

**“Environmental Economics for a Sustainable Development” Evaluation of Environmental and Recreational Values of the Area Lezhe –Shengjin using Indirect Approximate Method “Hedonic Price Method”**

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**Abstract:** The area of the project Lezhe –Shengjin has a combination of recreational tourism and industry development. Promotion of tourism and environmental values of Lezha is a bold undertaking for a region with a diversity of values. Stable ecological development impacts directly in the development of the inhabited area and in the standards of it, while reflecting also in the home prices. Project aims to identify and to study the basic areas of the ecosystem and to present the impact that has the environment to the economy, by analyzing of the home prices of those, their diversity and changes. Methodology that the project will use is based on an indirect approximate method “Hedonic Price Method”. The base of these methods lies on questioners made face to face with the residents of the region and a considerable part of the data collection would be the collaboration with the commune and municipality administration offices of the region. Firstly, the project members will identify specifically services and environmental goods that the project will assess. Meanwhile, the meeting with the head officer of the commune would be planned and a contract of collaboration with his office would be signed. An important phase of the project will be the preparation of the questioners, on which behalf, the project members are selected. It is considered to prepare around 2000 Surveys for the respective method for areas of the targeted region, Lezhe and Shengjin. Getting the result of the indirect method that will be used, as mentioned, would need the data collection of the surveys and the data taken officially from the commune of Shengjin and Municipality of Lezha. During the data collection period the project members will consider also several meetings with real estate offices of the region and ecological NGOs. All data collected will be considered to be analyzed due to “Hedonic Price Method” and the expected results are considered to conclude in direct relations between the high ecosystem standards and relatively high competitive home prices. As well the result would be a good guide for the evaluation of the agency investments. Result of the project will firstly be presented to the interest group and then will be presented at scientific seminars and conferences within and outside the country and will serve as a starting point for further studies related to this field of study. Key results would provide good material to be firstly presented and published in scientific journals.

**Keywords:** *Hedonic Price Model, Environment, House Pricing, Lezha*

## **1. Introduction**

“Environment is a good, which belongs to “everybody” but belongs to “nobody” (Gundimeda, 2005). Now it has become more difficult to protect the environment and it needs high costs. The better and cleaner the environment around the living places the higher the cost of living in that environment. It is the duty of everyone to protect what is the best despite the fact that this duty in the end is attributed to the job of the administrative staff of the government. Each decade has shown an increase in the number of the population. Essential denote of the wealth and standards of living of a country is the housing development. Now the housing construction takes into consideration the environmental factors in order to raise the standard and the perspective of a better life while obtaining a sustainable development. The area of the project Lezhe – Shengjin has a combination of recreational tourism and industry development. Promotion of tourism and environmental values of Lezha is a bold undertaking for a region with a diversity of values. Stable ecological development impacts directly in the development of the inhabited area and in the standards of it, while reflecting also in the home prices. This study tempts to identify and study the basic areas of the ecosystem and to present the impact that has the environment to the economy, by analyzing of the home

prices of those, their diversity and changes. Project aims to have results in two directions, firstly the identification of the recreational areas of the Shengjin- Lezhe region by resulting in the economic costs or benefits that these regions provide. These economic costs or benefits will show the direct impacts in the standards of living of the region and more precisely in the house prices of the region. Secondly, the study will conclude in real analyzed data that absolutely will be a good guide for the future investment agencies, therefore this project will be considered to be presented and published in the interested group and scientific journal.

This study will proceed firstly with the review of the literature dealing with the subject as it was faced a great interest on the Hedonic Price methodology on the study of the house pricing around different countries in the world. The region of Lezha has been divided in five parts including Shengjin in order to arrange the survey distribution of the study. The study area will be presented with the most important environmental elements that are composed of, despite the interesting history and culture it has. Hedonic Price Method is an indirect environmental valuation method which uses different markets for placing a value on the environmental quality (Gundimeda, 2005). This study has chosen the most commonly market used which is the housing market, by using the people answers regarding their houses and the environment around them. So this study indirectly through the Hedonic Price analysis will show the willingness of people to pay in order to get the best place to live and the healthier ones. The project team firstly identified specifically services and environmental goods that the project assessed. Meanwhile, the meeting with the head officer of the commune was planned and made and resulted in high cooperation through the phases of the study project. An important phase of the project was preparation of the questioners, on which behalf, the project members were selected. It was considered to prepare around 2000 Surveys for the respective method for areas of the targeted region, Lezhe and Shengjin. All data collected were considered to be analyzed due to "Hedonic Price Method" and the expected results are considered to conclude in direct relations between the high ecosystem standards and relatively high competitive home prices. As well the result would be a good guide for the evaluation of the agency investments.

## **2. Literature Review**

Environment and economy have a strong relation between them and their impacts on each other have always been part of the environmentalist and economists studies. This project was firstly initiated from the need to have real data analyses of the economic benefits or costs from the ecosystem around or the recreational areas, which should be well determined if some sites have to be increase or to be closed. Members of this project have been working on different ecological projects on the region that was specifically selected. After a detailed literature review on the studies of the subject, it was resulted that these kinds of methods have been important part of ecosystem evaluation. According to (King & Mazzotta, 2000) there exist many evaluation methods that economist may use to evaluate the beneficial ways the ecosystems affect people and their lives. Hedonic Price Method is used in the evaluation of the direct affect that the ecosystem has in the market prices. Mainly this method is applied in the house prices that would demonstrate the environmental values and gives results on the economic benefits or costs accompanied with the quality of the environment or the distance with the recreational areas. The first studies on this topics from the 1970s and all of them have been concluding in a right relation between the good environment enriched with high elements of it raise the price of the properties of that are. The proximity to parks and size of the park is associated with higher prices; the effect of size is small with approximately 0.01% increase in the price with a one percent increase in size. The size of common area is associated with statistically significance higher property prices. 1% increase in the size of common area relates with a 0.01% increase in property price. (Veie & Panduro, 2013) Urban green spaces have a positive impact on the property values and this represents a "capitalization" of park land into increased property values of proximate land owners (Noor, Asmawi, & Abdullah, 2015).

Hedonic Model and the regression analysis are the best tools to be used from the real estate professionals in order to find out the correlation between the characteristics of a property and its price, while also predicting the future prices. This technique makes easier the valuation of the properties regarding the environment around and also might help the construction companies and real estate ones to lead on the right paths of construction and properties in the right environmental elements that might raise their prices and values

(Monson, 2009). But among the variables related to the environmental conditions, air quality and the noise parameters have impact in the raise of the property value and also the inside space of the rooms, the garage and a terrace would imply an increase in value (Chiarazzo, Coppola, Olio, Ibeas, & Ottomanelli, 2014). Another study on the valuation of the urban open spaces and the elements that impact on it concluded in same results of a right correlation on the environmental indicators and income with the value of the space. While it was highlighted that prefer for open spaces had some differences across the regions depending in the properties it has, for example the quality of the open space or the air. So the results showed that there are important region differences in preferences for open spaces, which may constrain the potential for transferring estimated values between regions (Brander & Koetse, 2011). In different countries, different studies have attempt to include Hedonic Pricing and other methods on projects or researches and mainly in most of them the results came to be important not for the study itself but also to serve for the real estate or other construction companies in other researches in the future.

## **The Study Area**

**“At the gates of Lezha you can enter without knocking!”** Lezha, as city and bio-structure, it represents something very important and special. By geometric, geographic and ecological, Lezha is a wonderful kaleidoscope of nature, almost a kind of unparalleled ecological principality, where mountain, fields, forests, archaeological and historical monuments, the lagoon and the sea, constitute a striking unity. In this sense, Lezha is the favorite of the centuries, the synthesis of the work of nature and of people with a bright sense and art history. At the gates of Lezha can enter without knocking, knowing her face and heart can only endlessly fascinate. There is simply extreme metaphor, but automatically every Lezha viewer can look up its history, in the air of centuries, as out of Mjeda Ndre poetic breaths, who has written wonderfully and poetically for Lezha. Lezha from the four corners of the history surrounding metaphors. Every man lives among them and here lies the secret of survival itself. The ancient town of Lezha is located in a double ground: hilly field and surrounding walls cover an area of 20 hectares. Urbanism fortified city has four main areas:

1. The area of the upper, those placed on top of the hill;
2. The middle part area, lying on the hilly slopes;
3. Part of the following area under the hill;
4. Riparian area, Drini river bed and the western wall of the city.

According to the researcher K. Zhegu, each of these areas there has been a particular function and at the same time interconnected. Thus, the first area to the four, respecting the natural position to defend, have been established state institutions, territory so densely populated, handicraft-trading center and river port below, linking Lezha with all maritime routes Adriatic. Lezha urban layout is unique and unrepeatably in any of the cities Illyrian known until today. It can be said that Lezha ancient urban module is not made according to the example of cities modern in Greece, Macedonia and Epirus, but can not be characterized as a town with acropolis typologically. Illyrian urban planning period to date layout inherits the walls, defending towers, all entrances and part of the main road of the lower of the city. Within the town of Lezha preserved and ramified network of roads cross inside. From the outer, entering the city there are three, it came from the South, from the North and another third from the Northeast (Ecological Club of Lezha, 2002). Lezha has a great potential for tourism and will be an important sector in the medium and long term. Potentials, accompanied by infrastructure, comprehensive legislation and views to enhance the tourism industry in the future, it increases even more the value of this area as a place with rare resources and very convenient to welcome the tourists. Encouraging tourism and its impact on economic and social development, infrastructure and rapid development are required to precede the tourism industry, which is considered still in the early stages but a great potential. In Lezha and the beaches of Shengjin and Kune there are numerous hotels to host tourists which have traditional cuisine and specially fresh sea food. Different granted projects have been and still working on this area in order to create a regular tourist infrastructure to be served to the local and foreign tourist. This project is just a scientific one which would help the local governments and private institution to have a study on the Lezha potential and the division of the area through the specification of the environmental preferences of the residents.

### 3. Data and Methodology

The study is focused in the region Lezhe- Shengjin as previously mentioned. This region of study firstly was divided from the working group into 5 different areas as follow:

- Urban Area, Lezha City
- Touristic Area of Shengjin – Tale
- Urbanized Rural Area of Ishull Lezhe – Shenkoll
- Rural Area Balldre – Torovice
- Rural Area of Zadrima

The working group designed a survey of 20 questions in order to have the needed data relating the impact of built environment and position on the choices of households and the house prices. The survey was carried primarily in the branches of the banks which operate in the region of Lezhe – Shengjin questioning the clients of them and in the administrative offices around the region. The data were collected by a group of six persons employed for this purpose for a period of 4 months and contain information on some details of the houses that they were living at, the environment around them and as well the positioning with regard to urban area, city center, touristic places and open green spaces. The table below shows the definitions of all variables used in the analysis for the study of the home prices in the area of Lezha.

**Table 1: Definitions of the Variables in the Analysis: Lezha Region**

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AREA = the area of the Lezha region where the house is placed (one of five areas)
HOUSE_PRICE = the Market Prices of the houses in 2015
PROPERTY_AGE = age of the construction of the house
CONSTRUCTION = the quality of the construction of the house (=1 if yeas, =0 if no)
FLOOR = number of the floor of the house
ROOMS = the number of the rooms of the house
SUNLIGHT = the rooms that face the sunlight
DC = distance from the center of the city
DG = distance from the nearest green place or area
DS = distance from the nearest school
DB = distance from the beach
DH = distance from the nearest medical center
VALUE = the evaluation of the residents for their houses
MONTHLY_INCOME = monthly income of the residents
SATISFACTION = satisfaction level of the residents with the green areas around their houses
*Dependent Variable is House Price = Market Price

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According to the table above, the variables achieved for the analyses according to the Hedonic Model are interior and exterior. The market price is the dependent variable. The interior variables are physical characteristics of each house that affect its price, PROPERTY\_AGE regards to the years that the house has been constructed, CONSTRUCTION deals with the quality of the construction if it's a good or bad one. FLOOR deals with the number of floor that the house is placed, ROOMS regards to the number of the rooms that the house has and SUNLIGHT is expected to be an important physical characteristics which would positively affect to the price of the house. This variable deals with the number of the rooms that face sunlight during the day. The exterior variables are all variables that are around the house but affect to the price of it. DC, distance to the center of the city and the distance from the beach (DB) are considered as the most important variables that would affect the house price as also the areas of Lezha are considered to be touristic ones. Other exterior variables are the distance from the green places (DG), distance from the schools (DS) and the distance from the nearest medical center (DH). The smaller these distances the higher the prices are considered to be. While below, Table 2 shows the descriptive statistics of the study variables including mean and standard deviation.

**Table 2: Descriptive Statistics of Study Variables**

	N					
	Valid	Missing	Mean	Median	Mode	Std. Deviation
Area	520	0	1.86	1	1	1.194
Property_Age	514	6	2.27	2	3	0.711
Construction	514	6	1.4	1	1	0.491
Floor	508	12	2.56	2	1	1.621
Rooms	520	0	3.66	3	3	1.693
Sunlight	518	2	2.15	2	2	0.982
DC	518	2	12.56	10	10	11.267
DG	501	19	10.39	8	5	9.345
DS	517	3	10.14	10	10	7.208
DB	514	6	25.13	25	30	16.548
DH	509	11	10.61	10	10	7.802
Monthly_Income	503	17	3.04	3	5	1.433
Satisfaction	514	6	2.42	3	3	0.688

In the Appendix 1 are shown all the Frequency Tables of the Variables of the studies regarding the SPSS Estimation.

**Hedonic Price Method:** The Hedonic Price Method is used to estimate the value of environmental amenities that affect prices of marketed goods. Most of the studies would consider the housing prices to estimate the value of the environmental space around. The method is based on the assumption that people value the characteristics of a good, or the services it provides, rather than the good itself. Thus, prices will reflect the value of a set of characteristics, including environmental characteristics that people consider important when purchasing the good (King & Mazzotta, 2000). The hedonic pricing method may be used to value the economic benefits regarding with:

- environmental quality
- environmental amenities

Despite the fact of the nature of the environmental amenity or which recreational area would be studied Hedonic Price Method serves best to estimate its value and impact on the properties prices. However many cases showed difficulties and complications for the incorporation of the entire variety of factors affecting the environmental or land value (Pearson, Tisdell, & Lisle, 2002). In general, the price of a house is related to the characteristics of the house and property itself, the characteristics of the neighborhood and community, and environmental characteristics. Thus, if non-environmental factors are controlled for, then any remaining differences in price can be attributed to differences in environmental quality. For example, if all characteristics of houses and neighborhoods throughout an area were the same, except for the level of air pollution, then houses with better air quality would cost more. This higher price reflects the value of cleaner air to people who purchase houses in the region (King & Mazzotta, 2000). Some important issues and limitations of Hedonic Price Method:

- The Hedonic Price Method requires a large set of data in order to estimate a proper function, so large number of observations or surveys is needed.
- It is assumed that the household have the perfect information for the environment around and the prices of the properties, that's why they have had their choices.
- There is a problem of multi-collinearity. For example it is expected higher prices of properties near the city center but the air pollution around the area might be higher as well. So it would be difficult to separate these two effects.
- The environmental values and benefits are estimated just regarding the housing prices despite their larger set of values.
- It is assumed that people are willing to pay more for more environmental values, despite the other factors.
- It is assumed that people have the chance to choose their home just from the given combinations of features they prefer, despite that there would be effect of also taxes or other factors.

This project was designed as a necessity to have a real study in relation to environmental economics.

Aiming a study based on hedonic price method and feasible one for our region, the project seeks to achieve firstly an environmental awareness, to increase the education in environmental economy by contributing with a wide range of data and a real study.

#### 4. Discussion and Analysis

In general, the price of a house is related to the characteristics of the house and property itself, the characteristics of the neighborhood and community, and environmental characteristics. Thus, if non-environmental factors are controlled for, then any remaining differences in price can be attributed to differences in environmental quality. The data are analyzed using regression analysis, which relates the price of the property to its characteristics and the environmental characteristic(s) of interest. Thus, the effects of different characteristics on price can be estimated. The regression results indicate how much property values will change for a small change in each characteristic, holding all other characteristics constant. Once the data are collected and compiled, the next step is to statistically estimate a function that relates property values to property characteristics. Regression analysis is typically used to estimate the influence of various property characteristics. Regression is a fundamental operation in statistics and includes techniques for modeling and analyzing several variables at a time. Regression analysis is used for explaining the relationship between a dependent variable, usually denoted by Y, and a number of independent variables, X1, X2... Xp. The independent variables are also known as predictor or explanatory variables. In most regression analyses, the variables are assumed to be continuous. In simple regression, there is only one independent variable. However, most real world applications involve more than one variable which influence the outcome variable. A model for a set of factors determining house prices could be:

$$P = f(D, S, M, N, B, R)$$

P = Price

D = Distance from the Center

S = Distance from Green Space

M = Distance from the nearest Medical Center

N = Distance from the nearest School

B = Distance from the Beach

R = Rooms facing sunlight

This is called a hedonic price function. The regression typically uses the logarithms of the values for the various factors. A statistical analysis package such as the Regression function in SPSS can be used for the computations of the following type of equation:

$$\ln(P) = \ln \beta_0 + \beta_1 \ln(D) + \beta_2 \ln(S) + \beta_3 \ln(M) + \beta_4 \ln(N) + \beta_5 \ln(B) + \beta_6 \ln(R) + e$$

$$\text{Price} = 0.776 + \beta_1 * 0.670 + \beta_2 * 0.471 + \beta_3 * 0.460 - \beta_4 * 0.363 + \beta_5 * 0.112$$

The  $\beta$  values represent the role that each factor plays in the value of the residence. For example  $\beta_5$  is the value of each unit of proximity to the highway.

**Table 3: Descriptive statistics of the variables**

		Self Valuation of Property	Distance from the Beach	Distance from Green Space	Distance from the Center	Rooms facing sunlight
N	Valid	485	514	501	518	518
	Missing	35	6	19	2	2
Mean		43196.70	25.13	10.39	12.56	2.15
Median		40000.00	25.00	8.00	10.00	2.00
Mode		50000	30	5	10	2
Std. Deviation		20798.180	16.548	9.345	11.267	.982
Variance		432564286.6	273.822	87.333	126.947	.965
Skewness		.477	2.991	2.125	2.884	1.313
Std. Error of Skewness		.111	.108	.109	.107	.107
Kurtosis		.435	19.577	5.614	13.471	4.197
Std. Error of Kurtosis		.221	.215	.218	.214	.214
Range		145000	179	59	99	8
Minimum		5000	1	1	1	0
Maximum		150000	180	60	100	8
Sum		20950400	12915	5203	6505	1115

		Rooms	Floor	Distance from the nearest School	Distance from the nearest Medical Center
N	Valid	520	508	517	509
	Missing	0	12	3	11
Mean		3.66	2.56	10.14	10.61
Median		3.00	2.00	10.00	10.00
Mode		3	1	10	10
Std. Deviation		1.693	1.621	7.208	7.802
Variance		2.867	2.629	51.951	60.869
Skewness		1.744	1.397	1.847	1.824
Std. Error of Skewness		.107	.108	.107	.108
Kurtosis		3.663	3.111	4.824	4.013
Std. Error of Kurtosis		.214	.216	.214	.216
Range		10	10	49	49
Minimum		1	1	1	1
Maximum		11	11	50	50
Sum		1905	1303	5240	5398

The data set used to estimate the hedonic models is presented and described in this section. The models used in the present study will be estimated with data gathered from the Center or nearest medical area of Lezha. The most relevant variable is Distance from the center, Distance from the nearest School, Distance from the medical center. The house prices are not market values; they are mostly are performing on the distance from the green space or city center. Prices are highly correlation to the distance from the city center and the green areas. Our data set contains other measures of size of the dwelling aside from floor area the number of bedrooms and number of bathrooms. However, including too many size variables made it difficult to interpret the parameter estimates.

**Table 4: Estimated parameters of MLR model**

Var.	Parameter	MLR 1	Parameter	MLR2
		t-ratio		t-ratio
Rooms facing sunlight	0.6627894	7.619874	0.8627859	6.191874
Distance from the Center	0.2147578	5.212241	0.2455445	5.211241
Distance from Green Space	-	-	0.1248171	6.892121
Distance from the nearest School	-	-	0.1114547	0.240047
Distance from the Beach	0.1134738	9.247912	0.2341687	9.245676
Distance from the nearest Medical Center	0.2124535	2.454871	-	-
R2		0.63489		0.61473
R2 adj.		0.61454		0.6332

As shown from the table below in MLR2 the satisfaction from the green open space has a positive sign in the estimation of the observation. On the other side Distance from the nearest school shows that has a negative symbol in the parameter estimation. The relationship between dependent variable with independent variables was performed using Pearson correlation. It was found that the correlation coefficient indicated that house prices are positive and strongly significance to price (0.776), Distance from the Center (0.670), Distance from Green Space (0.471) and Medical Center (0.460), but negative relationship of the distance from the nearest School (-0.363). Meanwhile, house price is not significance to set variables. The value of F statistic is 380.696 and p-value is 0.0000, means that the model is suitable and can be fitted to the data. The coefficient of determination  $R^2 = 0.63489$  and Adj- $R^2 = 0.61454$ , it shows that 63% variance in house price can be explained by living area, Distance from Green Space, Distance from the Center and Distance from the Beach.

## 5. Conclusion

Hedonic model examines the effect of characteristics of goods on their prices. The paper analysis the determinants of house prices in Lezhe-Shengjin. Hedonic regression model is engaged in the analysis. Ordinary least square method is engaged in estimating the hedonic model. The results of the hedonic model reveal that Distance from the green space, distance from the city center and distance from the beach are the most significant variables that affect the house prices. This study presents an analysis for Lezhe-Shengjin and provides important findings on the determinants of house prices. The model's accuracy in predicting house price was measured by a number of criteria. The value of R<sup>2</sup> and MSE were compared to select preferred model. By using SPSS, the R<sup>2</sup> value was increase about 2% higher than MLR. The results from such a study can also produce answers to development decisions such as what building attributes to include in an effort to generate the house prices. Using these techniques can facilitate price valuation when traditional competition models cannot be estimating. That's why this study is considered also from the Local Government and will be presented to the group of interests. This study and the indicators generated have placed the Lezha region in better perspectives of the development according to the European Union standards.

**Recommendations:** The whole infrastructure of academic and regional study will have available the first indicators of the development planning, while preserving and improving the environment. Also they will help in the architecture of the building in this context, friendly architecture or green architecture while improving also the national accounting system (MRS). This region has for the first time this kind of indicators which will be used as a reference to orient development policies or regional units focusing on two conclusions:

**Firstly:** Results of the Hedonic Price study applied in Lezha region has reflected a positive element for all public and private structures to design, development and construction. These results can be used in a manner that suits the architecture of the building (eco-friendly), focused in these directions:

- Involving of the architecture in environment.
- Connectivity or combination of the environment with the green space around.
- The emblem of nature in architecture in cultural context.
- -Environmental design to support and accept Eco-Architecture.

**Secondly:** Traditional economic indicators do not consider the state of the environment. Thus a strong economic growth can mask a rampant consumption of natural resources. Economic growth can hide the overall risk of using natural resources in the medium or low level of investment in human capital. Green (Environmental) Accounting. On one hand some governments and international institutions have sought to improve the national accounting system that existed by establishing a new form of environmental accounting. They are equipped with instruments to rate the environmental state or improve indicators that were still present. National accounting system (NAS) is the sum of accounts performed periodically by states to follow the evolution of their economy. The economic value of natural resources and their role in the production activity are not included in the NAS. Elaboration of development concept included in the macroeconomic dimension of the environment in the political decision through a specific environmental accounting is also called Green accounting. So this study will motivate the policymakers not only in the Lezha and Shengjin region through the two most important recommendations derived from the analysis of an environmental engineer as well.

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