculty of Sciences and Technologies, University of Sidi Mohammed Ben Abdellah, Fès B.P. 2202 – Route d'Imouzzar, Fes, Morocco*² *Signal, systems & component Laboratory, Faculty of Sciences and Technologies, University of Sidi Mohammed Ben Abdellah, Fès B.P. 2202 – Route d'Imouzzar Fes, Morocco*³ *Vilnius Gediminas Technical University, Saulėtekio al. 11, 10223 Vilnius, Lithuania*E-mails: ¹ moumen.zineb@usmba.ac.ma; ² najiba.elamrani@usmba.ac.ma; ³ manuela.tvaronaviciene@vgtu.lt; ⁴ abderrahim.lahrach@usmba.ac.ma*Received 18 May 2019; accepted 25 June 2019; published 15 November 2019*

Abstract. In the realms of Climate change impact, economic and population growth, and pollution, Water security, and sustainable development are paramount, for addressing the food-water-energy nexus and mitigating the impact of the cited drawbacks. The presented paper in the first part, emphasizes water security and sustainable development notions. In 2015 the 2030 agenda were approved by 193 members of the United Nation, it consists of 17 goals (SDG) for environmental sustainability, social inclusion, economic development, peace, justice, good governance, and partnership. The 6th target of SDG is dedicated to clean water and sanitation since it is considered as one of the central focuses of Sustainable Development Goals. The second part is focused on Moroccan's water management plans. This latter elaborate a legal framework for water use, the law n° 36-15 that comprises the protection of human health through the regulation of exploitation, and provision of sanction. The green Morocco Plan (PMV) which aims first to develop modern agriculture aligned with the world global market requirement, and second to eliminate poverty by helping smallholder farming. The 140 dam's that Morocco counts provide strong support to economic growth. However, under the actual uncontrollable changing rate, Morocco is still threatened by low "water security", the access of drinkable water and sanitation services are improved but not totally covered. Moreover, the climate change

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influences the precipitation patterns, in long term this will led to the annihilation of water resources. In this light, Morocco should be more realistic, and adopt the appropriate management strategies, which go hand in hand with the sustainable development goals.

Keywords: water security; sustainable development; Green Morocco Plan; SDG6; Moroccan Dam's policy

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JEL Classifications: Q5; Q53

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1. Introduction

From the starting of civilization evolving, water was not only a source of life but also a root of conflict and annihilation, because of extreme flood and drought. Through history, water trigger several wars, back to the world war II, the U.S bombard the North Vietnamese irrigation canals in the 1960s (Jerome 2015), in 1999s, the people protest against the privatization of water in Cochabamba, Bolivia (Card 2005), and the disobedience in Cape Town, because of insufficient water supply in 2012s (Jerome 2015). In the other hand, the water excess may destroy humanity, a heavily unexpected rain may cause human and economic damages. For instance, in 1993s the Mississippi River overflowed and inundated more than 9.3 million hectares, (Julie Bosman n.d.). According to Munich Re's natural catastrophe database (NatCatService), in Europe during the last 15 years, flash floods and storms have caused economic damages between 1 and 18 billion US dollars per incident. The Elbe and Danube floods in Germany and other parts of Eastern Europe in 2002 and 2013, caused more than 10 billion US dollars of damages (Kottasova et al. n.d.), and according to a recent estimation, the risk of inundation in China is eight times higher than the global average (Feng et al. 2018).

According to the sixth report of intergovernmental panel of climate change (IPCC, 2014), a decrease of up to 20% in rainfall is predicted by the end of this century, and the increase in temperature is expected to reach 2.5 °C to 5.5 °C under the same scenario.

This paper introduces a broad definition of water security and sustainable development, the interaction between them, in the purpose of providing clear grasping of the concept. The second part is focused on Morocco as one of the countries in development that convoy sustainable development goals. It describes the legal framework of water, the role of the dam's policy and emphasizes the green Morocco plan (PMV). The last section points out the gaps in the cited strategies, and provide a recommendation that could be transposable to every country in development.

2. The hydrologic framework of water security

Only 2.5% of the total amount of water available of Earth is fresh water, 45 000Km³/year flow annually through the stream network to the sea (Oki 2006).

Hydrological cycle assure the conservation of the water stock, the rainfall flows perennial and intermittent rivers, and supply groundwaters, the part that falls on the overland and vegetation forms the intercepted rain (Perrin et al.. 2009), the heat of sun energy, raises the water temperature, breaks the intermolecular links and transform it into a gas form (Likens 2013).

The spatial distribution of precipitation is up to the geography and climate dynamics, there are regions with high water cyclicity, where extremes flood and droughts evoke risks of inundation and water scarcity.

The flow is the variation of water volume measured in cubic meter through the time, in another term, it is the circulation speed multiplied by the flowing area, this measure is relevant for the estimation of resident time of water molecule in a specific reservoir, by dividing its volume by the mean flux (Oki 2006), in zones unaffected by anthropogenic activities, the residential time in water stream is around two and a half weeks (Institute of Industrial Science, Japan). In contrast, the recharge rate of groundwater is very slow according to the human time scale, the excessive uses lead to the exhausting of the resource (Oki 2006).

Countries located in areas of high climate contrast (unpredictable floods and extensive drought) suffer from water insecurity. Grey and Sadoff (2007) emphasize the relation between hydrologic legacy and poverty rate, the study claims that countries which have an “easy” hydrologic legacy reach water security and have a high economic growth, in contrast, those with “difficult” hydrologic legacy are considered poor. This assumption is supported by Brown & Lall (2006), who claim that high rainfall variability is statistically associated with lower capita incomes.

Certain aquifers or rivers could be shared between two or more countries, the world counts 263 transboundary rivers and 300 transboundary aquifers. For instance, Nile river is shared between Burundi, Central African, Republic, Egypt, Hala'ib triangle, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Abyei, South Sudan, United Republic of Tanzania, Uganda, Dem, and Republic of the Congo (Ntem and Melvin n.d.). The excessive use, the depletion, the pollution, the growing demand for water supply, imperil these shared resources and cause political and social conflict. 1948 Know 37 warfare about water (Thematic et al. n.d.), in the endeavor of resolving this encompassing issue, 295 international water agreement was signed (UNECE water convention, the legal framework for transboundary water cooperation ..) (Analysis n.d.).

3. Water security

Depending on the context and disciplinary perspectives on water use, the definition of “water security” that first emerged in the 1990s differs (Cook and Bakker 2012), it is a coupled human-water system (Srinivasan et al. 2017) and a concept that provides a common language for all parties and components involved in water management (Arriens 2014), In the framework of UNESCO’s International Hydrological Program’s (IHP) Strategic Plan, Water Security was globally defined as **the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability**(Shrestha S, Aihara Y 2018). This implies that water security is a cycle with the implication of multiple interconnected and interdependent sectors or dimensions (hydrologic, geographic, economic, environmental, social, political, legal, financial...etc.) at local, national, regional, and global scales.

Water security concept is multidimensional, according to Van Beek and Arriens (2016), Falkenmark (2001) in his paper clarify the importance of bridging water security, with food and environmental security, as a major key to reach the sustainable development. Three key ones are to be considered – social equity, environmental sustainability, and economic efficiency (Table 1, Table 2).

Table 1. Economic, Social, Environmental dimension of water security

| Economic dimension | Social dimension | Environmental dimension |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • increasing water productivity and conservation in all water-using sectors • sharing economic, social, and environmental benefits in managing transboundary rivers, lakes, and aquifers. | <ul style="list-style-type: none"> • ensuring equitable access to water services and resources for all through robust policies and legal frameworks at all levels • building resilience in communities in the face of extreme water events through both hard and soft measures. | <ul style="list-style-type: none"> • managing water sustainably as part of a green economy • restoring ecosystem services in river basins to improve river health |

Source: Thematic, Waters et al. (2013)

To assess water security at regional scale so many indexes were developed, some of them can be described in the table below; while these indicators are helpful, they are limited and don't take in consideration a lot of important dimensions.

Table 2. Economic, Social, Environmental dimension of water security

| Index | Meaning | Framework | developers |
|-------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| NWSI | the national water security index (NWSI) | a national framework of water security measure applied to compare nations' water security performance in Asia and the Pacific region, The NWSI has five key dimensions: household, economic, urban, and environmental security and resilience to water-related disaster. | Asian development (ADB, 2016). |
| WII | water insecurity index | It was applied on a regional scale in India and consisted of six key dimensions: resource, access, consumption, capacity, environment, and climatic stress | Aggarwal, Punhani, and Kher (2014) |

The concept of water shortage was quantifying first by Falkenmark in 1989, by developing the water crowding index, using a threshold value of water scarcity level, the critical limit occurs when the index is low to meet people's water needs ($<1700 \text{ m}^3 \text{ cap}^{-1} \text{ yr}^{-1}$) (Falkenmark et al 1997). The crowding index was the stepping stone of the evolving of water stress indicators, (Raskin et al 1997), (Vörösmarty et al 2000), (Oki et al 2001), and (Alcamo et al 2003) develop other water stress indicator. The critical ratio compares the annual amount of available fresh water to withdrawal water (Alcamo et al 1997, 2000), (Klepper and van Dreht 1998) develop a "water satisfaction ratio", (Douglas et al 2006) worked on the 'relative water stress index'. All the above index converges to the same result, water stress is high when the used ration is superior to 0.4.

However, these indicators did not include the interaction between human and ecosystem (Cook and Bakker 2012).

Water resource faces other pressures, such as mismanagement, depletion, population, economic growth, and climate change impact, thus, the evolving of indicators that express better the relation between human-water-ecosystem is crucial for a better grasp and then management (Gain et al. 2016).

(Vörösmarty & al 2010) work on biophysical indicators to assess water security, (Lautze and Manthritilake 2012) add the human dimension and assess water security in 46 Asian countries, (Gain et al. 2016) figure out the gap in the listed studies by providing the first global-scale assessment of water security, by the virtue of multi-criteria analysis, the study conceptualize the security term in 4 majors part, each one is assessed by specific index (Fig. 1.), and gather them into one normalized unique index.

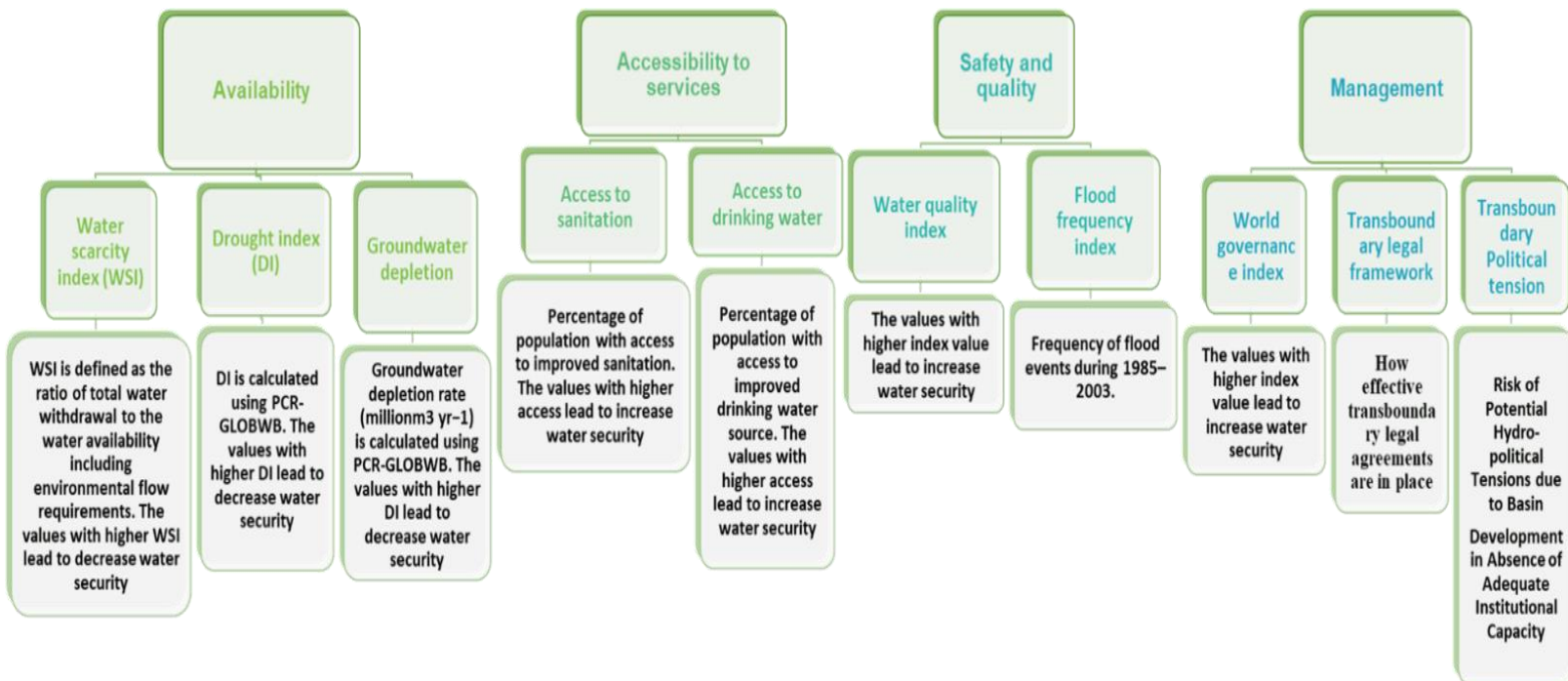


Figure 1. Water security global indicators

Source: Gain et al 2016

5. Sustainable development

The concept of sustainable development was first introduced in 1987 in the Report of the World Commission on Environment and Development called “our common future” as a “**development that meets the needs of the present without compromising the ability of future generations to meet their own needs**” (UN 1987). Sustainable Development (SD) is usually described as a three-dimension concept; environmental, economic and social (Giddings, Hopwood, & O’Brien, 2002). For a world called “sustainable”, this concept must be achieved in all these dimensions.

A sustainable environment can be attained by reserving, improving and valuing the environment and natural resources in the long term, maintaining the major ecological balances, on the risks and on the environmental

impacts. A sustainable society can be maintained if it satisfies human needs and meet a social goal, by encouraging the participation of all social groups in health, housing, consumption, education, employment, culture.... etc., and finally a sustainable economy that aims for a developing growth and economic efficiency through sustainable production and consumption patterns (UN 1987).

In 2000 the United Nations started the first steps by setting 8 original Millennium Development Goals (MDGs) to be achieved by 2015, to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases, ensure environmental sustainability, and develop a global partnership for development. In September 2015 The Sustainable Development Goals (SDGs) were approved by the 193 UN Member States and are also known as Agenda 2030 (Transforming our World: the 2030 Agenda for Sustainable Development). The framework consists of 17 goals for environmental sustainability, social inclusion, economic development, peace, justice, good governance and partnership, the main issues for the world population in the 21st century. Each goal has several targets that better define its aims. While the MDGs aimed to reduce the existing issues mostly in under/developing countries by half, the new set of goals were set to eliminate them and has all countries as target (Sustainability Science 2018), and according to the agenda are **“integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental (UN 2015).**

Since water resources are embedded in all forms of development, Water is considered as one of the central focuses of Sustainable Development Goals, as it is at the heart of sustainable development and is critical for socio-economic development, energy and food production, healthy ecosystems and human survival (UN 2018), The UN entirely distinguishes the importance of managing water for sustainable development, and the need for the water and water-using sectors to collaborate and wisely use the world's limited water resources.

The SDG 6 namely sustainable water and sanitation for all, is allocated to water and comprises 11 global indicators, to track the progress.

5. Morocco between water insecurity and management strategies

Morocco is a northwest African country, cover an area of 710,850 km², the agricultural land represents 25 %, 80% of the total surface of the country receive less than 250 mm/year of rain (Africa et al. 2014), 80% evaporated and 0.6% is intercepted or infiltrated, the remained part is used for industry, irrigation and human consumption (Fig. 2.) (AQUASTAT). According to 2017 census, the population is 35 M. The total yield of water is estimated by 22 Md m³ (Africa et al. 2014), world water problems are downscaled on Moroccan scale, the resource is rare especially in the South and the South-eastern because of arid climate conditions, unequally distributed in space and time, facing a growing demand and climate change impact (Africa et al. 2014).

The historical analysis of the hydrologic series data showed that morocco recorded during the last decencies, more than 20 dry periods (Africa et al. 2014), between 1982-1983 the water deficit in Ziziguir watershed reach minus 80 mm, In 1995 the deficit was almost minus 100 mm in Loukous.

The frequency analysis of the chronologic data point out that the risk of drought is increasing from 5 years in 40 years (1940-1979) to 4 years over 10 (1996-2006) (Africa et al. 2014)

These droughts have a direct impact on water supply and water ued for irrigation, for instance, in Tangier, there was a restriction of nearly 50% between 1993 and 1995, the deficit in the water allocated for irrigation rise from 16% to 90% between 1994-1995 (Africa et al. 2014).

According to **the UN Intergovernmental Panel on Climate Change** (IPCC), Morocco is a “very vulnerable” country concerning climate change effect, the average temperatures are predicted to increase by 1 to 1,5°, respectively Annual precipitation will decrease (IPCC 2014), In the 2050s, people living in urbanized area will face problem with access to water and food (Global Nexus 2017).

The three major sources of water pollution in Morocco are; municipal wastewater discharge, industrial effluents, and agricultural activities, urban area generate around 500 m³/year of wastewater, and it may reach 900 m³ in 2020. The high salinity and nitrate concentration affect the underground water, streams are generally contaminated by phosphorus, ammonia, organic matters, and high coliform counts. This polluted water is directly discharged to a natural water body, for example, Sebou watershed which constitutes 29% of Moroccan water resources is heavily polluted by nitrates, phosphorus and pesticide residues (World Bank group, 2012), see Fig. 2.

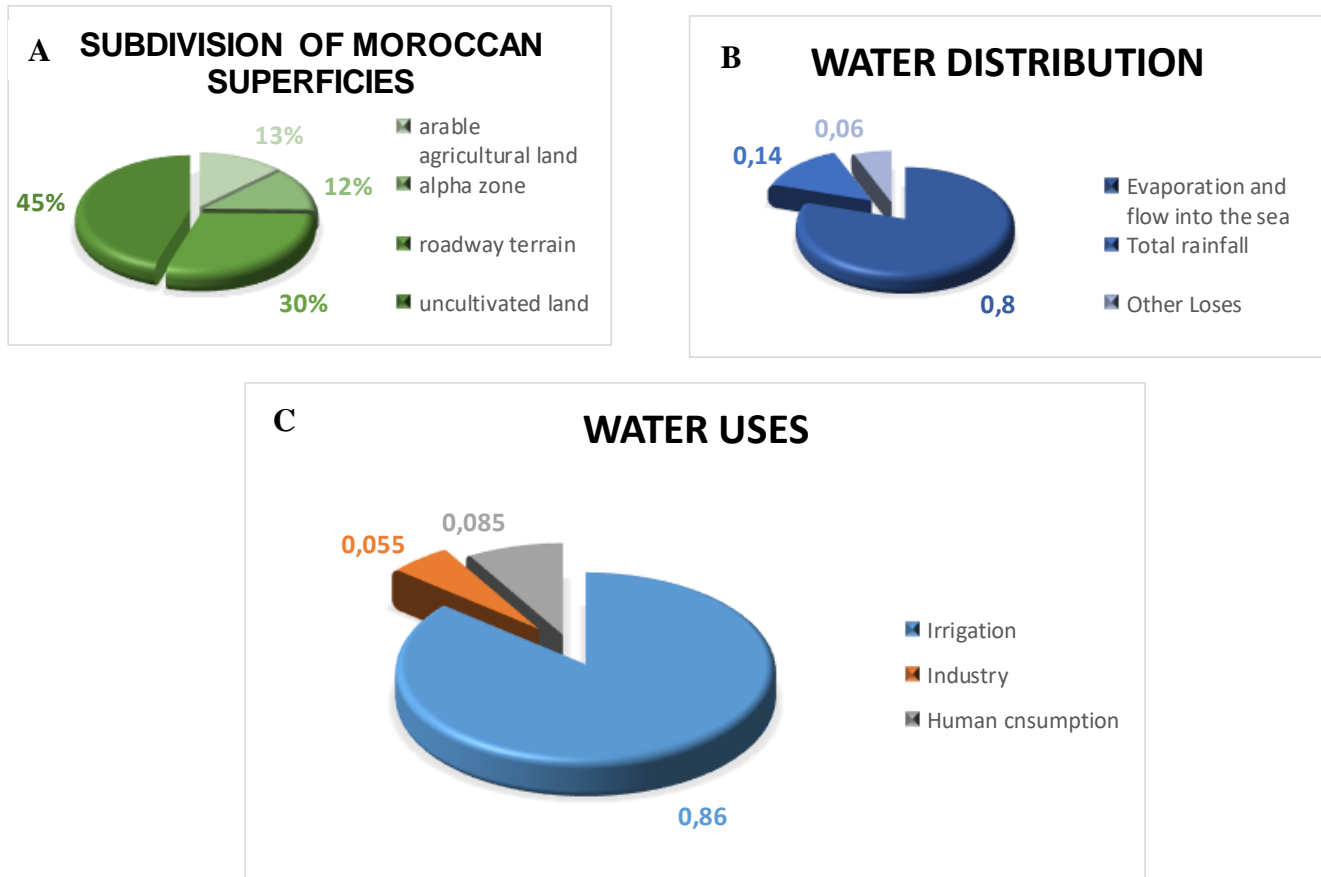


Figure 2. A subdivision of the Moroccan area, B: percentage of water loses from the total rainfall, C: Moroccan water uses.

Source A: (Africa et al. 2014), B C: AQUAQATAT

5. Water law in Morocco and the policy of dams

The water legislation framework in the country starts first with the Islamic laws, which incite rational management and the equitable sharing of the resource. During the French protectorate, the government put all the resources under the government authority, and in 1925, they adopt a law that defines the public ownership of water and defines the conditions of water use for irrigation and other purposes (A. Laamari, M. Boughlala, A. Herzenni et al. 2011). The independence era marks the green revolution when Morocco oriented the economic growth toward the evolvement of the agricultural sector, by adopting the revolutionary **dam's policy**. In the 1990s the government passed the Water Law of 1995 (Law 10/95), which, integrate and coordinate the allocation and management of all water sources, also create 6 river basin agencies in order to decentralize water institutional reforms (A. Laamari, M. Boughlala, A. Herzenni et al. 2011). The law 10-95 of 1995 was promulgated in October 2016, and become 36-15 this later has 12 chapter and 163 articles (Fig. 3).

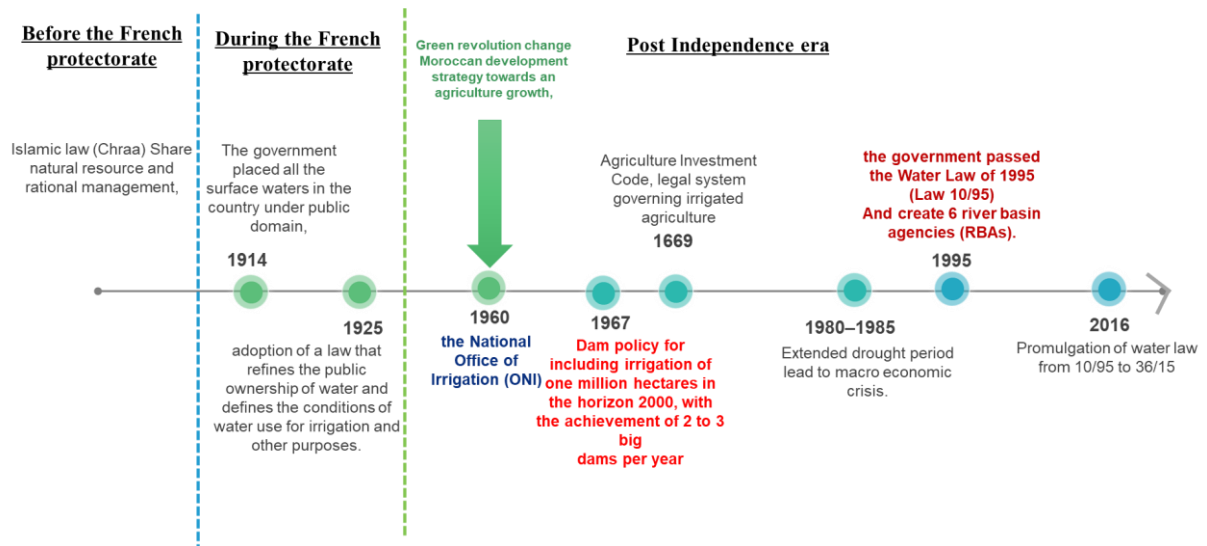


Figure 3. Water law timeline

Source: all the information in the scheme are in the following reference (A. Laamari, M. Boughlala, A. Herzenni et al. 2011) & (Dahir n°1-16-113 du 6 kaada 1437 portant promulgation de la loi n°36-15 relative à l'eau. 2016)

The law 36-15 includes cooperation between users and the public authorities, aims to protect human health through the regulation of exploitation, distribution and sale of drinkable waters, provision for sanctions and the regulation of activities that may pollute water resources (Dahir n°1-16-113 du 6 kaada 1437 portant promulgation de la Loi n°36-15 relative à l'eau. 2016).

In addition to water laws, the policy of dams is one of the most effective and decent management strategies that Morocco adopt, it includes solutions for a set of critical drawbacks, and gives strong support to the economic growth. Now, Morocco counts 140 large dams, with a global capacity higher than milliards cubic meters, 13 are used for water transfer with a capacity of 200m³ /s, length 1100 km and a volume of 2.5 billion m³ / year (El and Directeur 2016), see Fig 4 and Fig. 5.

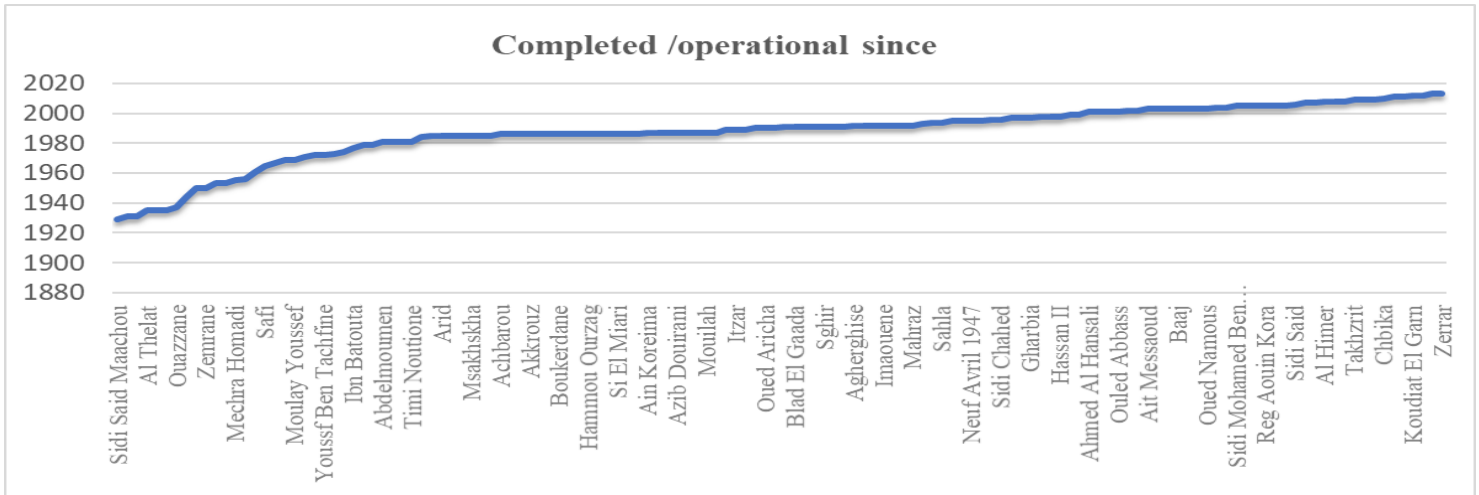


Figure 4. Operational date of large dams in Morocco

Source: Aquastat

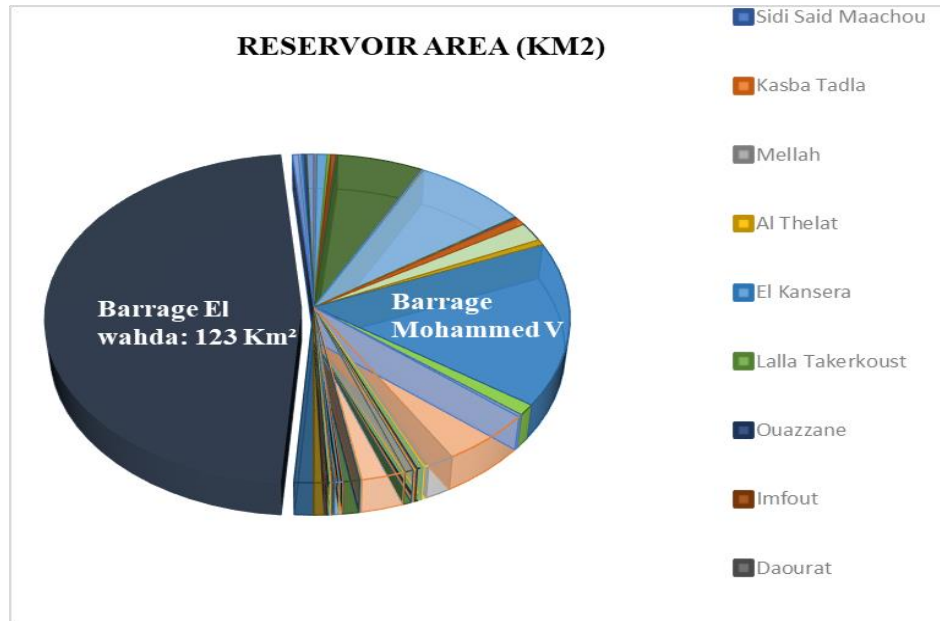


Figure 5. Reservoir area in km²

Source: Aquastat

Table 3. Dams' benefices in drinkable water, irrigation, energy, drought and flood mitigation.

| Drinkable water | Irrigation | Energy | Drought and flood mitigation |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dams satisfy 66% of the drinkable and industrial agglomerations water needs, this rate is predicted to reach 80% in 2020. | 1500,000 hectares are irrigated from dams. | Current hydroelectric productivity is around 2.750 GWh / year, Hydroelectric power represents 10% of total electricity production and will have to reach 14% by the year 2020 | the management of 160 sites vulnerable to flooding by dam construction. The lamination rate is high (100% in Abdelmoumen dam, 90.5 for Youssef ben each fin) |

Source: (El and Directeur 2016)

The policy has a significant result concerning the above beneficiary sectors, the drinkable water and sanitation services in both rural and urban areas have increased, more than 50% of the total population have access to drinkable water and safely managed to basic sanitation service, (Fig. 6. and Fig. 7.). In the 2030s it is predicted to provide drinkable water and good sanitation services to the total population, which aligned with the 6th sustainable development goal.

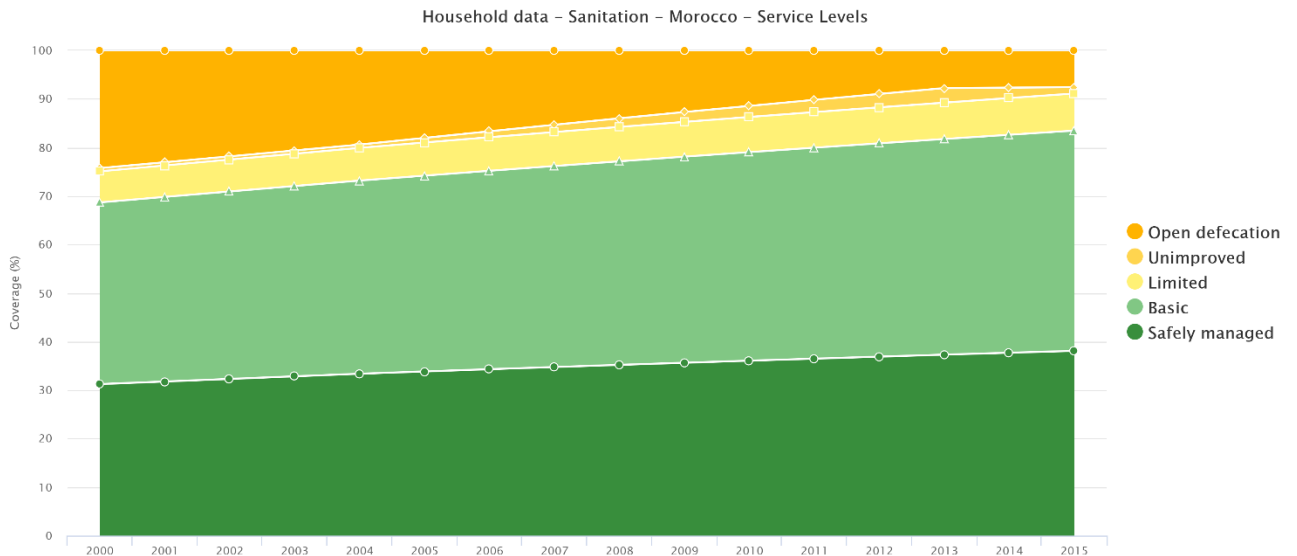


Figure 6. The variation of sanitation rate in Morocco from 200 to 2015

Source: Household data

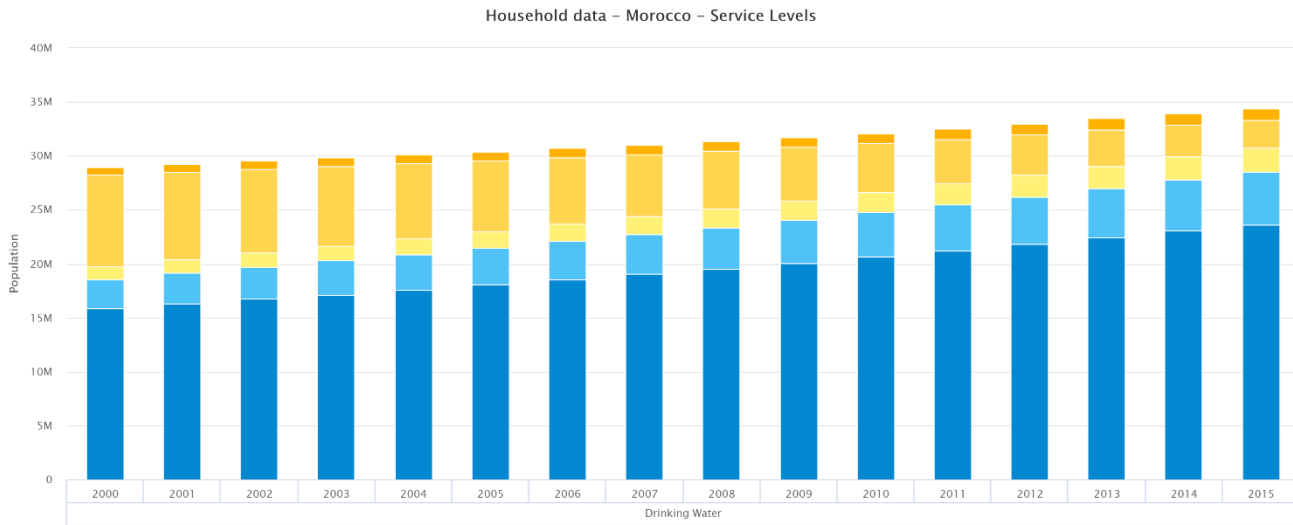


Figure 7. The variation of drinkable water in Morocco from 2000 to 2015

Source: Household data

6. Green Morocco Plan (PMV)

The Green Morocco Plan (PMV) aims to accelerate growth, reduce poverty and ensure the long-term sustainability of agriculture (Ministry of Agriculture and Maritime Fisheries 2016).

The plan has two pillars (Ministry of Agriculture and Maritime Fisheries 2016):

Pillar I

Aims to develop modern agriculture, market-oriented, with strong competitiveness, develop a new market in the USA, Russia, Asia, and encourage private investment through aggregation. This latter form is based on a double contracting, the aggregators should sign a contract with Morocco and with operators, this strategies mobilize 75 billion dirhams³ of investments over ten years, and benefit 540.000 farmers (Aksebi 2012).

Pillar II:

The targets of this approach are the elimination of poverty by improving the performance of smallholder farming (around 560,000 farmers), specifically those living in the marginalized area, and this through three social projects (Aksebi 2012);

- Reconversion projects that aim to switch from cereals to higher value products and less sensitive to water deficit, such as olive trees, almond trees, carob trees, cacti...

- Diversification project and augmentation of territory product.

- Intensification project is concentrated on the supervising of farmers and providing the decent in order to enhance the yield and raise the production rate.

The National Irrigation water saving program (PNEEI) aims to reduce water stress since it is the main limiting factor to the improvement of agricultural productivity. This program consists of conversion to localized irrigation over an area of nearly 550,000 hectares; an average equipment rate of nearly 55,000 ha/year (Ministry of Agriculture and Maritime Fisheries 2016).

In addition to drip irrigation, Morocco adopt other strategies for dealing with water stress issues, for example

- The rainwater harvesting method based on the collection of water rain using different technics (Hasnaoui 2011), this later is legally managed by the decrees number 2-97-224 of 24/10/1997.

Soil composting help protecting the environment and especially water from the toxic substances impact, improving soil fertility and then agricultural productivity, reduce plant's pelt, the liquid extracted from the composting is used in drip irrigation (LABIDI 2016) and (Azin khalid, INRA d'agadir).

Conclusions

The water, food, energy, and ecosystems complex are a dynamic system in which there is plenty of interactions. Water is the source of life and energy, which are crucial for food production, the food is the basic element that maintains the ecosystem equilibrium. In contemporary society, energy is used for the water treatment process, groundwater extraction, and food production...

Regarding the environmental problems that the world face, the United Nation define 17 sustainable. Water is included in all forms of development, since it is the central focuses of Sustainable Development Goals, as it is at the heart of sustainable development and is crucial for socio-economic development, energy, and food production, healthy ecosystems and human survival (UN 2018).

Morocco is one of the countries the most threatened by climate change impact (IPCC) and water stress scarcity (Gain et al. 2016). Dam's policy and green morocco plan help the country to overlap issues related to water supply, increase the food security, decrease intern and extern migration, avoid the population centralization in big Cities, reduce social problems such as ignorance and poverty, provide a good life quality, However, it still facing problems, since the stress is still increasing, also the drip irrigation does not assure a strong production growth (Tanouti 2017), (Alonso et al. 2019).

In addition, the pesticide used to eliminate plant pelts help the growth of the agriculture productivity, but in other hand is not aligned with the ecosystem protection notion, the excessive uses of such product, halt the biodiversity and has a harmful sequel on human health, such as the deployment of cancers. The agricultural policy should be oriented toward a biologic production which respects the compromise between human benefice and ecosystems requirement since humankind is a part of the ecosystems and not the master of it.

Also, Morocco should integrate all dimension of sustainability and combine the economic progress with environment protection, by involving public and semi-public authorities (National office of drinkable water), privates companies for the elaboration of technical studies, International development institution (World Bank) and the most important invest in the scientific research which help providing advanced tools in terms of water management. For instance, build a national database including all the necessary information about soil, land use and land cover, hydrology..., these data could be introduced in mathematical tools for modeling, the obtaining results serve the decision makers to define the appropriate management strategies and help ecosystems to build a strong resilience capacity against climate change and natural hazard risks.

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COMMUNITY PARTICIPATION IN REGIONAL TOURISM DEVELOPMENT: A CASE STUDY IN NORTH HALMAHERA REGENCY - INDONESIA *

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Abstract. This study aims to describe the community participation in regional tourism development from the perspective of Arnstein's theory through ladder of participation in Pitu Beach as the top Tourist Destination of North Halmahera Regency, Indonesia. The primary data used in this study were obtained from the representatives of local government (district-subdistrict-village), youth organization, local entrepreneur community and stakeholders who involved in regional tourism development of North Halmahera. While the secondary data were obtained from the Public Works Office of North Halmahera Regency. The results show that community participation in regional tourism development showed the existence of the control society in tourism planning, implementing and evaluating the development program. Thus it could be proofed that community-based tourism approach had been successfully implemented in the context of North Halmahera, Indonesia.

Keywords: community participation; regional tourism development; North Halmahera Regency

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1. Introduction

The tourism sector influenced economic development in Indonesia. The development of tourism sector in relation to regional economic growth could be seen from the increased income, employment and business opportunities (Dritasto & Anggraeni, 2013; Latiff & Imm, 2015; Subanti *et al.*, 2017; Sarmidi & Salleh, 2011; Kasimu *et al.*, 2012; Li *et al.*, 2013). Similarly, Darsini and Darsana (2014) pointed about the influence of tourist visit to the absorption of labor artshop business in the area of Nusa Dua, Indonesia. Pertiwi (2014) also showed that the number of tourist arrivals, tourist attraction fees, hotel and restaurant taxes have a significant effect on Local Own Revenue. Tourism was not only perceived on the economic aspect but on the environmental, social and cultural

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aspects (Arieta, 2010; Mohamad *et al.*, 2014). In the Structural Path Analysis (SPA) approach, the impact of changes in tourist spending affected the household income in Indonesia (Saptutyningsih, 2003). This suggested that the development of tourism sector in Indonesia, particularly at the province and district. It could affect the household income level, increased employment and business opportunities through community-based tourism.

A model of community-based tourism started since 1970 as a response to the negative impact of mass tourism development model in international level (Zapta *et al.*, 2011). The development of community-based tourism had a relationship with the small community of villagers and the conservation of the environment through the concept of ecotourism as well as managerial model. Community based tourism approach could be seen from the utilization of the village potential in the tourism sector. Susyanti (2014) showed that the utilization of the rural villages potential in tourism could be done by empowering communities as perpetrators of tourism in the village. On the other hand, Caroline (2006) showed that there was a participation of fishermen in the management of tourism.

The study about the development of tourism in the border region of eastern Indonesia especially on the implementation of community-based tourism in the context of rural communities in the coastal area were still limited as well as the impact itself. Further than that, study of public participation in the development of tourism could provide an overview of the social and cultural situation of the rural communities as well as the coastal regions of the eastern border of Indonesia. Furthermore, Sihasale (2013) explained the biodiversity in the coastal area of the city of Ambon as well as the consequences of coastal tourism development discussed about the consequences of the utilization of natural resources for tourism activities. In addition, Butarbutar and Soemarno (2013) also discussed the influence of tourist activity against plant diversity in Sulawesi. Both showed the social and cultural context from different community even though from the same part of the eastern region of Indonesia. This suggested that the study of the implementation of community-based tourism in the border region of eastern Indonesia needed to be done to examine the dynamics of coastal and rural communities in exploiting the potential of the village through the tourism.

Community-based tourism in the border region of eastern Indonesia were still on the early stages of development. Regional tourism development program still dominated by the role of local governments. Furthermore, economic development in the tourism particularly in Bunaken Island, North Sulawesi, were still dominated by a small and micro enterprise nautical tourism primary, secondary and tertiary such as rental diving equipment, catamaran boat rentals, homestays, souvenirs and food sellers, tour guide, and cottages, hotels, restaurants and boat owners (Friliyantini *et al.*, 2011). Even so, Knights (2009) showed that there was a strategy-based ecotourism development of the local economy that could be implemented to strengthen the economy in the countryside at the same time alleviated the poverty. This meant that a strategy for the implementation of community-based tourism approach could be implemented according to the context of border region of eastern Indonesia.

Community-based tourism development was a model of community participation. In the dynamics of participation, there was a difference of shape and degree of the community participation in accordance with the context of the social and cultural environment (Moyo & Tichaawa, 2017). According to Yuliane (2015), the form of public participation in Tegallalang slender stones was active participation based on the initiative to develop and manage tourism attraction. On the other hand, Muallisin (2007) suggested a form of community participation in tourism of Prawirotaman was the Village to support the program of community-based tourism development planning so that it became an international village. The community also participated by supporting the tourism businesses such as budget class hotels, cafes, art shops and money changers. In addition, the local community participated in the evaluation process to review the community who had not organized yet in tourism development program such as batik artisans and dance class. This indicated that the context of the social environment and culture affected the dynamics of community participation in tourism development (Pharino & Leawpenwong, 2015).

Implementation of community-based tourism approach in the border region of eastern Indonesia could be seen from the dynamics of tourism development of North Halmahera Regency. North Halmahera Regency located in the border area between Indonesia and the Philippines. Most of the rural areas of North Halmahera Regency were some coastal villages and a few of small islands. The potential of marine tourism became the potential of village economy that could be developed to increase the income and employment opportunities. One of the villages that successfully developed the tourism sector in North Halmahera is Pitu village. Pitu village was located in Central Tobelo Subdistrict, North Halmahera Regency. BUMDes "Pitu Marahai" known as local government enterprise. The local government of Pitu village utilized the tourism sector as a main product managed by BUMDes "Pitu Marahai". In addition, all facilities such as local restaurants, tourist vehicle parking area and other tourism facilities were available at the site. The development of Pitu Beach attractions was inseparable from the participation of the community in planning, implementing and evaluating the tourism program. In addition, the partnership formed between local government BUMDes "Pitu Marahai", youth organization "Karang Taruna" and local communities were able to create a safe and comfortable conditions for tourists according to the concept of seven charm (*sapta pesona*). This study aimed to describe the community participation in regional tourism development from the perspective of Arnstein's theory through ladder of participation in Pitu Beach as the top Tourist Destination of North Halmahera Regency, Indonesia.

2. Theoretical background and literature review

Arnstein (1969) stated that the community participation was identical with the citizen power. Community participation was stratified by the gradations of power that could be seen in the decision-making process, and the implementation until the evaluation stages. Furthermore, Cohen and Uphoff (1979) divided the participation into several stages: the decision-making phase, which was manifested by community participation in meetings. The decision-making phase in question was on planning and implementing a program. The next stage was the implementation stage, which was the most important stage in the development. The real form of participation at this stage was classified into three, in the form of thought contributions, material, and also action as the project members. Another stage was evaluation phase. It was considered important because the community participation at this stage was a feedback that could provide input for improving the implementation of the next project. The last stage was the stage of enjoying the results, which could be an indicator of the success from the community participation at the planning stage and implementing the project. In addition, the more position of the community as the subject of development the greater the project benefits were felt. It indicated the project was successful on the target. Meanwhile, the participation rate according to Arnstein (1969) consisted of eight levels such as manipulation, therapy, informing, consultation, placation, partnership, delegated power and citizen control. On the other hand, the community participation illustrated how a redistribution of power between the activity providers and the group of beneficiaries occurs, as in table 1 below.

Table 1. Level of Community Participation by Arnstein (1969)

| Number | Ladder of Participation | The Nature of Equality | Depth of Power Sharing |
|--------|-------------------------|----------------------------------------------------------------|--------------------------------------------------|
| 1 | Manipulation | Game by Government | No participation |
| 2 | Therapy | Just so that the People are not angry / socialization | |
| 3 | Informing | Just a one-way notification / socialization | |
| 4 | Consultation | Society heard, but not always used his advice | Tokenism / just justification to look convincing |
| 5 | Placation | Community suggestions are accepted but not always used or used | |
| 6 | Partnership | Reciprocity negotiated | Level of Power is in the Society |
| 7 | Delegated Power | Communities are given the power (part or all of the program) | |
| 8 | Citizen Control | Fully controlled by the society | |

Source: Rosyida and Nasdian (2011)

The table showed that the level of community participation in development varies. At the participation level of manipulation and therapy, gave the picture of the conditions under the development that was fully regulated and implemented by the government or the conditions where the development was just done so that people were not angry. Furthermore, the level of notification, consultation and placation showed the conditions under the development that was a mere socialization, or community aspirations were heard but not always used, or accepted but not implemented. Meanwhile, the next levels of participation were partnership, delegation of power and control of society. There was mutual reciprocity between the government and the community, even the community was given the power of a part or the whole program and was fully controlled by the community. This was the level of participation that reflected power in society.

Research on participation in tourism development had been done before, but participation level analysis was still done in general. As shown by San (2016) that the participation level of the villagers in Kutuh Village to seven levels which were the level of manipulation (providing information and opportunities to participate in decision making or program execution), informative (quickly getting information about something that happened) (taking part in the formulation of the program implementation policies prior to consultation with the other stakeholders), interactive (directly involved in the program implementation), incentives (donating personnel and earning wages in the process of making facilities, cleaning and pandawa beach gathering), functional (local decision-making by the pandawa coastal team) and initiatives (the community undertakes clean-up activities on their own initiative without the encouragement of others).

Taking that into consideration, this study described the level of participation at each stage of development from the tourism planning, tourism implementation and enjoyment stages up to the evaluation stages. The idea derived from previous research about community participation in regional tourism development. Effective community engagement strategies required project managers to adopt trust-building strategies in projects early and an intimate understanding of community concerns and social structures (Teo & Loosemore, 2017; Leisher *et al.*, 2012; Partington & Totten, 2012). Thus, it could be known in tourism context, the level of participation in community based tourism practices of previous research still focus on tourism planning (Priskin, 2003; Reggers *et al.*, 2016; Idzak *et al.*, 2015; Bonzanigo *et al.*, 2016), development or implementation process (Stewart *et al.*, 2016; Abdillah, 2014) and evaluation stages (Zhuang *et al.*, 2014). This research described every level of community participation in tourism planning until evaluation stages and discussed with the previous research.

3. Methodology

This study used a qualitative approach with a case study strategy (Yin, 2003). North Halmahera has a very favorable geographical location, including: (1) being close to Morotai Island as the Ten Top Tourism Destination in Indonesia, (2) located in a border area of Indonesia and Philippine (3) having easy access in the form of Manado and Ternate which facilitates the transportation of goods from production centers to seaports and airports; and (4) having competitive advantages in the form of tourism destination with Ternate (Spices Island), Bunaken (Coral Reef), and Raja Ampat (Archipelago) as the Top Tourism Destination. Although it is necessary to pay attention to Regional Tourism Development Masterplan and North Halmahera Regency Regional Regulation Number 9 of 2012 concerning the existing tourism spatial planning. The types of data used in this study were primary and secondary data. The primary data was obtained from the representatives of local government (district-subdistrict-village), youth organization, local entrepreneur community and stakeholders who involved in regional tourism development of North Halmahera. While the secondary data were obtained from the Public Works Office of North Halmahera Regency. The determination of informants was based on the consideration that they experienced and were involved in regional tourism development process (tourism planning, implementation and evaluation of Pitu Beach Development as North Halmahera's top Tourism Destination). The collected data was then analyzed by descriptive analysis techniques.

4. Results and Discussion

4.1 Community Participation in Tourism Planning

Community participation in tourism planning process provided an opportunity to the public to convey ideas and expectations associated with the development of tourism so that the tourism development program implemented was able to answer the needs of the local communities (Madiun *et al.*, 2012; Dragouni *et al.*, 2016; Dragouni *et al.*, 2017; Wray, 2011). Tourism planning process discussed deliberations on the development plan called *Musrembang* in 2016. The government of Pitu village were mapping a business location for the local people. After doing the mapping, the government along with BUMDes "*Pitu Marahai*" announced it to the public and provided the opportunities to complete the requirement. The local community support the program and signed up accordance to the announcement. The community were able to determine the business type based on respective interests. The planning for tourism development related to security, order, cleanliness, tranquility, beauty, hospitality, memories. Councilor along with BUMDes "*Pitu Marahai*" coordinated with youth organization "*Karang Taruna*" and people who had registered as an entrepreneur to maintain security, prevent the occurrence of conflicts mainly due liquor. In addition, to maintain cleanliness, freshness and beauty on the attractions site, the local government were planning to employ a janitor and environmental officer transport garbage. With regard to creating an atmosphere that was cool, the local government were planning to build a village of shelter and plant a tree at the edge of the beach. Now, the efforts to establish a good relationship between the communities involved as employers around tourist attraction with tourists visiting the village, the government directed and reminded everyone to be friendly towards customers and established a good communication between the host and the visitors (Saputra & Nugroho, 2017).

In order to leave the good memories for the tourists, the local government with BUMDes "*Pitu Marahai*" heavily relied on the good communication between officers that operated the "*banana boat*" attraction for tourists. The operational settings of the banana boat attraction was set specifically discussed in the planning process, including ticket purchasing service settings use the supplied water rides. Travellers who wish to use the services of a banana boat attractions were able to register and purchase the tickets at the office. The clerk gave you a referral about the importance of safety for tourists in advance, after that the tourists guided to tighten the safety jacket as well as ensure that the jacket had been installed properly before the banana boat attraction began. In the early stages of the developing process, BUMDes sought to optimize the management site as well as the quality services system for the visitors or tourists. Based on the foregoing, it could be noted that the concept of tourism awareness and seven charm discussed in tourism planning stages. The opinions of local communities remained a consideration of decision-making in determining the direction of policies in the development of the tourist coast of Pitu. This was in contrast with the case of the development of tourism in Laos, Ethiopia, Rote and West Manggarai of Indonesia that indicated the dominance of the government in the planning phase to implementation so that the form of consultative participation, passive flow from above especially and implementation model policies using a top-down approach (Sangkyun *et al.*, 2014; Kedebe, 2016; Wright & Lewis, 2012; Jupir, 2013).

The local government, BUMDes "*Pitu Marahai*" along with the youth organization "*Karang Taruna*" and the local community collaborated to establish tourism policies to close the access from the outsider. BUMDes "*Pitu Marahai*" in the development process were able to empower the communities and increased the local economy rate againsts all the circumstances. This suggested an attempt to improve the entrepreneurial skill in strengthening the local economy and reflect community-based development (Nitikasetsoontorn, 2015). Community participation in the planning stages indicated that there was a power at the community level. It could be seen from the partnership in planning, delegation of powers to the community in order to make decisions in planning, as well as community control or freedom to convey the aspirations of plotting the direction of development in Pitu Beach as shown in table 2 below.

Table 2. Community Participation in Tourism Planning

| Participation Level | The Nature of Equality | Depth of Power Sharing |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Partnership | Reciprocity was negotiated: the existence of communication between the Government of the local government, BUMDes "Pitu Marahai", coral and local community Officers in providing ideas for the planning of the Coastal attractions of Pitu | Level of Power is in the Society |
| Delegated Power | The community was given the powers of (some or all of the program): the community was given the opportunity to convey the views of the direction of development related to the pricing of the product to be sold, then the decision to be implemented. | |
| Citizen Control | Fully controlled by the community: the community was given the opportunity to be responsible for the related idea of the direction of development of the Coastal attractions of Pitu | |

Table 2 showed that at the planning stage, the level of power existed in the community. Meanwhile, there was a factor that supported to reach the level of participation which was the public trust to the actors of the local government and all the people who work in BUMDes "Pitu Marahai" because of the transparency and accountability. In addition, coordination or communication between the headman and the community established a harmonious relationship to create a cooperation or partnership with the youth organisation "*Karang Taruna*". Thus, it could be seen that the transparency and accountability, coordination and partnership as the important factors to increase the level of participation in the planning stage (Ruhanen, 2009; Mak *et al.*, 2017; Wisansing, 2008).

4.2 Community Participation in the Implementation Process

Community participation in the implementation of the program was in a form of public awareness in order to support the various development programs in tourism. Ziku (2015) indicated that the villagers of Komodo participated in tourism development project as workers such as infrastructure development, access development such as *paving block* road, drain the water to the village and sanitary facility. In addition, the society also participated in tourism development as a craftsman, being a tour guide in Loh Liang, managing homestay, as well as renting out boat for tourists to visit the beach around Komodo Island known as Red Beach. Komodo village community also collaborated with the government through the forestry police partner community as a conservation to maintain the forest and achieve environmental sustainability. On the other hand, Siswadi (2011) showed that the form of public participation in the effort to make Purogondo as tourism village, implemented the activities strengthening the capacity of the communities so that people were aware of, understand, care for and join a nature preservation. Now, Widiyanto, et al. (2008) showed a form of community participation in the program implementation of the tourism development in the village of Tirtoadi was to become entrepreneurs homestay, souvenir sellers chips and bolu kukus. This indicated that the public participation in the program implementation of the tourism development provided the benefits of economic, social and environmental (Nkemngu, 2014).

BUMDes "*Pitu Marahai*" managed with attention to "*sapta pesona*" (Seven charm) for tourists. *Sapta pesona* consist of: security, orderliness, cleanliness, tranquility, beauty, hospitality, memories. The security was a condition of attractions environment that gave a sense of calm, free from fear and anxiety. The specified order was the interesting environmental conditions that reflected the attitude of disciplined, organised and professional, so it could give the comfort for the tourists visited. The cleanliness was the environmental conditions that reflected the state of clean and healthy to give a sense of comfort for the tourists visited. The tranquility was the environmental conditions which caused a cool sight and shade and gave a feeling of comfort for the tourists visited. The beauty was the condition of attractions environment that reflected the beauty of nature and profound

impression against the tourists. The hospitality was the attitude of the community that reflected the familiar atmosphere, open and receive up to the tourists at home over his visit. The intended memories was the impression of the experience in the tourist attraction that pleased the tourists and left the beautiful memories to encourage tourists to visit again. Kovari and Zimanyi (2011) argued that the convenience and security became very important conditions in the tourism industry as well as having a large effect on the sustainability of tourism activity.

Local government along with BUMDes "*Pitu Marahai*" provided the location of business premises, while the physical building of the place of business became the personal responsibility of each entrepreneur. People who had built a restaurant business, groceries and entertainment business at the site had facilitated with the clean water and electricity. As a contribution to support the development processes, business owners had to pay for IDR 50.000 every month. Otherwise, public participation in tourism development provided opportunities for people to enjoy the results of tourism development. Huang and Fu (2015) showed that the government in developing the tourism sector were sharing the benefits with local communities so that people could feel the economic benefits of the tourism sector, especially for people living in historical and cultural heritage sites. On the other hand, Yusof *et al.*, (2012) indicated that villagers who were entrepreneurs as homestay entrepreneurs benefited from tourists thus changing the socio-economic order of rural communities. Nevertheless, Dewi *et al.*, (2013) showed that it was not always the people enjoyed the results of tourism development. In the context of the community in Jatiluwih Tabanan Bali, people did not enjoy optimal results due to the large-scale of business monopoly from foreign investors (foreign investors). Consequently, the benefits obtained were not evenly distributed.

Local communities derived the economic benefits but avoided the large-scale of business monopolies from foreign investors because the headman limited the access from other entrepreneurs in Pitu Beach tourist sites. This indicated that the development processes focused on improving the local economy based on the local community (Constanta, 2012). The entrepreneurship society at the site were enjoying the results of the development processes and could be measure by the economic, social, and environmental benefits. In the context of economic benefits, local entrepreneur gained the benefits from tourist expenditures between IDR 250.000 until IDR 300.000 per day in weekdays (Monday-Friday). For weekends or on public holidays, the local entrepreneur revenue increased at the range of IDR 500.000 costs up to IDR 700.000 per day. Saptutyningsih (2003) stated that the existence of tourist expenditures against the influence of the household income. This indicated the existence of a benefit from the development of the tourism sector towards household-based (Porter *et al.*, 2017).

On the other hand, the income from the house business were enough to make a live and financed the school tuition of the children. In the context of social benefits, set the direction of the products sold were able to create a good relationship between the entrepreneurs so that they could anticipate the problem of social jealousy or competition. Ekayani *et al.*, (2014) that the tourism sector in contributing to the economy of the community through the absorption of labour. Growing community effort were more labor was absorbed in the activity and in turn improved the economy of the community. Even so, the scale of the effort also affected a large or small labor absorption. As for the development of tourism, contribute to the economy of the community could be seen from tourist expenditure on tourist sites. The economic impacts need to be counted to see how big the benefits nature tourism for the economy of the community. If the public benefit for the fulfillment of the economics of tourism, then they joined to keep the sustainability of the natural resources for the sustainability of tourism (Lacmanovic & Bulatovic, 2014).

Environmental benefits as well as setting the direction of environmental hygiene which were able to create a beautiful environment and cool with the planting of flowers and trees in the coastal area of Pitu Beach site. In addition, each business owners were responsible for the cleanliness of their environment. This indicated the presence of social and cultural empowerment in waste management accordance with the local social and cultural characteristics (Sasmita, 2018). It helped to reduce the volume of garbage, junk quality improvement, throw

garbage in place, until the provision and waste separation (Wardi, 2011). Further, Arida (2008) showed that the consequences of the mass tourism development was the occurrence of environmental degradation in the various domains, such as dwindling public spaces on the beach, the destruction of the border river by the construction of the hotel or villa, scour excessive groundwater for the benefit of the tourism development. Therefore, coordination and partnership with stakeholders in the tourism sector became very essential especially with people living in the vicinity in order to pay attention to environmental conditions (Sihombing *et al.*, 2016).

The characteristic of the local bussiness were entertainment business and local food store. An effort to keep the environment clean and safety, the local community payed attention on the waste dissposal issues and kept the cleanness of the environment around the site, and also planting flowers, although officers had been prepared environmental hygiene activities in the morning and evening. This showed a strategy to anticipate environmental damage caused by domestic waste at the site. Concerns such as the findings of Laapo, et al. (2009) that environmental pollution due to tourist waste often occurs in coastal areas and islands. The main source of contamination came from the domestic waste in the form of detergents, garbage, plastics, pieces of wood and cans did not occur at Pitu Beach. Local government supported the program to establish bathroom facilities for tourists. Tourists who use tourism facilities voluntarily may contribute to improve the management of the site (Suwena & Arismayanti, 2017).

In front of the door, there was a box to provide the opportunity to the users of the facilities who with awareness to contribute in order to keep the cleanliness of the facilities available. Nonetheless, this indicated a change in traditional values due to the development of the commercialization and materialism in human relations, which was the logical consequence of tourism activity. Social relationships between people who were originally based on moral values turned into relationships based on economic value (Setyadi, 2007). Tourism could also construct a close interaction between tourism and community culture (Sasa *et al.*, 2017). This could be seen from the participation of the local community of Pitu Village in the development of tourism object which was done voluntarily in the form of community. This also could be seen from the construction project of leisure place which was done by the local community known as *Lingpel*. The local government provided the building materials along with wages and then offered them to complete the project. The offer was received and they started to complete. In addition, the participation of youth organization "*Karang Taruna*" could also be seen in supporting the infrastructure. The local government along with BUMDes "Pitu Marahai" established a good cooperation by providing land or business location owned by *Karang Taruna* in the site. *Karang Taruna* was given the opportunity to pour creative ideas such as mural activities to attract the tourists.

Youth participation could affect the resilience of the village economy. Rosida (2014) also pointed to the participation of youth in the development of the Nglanggeran ancient volcanoes ecotourism area, demonstrating the form of participation of ideas, the participation of personnel, the participation of property, the participation of skills and skills as well as the social participation provided in order to support the development of the ecotourism area. It affected the economic resilience of rural communities, social community, conservation of the natural environment, infrastructure development and youth development in Nglanggeran Village. Thus, youth could accelerate the process of regional development in the village. After the development of tourism object infrastructure had been done, the local government together with BUMDes set the tariff for the parking fee of the tourist vehicle for IDR 5.000,00. It increase BUMDes revenue in optimizing the management of the tourist object. Khalik (2014) showed that the factors that affected the comfort and safety were environmental factors, economic activity and access factors of tourism roads. On environmental factors, there were two aspects that have an effect on the inconvenience and insecurity of tourists, namely the management of parking areas and environmental hygiene. This indicated that the management of the parking area could not be ignored in maintaining the comfort of tourists when visiting Pitu Beach attractions (Magi, 2014).

The decision had been through the evaluation phase between local government and BUMDes "Pitu Marahai". This showed that the advantages of the development of tourism sector was not only felt by the people of local community but the local government and BUMDes "Pitu Marhai" itself. Community participation in the implementation stage indicated the level of participation was on the community. This could be seen from the partnership between the local government, BUMDes "Pitu Marahai" and youth organization "Karang Taruna" to develop Pitu Beach attractions. The development were through the program of revamping the facilities through mural activities, delegation of power to the community to build supporting facilities in the form of *gasebo*. Also, arranging the surrounding environment to remain beautiful, freedom in overseeing the Pitu Beach development program, as in Table 3 below.

Table 3. Community Participation in Implementation Process

| Participation Level | The Nature of Equality | Depth of Power Sharing |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Partnership | Reciprocity negotiated: The existence of cooperation between Pitu Village Government, BUMDes "Pitu Marahai", Karang Taruna and local communities in the program of reform and development of tourism facilities and efforts to implement the concept of conscious tourism and sapta charm | Level of Power is in the Society |
| Delegated Power | Communities are given the power (part or all of the program): the community is given the power to maintain security and comfort together by maintaining cleanliness or arranging the environment around the tourist object to remain beautiful, in accordance with the ability of each. | |
| Citizen Control | Fully controlled by society: the community is responsible for the implementation of the program as discussed in the planning. | |

Table 3 showed that at the stage of implementation and enjoying results could be categorized at the level of community control. It could be seen from the collaboration between the local government, BUMDes "Pitu Marahail" and youth organization "Karang Taruna" in the program of improvement and development of tourism supporting infrastructure as well as efforts to implement the tourism awareness and charm sapta in Pitu Beach. On the other hand, there was a delegation of power, in which the community was given the power to maintain security and comfort together by maintaining the cleanliness or arranging the environment around the tourist attraction in order to remain beautiful in accordance with the ability of each (Trialfhianty, 2017). Factors that support community participation in the implementation stage and enjoyment the results were the economic benefits which were felt by the local community, namely the increase in income per capita and the household economy as well as the availability of employment as a hygiene worker and banana boat attraction officer (Chalid & Koesbandrijo, 2019). Thus, it could be seen that the perceived benefits of tourism object development became very important in the implementation stage and enjoyment the results of the tourism development program. Unlike the case of Rahadiani (2014), study which showed that the inhibiting factor of participation in the context of the people living around Beratan Lake of Tabanan Regency and Tamblingan Lake in Buleleng Regency was the lack of extension organized by the local government. This suggested that the different regional contexts produced different levels of participation (Fernandes *et al.*, 2017; Adeyemo & Bada, 2017; Amanda *et al.*, 2013).

4.3 Community Participation in the Evaluation Stage

Community participation in the evaluation process was needed in order to update the direction and policy of the local tourism development and to remain the relevant to the needs of the community and the condition of the local attractions (Okiono & Dokpesi, 2016; Musadad, 2018; Badita, 2013). Ratnaningsih (2015) showed that the evaluation form of the community tourism development program in Belimbing village was conducted as a form of responsibility for developing tourist attraction by maintaining what had been done such as tracking track, road

improvement to tourist attraction. Andini (2013) indicated that the community conducted monitoring and evaluating based on monitoring and supervision mechanisms as well as a further recommendation of agro-tourism development. One of the evaluation process was the improvement of infrastructure of agro-tourism activities such as homestay, access improvement, variety of games offered, quality improvement and environmental hygiene. In addition, Raharjana (2012) indicated that the community in Dieng through *Pokdarwis* evaluated human resources support program, tourism, local institutions, accessibility, supporting tourism facilities and the surrounding environment. This suggested that the results of the evaluation program may be used to renew the concept of incorrect development or no longer relevant to the needs of the community in relation to the local tourism (Rolfe, 2016).

Local government together with the BUMDes "*Pitu Marahai*" conducted an evaluation every Monday to discuss the problems and challenges in developing tourism objects. Similarly, parking fee was determined based on the type of tourist vehicle which was the evaluation result of tourism object development. The local government and BUMDes "*Pitu Marahai*" focused on improving and developing tourism to support the infrastructure by building tourists' leisure spots, planting trees and coloring tourism facilities (mural). In its development, the evaluation results became some consideration for the future development (Jiang, 2018). In addition, the matters discussed in the evaluation phase were related to the policy to prohibit the activity of bathing the pets at the location of the tourist attraction and the prohibition to dispose of waste in the waters of Pitu Beach. In the evaluation phase, the headman as the commissioner could make a sudden decision such as the program to overcome the problems arising from the sea water supply and damage to the abrasion retaining (*talud*) infrastructure at the location of the tourist attraction. Thus, any decisions and programs formulated in the development of Pitu Beach attractions solely to improve the economy of the local communities. This indicated that the evaluation of the programs conducted regularly by BUMDes "*Pitu Marahai*" to make the management of tourist attractions to be responsive and adaptive to various changes in the trend of tourism. Community participation in the evaluation phase also found the solutions to the problems also served as a platform for setting strategies for dealing with various challenges in future development (Lusticky & Musil, 2016). BUMDes "*Pitu Marahai*" and local communities participating in tourism development strived to maintain sustainability on the economic, socio-cultural and environmental aspects. Thus, community participation in the evaluation phase indicated that the level of power existed in the community. This could be seen from the partnership between the local government, BUMDes, youth organization and the local communities in order to evaluate tourism development program. Also, the delegation of the power to the community in order to solve problems that hampered the development and provided the ideas related to the subsequent development program, and community control collectively formulated ideas and rationalization of priority programs in the future, as in table 4 below.

Table 4. Community Participation in the Evaluation Process

| Participation Level | The Nature of Equality | Depth of Power Sharing |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Partnership | Reciprocity negotiated: Existence of cooperation between Pitu Village Government, BUMDes "Pitu Marahai", Karang Taruna and community in evaluation of tourism development program Pitu Beach | Level of Power is in the Society |
| Delegated Power | Communities are empowered (part or all of the program): communities are given the power to solve problems that impede development and provide ideas related to subsequent development programs. | |
| Citizen Control | Fully controlled by society: society collectively formulates ideas and rationalizations of priority programs in the future | |

Table 4 showed that the evaluation phase could be categorized at the level of community control. This could be seen from the collaboration between local government BUMDes "*Pitu Marahai*", youth organization "*Karang Taruna*" and the local community in the evaluation of tourism development programs. On the other hand, there was a delegation of power in which the community was given the power to solve problems that hampered development and provided ideas related to the subsequent development program collectively and determined the priority program for the development of Pitu Beach attractions. Meanwhile, the factors that support community participation in the evaluation phase were the positive responses from the community as well as the motivation to increase tourist visits through better development programs. Unlike the case with Guzzi (2006) which showed that the existence of supporting and inhibiting factors of community participation living in the area of Sentarum Lake especially the tribe of Melayu and Dayak Iban, which caused by information and culture competition. His research showed that the delivery of information related to the importance of maintaining the environment and stakeholders was able to establish the cooperation, whereas the culture of competition could hamper the cooperation because each stakeholder prioritized their respective interests. However, his research did not describe specifically at the evaluation stage. Meanwhile, in the context of Pitu village community, the supporting factor of participation in the evaluation phase was the community responses or local community perspective became very important in the evaluation stage of tourism development program.

Conclusions

The level of participation at all stages of the development showed the existence of the control society (citizen power). Thus, it could be noted that community-based tourism approach had been successfully implemented in the context of North Halmahera, Indonesia. This research showed that community participation in the planning, implementation until evaluation stages indicated that the level of participation was on the community. Meanwhile, the supporting factors of participation in the planning process were transparency, accountability, coordination and partnership. In the context of North Halmahera Regency, communication or coordination between the local government, BUMDes "*Pitu Marahai*", youth organization "*Karang Taruna*" and the local community was able to increase the participation level into citizen power according to Arnstein (1969). Our result suggest this case need to be considered seriously as pilot project for regional tourism development in North Halmahera Regency of Indonesia.

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AN ASSESSMENT OF IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY IN ENTERPRISES OF KORÇA REGION

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Abstract. Ever-evolving and increasingly powerful Information and Communication Technologies (ICTs) have fundamentally changed the nature of global relationships, sources of competitive advantage and opportunities for economic and social development. ICTs have greatly increased the impact on every area of human life. Technologies such as the Internet, personal computers and wireless have turned the globe into a network of individuals, businesses, governments, and ever-growing schools who communicate and interact with one another. Without doubt ICTs plays a strategic role in managing organizations. This paper presents a part of the current state of ICTs for enterprises by establishing comparative bases for further studies in this field. It also helps academic institutions to evaluate and identify factors, as well as the specific role and weight of these factors have in the process of developing ICTs towards a developed economy and society in the context of digital Albania. It is presented as a scientific analyse, accomplished, detailed and expressed in percentage and graphical analysis of a number of very important data sets of enterprises in their full form, to unlock developments in the field of ICTs in our country, including specific ones based on concrete data. This study tends to study the extent to which these but have involved ICTs and what impact these technologies have in the daily work of these organizations in part of Albania (Korca Region) and brings its contribution as a perspective of literature, experience and international studies, the level of development of our country regarding the assessment of electronic readiness of business organizations.

Keywords: e-readiness; businesses organizations; information and communication technologies; Internet; impact

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JEL Classifications: O32

1. Introduction

Success nowadays depends on the penetration and impact of Information and Communication Technologies (ICTs) in the society. New ICTs values came into surface and individuals are becoming more and more aware of

their usefulness. Changes in attitude and behavior led to new solutions and models that radically changed work in businesses, hospitals, schools, and government.

Technologies such as the Internet, personal computers and wireless telephony have turned the globe into a network of individuals, businesses, governments, and ever-growing schools who communicate and interact with one another (ITG CID Harvard University, 2008). According to theorists of the network society (Castells, 1996-2000), social structures and activities are increasingly organized around network forms, largely grounded in electronically based information and communication technologies.

In the current technological advancement era that is taking place all over the world, a new kind of rationalization has been introduced into the public sector by the use of modern information and communication technologies (ICT). More and more the use of ICT tools and applications is leading the transformational shifts in the policies, processes and public functions. The electronic government is deciding not only to provide citizen services, but to public sector efficiency goals by improving transparency and accountability to government functions and allowing for cost savings in government administration. ICTs are changing the way the government makes business for the people. In this context, the electronic government seems to be a lever to transform the government.

Getting ready for the network creates many new opportunities for businesses and firms in the developing world by removing barriers for both, information and material goods. Educational institutions and large businesses can extend their activities to this giant network. Governance can become more effective if it extends certain elements of its services to this network. Thus, the benefits of societies in general by the use of this worldwide network are comprehensive both in economic, social and political terms.

Most governments around the globe started their electronic government initiatives with a focus on providing information and services to citizens, while service delivery platforms remain fragmented and parallel across government agencies. In this model, service delivery is built around the functions, structures, information, systems and capabilities of individual action. With the private sector leading the way, access enhancements and greater use of technology have allowed an expansion of new ICT solutions. Now citizens and businesses around the world are increasingly demanding that their governments follow suit. Citizen groups have come to expect a user-friendly interface with ease of use, in a language that the user understands and is tailored to individual needs. The common argument is that intensive use of technology could transform the operational rules of public administration to increase its efficiency, simplify administrative procedures (Fountain, 2006), expand the processes of citizen participation (Hague, 1999) and make government activities more transparent and accountable (Limba et al., 2017).

Our paper is organized as follows: the first part clarifies our use of the concept of "network economy"; it follows with an introduction to the previous state of the business assessment reports on the network and its general characteristics; then assesses the penetration level of business in the network for Korça region, in order to take measures to increase its level. It ends with a synthesis of key findings and points, towards future research topics.

2. Literature review and methodology

Preparing for the networked world creates new opportunities for firms and individuals in the developing world, eliminating the traditional barriers of information and goods for developing countries, and promotes efficiency in a variety of activities. Learners can learn more about the world and themselves through the use of the network. Businessmen can find new market opportunities and the most efficient ways to run their firms. Governments can

provide more efficient public services. Individuals can communicate with friends and family and become more informed about everything in the network.

Participating in the networked world can provide new ways for developing countries to improve their economic, social and political well-being. These opportunities for positive change are increasingly important and accessible as information and communication technologies become more powerful and less costly.

Businesses and governments that are capable of effectively employing information and communication technologies find more sophisticated and efficient ways to manage their external relations and communications. For assessing the networked economy, we have divided it into two categories. These categories were selected based on several analogous studies in Australia (Australia ICT Data Collection Case Study, 2005) and Greece (eGovernment in Greece, 2016) as well as in the models provided by ITG CID Harvard University (2008), Prodani et al. (2012) and Oxford Analytica (2015), but also relying on the concrete features of our country as well as on the needs and opportunities it has for development. These categories are (figure 1) :

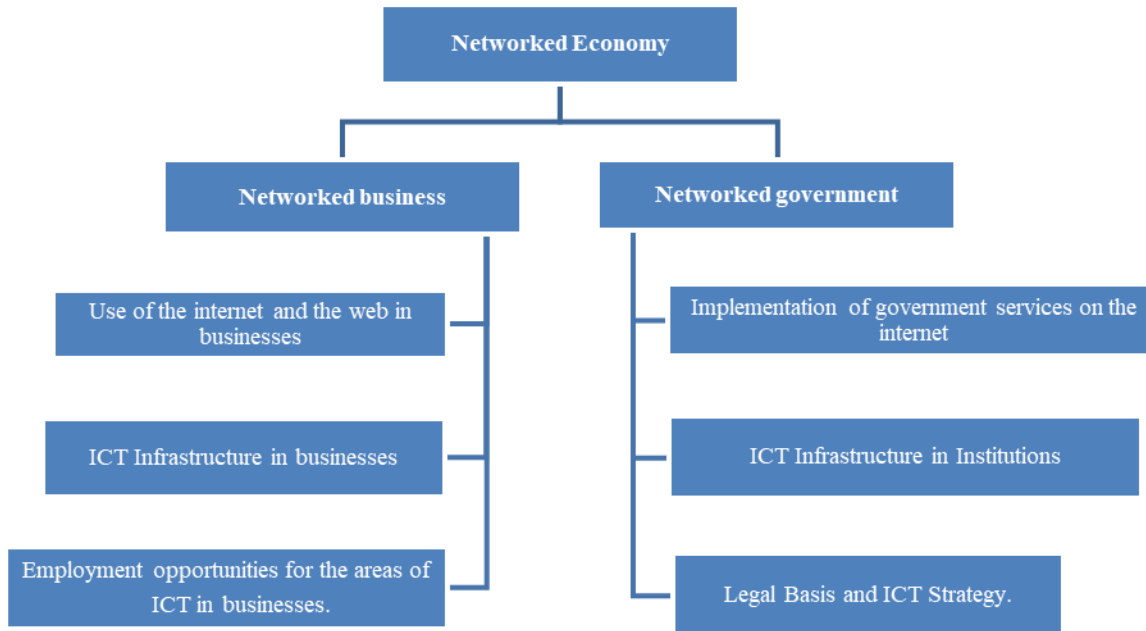


Figure.1. Networked economy

Source: elaborated by the authors based on Australia ICT Data Collection Case Study, 2005; eGovernment in Greece, 2016; ITG CID Harvard University, 2008; Prodani et al., 2012; Oxford Analytica, 2015.

According to Oxford Analytica (2015), Network government is the transition to a more transparent, cooperative and beneficial relationship between government, citizens and business as a result of technological integration and organizational connectivity. By enabling active stakeholder participation and access, it transforms government services by placing users at the center of policy design and implementation, and service delivery.

The concept of connected government is derived from the whole-of-government approach which is increasingly looking towards technology as a strategic tool and as an enabler for public service innovation and productivity growth (United Nations, 2008).

The assessment of the network economy is also closely related to the other categories of e-readiness estimates, as network access, networked society and networked education (ITG CID Harvard University, 2008).

Assessing the networked economy is one of the most difficult to estimate if we consider the calculation of other categories of electronic readiness (e-readiness). In this paper, as the part of networked economy is estimated, the calculation is slightly simplified because some of the indicators that are directly related to central governmental factors or that relate to legal factors were not reviewed. We will only deal with modeling of networked business assessment and partial evaluation within our region. This valuation model can be used for similar assessments in developing countries, their characteristics are similar to those of our country.

Porter (1990) determines competitive advantage as the heart of a company's performance. It reflects a company's ability to provide customers with greater value either by lowering prices or offering greater benefits and services that justifies higher prices.

Olugbenga (2006) argues that ICT is being used for strategic management, communication and collaboration, customer access, managerial decision-making, data management and knowledge management as it helps provide an effective tool for organizational productivity and service delivery. Krishnaveni and Meenakumari (2010) claim that ICT has played a major role in reducing operational inefficiency and improving decision-making in many areas of government. Moreover, Hengst and Sol (2001) claim that ICT enables organizations to lower costs, enhance organizational skills, and also assist in the formation of cross-organizational coordination. Therefore, ICT use can help reduce the cost of coordination and increase external resources in organizations. In addition, Irvine and Anderson (2008) comment that the use of ICT provides not only practical benefits to overall management, but also enables companies to overcome place and space disadvantages.

Apulu and Latham (2010), claim that ICT enables customers to get immediate feedback that allows companies to react quickly to customer requests and to recognize new market gaps.

Alam and Noor (2009) argue that ICT provides enterprises with ways to compete globally with improved efficiency and closer relationships with customers and suppliers. Therefore, ICT should be considered by businesses as an important strategy to stay competitive. This implies that organizations that are able to utilize the potentials offered by ICT can address different types of innovative processes in their businesses as ICT influences the performance of an organization in multi-faceted ways. Thus, ICT can bring changes to organizations and make them more competitive, innovative, and help increase organizational growth (Obijiofor et al., 2005).

Case study, is one of the most common methods applied in the Information Systems (SI) field (Alavi et al., 1992). (Sauer, 1993) argues that search in information systems is best done by case studies. The case study method was considered appropriate, as the purpose of the paper is to broaden our understanding of the impact of ICT implementation on business. All businesses that are considered are large businesses in our region, with over 10 employees, with typical representatives of all types of businesses and about 2.5% of them. Data was collected through semi-structured interviews, questionnaires and observations.

The networked business level in our region will not give it a certain value because the final goal of this study is not to estimate a value for it but to estimate its level as well as to create opportunities to find solutions for improving based on the analysis of several factors that directly affect the online economy. Data is collected in accordance

with International Telecommunication Union (ITU) standards, according to (Core List of ICT Indicators, 2016), Eurostat indicators for evaluation digital economy and similar studies in other countries.

3. Research results

In Korça region and in Albania before 1990 there was no industry for the production of equipment and software related to ICTs but even after the 90s during the economic transition period we did not have a significant development in these areas. Businesses and other private and state institutions have implemented too late new digital technologies, showing a tendency towards ignoring these technologies. This was due to lack of knowledge about ICT fields by employees and executives of that time. A major implementation of these technologies was observed after 2000 when the implementation of new technologies became irreplaceable and an important factor of competition between businesses. It became irreplaceable because the volume of work grew and the actions were very difficult to carry out manually, the quality and performance of work with computers is significantly greater, competition between businesses became stronger and the impetus for ICT implementation was coming and increased by government institutions. An important factor for the implementation of ICT in businesses and state institutions is also the Internet. Communicating and receiving various information via the internet was at the beginning a good impetus for the introduction of the Internet into state institutions and business. The situation has changed completely with the release of Web 2.0, 3.0 or semantic web. Introducing the Web to a variety of government services, creating opportunities to make financial transactions on the web, buying opportunities and establishing business-to-business relationships on the web have made the implementation of Internet technologies a need and a duty for every institution and business.

So, a greater implementation of these technologies was observed after year 2000 when the implementation of new technologies became an important factor of competition between businesses. While after 2010, with the introduction of ADSL, Fiber Optics, WIMAX and 4G technologies, we are seeing an ever-increasing implementation.

Let's analyze one by one the indicators of network business category:

1. The percentage of businesses that have been using computers and internet during the last year is 90% for both. There is an increase in comparison to 62% and 52% for computers and internet in the year 2012, see (R. Prodani et al, 2012). This is because of the real growth of online government services, low cost broadband internet, implementation of technologies such as Adsl, Fiber Optic, 4G, use of smartphones and other devices on the Internet.
2. The percentage of people employed in businesses which work regularly on computers in our region is smaller if we take into account the level of developed countries. The value of this indicator is 25%, somehow higher than the 19% value that was in 2012, see (Prodani et al, 2012).
3. The percentage of regular internet users in Korça region businesses is 23%. This percentage for our region in 2012 was about 12%. This seems an increase not too small but comparable with developing countries where this percentage goes above 50%.
4. Nowadays the implementation of networked businesses is an important factor that guarantees the success of the business. If we take into account the various internet services provided, such as a website, social networks etc. where we can put all the information necessary for business operation. At the moment when this study started, Korca's businesses have a web presence of 50%. We have a big increase compared to the 5% we had at the beginning of 2012, see (Prodani et al, 2012).
5. The percentage of businesses in Korca region with Intranet is about 10%. We have to be optimistic about this value if we take into consideration the short period of these technologies are present in our city. Intranet has

mostly second level banks and, as far as other businesses are concerned, they do not have the necessary capacity to apply such technology. The study conducted in 2012 on intranets in the Korça region businesses almost did not speak at all. In this survey, businesses with LAN accounted for about 20% of large businesses, whereas today they go to 90%. Another important indicator that impacts the largest involvement of large businesses and their networking activities is the type of internet installed in them. In 2012 only 31% of businesses interviewed had access to the internet broadband while today 90% of interviewed businesses had such internet, using technologies such as ADSL 30%, Fibber Optic 60%, 4G 10%.

6. There are a growing percentage of businesses offering online products. In the study conducted in 2012, only 2% of the businesses interviewed carried out online sales. While today this percentage has gone to almost 10%. This indicator in the European Union countries in 2017 is worth 18%, see (Eurostat-Ecommerce sales, 2017). We are optimistic, although we have to mention that the clients of these businesses are not far from the geographic location of the latter ones. They usually prefer to order their product directly from business wholesale sites. We can expect that this indicator will increase in parallel with Korça's businesses increase which will bring to a growing number of clients. This can be achieved by creating a website, displaying different products on catalogs and receiving client orders online. Providing various services online requires the business staff and IT managers training in implementing the new technologies and knowing the advantages and disadvantages of internet services.

7. Extranets are widespread in banks and large companies. The connection of businesses by extranet is typical of contexts when such businesses trade with each other online, usually through the internet being isolated from the other part of it. This type of commerce is named B2B to the business network and some of its advantages are related to the fact that communication between businesses becomes easier and less costly, payments are faster and transparency is generally bigger. The number of these businesses in Korça is very limited, only a few banks, therefore the value of this indicator is very low about 2%.

8. The indicator that shows the Internet business activities is one of the most interesting ones to follow because it basically informs us on how the business uses the internet. The more computerized public institutions are, and the broader range of services they offer, the greater the collaboration of businesses with them will be. So the number of businesses using online government services has increased a lot. The percentage of businesses receiving information from online government services is about 55%, while the percentage of businesses interacting with them is 45%. Growth is also noticed in the percentage of businesses purchases online, is around 18%. It is a big increase if we consider the 5% value that this indicator had in the 2012 survey. In European Union countries this value goes to 26%, see (Eurostat, 2017b). Let's look at figure 2:

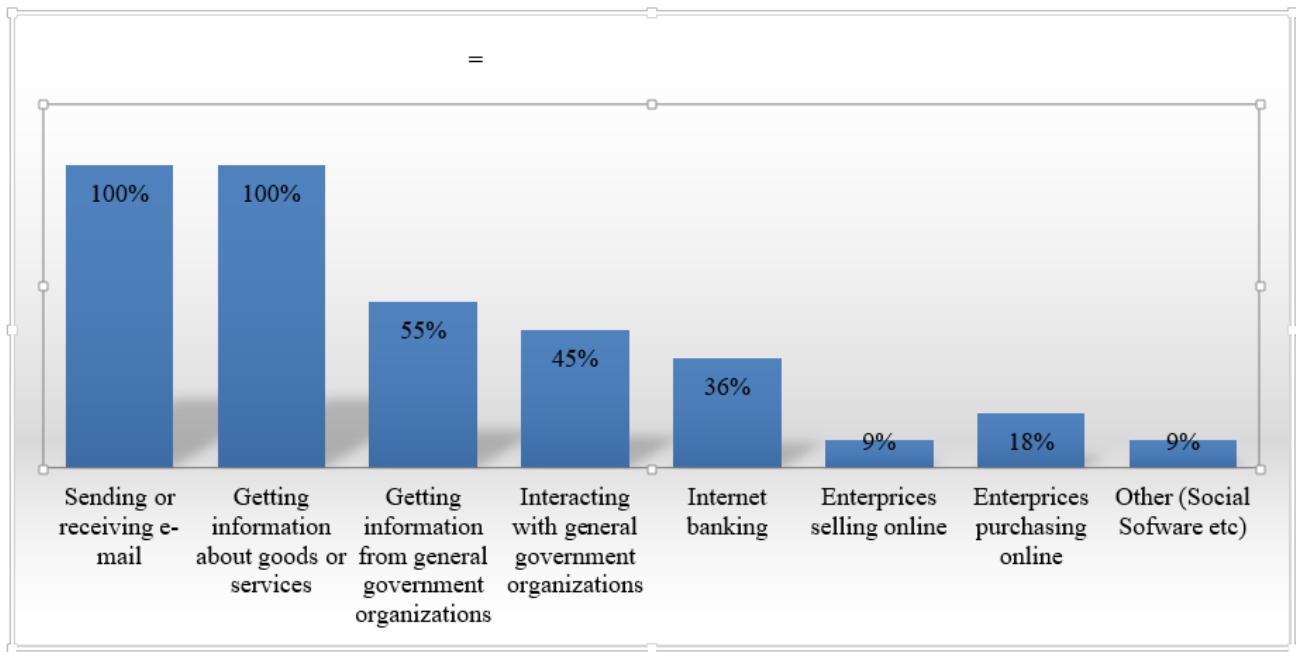


Figure 2. Proportion of businesses using Internet by activity

Source: Eurostat, 2017b.

4. Conclusions

The IT infrastructure of the businesses of our region has gone through a rapid development during the last few years. This same period has witnessed the implementation of a great number of online government services related to businesses and we think that the penetration of businesses to the network is tending to reach maximum levels.

There has been growth in almost all the indicators of this category and this has happened for several reasons. The first reason is the liberalization of the Internet distribution market, the introduction of technologies such as ADSL, Fiber Optic, 4G etc. Another reason is the implementation of many government services in the internet such as online tax system, building permits, obtaining certificates, online tenders, etc. all incorporated in the e-Albania portal. Fullanteli and Allegra (2003) emphasize that ICT provides enterprises with a wide range of opportunities to improve their competitiveness and provides mechanisms for access to new market opportunities. Also (Fink and Disterer, 2006) also advocate that ICT provides many potential benefits to organizations in order to make them more efficient, effective and competitive.

From the interviews with managers of different companies we also have noticed these direct reasons that could get businesses in our region to incorporate the modern technologies into their business: competition and effectiveness at work. This implies that organizations need to invest in ICTs to stay independent of their competitors and also to give them a sustainable competitive advantage and also to increase efficiency at work.

Despite these achievements, businesses in European Union countries are far ahead in the implementation of internet technologies especially IoT(Internet of Things) systems. What emerged from the conversations that we had with heads of local businesses, was the need of regional businesses for qualified specialists in the new ICTs fields, especially those that are connected to the Internet technologies. These specialists will be aware of the

further benefits that these businesses may have from applying new ICTs and will help these businesses apply these technologies.

Implementing ICTs in businesses also brings about organizational and structural changes in them, this is a challenge that businesses and government institutions have to face.

To increase the level of ICTs involvement in businesses we can give two basic recommendations:

- 1) Awareness of business managers and owners about the benefits of ICTs implementation, information about the latest ICTs and the creation of opportunities to have the most skilled professionals in the ICTs field.
- 2) Creating opportunities to include the IoTsystem in businesses, between businesses, and perhaps even wider.

We can say that today we are moving from the first phase characterized by good internet and computer access to businesses, low level of network services in them, and poor use of ICT in assisting the process work in institutions and manufacturing in the second phase where we have a new inclusion of new ICT technologies in the work and production process, the implementation of most of the network services supported by skilled specialists in ICT fields where the vast majority of transactions with government institutions and businesses are carried out on the Internet.

This study will be useful to entrepreneurs, policy makers especially in developing countries, as well as researchers who are interested in ICTs development because the study helps to identify ICTspenetration and impact in businesses, the ways to take for increasing its level of involvementin businesses as well as some of the positive effects that this involvement has.

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REGIONAL AND PRODUCT PROFILE OF POST-INDUSTRIAL SERVICES IN THE ECONOMY OF KAZAKHSTAN*

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Abstract. The article examines the post-industrial services sector in the economy of Kazakhstan, the state and dynamics of which is a characteristic feature of the modern techno-technological structure in the post-industrial countries of the world. The sector includes information and communication, business and professional services. The authors study the regional profile of the post-industrial services in Kazakhstan and identify the level of centralization of these types of activities in the regions of Kazakhstan, as well as the nature of its dynamics. Using the method of rating assessment and the method of absolute differences to group regions by the volume of the post-industrial services in the medium term, the authors give a qualitative description of the selected groups. Concerning the product profile of the types of activities as a part of post-industrial services, the authors conduct a dynamic analysis of all types of services within three aggregated positions: computer programming services; information services; services in the field of architecture, engineering surveys, technical tests and analysis. The article assesses the characteristics of the dynamics and structure of supply in the markets of these services, the concentration of services in the regions of Kazakhstan. The types of services that are characterized by the absolute and relative growth in all the regions of the country are identified, which makes it possible to draw conclusions about the vector of development of the economy of Kazakhstan as a whole. The main positive trend is the emergence in the first place of the specific gravity and growth rate of engineering services, which generally corresponds to the trend of transition towards the post-industrial economy with its emphasis on services for all the sectors. Since engineering services are complementary to the real sector of the economy, we can positively assess this trend in the development of Kazakhstan.

Keywords: postindustrial services; business and professional services; information services; regional profile; rating

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JEL Classifications: O47

1. Introduction

The growth stages theory (Rostow 1973), the theory of the post-industrial society (Toffler 2010), (Bell 1986) lay the system of initial representations for the modern concepts of the knowledge economy, the change of technological paradigms, innovative economics, and the post-industrial society.

Offering a research methodology for the modern post-industrial economy, they identified many areas in economic science, based on the idea of the driving forces of the post-industrial stage of production and its empirical forms. National innovation systems (Lundvall 1992), clusters (Porter 2011), interactive scientific and educational structures (Kravets 2016), network communities (Verchenov et.al. 2017), business ecosystems and platform technologies (Muegge 2013, Weill 2018), etc. have become such forms.

The main feature of a complex system of post-industrial economy is the support in the production of goods on services that have high added value, i.e. are high tech. Such a quality of services appears as a result of the use of information and electronic technologies in their production, which provide for a transition to a new level of labor productivity, marketing, logistics, etc. (Lidtko 2015, Tapskott 2009)

According to this methodology, the country's transition to the post-industrial stage of development is diagnosed on the basis of positive structural changes in the share of information and communication, business and professional services, which are included in the production process at its intermediate stage and have a decisive effect on the final product or the final result in the form of a service.

For Kazakhstan, which has set the goal of becoming one of the thirty most competitive countries in the world, one of the urgent tasks of development is structural restructuring of the economy and implementation of the development programs aimed at establishing a modern post-industrial structure of the economy (Nazarbayev 2018, Information Kazakhstan – 2020).

2. Research background

In the developed countries, a significant array of studies is devoted to services with intensive use of knowledge, the most interesting of which, in our opinion, are publications (Sarkar et al 2016, Tachiciu 2016, Zenka et al 2017, Zhou et al 2017). In the post-Soviet space, the research of (Inozemtsev 2007, Varnavskiy 2016, Demidova 2010, Kondratyev 2011, Kraft 2017) and others is devoted to the development of services in the post-industrial economy.

At the same time, in Kazakhstan science, a systematic study of regional parameters and structural characteristics of supplying the post-industrial services has not yet been implemented. Some issues of post-industrial services in Kazakhstan were previously considered (Beisenova 2017). Our research complements and develops the results obtained by the author.

The aim of our research was to assess the regional and product profile of post-industrial services to identify development trends in the regions of Kazakhstan.

The methods of the research were methods of the structural and dynamic economic and statistical analysis.

3. Main results of the research

According to the modern methodology of research of the post-industrial economy, the sector of services, which determine the features of its development, includes:

- information and communication services;
- business and professional services (that consist of architectural, scientific and technical, legal services, management consulting and a number of other business-related services).

The regional profile of the sphere of services provided to the population of Kazakhstan for the period from 2011 to 2017 is characterized by an increase in the unevenness of their production, which essentially reflects the imbalances in the development of the country's economy as a whole.

For the period from 2011 to 2017, there was a negative trend of increasing imbalance between the regions in the production of services and, as we will show later, primarily of post-industrial services. (Figure 1)

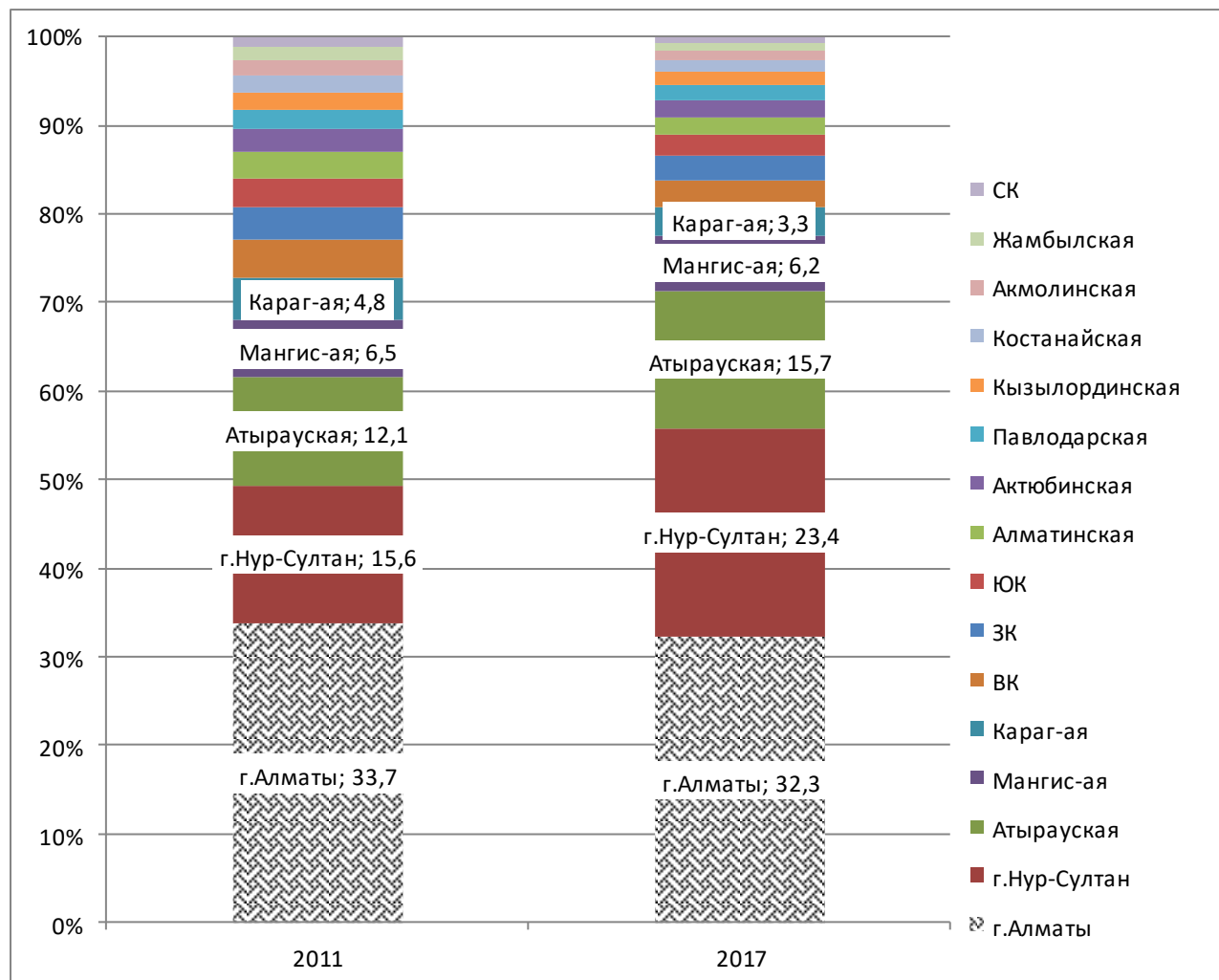


Figure 1. Regional profile of the service sector in Kazakhstan in terms of the volume of services provided by enterprises and individual entrepreneurs, 2011-2017.

Source: compiled by authors according to official website of the Committee on Statistic <http://stat.gov.kz>

СК – North Kazakhstan
Жамбылская – Zhambyl
Ақмолинская – Akmola
Костанайская – Kostanay
Қызылординская – Kyzylorda
Павлодарская – Pavlodar
Ақтөбинская – Aktobe
Алматынская – Almaty
ЮК – South Kazakhstan
ЗК – West Kazakhstan
ВК – East Kazakhstan
Қарағандинская – Karaganda
Мангистауская – Mangistau
Атырауская – Atyrau
г.Нур-Султан – city of Nur-Sultan
г.Алматы – city of Almaty

The city of Nur-Sultan (from 15.6% in 2011 to 23.4% in 2017) and the Atyrau region (from 12.1% in 2011 to 15.7% in 2017), which has a pronounced specialization in oil production and the production of petroleum products, increase their shares in the volume of the production of services. All other regions reduced their share in the structure of production, and in some regions there was a decrease in absolute indicators.

A rather high and growing level of concentration of these activities in several regions is also revealed. If in 2011 seven regions produced 80.7% of services, in 2017 the same regions already produce 86.6%. The seven regions include two capitals of Kazakhstan, Nur-Sultan and Almaty, oil regions of Atyrau and Mangistau, traditionally industrial regions of Karaganda, East Kazakhstan, West Kazakhstan.

The centralization coefficient, equal to the sum of the squares of the specific gravities of production volumes, is 0.167 in 2011 and 0.170 in 2017, which characterizes the increasing uneven distribution of volumes between the regions of Kazakhstan (Shamoylova 2011).

Analysis of the share of different types of post-industrial services in the economies of the regions allows us to conclude that the differences between the regions are significant. Particularly significant differences are observed in technical research and architecture services, management consulting services, scientific research services, advertising and market research services (Table 1).

The general trend for all the regions is the absolute and structural growth of three types of services:

1. Computer programming and similar consulting services, which are characterized by growth in 15 regions out of 16, while their share in the volume of services in the aggregate of regions increased from 1.5% to 3.14%.
2. Information services grew in 10 regions out of 16, while their share in the aggregate of regions increased from 1.53% to 1.67%.
3. Scientific and technical services from the “other” category grew in 7 regions and their share in the aggregate of regions increased from 4.8% to 5.6%.

For other services, there is neither a massive increase in the number of regions, nor positive growth trends in the aggregate share.

Thus, technical research and architecture services have positive dynamics only in the Atyrau and Kyzylorda regions, which is associated with the mineral and raw materials sector of the economy, in all other regions the share of these services has slightly decreased, and the share in the total volume has not changed.

As for the share of post-industrial services in the total volume of services in the region (excluding education, health, trade, transport, accommodation and food), in 2017 the first places are occupied by the Atyrau region (50.1%), the city of Almaty (42.2%) and the city of Nur-Sultan (37.9%), the Kyzylorda region (55.7%). (Table 1) Table 1 - Share of the type of post-industrial services (PIS) in the total volume of services in the region, %, 2017/2011.

Table 1. Share of the type of post-industrial services (PIS) in the total volume of services in the region, %, 2017/2011.

| Regions | Computer programming ** | Information services ** | Legal and accounting services ** | Management consulting ** | Technical research and architecture ** | Scientific research ** | Advertising and market research ** | Other scientific-technical ** | Aggregate share of PIS services in the region |
|---------------------------------------------------------|-------------------------|-------------------------|----------------------------------|--------------------------|----------------------------------------|------------------------|------------------------------------|-------------------------------|-----------------------------------------------|
| city of Almaty | 4,1/5,14 | 0,8/1,5 | 4,4/3,3 | 6/3,8 | 12,2/10,1 | 4,5/3,1 | 14,3/10,6 | 5,5/4,8 | 51,8/42,2 |
| city of Nur-Sultan | 4,7/4,17 | 5,1/4,2 | 3,7/1,5 | 6,8/14,4 | 14,5/6,2 | 6,4/4,1 | 2,1/1,4 | 1,2/5,4 | 44,3/37,9 |
| Atyrau | 0,4/0,69 | 0,1/0,1 | 0,2/0,2 | 0,5/0,8 | 31,1/40,7 | 1,7/1,2 | 0,1/0,1 | 5/6,3 | 39,1/50,1 |
| Mangistau | 0,2/0,41 | 0,1/0,6 | 0,2/0,2 | 0,7/1,1 | 38,8/26,0 | 4,4/4,5 | 0,3/0,5 | 0,5/2,1 | 45,2/35,41 |
| Karaganda | 2,4/3,14 | 0,7/0,8 | 0,5/0,5 | 0,4/4,7 | 23,3/16,4 | 1,9/2 | 3,4/1,7 | 0,7/2,6 | 33,3/31,84 |
| East Kazakhstan | 0,9/1,6 | 0,1/0,4 | 0,3/0,4 | 1,6/2,4 | 16,4/17,1 | 10,8/4,4 | 2,1/2,2 | 1/ 2,4 | 33,2/30,9 |
| West Kazakhstan | 0,4/0,8 | 0,6/0,2 | 0,3/0,7 | 13,4/1,2 | 27,7/21,8 | 0,9/1,6 | 1,9/0,8 | 0,4/1,9 | 45,6/29 |
| South Kazakhstan | 0,3/0,76 | 1,6/1,5 | 0,7/0,6 | 1,6/1,1 | 30,5/24,3 | 0,8/0,5 | 1,9/1,5 | 0,7/0,3 | 36,5/30,6 |
| Almaty | 1,3/0,5 | 0,3/1,2 | 0,5/0,5 | 1,7/5,7 | 16,4/14,4 | 1,1/1,4 | 1,5/1,4 | 1/ 2,1 | 23,8/24,9 |
| Aktobe | 0,5/0,9 | 0,7/1,2 | 0,4/0,4 | 0,2/0,4 | 29,2/23,8 | 0,2/0,1 | 1,6/0,8 | 0,5/0,6 | 33,3/28,2 |
| Pavlodar | 1,4/2,1 | 0,4/0,8 | 0,9/0,6 | 0,3/0,3 | 18,1/16,1 | 0,1/0,4 | 3,6/2,3 | 1/ 1,8 | 25,5/24,4 |
| Kyzylorda | 0,5/0,63 | 0,2/0,2 | 0,2/0,3 | 0,2/0,2 | 41,3/50,1 | 0,3/0,3 | 0,4/1,1 | 0,5/2,9 | 43,6/55,73 |
| Kostanay | 1,2/3,8 | 0,9/0,5 | 0,6/0,7 | 0,6/0,2 | 17,8/17,4 | 0,6/0,9 | 1,8/2,6 | 0,9/1,8 | 24,4/27,9 |
| Akmola | 0,8/1,6 | 0,4/0,4 | 0,9/0,3 | 0,1/0,2 | 10,7/9,6 | 2,9/1,5 | 0,6/0,4 | 0,6/1,4 | 16,9/16,9 |
| Zhambyl | 0,5/0,45 | 0,6/0,6 | 0,2/1,1 | 0,7/0,6 | 13,8/9,7 | 7,4/1,8 | 1/1,8 | 0,9/0,8 | 25,1/16,8 |
| North Kazakhstan | 1,3/3,37 | 0,4/0,7 | 0,5/0,4 | 0,2/0,3 | 11,1/7,2 | 0,5/0,4 | 2,6/1,7 | 1,5/1,3 | 18,1/15,4 |
| Share in the total volume of services in the RK regions | 1,5/3,14 | 1,53/1,67 | 1,59/1,58 | 6,37/6,28 | 16,7/16,6 | 2,8/2,5 | 4,2/3,9 | 4,8/5,6 | |

* The total volume does not include education and health services, transport, accommodation and food services, as otherwise, very small specific gravities will be obtained, which complicates the analysis. ** The numerator is 2011, the denominator is 2017.

Source: Compiled by authors according to official website of the Committee on Statistic <http://stat.gov.kz>

To obtain an objective description of the development of the post-industrial services sector, we have conducted a rating assessment of the regions of Kazakhstan for 2011-2017 and identified areas that are leaders in each individual type of services based on the assessment of the structure of the volume of services provided for each variety (Table 2).

Table 2. Regional ratings by the structure of the volume of post-industrial services provided, average for the period of 2011-2017.

| Regions | Computer | Information | Legal and accounting | Management consulting | Architecture, engineering, technical research | Scientific research and development | Advertising and market research services | Professional, other scientific technical | Average rating | Absolute difference between regions |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------|----------------------|-----------------------|-----------------------------------------------|-------------------------------------|------------------------------------------|------------------------------------------|----------------|-------------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | Rating for each type of service on average for the period of 2011-2017 | | | | | | | | | |
| city of Almaty | 1 | 2 | 1 | 1,5 | 1 | 1,5 | 1 | 1,5 | 1,3 | |
| city of Nur-Sultan | 2 | 1 | 2 | 1,5 | 3 | 1,5 | 2 | 3 | 2,0 | 0,7 |
| Karaganda | 3,5 | 4,5 | 4 | 6 | 6,5 | 6 | 3,5 | 7 | 5,1 | 2,9 |
| Atyrau | 3,5 | 9,5 | 3,5 | 4 | 6 | 5 | 15 | 1,5 | 6,0 | 0,9 |
| East Kazakhstan | 6 | 12 | 9 | 4,5 | 8,5 | 3,5 | 3,5 | 4 | 6,4 | 0,3 |
| Mangistau | 10,5 | 8 | 10,5 | 7 | 3 | 3,5 | 11,5 | 6,5 | 7,6 | 1,2 |
| West Kazakhstan | 10 | 8 | 8 | 4,5 | 6 | 8,5 | 9 | 9 | 7,9 | 0,3 |
| Almaty | 9,5 | 7,5 | 8,5 | 7 | 11 | 7,5 | 7,5 | 6 | 8,1 | 0,3 |
| South Kazakhstan | 13,5 | 3 | 6 | 11,5 | 6 | 12,5 | 6 | 10,5 | 8,6 | 0,5 |
| Pavlodar | 7 | 9 | 7 | 14 | 12 | 12,5 | 5,5 | 9,5 | 9,6 | 1,0 |
| Kostanay | 6,5 | 9 | 8,5 | 12 | 13 | 11,5 | 9 | 10,5 | 10,0 | 0,4 |
| Aktobe | 11,5 | 6,5 | 13,5 | 12,5 | 9 | 16 | 11 | 13,5 | 11,7 | 1,7 |
| Kyzkorda | 14,5 | 15,5 | 13,5 | 11,5 | 6 | 13,5 | 13 | 11 | 12,3 | 0,6 |
| Akmola | 11,5 | 13,5 | 11 | 13 | 14,5 | 8 | 15 | 15,5 | 12,8 | 0,6 |
| Zhambyl | 16 | 11,5 | 16 | 11 | 14,5 | 10 | 11 | 13,5 | 12,9 | 0,1 |
| North Kazakhstan | 9,5 | 15,5 | 14 | 14,5 | 16 | 15 | 12,5 | 13,5 | 13,7 | 0,8 |
| Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz | | | | | | | | | | |

The calculations were carried out in four stages:

1) To calculate the rating, we analyzed the volumes of services provided by enterprises and individual entrepreneurs for each year separately in the period of 2011-2017, and based on the specific gravity of the region, its rating was determined in each year. Next, the average rating for the period for each type of service was determined. Values are presented in columns 1 through 8.

2) At the next stage, the average rating for all the types of post-industrial services was calculated. The value is presented in column 9.

3) The next step, on the basis of the method of absolute differences between rating values, has revealed groups of regions that are quite homogeneous from the point of view of the level of development of post-industrial services. The values of the absolute differences of the indicator between neighboring positions in the rating are presented in column 10. The method of absolute differences allows us to identify groups, within which the absolute deviation in the value of the indicator in question is less than between groups. Jumps in the values make it possible to distinguish groups with a sufficient degree of certainty.

According to the assessment results, the following groups were identified:

- Unconditional leaders are the cities of Almaty and Nur-Sultan, which have the first and second ratings for almost all types of services.

- Leaders of the second level are Karaganda, East Kazakhstan and Atyrau regions. They occupy stably 3,4,5 places, but in one or two types of services they have “failures”. For the Atyrau region, such “failed” types of services are information (9.5 points) and market research services (15 points). For the East Kazakhstan region such services were information (12 points), legal and accounting (9 points), architectural and technical (8.5 points). In the Karaganda region, lower values are defined for engineering and other technical services (6.5 and 7 points).

- Sustainably-average regions are Mangistau, West Kazakhstan, Almaty, South Kazakhstan regions. They have one or two winning positions. The Mangistau region has 3 and 3.5 points for the development of engineering and scientific research services. The South Kazakhstan region has 3 points for the development of information services. The West Kazakhstan region has a high score for management consulting services. The Almaty region has a stable average scores for all types of services.

- Unsustainably-average regions are Pavlodar and Kostanay regions, which have almost all positions in the rating below average, but due to one or two positions with a rating above average, they will deviate from the closing group of regions. For the Pavlodar region this position is advertising and market research services (5.5 points), and for the Kostanay region this position is computer programming services. (6.5 points).

- Outsiders are Aktobe, Zhambyl, Kyzylorda, North Kazakhstan and Akmola regions, which have low ratings for all the types of post-industrial services, corresponding to low volumes of the production of these types of services. For certain types of services, they are in the field of average rating values, but the critical mass of indicators is low. Thus, the Aktobe region in the average rating zone has 6.5 points for information services, and the Kyzylorda region has 6.5 points for engineering and architecture services. The Akmola region was marked with 8 points for scientific development and research.

Analysis of the product profiles of certain types of post-industrial services allows us to see more and less dynamic intraspecific positions.

Computer programming services

The range of computer services is characterized by eight positions, but the share of these positions in the total volume of services and the growth rate of individual products vary significantly (Table 3).

The most demanded by the market are services on design and development of application programs, the share of which in the total volume of computer services provided has increased from 32.0% to 49%. That is, by 2017, 50% of the supply of services in this market segment is accounted for by services on design and development of application programs.

The growth rate of this type of services amounted to 300.5%, which is 184.5% higher than the growth rate of computer services as a market segment (Table 3).

Table 3. Growth rates and structure of the computer services segment for the period of 2017/2011.

| Types of computer services | Volumes of services production, mln. tenge | | Growth rate, * | Structure, % | |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|----------------|--------------|--------------|
| | 2011 | 2017 | 2017/ 2011 | 2011 | 2017 |
| Computer systems and networks management | 2943 | 687,4 | -76,6 | 5,4 | 0,5 |
| Installation of computers and peripheral equipment | 3327,8 | 3 964,70 | 19,1 | 6,2 | 2,8 |
| Technical support consulting | 4199,8 | 7 057,10 | 68,0 | 7,8 | 5,0 |
| Other IT-services | 13623 | 23 878,00 | 75,3 | 25,2 | 16,9 |
| Software consulting | 5325,2 | 10 052,60 | 88,8 | 9,8 | 7,1 |
| Total | 54069,5 | 141 501,90 | 116,3 | 100,0 | 100,0 |
| Networks and systems design and development services | 2719,8 | 8 088,00 | 197,4 | 5,0 | 5,7 |
| IT-technologies technical support | 2653,7 | 9 418,70 | 254,9 | 4,9 | 6,7 |
| Application programs design and development services | 17327,4 | 69 390,60 | 300,5 | 32,0 | 49,0 |
| Originals of software (including computer games) | 1949,8 | 8964,8 | 359,8 | 3,6 | 6,3 |
| * Data ranking is carried out by this indicator. | | | | | |
| Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz | | | | | |

Another type of service that is growing more intensively than this supply of computer services in general is the originals of software (including computer games). This product in 2011 had the smallest share - 3.6%, and in 2017 the supply was doubled to 6.3%, and the growth rate compared to 2011 was 359.8%.

More than the segment as a whole, the offer of technical support for IT technologies is growing - 254.9% compared to 2011, as well as systems design and development services - 197.4%.

All four subtypes of the computer services segment considered above increase their share in the total supply volume and represent the most promising areas of specialization for the economy of Kazakhstan. The total share of growing subtypes of computer services is 68% in 2017, while in 2011 it was 45.5%.

In general, the development trend of the segment can be considered intellectual, because in the segment, it is precisely those types of services represented by “development and design” and not by “support” that grow. That is, those types of services that require a high level of vocational training and specific qualifications of human resources are growing. At the same time, the consulting subtypes of computer services are so far represented by insignificant structural shares that do not have a growth trend. That is, there is a market share, but these services have not reached the level of consulting yet.

Information services

The information services segment includes 9 positions, but as with computer services, demand for several types of services dominates. In 2011, the main demand was for data processing services (31.7%) and infrastructure provision services for data placement (34.8%). By 2017, demand for the first position increased and reached 40.2% of the total demand in this market segment, while the demand for infrastructure provision services decreased and amounted to 28.5% in 2017 (Table 4).

Table 4. Growth rates and structure of the information services segment for the period of 2017/2011.

| Types of information services | Volumes of services production, mln. tenge | | Growth rate, * | Structure, % | |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------|----------------|--------------|--------------|
| | 2011 | 2017 | 2017/2011 | 2011 | 2017 |
| Data streaming | 37,4 | 12,1 | -67,6 | 0,1 | 0,0 |
| Services of news agencies for newspapers, periodicals and audiovisual media | 655,4 | 48,4 | -92,6 | 2,4 | 0,1 |
| Application programs provision | 4289 | 584,5 | -86,4 | 15,7 | 0,8 |
| Web sites processing | 795,1 | 1 726,4 | 117,1 | 2,9 | 2,3 |
| Infrastructure provision for data placement | 9490 | 21 523,7 | 126,8 | 34,8 | 28,5 |
| Total | 27259,9 | 75 644,9 | 177,5 | 100,0 | 100,0 |
| Data processing | 8650,7 | 30 387,1 | 251,3 | 31,7 | 40,2 |
| Other information services | 2541,9 | 12 954,1 | 409,6 | 9,3 | 17,1 |
| Web portals support | 720 | 5 823,0 | 708,8 | 2,6 | 7,7 |
| Providing space and time for online advertising | 80,4 | 703,1 | 774,5 | 0,3 | 0,9 |
| * Data ranking is carried out by this indicator. | | | | | |
| Source: compiled by authors according to official website of the Committee on Statistic http://stat.gov.kz | | | | | |

In 2017, the third most important center of attraction for demand was the group of diversified services, which attracted 17.1% of demand.

The analysis of growth rates in this market segment allowed us to conclude that the demand for data processing services, web portals support, and other information services is growing higher than the segment average. The highest growth rate is demonstrated by the service of providing space and time for online advertising, the growth rate of which amounted to 774.5%.

At the same time, a number of positions significantly reduced their production volumes. This applies to data streaming, application programs provision, services of news agencies for newspapers, periodicals and audiovisual media.

Positive growth rates, but lower than in the segment as a whole, were recorded in the web sites processing services, as well as in the infrastructure provision for data placement.

Assessing the dominant trend in this market segment, it can be noted that the “data processing” service is not an intellectual trend in the development of information services, it is rather the exploitation of various kinds of technical means for the production of information services. At the same time, this service is more high-tech in comparison with “infrastructure provision for data placement”, which went to the second position in terms of supply in this market segment.

Architecture, engineering, technical testing and analysis services

The dominant type of services in terms of their specific gravity in this segment is geology and geophysics services, which generally corresponds to the outstripping growth rates of the mining industry in the economy of Kazakhstan. This group includes mineral exploration and assessment services, land surveying services, cartography services. In 2011, this type of services occupied a share of 36.1% of the market, but in 2017 its share fell to 31.7% and leadership shifted to another group. (Table 5).

Table 5. Growth rates and structure of the architecture, engineering, technical testing and analysis services segment for the period of 2017/2011.

| Types of computer services | Volumes of services production, mln. tenge | | Growth rate, * % 2017/2011 | Structure, % | |
|------------------------------------------------------------------------|--------------------------------------------|-----------------|-------------------------------|--------------|--------------|
| | 2011 | 2017 | | 2011 | 2017 |
| Planning of cities, lands, parks, etc. | 13620,9 | 4717,5 | -65,4 | 3,2 | 0,6 |
| Architectural services of all kinds | 90662,9 | 128206,4 | 41,4 | 21,1 | 17,6 |
| Total | 428910 | 729827,1 | 42,0 | 100,0 | 100,0 |
| Technical testing and analysis | 62562,1 | 92689 | 48,2 | 14,6 | 12,7 |
| Geology and geophysics | 154888,4 | 231 401,8 | 49,4 | 36,1 | 31,7 |
| Engineering services | 107176,1 | 272810,3 | 154,5 | 25,0 | 37,4 |
| * All types of services include consulting in the corresponding field. | | | | | |
| Source: Compiled by the author by source Zenka et al. 2017 | | | | | |

This group was engineering services, including such services as design of buildings, power plants, vehicles, waste processing plants (hazardous and non-hazardous). This also includes a segment of services for the design of industrial and technological processes, the design of communication and broadcasting lines, the design of water, drainage, and sewer systems. In 2017, the share of engineering services increased to 37.4, and this type of activity moved to the first place in demand in the services market.

Architectural services of all kinds began to occupy the third place in the services market in the segment they occupied. The share of this type of service decreased from 21.1% to 17.6%.

The third place in terms of growth rates exceeding the average growth rate in the segment was taken by technical testing and analysis services (48.2%). The latter group includes such services as purity analysis and air composition testing, physical properties testing and analysis, testing and analysis of complex electro-mechanical systems, technical control of road vehicles, etc.

Services on planning of city, lands, and parks have the smallest share and negative growth rates. The share was 3.2% in 2011 and only 0.6% in 2017.

4. Conclusions

Thus, according to the results of the analysis made, the following conclusions can be drawn:

1) In the development of the services sector in Kazakhstan, a high level of concentration of these activities in several regions is observed. If in 2011 seven regions and cities of the republican significance produced 80.7% of services (excluding education, health, transportation, accommodation and food), then in 2017 the same regions already produce 86.6% of services. The centralization coefficient, equal to the sum of the squares of the specific gravities of production volumes, is 0.167 in 2011 and 0.170 in 2017, which characterizes the growing unevenness in the distribution of volumes between the regions of Kazakhstan. The ranking of the regions of Kazakhstan by the volume of services provided for the period from 2011 to 2017 showed that the ranks of the regions did not change. The leaders are the cities of Almaty and Nur-Sultan, followed by the oil Atyrau and Mangistau regions, which are ahead of the traditional industrial regions of Karaganda, East Kazakhstan, and West Kazakhstan.

2) If we turn to the analysis and assessment of post-industrial services, then for the period under review, the Karaganda and East Kazakhstan regions are included in the group of second-level leaders along with the Atyrau region. Mangistau and West Kazakhstan regions open the third group of sustainably-average regions. Sustainably-average regions of Mangistau, Almaty, South Kazakhstan and West Kazakhstan have one or two winning

positions. Unsustainably-average regions are the regions of Pavlodar and Kostanay, which have almost all positions in the rating below average, but due to one or two positions with a rating above average, they will deviate from the closing group of regions. Outsiders are Aktobe, Zhambyl, Kyzylorda, North Kazakhstan and Akmola regions, which have low ratings for all the types of post-industrial services. To compile the rating, the structure of the volume of services provided for each type was used, profiles of regions for 2011-2017 were determined, and regions were grouped by types of profiles on the basis of the method of absolute differences.

3) The general trend for all the regions is the absolute and relative growth of three types of services:

- Computer programming and similar consulting services, which are characterized by growth in 15 regions out of 16, while their share in the total volume of services in the aggregate of regions has grown from 1.5% to 3.14%.
- Information services grew in 10 regions out of 16, while their share in the aggregate of regions increased from 1.53% to 1.67%.
- Scientific and technical services from the “Other” category grew in 7 regions and their share in the aggregate of regions increased from 4.8% to 5.6%.

For other services, there is neither a massive increase in the number of regions, nor positive growth trends in the aggregate share.

4) Analysis of product profiles of certain types of post-industrial services allows us to see more and less dynamic intraspecific positions.

So, in computer services, 50% of the supply in the domestic market is occupied by application programs development services. The growth rate of this type of services amounted to 300.5%, which is 184.5% higher than the growth rate of computer services as a market segment. As a result, the development trend of the segment can be considered intellectual; this type requires a high level of professional training and qualifications. Another type of services, growing more intensively than the supply of computer services in general, is the originals of software (including computer games). This product in 2011 had the smallest share - 3.6%, and in 2017 the supply was doubled to 6.3%, and the growth rate compared to 2011 was 359.8%.

In 2011, the main demand was for data processing services (31.7%) and services on infrastructure provision for data placement (34.8%). By 2017, demand for the first position increased and reached 40.2% of the total demand in this market segment, while the demand for infrastructure provision services decreased and amounted to 28.5% in 2017.

Services on architecture, engineering, technical testing and analysis represent the most significant segment of the domestic market of post-industrial services. The dominant type of services in terms of their specific gravity in this segment in 2011 was services on geology and geophysics, which generally corresponded to the outstripping growth of the mining industry in the economy of Kazakhstan. This group includes mineral exploration and assessment services, land surveying services, cartography services. In 2017, engineering services took the first place in terms of specific gravity and growth rates, which generally corresponded to the trend of transition to the post-industrial economy with its emphasis on high-tech services for all the sectors of the economy.

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FORESIGHT FOR SUSTAINABLE ENERGY POLICY IN EGYPT: RESULTS FROM A DELPHI SURVEY*

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Abstract. This paper presents energy opportunities, particular areas of high potential and reflections on energy challenges in Egypt by the year 2040. Energy foresight significantly contributes in the effective review and formulation of national energy policies and strategies. In this work, 350 experts participated in real-time Delphi survey and responded to a set of structured and cross-linked questionnaires that aim to assess and provide future dimension to the energy sector in Egypt. Priorities are presented across 14 energy cluster-areas with 180 identified topics. The two-round Delphi study with an iterative process was performed to determine and measure the expectations of the different stakeholders with specific emphasis on the prospects of renewable energy and energy efficiency. The designed cross-linkages between survey components allowed the systematic pooling and convergence of knowledge in addition to the technical insights and different perspectives. About 50% of Egypt's energy demand was foresighted to be met by renewable energies around 2030. The results showed that all types of energy would not only provide economic and environmental benefits but also improve living standards. This work demonstrates that involving large diversity of expertise and different stakeholders, comprising heterogeneous groups, in foresight studies would potentiate the forecasting power, reduce the polarization effect, and enhance the reliability of the foresight exercise.

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Keywords: science policy; foresight; Delphi survey; energy; sustainable development; renewable energy

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Additional disciplines political sciences; ecology and environment; environmental engineering

1. Introduction

At the national level, the energy policies enact in the near future in Egypt could have a significant effect on both the energy efficiency and renewable energy. Many authors consider these two folds as the twin pillars of the sustainable energy policy (Armin Razmjoo, Sumper et al. 2019). The formulation of sustainable energy policies influences the economic development, environmental resource management and social acceptance. Many policies and strategic visions of developing countries set a long-term target for the national contribution of renewable energy and the overall energy efficiency. Despite these targets are usually perceived as highly ambitious, it requires augmentation of several policy tools to effectively anticipate challenges and opportunities (Radwan and Sakr 2017, Radwan 2018).

In this respect, it is important to understand how Egypt's energy matrix has evolved and it is even more important to consider this pattern of evolvement in analyzing the possible forecasted scenarios for future energy policies and national interventions (Rezk et al. 2016; Armin Razmjoo, Sumper et al. 2019). The forecasted scenarios would help better identifying opportunities while anticipating possible policy and strategic implications (Okoli and Pawlowski 2004).

While research on forecasting has mostly examined several technical aspects, technological-based forecasting research are less performed in many developing countries and hence, less contributing to national policy development (Okoli and Pawlowski 2004, Ghinolfi, El Baz et al. 2014). Energy future studies are usually implemented on the basis of foresight method with a combination of qualitative and quantitative tools, effective participation of experts and decision-makers. Many Studies have made important contributions to explore and define energy technology future (Lee and Yang 2018, Proskuryakova 2019). Technology foresight is a process comprising different techniques in developing mid-term future scenarios regarding the advancements in the use and production of technology and with the overall aim of identifying the areas of strategic importance and the emerging technologies are more likely to yield higher economic and social benefits (Rowe and Wright 2011). Delphi method, one of the important forecasting techniques, is commonly used in assessing specific aspects in the future and is frequently used in many energy foresight studies (Renzi and Freitas 2015). Being widely used in different research fields, the Delphi method is also known for harvesting the intelligence capacity of different expertise while making unified opinions to support the decision-making process.

Egypt has high potential of natural resources including natural gas, oil, coal and high reserves of fossil fuel energy sources; about 4189 billion barrels of oil reserve and about 77200 billion cubic meters of natural gas reserve (Table 1). The reserves are in the form of both mainland and coastal deposits (Ibrahim 2012, Shouman 2017). During the time of the late 1990s and mid-2000s, Egypt experienced helpful conditions regarding the findings of enormous natural gas holds in several locations, which contributed to different developmental plans and strengthened Egypt's position as natural gas producer and exporter (Suding 2011). This might be related to the increased consumption of natural gas by 7% per year during the first decade of 2000s with noticeable decrease in production by around 3% yearly during the period of 2009-2013. Consequently, the natural gas exporting capacity

was limited to only 5% of its total production in 2013 and eventually driving the country to start signing importing agreements in the following years of 2014 and 2015. On the other front, phasing out energy subsidies is clearly listed among the top priorities for policy makers (Breisinger, Mukashov et al. 2019). Egypt is by far the largest consumer of oil and natural gas in Africa while representing 22% of petroleum and other liquids of the continent's total consumption and 37% of its dry natural gas consumption. In 2016, the Supreme Council of Energy adopted the Egyptian Energy Strategy until 2035 and selected four different scenarios to guide energy planning in Egypt for the coming years with a target of 37.2% of renewable energy contribution in 2035 (NREA 2019), see Table 1. In this respect conducting a foresight studies are paramount for effective strategic planning. In this context, the Delphi method is mainly used when long-term issues (up to 30 years) have to be assessed. It is also useful for looking at emerging developments where external factors are likely to have a determining effect and when social aspects could influence economic or technical considerations. As it implies, it supports the identification of statements (topics) that are relevant for the future through channeling the tacit and complex knowledge to a single statement and makes it possible to judge (Di Zio, Castillo Rosas et al. 2017), see Table 1.

Table 1. Egypt's Production of Different Energy Sources during the 2000s.

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------------------|-------|-------|-------|-------|-------|-------|--------|
| Coal | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crude Oil | 30111 | 32142 | 29537 | 32825 | 33210 | 30835 | 31885 |
| Natural gas | 35901 | 54839 | 50143 | 39084 | 34763 | 34763 | 35362 |
| Electricity from Fossil Fuels | 8211 | 12250 | 12250 | 13431 | 14355 | 14514 | 14679 |
| Hydro Electricity | 1087 | 1112 | 1113 | 1188 | 1155 | 1171 | 1187 |
| Electricity from Renewables | 47 | 139 | 139 | 145 | 137 | 150 | 165 |
| Refinery/Oil Products | 28561 | 24754 | 21836 | 25348 | 25676 | 26357 | 270565 |

Source: African Energy Commission (AFREC 2017)

2. Methodology

The used Delphi method in this study comprises development of quantitative with qualitative metrics and the systematic utilisation of the experts' opinions and the insights gathered althrough the process. The Delphi is a well-established methodology in futures studies with evidence going back nearly 60 years (Gupta and Clarke 1996). Group of specialized experts served in the inception phase for identifying large set of topics based on literature review, existing policy briefs, strategies and Egypt vision 2030. Topics were then grouped per cluster area (table 2) and substructured to matrix of technical questions to develop specific questionnaire relevant to each target group. The Delphi method comprises iterative rounds (two or more) of the same questionnaire to the same respondents. This process continues until the answers converge to a specific line of argument. In the second round, the respondents were allowed to change their answers based on the summarized findings of the previous round. Besides, this iterative and opinion convergence process served the validation of reliability and robustness by a sensitivity analysis.

2.1 Setting the survey topics

The database of the Academy of Scientific Research and Technology in Egypt was used to select 350 experts regarding each of the 14 energy clusters' technical areas whilst each group include 25 experts comprising different and relevant expertise and background. Pre-defined criteria were used to select experts including major

and minor fields of expertise while respecting the specific quota for the different stakeholders. In this context and based on the outputs of the 14 groups, a workshop was organised to scientifically discuss these topics while ensuring wide acceptance of all involved participants. Afterwards, the experts were asked to conduct macro contextual analysis using foresight cards regarding the social, technology, economic, environment and political (STEEP) influences (Markley 2011). STEEP cards method contributes to the better understanding of probabilities of occurrence and impact of influence in the future until 2040 by taking into account the specific topics that could lead to resolve an existing problem and achieve a desired progress (Kononiuk and Magruk 2015). The experts selected 180 topics regarding the 14 energy cluster areas including technological and non-technological topics, see Table 2.

Table 2. Energy cluster-areas

| |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bioenergy including biomass, waste, bioethanol, biodiesel and biogas. |
| Energy efficiency including energy conversion, energy efficiency, distribution networks and energy transportation. |
| Enabling environments including social environment, energy pricing, enabling legislation and energy culture. |
| Energy storage including batteries and storage of solar energy |
| Environment Impact including environmental concerns with respect to air and water pollution, damage to public health, wildlife and habitat loss, water use, land use and global warming. |
| Fossil Fuels including coal, oil and natural gas. |
| Hydrogen energy including production and installation. |
| Materials for energy including material use, composite, raw materials and manufacturing. |
| Mixed energy technologies including solar wind energy, solar- bio energy and bio-hydro energy. |
| Nuclear Energy including nuclear fusion and nuclear stations. |
| Renewable energy (1) including wind, geothermal energy, wave power and hydropower. |
| Renewable energy (2) including concentrated solar power, solar heating, photovoltaics, solar thermal energy, solar architecture, molten salt power plants. |
| Transportation including roads and smart transportation. |
| Urban planning and Buildings including housing, technology codes and laws. |

2.2 Real time Delphi survey

Real time Delphi was used with an online version of the structured survey to support convergence of opinion in real time (Di Zio, Castillo Rosas et al. 2017). Real time Delphi is known also for its convenience when addressing large target groups with higher response rate than other similar tools (Aengenheyster, Cuhls et al. 2017).

The survey was designed to evaluate the selected topics regarding:

- Importance (importance at the national or international levels or both),
- Governmental interventions; actions that the government should address in each topic with respect to strategy formulation, human resource, capacity building, legal system reform (including intellectual property rights), public research institution reform, industry support, social acceptance, required investment).
- Forecasted time of technological impact realization which shows the required duration for either of the technology, process or solutions to be ready at technical level.
- Forecasted time of social impact which shows the required duration for the adapted technology, service or solution to be either used, promoted or accepted by local communities.

Furthermore, participants were also asked to rank and identify sectors of technological and strategic importance i.e a specific feasible technology in the near future could contribute to a multilevel impact at social, technological and economic levels. Moreover, while considering the sensitivity of the analysis, participants were asked to assess their level of expertise for each cluster area. Each participant received personal invitation with a link to an online Delphi survey. The designed cross-linkages between survey components supported gathering of technical insights and different prospects on real time.

3. Results and discussion

At the first round of the survey, all the experts expressed their opinions and answered all the required questions. For the second round, a number of respondents decreased to 190 experts who expressed their opinions in the view of the findings of the first round. The average response rate was 74%. Most of the participants are males (70% of the total number of participants). For all cluster-areas the number of males' participants was higher than female except in urban planning and building cluster where the percentage of females reached 56%. The results showed that 64% of participants showed a high level of expertise, while 18%, 13% and 4% showed a moderate degree of expertise, a low degree of expertise and no relevant expertise, respectively (Figure 1).

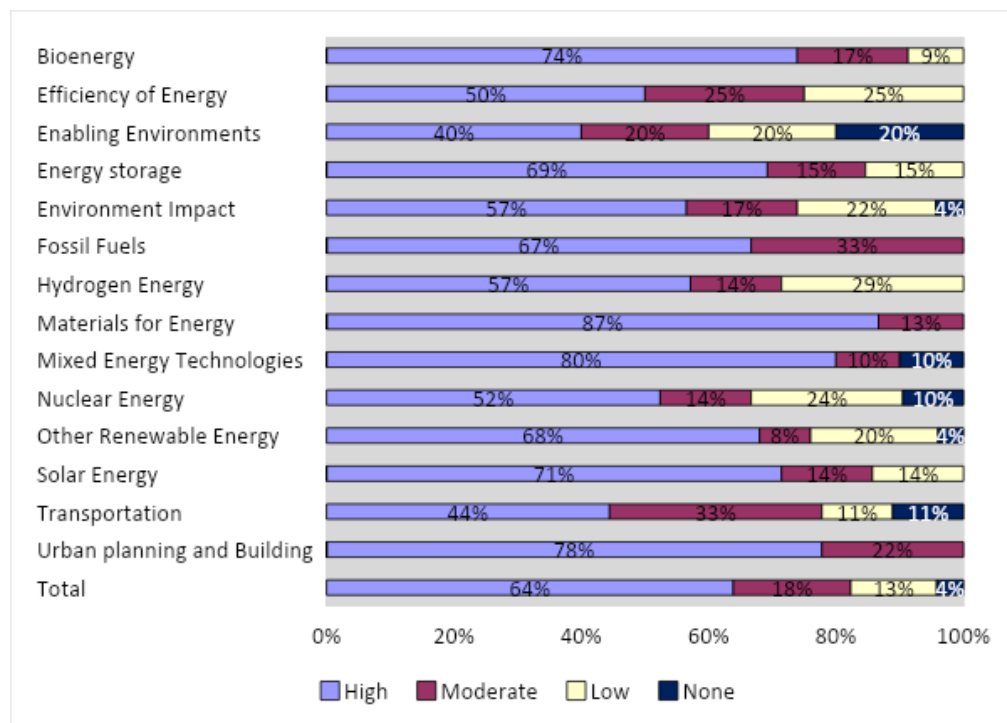


Figure 1. Distribution of Respondents by degree of expertise per cluster area

Since participants represent diverse groups of multidisciplinary backgrounds covering all aspects of energy from natural sciences and engineering to the social and human sciences, it is understandable to the authors to find different experience levels, to a specific cluster area, recorded among the findings. Participants were representatives of universities, industrial sectors, civil societies and research organizations. In this respect, 52% of the participants were representatives of research institutions while industry and academia were represented by 41%. Previous studies showed that expertise and flow of exchanges are of higher importance than the number of participants (Nguyen, Chen et al. 2019). On the other front, previous empirical evidence showed that lower number of participants than the one used in the present study could have high social acceptance (Rowe and Wright 2011, Proskuryakova 2019). Other studies showed that increasing the number of participants to capture more reflections and opinions could elongate the process with more dragging sessions and accordingly might increase the dropout rate of experts (Okoli and Pawlowski 2004). The diversity of participants and stakeholders involved in the present study is aligned with previous studies, which showed that the heterogeneous groups

potentiate the forecasting power from one side while reducing the polarization effect and enhancing the accuracy of findings from the other side (Yaniv 2011).

3.1. Important future topics

The participants were asked to assess importance for each of the 180 identified topics clustered in 14 energy areas. The study shows that the topic is of high importance if reached consensus equal or higher than 70% by all participants. The results showed that 14 topics in 5 cluster areas (Bioenergy, enabling environments, energy storage, fossil Fuels, urban planning and building) achieved relative consensus for being important at the national level with an agreement of over 70% (Table 3). While regarding the topics of high importance at both the national and international levels, the results showed that 50 topics in 12 cluster areas (Bioenergy, energy efficiency, energy storage, enabling environments, hydrogen energy, materials for energy, mixed energy technologies, nuclear energy, other renewable energy, solar energy and transportation) achieved relative consensus with agreement over 70%.

To limit the inadvertently polarization effect which might result into an interdependent agreement of experts (spurious consensus), each group had to have a diverse level of expertise and different stakeholders while having iterative Delphi rounds. Within this methodological approach, the adopted consensus process is aligned with other previous studies (Kerr and Tindale 2011, Önköl, Lawrence et al. 2011, Proskuryakova 2019).

Table 3. Topics importance for Egypt with highest degree of consensus among the respondents (70% consensus or higher)

| Area | Topic | Percentage degree of consensus of respondents |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Enabling environments | A legislation was developed for a fair distribution of natural resources in terms of use and energy pricing by doing a fair population survey | 100 |
| Urban planning and Building | A system of recycling garbage is created that is easy & simple to reuse this garbage in the production of energy, this does not need labor as each member of the family can manage it. | 89 |
| Enabling environments | Human behavior and environmental ethics were modified through education - culture - media | 86 |
| Enabling environments | the general and technical education curriculum technical had included new topics about the use of green energy and energy management technology | 86 |
| Enabling environments | Issued Laws for the construction of new housing on the installation of solar water heaters as a condition of the construction license terms | 86 |
| Fossil Fuels | Proper development plans were set for improving and developing refinery plants in Egypt | 82 |
| Urban planning and Building | Transparent solar cells (Integrated solar cells) in curtain walls and opening and skylight | 78 |
| Energy storage | Established the targeted collaboration projects with South Asian countries, China, Japan & Korea. | 75 |
| Energy storage | Establishment of centers of excellent for improving energy storage media. | 75 |
| Enabling environments | The education curriculum designers and makers and the general standards nationalism's vision was changed to increase awareness of the new concepts associated with energy alternatives and population awareness and recycling of waste | 71 |
| Enabling environments | The rationalization of waste and consumption was insured through good management of resources to overcome the gap between the increase in the population growth rate and the amount of resources | 71 |
| Enabling environments | Localization for know-how for the manufacture of solar cells and solar heaters | 71 |
| Bioenergy | A pilot plant was built for the production of biofuel as a nucleus for circulation in Egypt | 70 |

3.2. Time of occurrence

The Delphi topics and their forecasted time of occurrence were assessed by all participants and respondents were asked to assess frequent times of occurrence of all Delphi topics in the duration between 2018 to 2040. The assessment was performed with respect to, first, the time of technical realization which refers to the time when the technology, process or solutions could be ready at the technical level (Table 4). And second, the time of social acceptance which refers to the time when a particular technology, service or solution could impact the market and local communities in Egypt (Table 5). An average time of occurrence of all the captured statements was assessed after the second round of Delphi. The majority of Delphi topics were expected to be technologically realized in the duration between 2018-2022, while the reset of topics (25%) are expected to be realized after the year 2022. The topics that are expected to be realized after 2027 addressed issues regarding the use of electric and hybrid cars, use of advanced material in hydrogen storage, hybrid unit of wind and solar and hydrogen PV, nuclear reactors components and the treatment of nuclear wastes. Table 3 and 4 list these specific topics regarding the technology realization time and social realization time. For the topics achieved high social realization with either market impact or high local community acceptance in Egypt (Table 3), the majority of topics (75% of all topics) are expected to be realized during the years 2018-2027, while the reset of topics (25%) are expected to be realized after the year 2027. The topics that could be realized after year 2027 addressed issues related to specific areas of nuclear energy, bio-energy, energy efficiency, energy storage and hydrogen energy.

Table 4. Allocation of topics according to technological realization time

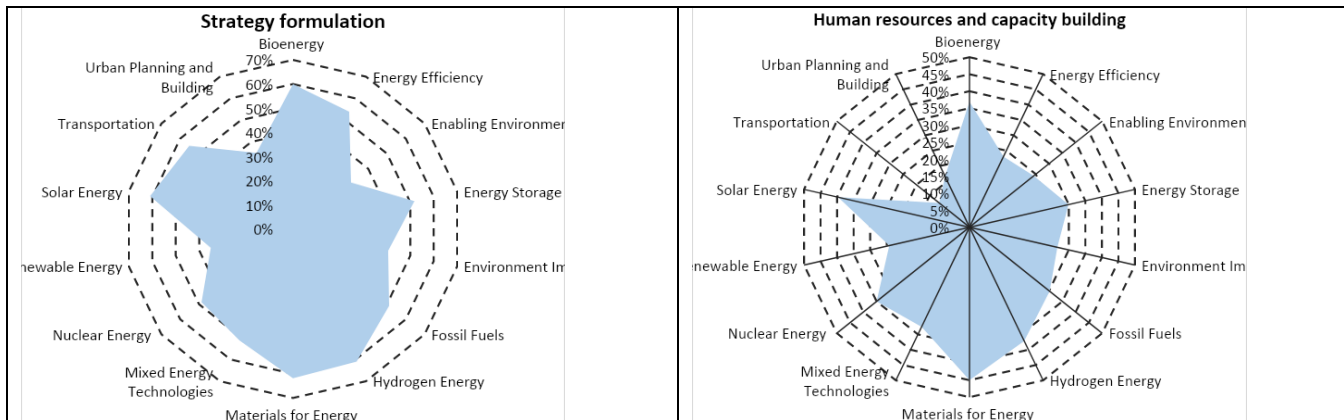
| Area | Number of topics per Technological Realization Time | | | | | Total Number of topics |
|-----------------------------|-----------------------------------------------------|-----------|-----------|-----------|------------------|------------------------|
| | 2018-2022 | 2022-2027 | 2027-2032 | 2032-2037 | Already realized | |
| Bioenergy | 13 | 0 | 0 | 1 | 1 | 15 |
| Energy efficiency | 7 | 2 | 1 | 0 | 3 | 13 |
| Enabling environments | 9 | 6 | 1 | 0 | 0 | 16 |
| Energy storage | 11 | 4 | 1 | 0 | 0 | 16 |
| Environment Impact | 12 | 2 | 0 | 0 | 0 | 14 |
| Fossil Fuels | 5 | 3 | 0 | 0 | 1 | 9 |
| Hydrogen energy | 14 | 0 | 1 | 0 | 0 | 15 |
| Materials for energy | 8 | 2 | 0 | 0 | 0 | 10 |
| Mixed energy technologies | 14 | 1 | 0 | 1 | 0 | 16 |
| Nuclear Energy | 3 | 3 | 1 | 3 | 0 | 10 |
| Other Renewable energy | 6 | 0 | 0 | 0 | 1 | 7 |
| Solar Energy | 13 | 1 | 0 | 0 | 0 | 14 |
| Transportation | 4 | 1 | 0 | 0 | 3 | 8 |
| Urban planning and Building | 16 | 0 | 0 | 0 | 1 | 17 |
| Total | 135 | 25 | 5 | 5 | 10 | 180 |

Table 5. Allocation of topics according to Social realization time

| Area | Number of topics per Social Realization Time | | | | | | Total Number of topics |
|-----------------------------|----------------------------------------------|-----------|-----------|-----------|-----------|------------------|------------------------|
| | 2018-2022 | 2022-2027 | 2027-2032 | 2032-2037 | 2037-2042 | Already realized | |
| Bioenergy | 7 | 5 | 2 | 0 | 1 | 0 | 15 |
| Energy efficiency | 0 | 7 | 3 | 0 | 2 | 1 | 13 |
| Enabling environments | 6 | 4 | 6 | 0 | 0 | 0 | 16 |
| Energy storage | 6 | 6 | 3 | 0 | 1 | 0 | 16 |
| Environment Impact | 8 | 6 | 0 | 0 | 0 | 0 | 14 |
| Fossil Fuels | 4 | 5 | 0 | 0 | 0 | 0 | 9 |
| Hydrogen energy | 9 | 0 | 5 | 1 | 0 | 0 | 15 |
| Materials for energy | 3 | 4 | 3 | 0 | 0 | 0 | 10 |
| Mixed energy technologies | 7 | 8 | 1 | 0 | 0 | 0 | 16 |
| Nuclear Energy | 0 | 0 | 10 | 0 | 0 | 0 | 10 |
| Other Renewable energy | 2 | 2 | 3 | 0 | 0 | 0 | 7 |
| Solar Energy | 6 | 5 | 3 | 0 | 0 | 0 | 14 |
| Transportation | 3 | 4 | 1 | 0 | 0 | 0 | 8 |
| Urban planning and Building | 16 | 1 | 0 | 0 | 0 | 0 | 17 |
| Total | 77 | 57 | 40 | 1 | 4 | 1 | 180 |

3.2. The actions that the government should address in the near future

The respondents were asked to select the actions needed to realize the topics in the future with respect to strategy formulation, human resources, capacity building, legal system reform, academia and public research institution reform, industry support, public acceptance and the required investment. The results showed four actions with the highest consensus among the respondents which represent the actions of high priority at both the technological and social levels. The intervention for strategy formulation has achieved a consensus of 49% of all participants and it is followed by investment requirements (47%), reform of higher Education establishments and public research institution (41%) and Industry support action (40%). Figure 2 shows the actions that the government shall address in all 14 energy areas.



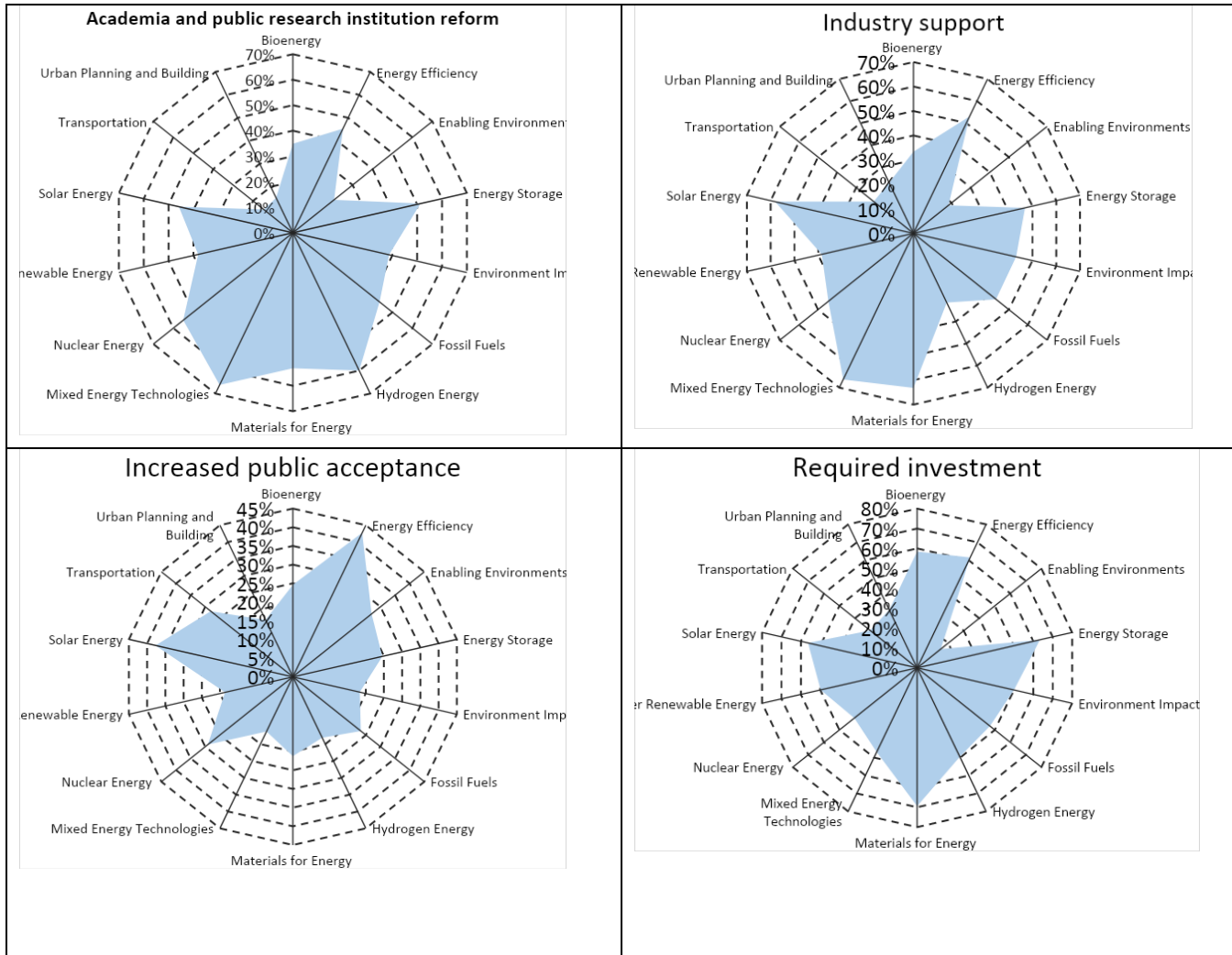


Figure 2. Specific actions require government interventions

3.3. Sectors that will make the identified Delphi topics realized in future

The respondents were asked to select the sectors that will make technological and social realization possible for each of the Delphi topics and across all the 14 cluster areas with respect to stakeholder type including higher education establishment, public research organization, private enterprise, a collaboration of multiple sectors or through the support of international organizations. Results indicate that the first priority (highest consensus percentage) shall focus on the need for collaboration among multiple sectors for topics to be realised at technological and social level and more specifically for the subtopics of the areas of bio-energy, energy efficiency, energy storage, environment impact, enabling environments, materials for energy, renewable energy, solar energy, transportation and urban planning and building (Figure 3).

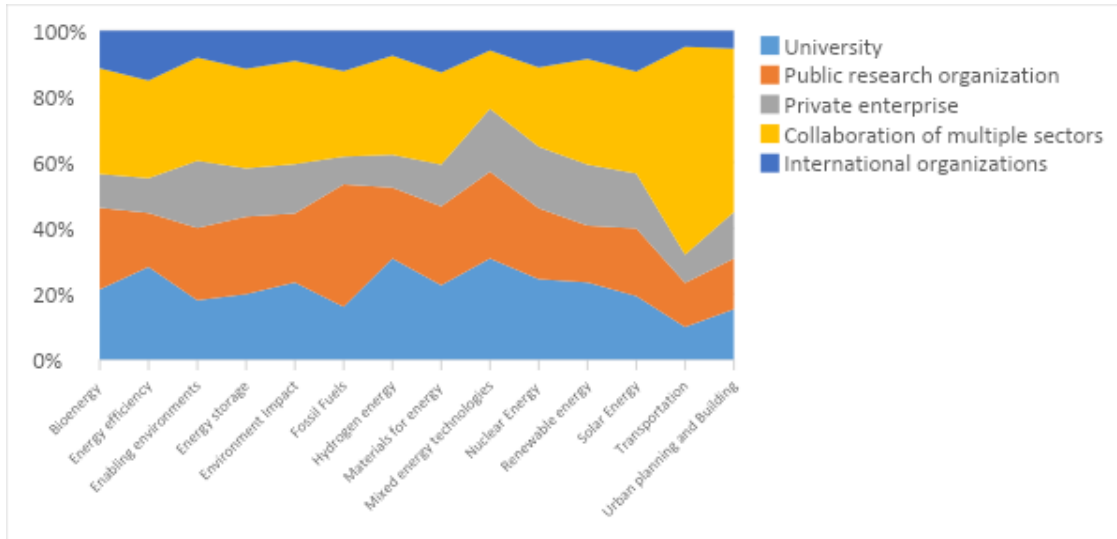


Figure 3. Sectors that will make Delphi topics realized in future

On the other front, participants expected higher education establishments to address that the topics of fossil fuels areas to be impactful while the contribution of public research organization could significantly topics of nuclear energy and mixed energy technologies areas.

Conclusions

In this work large data set of topics were screened based on a literature review, existing policy briefs, strategies and relevant components of Egypt vision 2030. Topics were then grouped per cluster area and sub-structured to a matrix of technical questions to develop specific questionnaire relevant to each target group. Real time survey was performed through an iterative process. About 50% of Egypt's energy demand was foresighted to be met by renewable energies around 2030. The results showed that all types of energies would not only provide economic and environmental benefits but also improve living standards. This work demonstrates that involving large diversity of expertise and different stakeholders, comprising heterogenous groups, would potentiate the forecasting power, reduce the polarization effect, and enhance the reliability of the foresight exercise. The amalgamation of social, economic and political aspects in technology-based foresight ensures relevance of the findings to a wide range of beneficiary.

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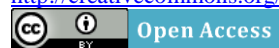
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DIFFERENTIATION OF INTERNAL REGIONS IN THE EU COUNTRIES*

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Abstract. The aim of the article is to study safety and sustainability of differentiation of performance of internal regions (NUTS 3) in the EU countries measured by the Sub-national Human Development Index (SHDI). The authors examine differentiation of the SHDI of internal regions in the EU countries by means of correspondence of distribution of this indicator [SHDI] of regional performance to Gauss curve, as well as by analyzing the SHDI of internal regions in the EU countries with the help of the coefficient of variation. As follows from the research, the authors proved that differentiation of regional performance in the EU over the last three decades were not chaotic but they were subjected to certain regularities: the distribution of performance of internal regions is normal, with metropolitan areas almost always being leaders of regional performance; regional differences in the area that is now the EU were increasing during the collapse of the Eastern European Socialist Bloc in the early 1990s, and they were declining later, as the regions adapted to the new conditions. So, identified regularities in performance of internal regions (NUTS 3) in the EU countries – normal distribution and spatial convergence – have been considered by the authors as safe and sustainable for further development of the whole EU and its countries.

Keywords: EU countries; internal regions; differentiation; normal distribution; spatial convergence

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JEL Classifications: O15, O52, O57

1. Introduction

From the standpoint of economic efficiency, spatial inequality may be beneficial or harmful (Kim, 2008; Kiselitsa et al., 2018; Mikhaylov et al., 2018), disruptive (Schwab, Sala-i-Martin, 2017). On the one hand, socio-economic differentiation within a country gives impetus to the development of poorer regions, promotes sustainability of more successful regions, but on the other hand, the stimulating effect of territorial differentiation of socio-economic development takes place only up to a certain level (Glinskiy et al., 2017).

A rather large number of researchers both in Europe and around the world deal with the study of performance of countries' internal regions. For example, M. E. Porter is one of the most active researchers of the economic performance of regions. He studied performance of regional economies in the USA and discovered that it "varies markedly in terms of wage, wage growth, employment growth and patenting rate" (Porter, 2003). The New Zealand Institute of Economic Research (NZIER) in their study into regional economies in New Zealand also dealt with the economic aspect of performance of internal regions having measured its performance using three separate indicators: the level of GDP per capita (economic prosperity), GDP growth (economic progress), and volatility (economic resilience). The NZIER researchers discovered that "the level of GDP per capita (income), GDP growth (progress) and volatility of growth (resilience) rank each region differently – there is no consistent winner. It is also clear that measures like GDP do not capture the whole story. For example, Taranaki, the region of New Zealand, has a very high level of GDP per capita, but this does not fully flow through to household incomes" (New Zealand Institute of Economic Research, 2014). The researchers from Daugavpils University (Latvia), in turn, studying higher education's contribution into economic performance and innovativeness of countries and being aware of all downsides of such an indicator as GDP per capita, still choose it as a tool for measuring economic performance of countries, explaining that "in practice, GDP per capita is a basis for empiric interpretation of the methodological understanding of state economic performance through income" (Stankevics et al., 2014; Boronenko et al., 2014).

The aim of the article is to study the differentiation of performance of internal regions in the EU countries more broadly than economic one. In the authors' opinion, this broader and more integrated perception of performance is included in the Human Development Index (HDI) applied by the United Nations Development Program (UNDP) (UNDP, 2019). Internal regions (NUTS 3) in the EU countries, i.e. regions in 26 countries (excluding Cyprus and Luxembourg which have no internal regions) are the object of the research. Safety and sustainability of differentiation of performance of the research object are the subject of the research.

In order to achieve the aim of the article, the authors study variance and differentiation of the HDI of internal regions in the EU countries by means of examination of correspondence of distribution of this indicator to Gauss curve, as well as by analyzing differences between internal regions in the EU countries with the help of the coefficient of variation of the SHDI. The database of the Sub-national HDI (SHDI) – NUTS 3 level – in the period 1990-2017 created by the Dutch Global Data Lab of Radboud University (Radboud University, 2019) serves as the source of information for the research.

Further, the body of the article is organized as follows: Part 1 discusses the theoretical framework and methodology of the measurement of performance of territories; Part 2 presents the outcomes of the study into performance's distribution of internal regions of the EU countries; Part 3 presents the outcomes of the study into performance's differences between internal regions of the EU countries.

2. Theoretical framework and methodology of the measurement of performance of territories

In August 2009, the European Commission published an important report “GDP and Beyond. Measuring Progress in a Changing World” which recognized the need to complement GDP with the indicators of environment and social indicators when measuring performance of territories (European Commission, 2009). In September 2009 “Report by the Commission on the Measurement of Economic Performance and Social Progress” (more known as “Stiglitz-Sen-Fitoussi commission report”), which identified the boundaries for using GDP as an indicator of economic development and social progress, was published (Stiglitz et al., 2009). The Commission recognized that GDP was the main indicator of economic activity, but it was insufficient to measure the well-being of society, and it was time to shift the focus from the measurement of economic production to the assessment of human well-being. This does not mean a refusal from GDP as an indicator of production, but it shows that indicators which complement indicators of market performance with indicators of human well-being and sustainable development should be used.

Despite the fact that sustainable economic growth is still an important goal for the development of a territory, modern society wants to make sure that this economic growth will result in a higher standard of living and higher well-being for as many people as possible; that people will not only gain benefits from the development process, but they will also participate in it.

The impact of economic growth and its preconditions on the human overall well-being within the framework of the modern Human Development Conception is presented in Figure 1.

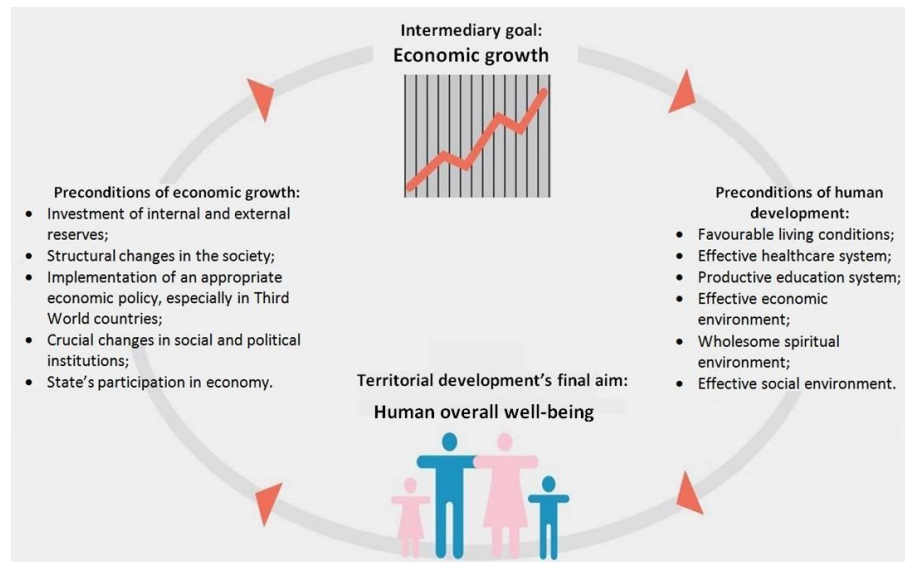


Fig. 1. The impact of economic growth and its preconditions on the human overall well-being within the framework of the Human Development Conception

Source: J. Lonska (2015) on the basis of Soubbotina, Sheram, 2000; Domar, 1957; Lewis, 1955; Todaro, Smith, 2011; Myrdal, 1968; Prebisch, 1978; Cortright, 2006; Haq, Jolly, 1996

As it has been already mentioned in the introduction to the article, the authors believe that the Human Development Index can be the best tool for measuring performance of countries and their regions. The Human Development Index was elaborated in 1990 by a Pakistani economist Mahbub ul Haq (Haq, 1990) to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not

economic growth alone (Seers, 1969; Sen, 1983; World Bank, 1991; Stiglitz, 1994; UN General Assembly, 2000; Boronenko, Lonska, 2013; Lonska, 2015). The HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living (Figure 2).

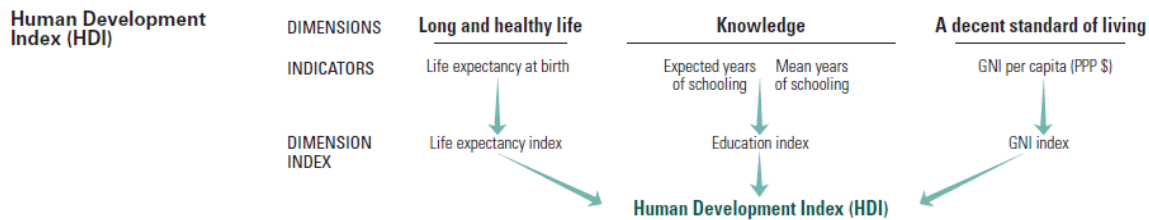


Fig. 2. The structure of the Human Development Index

Source: UNDP, 2019a

The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing Gross National Income (GNI). The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean (UNDP, 2019a).

It should be emphasized that the development of tools for measuring performance of territories is continuing, and at the moment there is also the Inequality-adjusted Human Development Index (IHDI) used. It combines a country's average achievements in health, education and income with how those achievements are distributed among a country's population by "discounting" each dimension's average value according to its level of inequality. Thus, the IHDI is the distribution-sensitive average level of human development. Two countries with different distributions of achievements can have the same average HDI value. Under perfect equality the IHDI is equal to the HDI, but falls below the HDI when inequality rises. The difference between the IHDI and HDI is the human development cost of inequality, also termed – the loss to human development due to inequality (UNDP, 2019b).

In the authors' opinion, the IHDI measures the performance of regions better than the HDI. However, the researchers do not have a database on the IHDI at regional levels at their disposal. Therefore, the research will have to be limited to the analysis of the Sub-national HDI (SHDI), excluding intra-regional inequality in human development which affects the performance of each region of any country.

3. Distribution of performance of internal regions of the EU countries

The philosophy of statistics argues that normal distribution commonly found in nature and in society is the most safety and sustainable for further development, and gives the following explanation for this: the overall selection pressure determines an ideal norm for something (for instance, people's height or intellect), but the selection pressure is not perfect itself, and some variability around the ideal norm will not matter very much. There may even be a selection pressure to maintain some variability to hedge against fluctuating circumstances in the environment. Therefore, in the process of natural selection only the average value (an ideal norm) and the extreme

limit of the indicator's variability (in one direction and the other) are strictly fixed. Apart from that, there is no other relevant selection pressure, and the elements of the system (countries, people, animals, cells, etc.) will naturally tend to the state of maximal disorder – i.e., the state of maximum entropy – subject to its selection constraints. (This is another appeal to something like the second law of thermodynamics). The variance of some measured indicators that maximizes entropy subject to those constraints is a normal distribution, and, so, that is why most indicators in nature and society are normally distributed (Cover, Thomas, 2006; Lyon, 2014) or, in other words, that is why nature and society “have chosen” this kind of distribution of random variables as normal.

In order to study the regularities in performance's distribution of internal regions of the EU countries the authors will analyze the parameters of variance of the SHDI in the internal regions (NUTS 3) of the EU countries in the period 1990-2017 with respect to compliance of the SHDI distribution to normal one. This analysis will allow the authors to find out whether the distribution of the SHDI of the European regions corresponds to Fauss curve or the Gauss curve and how close this correspondence is.

Table 1. Results of checking for compliance of distribution of the Sub-national Human Development Index (SHDI) with the Gauss curve in the EU internal regions (NUTS 3)*, n = 278 regions, 1990-2017

| Year | Mean of SHDI in the EU internal regions (NUTS 3) | Standard deviation | Significance from the Kolmogorov-Smirnov test, p-coefficient | Decision according the hypothesis about normal distribution of SHDI (null hypothesis) |
|------|--------------------------------------------------|--------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1990 | 0.746 | 0.049 | 0.115 | Retain the null hypothesis |
| 1991 | 0.748 | 0.053 | 0.027 | Reject the null hypothesis |
| 1992 | 0.753 | 0.056 | 0.006 | |
| 1993 | 0.758 | 0.059 | 0.007 | |
| 1994 | 0.766 | 0.060 | 0.003 | |
| 1995 | 0.773 | 0.059 | 0.001 | |
| 1996 | 0.780 | 0.058 | 0.003 | |
| 1997 | 0.786 | 0.057 | 0.006 | |
| 1998 | 0.793 | 0.056 | 0.003 | |
| 1999 | 0.799 | 0.056 | 0.011 | |
| 2000 | 0.806 | 0.055 | 0.015 | |
| 2001 | 0.813 | 0.054 | 0.011 | Retain the null hypothesis |
| 2002 | 0.818 | 0.052 | 0.059 | |
| 2003 | 0.824 | 0.051 | 0.099 | |
| 2004 | 0.829 | 0.051 | 0.133 | |
| 2005 | 0.835 | 0.050 | 0.055 | |
| 2006 | 0.841 | 0.050 | 0.066 | Reject the null hypothesis |
| 2007 | 0.847 | 0.049 | 0.025 | |
| 2008 | 0.849 | 0.048 | 0.120 | Retain the null hypothesis |
| 2009 | 0.849 | 0.048 | 0.093 | |
| 2010 | 0.853 | 0.048 | 0.102 | |
| 2011 | 0.856 | 0.048 | 0.107 | |
| 2012 | 0.857 | 0.048 | 0.205 | |
| 2013 | 0.862 | 0.047 | 0.143 | |
| 2014 | 0.864 | 0.047 | 0.276 | |
| 2015 | 0.868 | 0.047 | 0.196 | |
| 2016 | 0.871 | 0.047 | 0.122 | |
| 2017 | 0.873 | 0.046 | 0.237 | |

*The analysis in the period 1990-2017 involves the internal regions (NUTS 3) of all countries (except Cyprus and Luxembourg which do not have internal regions) that are members of the EU in 2018.

Note: according to the official website of the European Union (European Union, 2019), the UK was officially a member of the EU at the time of submission of the article.

Source: the authors' calculation on the basis of The Global Data Lab, Sub-national HDI database (Radboud University, 2019)

According to the results presented in Table 1, the distribution of the SHDI for the internal regions in the current EU came to steadily correspond to the normal one only after 2008, when the p-coefficient of statistical significance of the Kolmogorov-Smirnov test became consistently higher than the threshold value of 0.05 (Table 1).

The authors explain a long-term (from 1991 to 2001) and short-term (in 2007) inconsistency of distribution of the Sub-national HDI for the EU internal regions to Gauss curve by the fact that until 2008 many internal regions of the current EU were part of other political and socio-economic systems (for example, the USSR, or Yugoslavia) and they probably fell under the law of normal distribution only within their systems. During the periods of transition of the current EU countries from one political and socio-economic system to independence or to another system (for example, 1990-1991 for the countries of Eastern Europe, 2004 for 10 “new” EU countries, 2007 for Bulgaria and Romania) distribution of performance of the internal regions in the EU was inconsistent with the law of normal distribution and began to correspond to it again only after a certain period of adaptation to a new state or to a new system.

This can be checked by “cleaning” the database of the EU internal regions exactly in accordance with the year of a country’s accession to the EU and comparing the new results (compliance of the distribution of the “cleaned” Sub-national HDI with the Gauss curve) with the data presented in Table 2.

Table 2. Results of checking for compliance of distribution of the Sub-national Human Development Index (SHDI) with the Gauss curve in the EU internal regions (NUTS 3)*, 1990-2017

| Year | Mean of SHDI in the EU internal regions (NUTS 3) | Standard deviation | Number of regions, n | Significance from the Kolmogorov-Smirnov test, p-coefficient | Decision according the hypothesis about normal distribution of SHDI (null hypothesis) |
|------|--------------------------------------------------|--------------------|----------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1990 | 0.767 | 0.035 | 151 | 0.537 | Retain the null hypothesis |
| 1991 | 0.775 | 0.034 | 151 | 0.405 | |
| 1992 | 0.782 | 0.034 | 151 | 0.372 | |
| 1993 | 0.790 | 0.034 | 151 | 0.483 | |
| 1994 | 0.800 | 0.036 | 151 | 0.284 | |
| 1995 | 0.806 | 0.036 | 151 | 0.117 | |
| 1996 | 0.814 | 0.035 | 173 | 0.115 | |
| 1997 | 0.819 | 0.035 | 173 | 0.157 | |
| 1998 | 0.826 | 0.035 | 173 | 0.085 | |
| 1999 | 0.830 | 0.036 | 173 | 0.170 | |
| 2000 | 0.837 | 0.036 | 173 | 0.367 | |
| 2001 | 0.842 | 0.035 | 173 | 0.322 | |
| 2002 | 0.845 | 0.036 | 173 | 0.596 | |
| 2003 | 0.850 | 0.036 | 173 | 0.756 | |
| 2004 | 0.855 | 0.036 | 173 | 0.508 | |
| 2005 | 0.846 | 0.042 | 243 | 0.229 | |
| 2006 | 0.852 | 0.042 | 243 | 0.189 | |
| 2007 | 0.857 | 0.042 | 243 | 0.137 | |
| 2008 | 0.855 | 0.045 | 257 | 0.164 | |
| 2009 | 0.855 | 0.045 | 257 | 0.128 | |
| 2010 | 0.859 | 0.046 | 257 | 0.137 | |
| 2011 | 0.861 | 0.046 | 257 | 0.135 | |
| 2012 | 0.862 | 0.045 | 257 | 0.251 | |
| 2013 | 0.867 | 0.045 | 257 | 0.182 | |
| 2014 | 0.864 | 0.047 | 278 | 0.276 | |

| | | | | | |
|------|-------|-------|-----|-------|--|
| 2015 | 0.868 | 0.047 | 278 | 0.196 | |
| 2016 | 0.871 | 0.047 | 278 | 0.122 | |
| 2017 | 0.873 | 0.046 | 278 | 0.237 | |

*The analysis in the period 1990-2017 involves the internal regions (NUTS 3) of all EU countries (except Cyprus and Luxembourg which do not have internal regions) since the year which follows the year of their joining to the EU: Austria's, Finland's, and Sweden's regions since 1996, the Czech Republic's, Estonia's, Latvia's, Lithuania's, Malta's, Poland's, Slovakia's, and Slovenia's regions since 2005, Romania's and Bulgaria's regions since 2008, Croatia's regions since 2014 (i.e. only the regions included in the EU during all of the period 1990-2017 have been analyzed).

Note: according to the official website of the European Union (European Union, 2019), the UK was officially a member of the EU at the time of submission of the article.

Source: the authors' calculation on the basis of The Global Data Lab, Sub-national HDI database (Radboud University, 2019)

According to the results presented in Table 2, the authors' assumption has been fully confirmed, and the distribution of the SHDI for the internal regions that are part of the EU over the period 1990-2017 consistently corresponded to the normal distribution over the study period of 28 years (p-coefficient of statistical significance of the Kolmogorov-Smirnov test every year during 1990-2017 exceeded the threshold value of 0.05) (Table 2).

During the period 1990-2017, the EU experienced 4 "accessions" of new regions: in 1995, the internal regions of Austria, Finland and Sweden joined the EU (and this led to an increase in the average European SHDI from 0.806 in 1995 to 0.814 in 1996); in 2004, the internal regions of the Czech Republic, Estonia, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia joined the EU (and this led to a decrease in the average European SHDI from 0.855 in 2004 to 0.846 in 2005); in 2007, the internal regions of Romania and Bulgaria joined the European Union (and this led to a decline in the average European SHDI from 0.857 in 2007 to 0.855 in 2008); and, finally, in 2013, the internal regions of Croatia joined the European Union (and this resulted in a decline in the average European SHDI from 0.867 in 2013 to 0.864 in 2014) (Table 2). Therefore, each of the European Union's new "accession" countries of the former Socialist Bloc were a "blow" which the EU quickly "recovered" from and continued to develop (Figure 3).

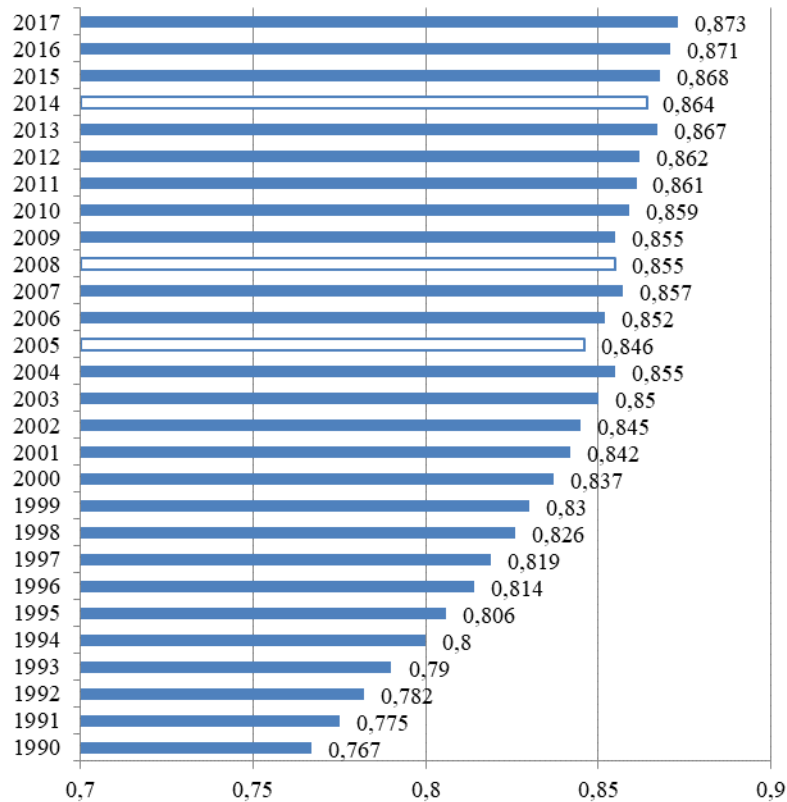


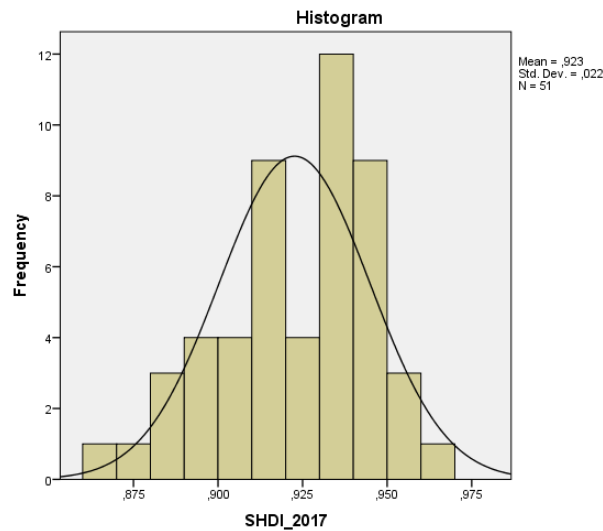
Fig. 3. Mean of the European Sub-national HDI, standardized values from 0 to 1, 1990-2017

Source: the authors' elaboration on the basis of the data from Table 2

Therefore, despite the almost constant growth of mean of the European Sub-national HDI, its variance consistently corresponded to the normal distribution every individual year in the period (1990-2017) of the EU history under study, and in a short time the European Union absorbed the negative impact on the regional performance of each new "accession" of the internal regions of the countries of the former Socialist Bloc in its structure, which at the time of their accession to the EU had quite low indicators of performance.

It is interesting that in almost all EU countries which have internal regions, the metropolitan regions are the leaders of performance measured by the Human Development Index, with the exception of only 3 countries. Germany where Hamburg is the leader of human development (HDI = 0.977), but Berlin, which is a metropolitan region (HDI = 0.944), in terms of human development occupies only the 5th place among the regions of Germany; the Netherlands where Utrecht is the leader of human development (HDI = 0.950) followed by the metropolitan region of Amsterdam (HDI = 0.946); Italy where Trento is the leader of human development (HDI = 0.912), whereas the metropolitan region of Rome (HDI = 0.901) in terms of human development only takes the 3rd place among the regions of Italy.

In support of the fact that in the modern world the variance of regional performance corresponds to the Gauss curve not only in the European Union, the authors analyzed the variance of the SHDI in the US internal regions (figure 4), as their number (51 regions) allows, although with great reserve, to apply the Kolmogorov-Smirnov test (ideally, at least 80 objects are needed for the correct application of this statistical test) to assess the compliance of the variance of the SHDI with the Gauss curve.



Note: variance of the SHDI in the US internal regions corresponds to the Gauss curve, i.e. normal distribution (p-coefficient of statistical significance of Kolmogorov-Smirnov test equals 0.296).

Fig. 4. Variance of Sub-national Human Development Index in the US internal regions, $n = 51$ region, 2017

Source: the authors' elaboration on the basis of The Global Data Lab, Sub-national HDI database (Radboud University, 2019)

Therefore, as a result of the analysis of the Sub-national HDI in the EU and the USA for its compliance with the Gauss curve, the authors obtained the basis to claim that the variance of performance in the EU (as well as the USA) internal regions consistently corresponds to the normal distribution, since it is the normal distribution of performance of territories which most effectively provides simultaneous sustainability of development and the possibility for survival and progress of any territorial systems (Cover, Thomas, 2006; Lyon, 2014). The outcomes of this study give the authors reason to assume that not only indicators of human development of the internal regions in the EU, but also their economic achievements, measured by GDP, national income, and other socio-economic indicators are distributed in accordance with the Gauss curve, which can be studied in further research, checking the variance of the abovementioned indicators for their compliance with normal distribution.

4. Differences of performance between internal regions of the EU countries

Performance's differences between internal regions of the EU countries within the framework of this research have been studied by means of the analysis of coefficients of variation of the Sub-national HDI, which characterizes σ -convergence, i.e. "spatial convergence" (Sala-i-Martin, 1996) in performance of internal regions of the EU countries. The calculation of coefficient of variation was carried out in a traditional way – the ratio of the standard deviation to the mean of the sample (Marques, Soukiazis, 1998). Similar to the analysis of performance's distribution between internal regions of the EU countries which was carried out in the previous part of the article, regional performance's differences will also be examined on both the sample of current EU internal regions (a permanent sample of 278 regions over the period 1990-2017), and the sample of internal regions in accordance to the accession of a country to the European Union. Coefficients of variation of regional performance in the period 1990-2017 are presented in Table 3.

Table 3. Coefficients of variation* of performance of the EU internal regions, 1990-2017

| Year | Coefficients of variation of SHDI in the current EU internal regions (n = 278 regions) | Coefficients of variation of SHDI in the EU internal regions with account of the year of a country's accession to the EU |
|------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 1 | 2 | 3 |
| 1990 | 0.066 | 0.046 (n = 151 regions) |
| 1991 | 0.071 | 0.044 (n = 151 regions) |
| 1992 | 0.074 | 0.043 (n = 151 regions) |
| 1993 | 0.078 | 0.043 (n = 151 regions) |
| 1994 | 0.078 | 0.045 (n = 151 regions) |
| 1995 | 0.076 | 0.045 (n = 151 regions) |
| 1996 | 0.074 | 0.043 (n = 173 regions) |
| 1997 | 0.073 | 0.043 (n = 173 regions) |
| 1998 | 0.071 | 0.042 (n = 173 regions) |
| 1999 | 0.070 | 0.043 (n = 173 regions) |
| 2000 | 0.068 | 0.043 (n = 173 regions) |
| 2001 | 0.066 | 0.042 (n = 173 regions) |
| 2002 | 0.064 | 0.043 (n = 173 regions) |
| 2003 | 0.062 | 0.042 (n = 173 regions) |
| 2004 | 0.062 | 0.042 (n = 173 regions) |
| 2005 | 0.060 | 0.050 (n = 243 regions) |
| 2006 | 0.059 | 0.049 (n = 243 regions) |
| 2007 | 0.058 | 0.049 (n = 243 regions) |
| 2008 | 0.057 | 0.053 (n = 257 regions) |
| 2009 | 0.057 | 0.053 (n = 257 regions) |
| 2010 | 0.056 | 0.054 (n = 257 regions) |
| 2011 | 0.056 | 0.053 (n = 257 regions) |
| 2012 | 0.056 | 0.052 (n = 257 regions) |
| 2013 | 0.055 | 0.052 (n = 257 regions) |
| 2014 | 0.054 | 0.054 (n = 278 regions) |
| 2015 | 0.054 | 0.054 (n = 278 regions) |
| 2016 | 0.054 | 0.054 (n = 278 regions) |
| 2017 | 0.053 | 0.053 (n = 278 regions) |

* The ratio of the standard deviation to the mean of the sample.

Source: the authors' calculation on the basis of the data from Tables 1 and 2

Both trends of changes in the coefficients of variation of performance in the EU internal regions in the period 1990-2017 are visually presented in Figure 5.

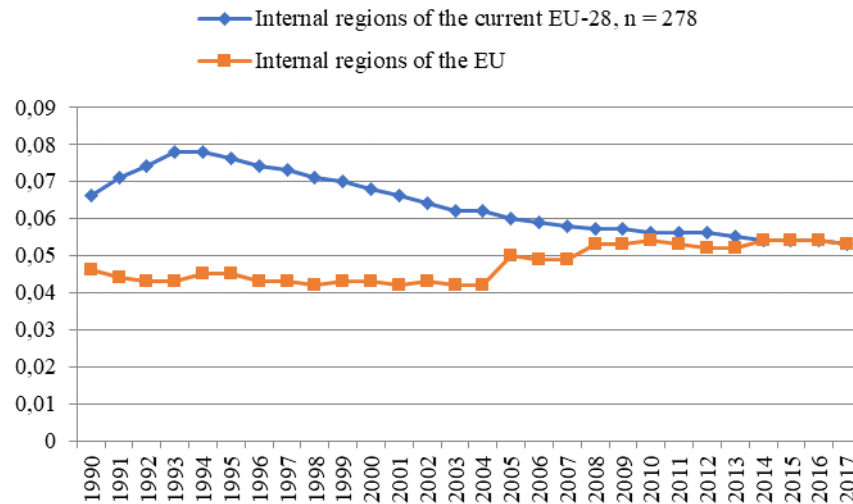


Fig. 5. Trends of changes in coefficients of variation of performance in the EU internal regions, 1990-2017

Source: the authors' elaboration on the basis of the data in Table 3.

According to the data presented in Table 3 and Figure 5, regional performance's differences between the EU internal regions, similar to regional performance's variance, underwent "shocks" every time when one of the countries of the former Socialist Bloc with its internal regions joined the European Union. Thus, after each of the three EU expansions in the period 1990-2017, the coefficient of variation of the Sub-national HDI in the European Union increased (Table 3 and Figure 5). In turn, after the accession of Austria, Finland and Sweden with their internal regions to the EU in 1995, the coefficient of variation of the Sub-national HDI in the European Union, on the contrary, decreased (Table 3 and Figure 5).

As far as the trend of change in regional performance's differentiation between internal regions of the current EU (i.e., on a 28-year long constant sample equal to 278 internal regions of those countries that were the EU members in 2018) is concerned, there is a regularity illustrated by the inverted U-shape curve, which was noticed already in one of the previous study on the example of GDP of the internal regions of the "new" EU countries (Boronenko et al., 2014; Williamson, 1965).

In the study into the economic differentiation of the internal regions of the "new" EU countries that joined the European Union in 2004 and later, it was found that the coefficient of GDP variation in the regions under investigation increased significantly during the transition period of these countries to a market economy, and then – as adaptation to it – again decreased to the level characteristic of the political and socio-economic system (in this case, the market system of the EU) which these countries entered (Boronenko et al., 2014). As it can be seen from the data in Table 3 and Figure 7 relating to the 278 internal regions of the current EU, the same happened to the differentiation of regional performance measured by the Sub-national Human Development Index. In the 1990s a significant number of the current EU countries just gained their independence after the collapse of the USSR and the entire Eastern European Socialist system. According to J. Williamson, the performance of the internal regions of these countries underwent a sharp increase in differentiation, and it was reflected in the coefficients of variation in the performance of the internal regions of the entire territory that is now the European Union (Williamson, 1965). It puts the segment of the graph related to the 1990s into the shape of an inverted U-shaped curve (Figure 5).

Conclusions

As a result of the research carried out, the authors have made the following conclusions:

- the Human Development Index developed by the Pakistani economist Mahbub ul-Haq in 1990 is the best tool to measure the performance of the internal regions in the EU countries in order to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone;
- the indicators of the Human Development Index in the internal regions (NUTS 3) of 189 countries in the world over the period 1990-2017 are located in the Sub-national HDI (SHDI) database elaborated by the Dutch Global Data Lab of Radboud University;
- the analysis of parameters of distribution of the Sub-national HDI in the internal regions of the European Union and the United States (for comparison) over the period 1990-2017, as well as its [distribution] compliance with the Gauss curve, showed that in the EU the performance of internal regions is distributed normally, while metropolitan regions are almost always the leaders of regional performance;
- regularities in performance's differences between the internal regions of the EU countries are examined by means of the analysis of coefficients of variation of the Sub-national HDI which characterizes σ -convergence, i.e. "spatial convergence" of performance of internal regions over the period 1990-2017 for both the current EU regional structure and considering the time when several countries joined the EU;
- the trend of changes in regional performance's differences between the internal regions in the current EU (i.e., on a constant sample that remained unchanged over the period 1990-2017 and is equal to 278 internal regions of those countries that were the EU members in 2018) has a shape of the inverted U-shape curve, i.e. regional differences on the territory which is now the EU increased over the last 28 years during the collapse of the Eastern European Socialist Bloc at the beginning of the 1990s, but later, in the process of adaptation of regions to new conditions of independence and market economy, they decreased;
- the trajectories of differentiation of regional performance in the EU over the last three decades were not chaotic, but they were subjected to certain regularities – normal distribution and spatial convergence, which have been considered by the authors as safe and sustainable for further development of the whole EU and its countries.

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