How to Cite:
Japhet, M., Tuni, I. C., & Chukwudi, O. J. (2022). Eco-friendly indicators and management innovation adoption: Performance consequences in public sector organizations. *International Journal of Health Sciences*, *6*(S5), 12233–12245. https://doi.org/10.53730/ijhs.v6nS5.11970

Eco-friendly indicators and management innovation adoption: Performance consequences in public sector organizations

Mordi Japhet
Department of Business Administration, Delta State University, Abraka

Ijoya Christopher Tuni
Department of Business Administration, Delta State University, Abraka
Corresponding author email: cijoya@gmail.com

Okoh Joseph Chukwudi
Department of Business Administration, Delta State University, Abraka
Email: jokolo2000@yahoo.com

***Abstract*---**The main aim of this study was to identify the eco-friendly factors responsible for property buyers' choice of residential location, including single-family houses and apartments. The following objectives were formulated: analysis of consumers' residential preferences based on their personal experience supports a more reliable evaluation of individual attributes of a residential location. This paper overviews the existing literature on the subject and analyzes primary data collected by the computer-assisted web-interviewing (CAWI) method. The questionnaire developed by the authors was completed by 269 public servants. The respondents evaluated the quality of their residential environment and identified environmental factors that could influence their health. The data were processed statistically to reveal that price is the most important factor behind the residential location choice. Other factors identified by the respondents included a sense of security and a quiet neighbourhood. High scenic value was regarded as a moderately important factor, although its significance was recognized by the majority of the respondents.

***Keywords*---**environment, quality of life, property market, residential property.

Introduction

The evolution of Information systems has given rise to a lot of socio-economic activities that organized private and public sector services has benefited from even when there could be some attendant consequences. Notwithstanding lagging behind its private counterpart, there have been signs indicating that the public sector's conservative approach to using information systems has begun to change. The traditional information systems are gradually being replaced by modern systems with more sophisticated software and hardware applications. Furthermore, the advent of communication technologies such as the Internet in the environment have resulted in better inter and intra agency collaboration in the public sector. These developments have forced governments to re-evaluate and re-assess their information systems' effectiveness.

For over two decades, information systems (IS) success was the primary focus of IS literature (Andersson, et al, 2019). One of the highly significant contributions in the literature was the study done by Mitkus & Šostak, (2009), which resulted in a proposed information systems success model. This model had since become instrumental in contributing to a universal model, which many employed when looking at information systems performance. Further attempts have been made to produce enhanced models (Rai et al., 2002). Invalidating their proposed IS success model, Rai et al. (2012) made use of six dimensions namely system use, system quality, user satisfaction, information quality, individual impact, and organizational impact. The model had since been updated in 2003 to allow application in the e-commerce context. The authors also pointed out that there was a huge gap in the earlier IS studies which many researchers seemed to overlook. One such gap is the lack of understanding of the impact of the organizational dimension.

In the context of the early Nigerian government, the impact of organizational factors on IS success is least understood. One of the early studies indicates that organizational factors are one of the most important issues to be looked into when implementing computer-based information systems in Nigerian government agencies (Yusuf, 2017). As the Nigerian government continues to provide huge IT investments for its designated e-government agencies, the need to understand the antecedent factors of IS success including organizational factors becomes more important. This study attempts to provide a better understanding of eco-friendly factors on innovation adoption: consequences for performance in public sector organizations.

Problem Construct

With the commencement of the National Information Technology Development Agency Act of 2007, NITDA (under the auspices of the Federal Ministry of Communication Technology), several government agencies have been designated as e-government agencies. Their primary role was to lead the implementation of government applications in Nigeria. Since the launch of NITDA, there have been few empirical studies on Nigerian e-government initiatives. Some attempts were made to understand information systems' success and the factors contributing to

them. Mohamed applied the DeLone and McLean (2003) upstream model of information systems success to evaluate the effectiveness of e-government applications from the end users' perspective in selected e-government agencies. While there was evidence to suggest that the e-government applications were generally successful, some variability existed in the perceived relative success of each application. One obvious gap, however, was the lack of consideration for external variables.

The 1990s saw the government making major provisions for automating agencies primarily involved in revenue collection (Mohammad, 2003). This development continued to progress steadily since the mid-1990s with the wider adoption of new technologies by the Malaysian public sector agencies as observed by Mohamed (1998). The steady progression was believed to be largely driven by strategic frameworks of the NITDA which guide the transformation process of the nation into a knowledge-based society. In a related study, Mohamed et al. (2006b) explored the role of enabling change factors in information systems' successful implementation of e-government applications. Enabling change factors refers to the capability of organizations to bring about desired changes in terms of possessing the appropriate mechanisms like human skills, tools, technology and methodology. Enabling change factors consisted of organizational support for change, project-planning process and proactive technological orientation. Mohamed et al. (2006b) concluded that there was a link between enabling change factors and information systems success in Nigerian e-government agencies.

Study objectives

1. to examine the relationship between decision-making structure and innovation adoptions.
2. to examine the relationship between goal alignment and innovation adoptions.
3. to examine the relationship between Management Style and innovation adoptions.

Research Questions

The following research questions are posed to guide the study;

1. What is the relationship between decision-making structure and innovation adoptions?
2. What is the relationship between goal alignment and innovation adoptions?
3. What is the relationship between Management Style and innovation adoption?

Hypotheses

Ho_1: There is no significant relationship between decision-making structure and innovation adoptions.
Ho_2: There is no significant relationship between goal alignment and innovation adoptions.

Ho_3: There is no significant relationship between Management Style and innovation adoption.

Review of Related Literature

Introduction

Rapid urbanization and the pursuit of a better quality of life in Nigeria have caused the country's environmental degradation, resulting in a series of environmental problems. The International Agency for Research on Cancer (IARC), which is a sub-organization of the World Health Organization (WHO), categorized "particulate matter," a kind of major component of air pollution, into Group 1A carcinogens in 2013. Among all kinds of particulate matter, PM2.5 causes the most serious damage to humans' health. In recent years, the authorities and concerned citizens have paid much more attention to the issue of air quality due to the serious air pollution, since recent air pollution has often exceeded the standard level. Various sources of air pollution have cast much negative influence upon citizens' health and daily routine.

Conceptual Review

Concept of Environmental and Organizational Factors

Organizational influencing factors can be thought of as operational attributes, processes or conditions within an organization. Organizational factors affecting collaboration can include, "structure and philosophy, team resources and administrative support, as well as communication and coordination mechanisms". Our scoping literature review identified five major organizational influences on collaboration between PC and PH. They included: lack of a common agenda; knowledge and resource limitations; leadership, management and accountability issues; geographic proximity of partners; and shared protocols, tools and information sharing. No research papers were found in our review that specifically explored influences on PC and PH collaboration. However, we extracted factors from results and discussions of papers reporting on collaboration. The present study contributes new knowledge by validating our previous review findings and delving deeply into factors explicitly influencing organizational influences on PC and PH collaborations supported by experiences of key informants in PC and PH. It also explores mechanisms that help to explain relationships between influencing factors, (Renigier-Biłozor. & Wiśniewski, 2013),
On the other hand, an environmental factor, ecological factor or eco factor is any factor, abiotic or biotic, that influences living organisms. Abiotic factors include ambient temperature, amount of sunlight, and pH of the water soil in which an organism lives. Biotic factors would include the availability of food organisms and the presence of biological specificity, competitors, predators, and parasites.

Socioeconomic Drivers

Global change is driven by many factors; however, the five main drivers of global change are population growth, economic growth, technological advances, attitudes, and institutions. These five main drivers of global change can stem

from socioeconomic factors which in turn, can be seen as drivers in their regard. Socioeconomic drivers of climate change can be triggered by a social or economic demand for resources such as a demand for timber or demand for crops. In tropical deforestation, for instance, the main driver is economic opportunities that come from the extraction of these resources and the conversion of this land to crops or rangelands. These drivers can be manifested at any level, from the global level demand for timber to the household level.

An example of how socioeconomic drivers affect climate change can be seen in the soybean trading between Brazil and China. The trading of soybeans from Brazil and China has grown immensely in the past few decades. This growth in trade between these two countries is stimulated by socioeconomic drivers. Some of the socioeconomic drivers in play here are the rising demand for Brazilian soybeans in China, the increase in land-use change for soybean production in Brazil, and the importance of strengthening foreign trade between the two countries, Cellmer & Źróbek, 2011). All of these socioeconomic drivers have implications for climate change. For instance, an increase in the development of soybean croplands in Brazil means there needs to be more and more land made available for this resource. This causes the general land cover of the forest to be converted into croplands which in its regard has an impact on the environment. This example of land-use change driven by the demand for a resource isn't only happening in Brazil with soybean production.

land, humans, resources, and the environment as a whole. With this being said, humans need to fully understand how their socioeconomic drivers can change the way we live. For instance, going back to the soybean example, when the supply can't meet the demand for soybeans the global market for this crop increases which then in turn affects countries that rely on this crop for a food source. These effects can cause a higher price for soybeans at their stores and markets or it can cause an overall lack of availability for this crop in importing countries. With both of these outcomes, the household level is being affected by a national level socio-economic driver of increased demand for Brazilian soybeans in China. From just this one example alone, one can see how socioeconomic drivers influence changes at a national level that then lead to more global, regional, communal, and household level changes. The main concept to take away from this is the idea that everything is connected and that our roles and choices as humans have major driving forces that impact our world in numerous ways, Okpala, et al (2021).

Effect of Environmental and Organization Factors on Innovation

Several specific environmental issues can impede human health and wellness. These issues include chemical pollution, air pollution, climate change, disease-causing microbes, lack of access to health care, poor infrastructure, and poor water quality.

Chemical Safety

Different chemicals can impact human health in different ways, and often, exposure to dangerous or foreign substances creates health vulnerabilities. The chemical safety field is concerned with minimizing the effects of both natural and

synthetic chemicals. More specifically, chemical safety seeks to safeguard human and environmental health from exposure to potential toxins; it focuses on chemicals that exist in the ambient world, as well as synthetic chemicals that are used in industrial processes or are the by-products of manufacturing activity.

Public health officials who work in chemical safety often focus on toxicology, which is the study of substances that have a toxic effect on the human body, whether when ingested or when absorbed through natural surroundings. Another important aspect of public health is chemical risk assessment, which involves scientists and clinicians working to determine a substance's full biological effects. This is a critical field of public health: According to the World Health Organization (WHO), more than 1.6 million deaths in 2016 were due to exposure to selected chemicals. Some examples of dangerous chemicals in the environment are heavy metals and toxins that find their way into the water supply and harmful pesticides that make their way into the food supply chain.

Air Pollution

Studies have shown that air pollution effects on humans are a significant public health concern, not only because of their role in climate change but also because exposure to air pollution can increase morbidity and mortality. When environmental scientists talk about air pollution, they're describing any solid or liquid particles, as well as gases, that are suspended in the air and have harmful or poisonous effects. When we think about air pollution, we tend to think in terms of human-caused pollutants, and rightly so: Some of the most dangerous and ubiquitous examples of air pollution include car and truck exhaust, as well as polluting by-products of industrial processes. However, many natural air pollutants can cause health concerns; for example, pollen and mould spores are often linked with asthma and allergies. According to the WHO, air pollution effects on humans are significant. For example, air pollution causes:
29% of all global deaths from lung disease
24% of all global deaths from stroke
17 % of all global deaths and diseases from an acute lower respiratory infection

Climate Change and Natural Disasters

Another environmental issue with serious ramifications for human health is climate change, along with the increase in natural disasters that has accompanied the shift in Earth's climate. The National Environmental Health Association lists climate change as the single biggest human health threat of the 21st century. Climate change disrupts the natural world in several ways that can impede health and increase vulnerability to disease; these include increases in the planet's temperature and more frequent heavy rains and runoff. The various impacts may result in greater vulnerability to nervous and respiratory diseases, diarrhoea, and more. Additionally, climate change increases the frequency of natural disasters, often having a ravenous effect on homes and communities and sometimes resulting in loss of life. Wildfires, hurricanes, cyclones, and droughts are just a few examples.

Diseases Caused by Microbes

Diseases caused by microbes also known as microorganisms present another area of public health concern. Trillions of microbes exist within the human body, and they also live-in water, soil, and air. Most of them have no negative health effects, and many microbes perform important biological functions, such as supporting digestive and immune health, according to the National Human Genome Research Institute. Bacteria, viruses, and fungi are types of microbes.

Harmful microbes, which are more commonly called pathogens or germs, can infect humans and cause illness. Eating is one of the primary ways in which humans can contract diseases caused by microbes. One example is food poisoning from E. coli, a type of bacteria that can be found in the environment and foods, and which can cause respiratory illness, urinary tract infections, and other adverse health effects. Several harmful microbes live in the soil. Humans can come into contact with them by ingesting them (through contaminated food) or by inhaling them (through soil particles in the air). Tetanus and botulism are examples of diseases caused by soil-borne microbes.

Lack of Access to Health Care

Another environmental factor that contributes to disease and overall poor health outcomes is living in an area with a lack of access to health care services. According to Healthy People, “Many people face barriers that prevent or limit access to needed health care services, which may increase the risk of poor health outcomes and health disparities." Some factors that contribute to the lack of access to health care are economic instability, unreliable transportation to clinical facilities, and a simple lack of education about the importance of preventive care. Individuals who don't have access to health care services (including pharmaceuticals as well as dental care) are at a higher risk for chronic conditions, which may include asthma, cancer, diabetes, or heart disease.

Theoretical Review

Resource-Based View (RBV)

Resource-based view theory, developed by Wernerfelt (1984), suggested that a firm’s competitive strategy and performance depend significantly on its valuable, rare and inimitable organizational resources. Many scholars have further developed the theory by integrating RBV with relational theory, social network theory and environmental issues. There are two branches in the literature: the natural resource-based view (NRBV) (Hart, 1995), and the relational view (RV). NRBV proposes that there are three key strategic capabilities: pollution prevention, product stewardship, and sustainable development. Each of these has different environmental driving forces, builds upon different key resources, and has a different source of competitive advantage. In this paper, we mainly focus on the first two capabilities. RV proposes that the specific inter-enterprise relationship forming through long-term organization partnership is a key resource for competitive advantage.

According to NRBV, pollution prevention technologies involve much tacit knowledge through skill development and “green” teams. The tacit knowledge results in a resource that is difficult to be replicated. Product stewardship technologies could produce knowledge of the entire "product life cycle", which can be converted into the potential for competitive advantage through strategic priority. In brief, tacit knowledge and product life cycle knowledge, which are generated by environmental management practices, are significant for corporate competitiveness and performance.

Environmental Management Practices

There are different understandings of environmental management practices. Shrivastave and Hart (1995) pointed out that environmental management could provide an overall system perspective to deal with environmental issues. Every organizational activity from raw material inputs, production process, packaging, to waste disposal, are related to environmental issues. Therefore, environmental management practices are a combination of organizational activities aiming at reducing resource consumption and improving waste disposal. Technological options, product design, manufacture and waste management are all included in environmental management practices. Bergmiller and McCright (2009) proposed that environmental management practices (green practices) were activities that aimed at improving environmental performance, including improving efficiency, shortening response time, cutting down energy consumption, reducing waste and toxic material usage.

Hajmohammad et al. (2013) defined environmental management practices as “the level of resources invested in activities and know-how development that led to pollution reduction at the source”, including the application of environmental management systems (e.g., ISO14001), and efforts to recycle materials and reduce waste. These management practices include environmental audits, total quality management, pollution prevention plans, environmental training for employees, total cost accounting, life-cycle analysis, hiring a designated environmental manager, R&D, environmental standards for suppliers, and employee incentive programs for environmental suggestions.

Empirical Reviews

Hagedoorn and Cloodt's (2003) research on technological Innovation Performance Technological innovation is an important way for enterprises to obtain a sustainable competitive advantage and is also a key topic of concern for the Chinese government and enterprises. The Organization for Economic Cooperation and Development (OECD) and Eurostat defined technological innovation as "It has to be based on new technology knowledge, including product innovation and technological process innovation, which is also new to the enterprise and can be applied to the market and production (new products must come into the market or new processes must be applied to the enterprise)". Technological innovation performance is of multidimensional construction and many scholars have studied the measurement of technological innovation, but there is no uniform measure index. Put forward to the assessment of technological innovation performance from the number of patents, new products, R&D investment, patent citations. In

addition, Chen and Chen (2006) proposed the assessment of technological innovation performance based on the measure indexes: the sale of innovative products, the cost and speed of new product development, the sales rate of new products, the success rate of innovative projects, and leading or participation in the development of the industrial standard. In this study, we used the announcement, sales rate, and development.

Methodology

This study used the questionnaire survey method to collect data. The survey was divided into two stages. The first stage was a questionnaire test. We generated twenty-five valid questionnaires through face-to-face interviews with some government executives in Delta State, and twenty valid questionnaires from interviews with some executive MBA students. Then, the structure and questions of the questionnaire were modified and improved by analysis outcome.

The second stage was the formal investigation stage. We focused on government enterprises and asked for senior managers who had a comprehensive understanding of enterprises to fill in the survey. Enterprise samples were distributed mainly within Delta State. A total of 375 formal questionnaires were given out, and 154 questionnaires were received with 112 valid, which represented a 29.9% response rate.

Data and Results Analysis

Test of Hypotheses

The null hypotheses for the study are hereby tested. Thus, Linear Regression and correlation analysis were employed as analytical tools for testing the hypotheses. The p-values reported in the regression coefficient tables are used for testing the study hypotheses.

The Decision Rule

If the probability value calculated is smaller or lesser than the critical level of significance which is (5% or 0.05), then the null hypotheses will be rejected while the alternate hypotheses are accepted and vice versa. For example, If the probability value of 0.00 is smaller than the critical value of 5% (i.e., 0.00 < 0.05), we conclude of the given parameter that it is statistically significant.

Multiple Regression Analysis

Table 4.1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.914[a]	.799	.64k9	1.5617

a. Predictors: (Constant),
b. Environmental and organizational factors

Table 4.1 shows the extent to which environmental and organizational factors accounted for innovation adoptions as indicated by the adjusted R square, which shows that 91% (.914) of the innovation adoptions is brought about by environmental and organizational factors. The correlation coefficient R is 0.799. Therefore, we can conclude that environmental and organizational factors have a positive correlation with innovation adoption, and the relationship is strong since it is about 49%. While the R^2 of 0.649, which means about 48% of the variance in innovation adoptions is explained by environmental and organizational factors.

Table 4.2 ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	141.285	3	52.581	52.244	.002[b]
	Residual	138.732	60	2.271		
	Total	279.017	93			

Dependent Variable: Constant
Predictors: (Constant), Environmental and organizational factors

The *F*-ratio in table 4.2 tests whether the overall regression model is a good fit for the data. The table reported that environmental and organizational factors significantly predict Innovation adoptions, F (3.60) = 52, 224 P<.005. This implies that the regression model is a good fit for the data. In addition, the results of the analysis of ANOVA shows that the independent variables; Decision-making structure, Goal alignment and Management Style are statistically and significantly predict the dependent variables (Innovation adoptions).

Table 4.2 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.680	1.387		.715	.522
	Decision-making structure	.373	.074	.235	3.951	.001
	Goal alignment	.291	.092	.342	6.045	.002
	Management Style	.283	.087	.381	.847	.001

a. Dependent Variable: Constant

Table 4.2 exhibited the multiple regression analysis results for environmental and organizational factors and innovation adoptions. It was reposted that; Decision-making structure, Goal alignment and Management Style which is the variables has a positive effect on innovation adoptions (β=.373, p<0.001), this implies that the p-value critical 0.05(5%) level of significance is greater than the calculated level of significance (0.05>0.001), therefore the null hypothesis which states that there is no significant relationship between; Decision-making structure, Goal alignment and Management Style and innovation adoptions is hereby rejected while the alternate is accepted implying that there is a significant statistical

relation between; Decision-making structure, Goal alignment and Management Style and Innovation adoptions.

Conclusion

This study aims to investigate the relationship between Eco-friendly factors and IS success dimensions in the Nigerian e-government environment. The findings of this study provide a clear indication that organizational factors are, indeed, highly significant in ensuring successful information systems adoption, particularly in the context of the public service sector. In addition, this study also reaffirms Mohd-Yusofs' (2005) assertion as to the importance of organizational factors in a similar sector. Ostensibly, the study allows for the enhancement of the theoretical contributions made by De Lone & McLean (2003) on IS success by addressing the gaps in the need for identifying IS success contributing factors.

With the identification of the organizational factors, future researchers may validate these relational contributions by testing them in a different environment. As highly anticipated, goal alignment, which is comprised of the alignment of IS strategy and business objectives, was found to be the most influential contributor to organizational factors on IS success. This provides a clear indication that IS strategic role has gained as much interest among the public sector managers as among private sector managers. The strategic role taken by the government, for instance, through the development of National NITDA in overlooking the e-government strategic agenda, may have reflected the high contribution of goal alignment in the Nigerian e-government context.

Recommendations

1. Due to home-buying pressure and the present market outlook, price continues to be the main determinant of property buyers' choice of residential location, whereas environmental issues are identified as less important. Again, the study points to positive changes in the attitudes of property owners who are more likely to recognize the importance of environmental factors and their influence on the residents' health.
2. In this study, homeowners' preferences regarding the choice of residential location were surveyed based on their previous experiences; therefore, the significance of the analyzed attributes could be evaluated more reliably than if the respondents were potential property buyers or developers.
3. The influence of eco-friendly factors on property buyers' choice of residential location cannot be accurately evaluated due to the multitude of factors that determine the final decision to buy. In other words, the factors that influence property buyers' choice of residential location could constitute valuable inputs for residential design, and they could be used to minimize the potential adverse effects of housing estates on human health and the natural environment.
4. Local authorities responsible for urban planning could use the results of this study to identify priority tasks that need to be undertaken to create friendly residential environments. The results of this study indicate that the quality of the surrounding environment influences the value of the property.

For this reason, the term "residential property" should be used in a broader context in standard appraisal practice.

References

Adriaanse, C.C.M. (2007), Measuring residential satisfaction: a residential environmental satisfaction scale (RESS), JHousing Built Environ, No 22, pp. 287-304.

Alkay, E. (2009), The relationship between environmental quality level and housing sale prices in the Istanbul Metropolitan Area, A/Z ITU Journal of the Faculty of Architecture, Vol. 6, No 1, pp. 60-76.

Andersson, H., Jonsson, L., Ögren, M. (2010), Property Prices and Exposure to Multiple Noise Sources: Hedonic Regression with Road and Railway Noise, Environmental Resource Economic Springer Science, No 45, pp. 73-89.

Cellmer R., Źróbek, S. (2011), Applying GIS tools to studies over the impact of noise pollution on house prices, in The Future with GIS, Zagreb Croatia, pp. 245-256.

Cellmer, R., Senetra, A., Szczepańska, A. (2012), The Effect of Environmental Factors on Property Value, (paper presented at the FIG Working Week 2012 TS06H - Valuation - Environmental Factors 5748, Rome, Italy), www. fi g.net (access 2014.03.25),

Chiesura, A. (2004), The role of urban parks for the sustainable city, Landscape and Urban Planning, No 68, pp. 129–138.

Dragomyretska, N., Matvieienko, I., & Samofalov, D. (2022). Systematic and educational influences of civil society on public administration communications organization in quarantine restriction COVID-19 condition. *International Journal of Health Sciences*, *6*(1), 214–233. https://doi.org/10.53730/ijhs.v6n1.3828

Fibrianti, B. S., Sulistiyono, H., & Hartana, .-. (2018). A feasibility study for social and general facilities: Perumnas Tanjung Karang Permai Mataram. *International Journal of Physical Sciences and Engineering*, *2*(1), 57–70. https://doi.org/10.29332/ijpse.v2n1.130

Food Insecurity: Nigeria a Case Study, Food Reviews International, DOI: 10.1080/87559129.2021.2012793

Hall, F.L., Breston, B., Taylor, S. (1978), Effects of highway noise on residential property, Values Transport Res Rec., No 686, pp. 38–43.

Huderek-Glapska S., Trojanek, R. (2013), The Impact of Aircraft Noise on House Prices, International Journal of Academic Research, Vol. 5, No 3, pp. 397-408.

Kempa, O., Krajewska, M., Palicki, S., Rącka, I., Wójta-Kempa, M. (2015), Students Preferences on Housing Market in Polish Cities, Real Estate Management and Valuation, vol. 22, No 1, pp. 90-102.

Lake, I.R., Lovett, A.A., Bateman, I.J., Langford, I.H. (1998), Modelling environmental influences on property prices in an urban environment, Compute. Environ. and Urban Systems, Vol. 22, No 2, pp. 121-136.

Many, J.A., McLafferty, S. (Eds.) (2011), Geospatial Analysis of Environmental Health, Series: Geotechnologies and the Environment, Vol. 4, No 14, (Springer).

Mitkus, S., Šostak, O.R. (2009), Preservation of healthy and harmonious residential and work environment during urban development, International Journal of Strategic Property Management, Vol 13, No 4, pp. 339-357.

Nelson, T., Rabianski, J. (1988). Consumer Preferences in Housing Market Analysis, in An Application of Multidimensional Scaling Techniques. AREKEA Journal, Vol.16, No 2, pp. 46-64.

Okpala, E.F L. Manning & R.N Baines (2021). Socio-Economic Drivers of Poverty and

Renigier-Biłozor. M., Wiśniewski, R. (2013), Real estate market rating – need or necessity? Real Estate Management and Valuation, Vol 21, No 4, pp. 54-64.

Saks, E. (2009), Świadomość proekologiczna mieszkańców – wpływ na środowisko i uatrakcyjnienie regionu. (Environment-friendly awareness of inhabitants- – the infl uence on the environment and enhancing the region), Problemy Ekologii Krajobrazu, No XXV, pp. 47-52.

Smersh, G.T., Smith, M.T., Schwartz, A.L.Jr. (2003), Factors Affecting Residential Property Development Patterns, Journal of Real Estate Research, Vol 25, No 1, pp. 61-76.

Srour, I.M., Kockelman, K.M., Dunn, T.P. (2002), Accessibility Indices: A Connection to Residential Land Prices and Location Choices, Transportation Research Record, Vol 1805, No 1, pp. 25-34.

Stachura. E. (2013). Środowisko mieszkaniowe w Polsce. Ocena, oczekiwania, aspiracje. Kraków: Wyd. Politechniki Krakowskiej.

Yusuf. K A.(2017), Modeling the Choice of Residential Location, in The Economics of Housing, vol. 1, London.