

## PROSPECTS FOR ECOLOGICAL TOURISM DEVELOPMENT: UKRAINIAN CARPATHIANS FOREST FUND TERRITORIES AS A CASE STUDY

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### Abstract

To optimize the use and management of Ukrainian Carpathians forest fund territories, ecological tourism is actively promoted by the government and reflected in the leisure sector. The attention of economists is mainly drawn to the market value of forest areas and forest resources. However, the trend is changing as the non-market values of forests are increasingly assessed and measured. This case study assessed the potential value of ecological tourism development using the contingent valuation method. A total of 235 respondents were interviewed in four regions of Ukraine. The results showed that most visitors to the Ukrainian Carpathians are willing to pay for ecological tourism on these territories. The average value was 35 USD per day in the conditions of organised ecological tourism and 10 USD per day in the conditions of individual ecological tourism on the territories of Ukrainian Carpathians forest fund. The results may justify financial support from the state for the development of ecological tourism and the adoption of relevant regulations. Prospects for it depend on the level of well-being and education of citizens, as well as the distance from the place of residence of the respondents to the territories of Ukrainian Carpathians forest fund. Regarding organised ecological tourism, the prospects for the development depend on certification of tour operators providing services.

**Key words:** ecotourist, environment, non-market goods, regression analysis, sustainable development, willingness to pay.

### Introduction

Carpathian region is one of the most attractive regions of Central and Eastern Europe, which has strategic importance in the development of the territories of eight states, including Ukraine.

Significant recreational, health, and historical and cultural potential is concentrated in the Carpathian region. There are seven sites on the territory of Ukraine included in the UNESCO World Heritage List. Four of these places are located in the Carpathian region, two of

them are transnational.

The Ukrainian Carpathians as a mountainous region, characterized by high natural resource potential and important geopolitical location, has of great importance for the socio-economic development of near-by regions.

Most mountainous areas, which are located at an altitude of 400 m a. s. l. and above, are difficult to access. The resource potential of these territories, inhabited by 978 thousand citizens in 715 settlements, is not realized, and the level of their socio-economic development is much lower than in Ukraine as a whole. This leads to low quality of life, increasing disparities in the system of economic complexes, and deteriorating investment attractiveness of mountainous areas, increasing differentiation of key socio-economic indicators, exacerbates the depression and subsidization of such areas, leads to deterioration of their ecological status, loss of potential for restoration, and hinders the balanced development of Carpathian regions. Therefore, the concept of development of mountainous areas of the Ukrainian Carpathians was recommended to create conditions for further development of rural and ecological tourism in the region (Cabinet of Ministers of Ukraine 2019).

The highest forest cover of Ukraine by natural zones is in the Ukrainian Carpathians (the optimal forest cover is 45 %, and the actual one is 42 %) (SAFRU 2019). The total area of the forest fund in Ukrainian Carpathian region is about 2 million ha. In particular, covered with forest – about 1.8 million ha. The forests areas of green zones are allocated near 44 cities and towns in the region occupy 153.6 thousand ha. Including, squares and parks occupy 44.8 thousand ha. These forests are located mainly in the

Carpathian region and Transcarpathia. The area of resort forests in the region is 35.6 thousand ha (SAFRU 2019).

The Ukrainian Carpathians is a unique and majestic region with an outstanding combination of mountains and forests beauty. They are part of the mountain system of the Eastern Carpathians. Their length is 280 km, width is more than 100 km. The mountains cover the territory of Transcarpathian, Lviv, Ivano-Frankivsk, and Chernivtsi regions. Their territory is delimited by deep valleys, rivers, and lakes located hundreds of meters above sea level. In Transcarpathia, there are 457 objects of the nature reserve fund on the area of 151 thousand ha (e.g. the Carpathian Biosphere Reserve, Uzhansky National Nature Park, National Nature Park 'Sinevir', regional landscape park 'Enchanted land', etc.), which creates significant opportunities for the development of ecological tourism (Vyshneve City Council 2020).

The forests of the Ukrainian Carpathians have a significant impact on the climatic, water-regulating, protective, and recreational functions of the region and surrounding areas (Kravtsiv et al. 2013).

This creates significant prospects for the development of ecological tourism, which brings significant benefits in environmental, social, and economic aspects. Among these benefits of ecological tourism, it is necessary to highlight the socio-economic and environmental benefits for local communities, its potential to reduce the impact on the environment and increase profits (BRM 2020).

The concept of 'ecological tourism' was proposed in the 1980s, but since the concepts of 'ecology' and 'tourism' are used for more than 100 years, during this

period, in different cases, in essence, they were placed side by side (Vyshnevsky 2015).

A significant contribution to the development of the theoretical basis of ecological tourism was made by Dmytruk (2004), who defined the principles, functions and tasks of ecological tourism. Vyshnevsky (2015) studied the driving forces that determine the objects and development of ecological tourism, also the basics of such activities. Problems and prospects of recreational use of forests were shown by Deyneka and Kopach (2001). Modern problems of economic and legal regulation of ecological tourism in Ukraine are covered in scientific articles by Dubovich and Fomicheva (2020). A key elements approach to operationalising of ecological tourism concept was investigated by Bottrill and Pearce (1995). Its development and implementation for wild lands and neighbouring communities was analyzed by Blangy and Wood (1993). Contingent valuation of ecological tourism development in country parks in urban shadow was made by Chen and Jim (2012). Boo (1993), Western (1993) and Weaver (2001) defined it as a responsible nature travel experience, that contributes to the conservation of the ecosystem, creating employment opportunities for local communities, and offering environmental education, etc.

Despite the fact that their scientific achievements served as a theoretical and methodological basis for the research and allowed to identify a number of additional issues in the research of ecological tourism, its current state and prospects in the forest fund of the Ukrainian Carpathians are insufficiently studied today.

In our opinion, ecological tourism is a type of tourism that can be successfully

developed in Ukrainian Carpathians forest fund, as well as in protected areas in recreational areas. It provides for the preservation of the environment, promoting the well-being of the local population and development following the concept of sustainable development (Dubovich and Fomicheva 2020). Ecological tourism is a responsible trip of an ecotourist to natural areas, areas that have minimal impact on the environment and support the well-being of local residents. An ecotourist is a person with an ecological consciousness who makes a responsible trip to natural areas, preserves the natural environment (TIES 2020).

By nature the organisation ecological tourism in the territories of the forest fund can be divided into organised and individual. Organised ecological tourism is group travel organised by a travel agency. Ecotourists have the right to tour by buying a tourist voucher. The number of services may be different. For example, ecotourists can purchase only food services or a range of services, including transportation, food, accommodation, excursions, etc. (Pucenteilo 2007).

Individual ecological tourism is a form of tourism, where tourist services are provided based on amateur ecotourists. Ecotourists themselves choose routes and ways of travel, provide themselves with food, accommodation, and rest, make excursions, and do not use the services of a travel agency. Individual ecological tourism involves the travel of an individual family or a person, or a group according to their plan (Pucenteilo 2007).

A tour operator must pass a system of mandatory certification as a way of state regulation of tourism. Certification – a procedure by which an authorised institution establishes the compliance of the object of certification with the

requirements established by law (Halasiuk 2011).

However, many factors hinder the development of ecological tourism in Ukrainian Carpathians forest fund territories. Among them, there are illegal landfills, illegal logging, fires, mass tourism at the environmental facilities, lack of certification of tour operators, construction of buildings and structures with violation of norms and standards for construction, insufficient number of special recreational areas (Kravtsiv et al. 2013).

This study aims at research the current state and prospects for the development of organised and individual ecological tourism on the territories of Ukrainian Carpathians forest fund by studying the interests of Ukrainian citizens in this area.

Therefore, the study of the prospects will make it possible to assess the forest's non-market values and identify the potential value of ecological tourism development.

## Methods

Many methods for estimating the value of public goods have been developed (Hanley et al. 2001, Bateman et al. 2002, Haines-Young and Potschin 2009). To study the main prospects for ecological tourism development on the territories of Ukrainian Carpathians forest fund, we used the contingent valuation method (CV method). It is based on the concepts of willingness to pay (WTP) a certain amount for non-market goods. It is widely used as an effective policy tool in the management of protected areas and biodiversity conservation (Baral et al. 2008).

The willingness to pay for non-market goods is based on the theory of rational choice and utility maximization

(Reynisdottir et al. 2008). CV method is a method that allows people to buy public goods in hypothetical situations, especially in the absence of a real market or available information about a real market scenario (Boyle 2003). It plays a significant role in shaping environmental policy. CV method is used in many areas, including protected areas, endangered species conservation, ecosystem services, and biodiversity conservation (Chen and Jim 2012, Adamu et al. 2015). Other areas of gaining its popularity include improving water quality, energy systems, human health, land conservation, and many of its applications in the outdoor recreation or ecological tourism sphere (Pelyukh and Zahvoyska 2018).

We have used CV method and obtained information by receiving answers from the respondents living throughout Ukraine. The survey was conducted online during year 2020 using Google form and telephone interviews using a computer based on a random sample of mobile phone numbers. The answers were anonymous. For our research, we use a random sample by age, sex and type of settlement. The respondents were mainly people who want to travel responsibly to the Ukrainian Carpathians and have some experience in ecological tourism. The preparation of the questionnaire was based on a study of the current state of ecological tourism and its application on the territories of Ukrainian Carpathians forest fund. It was a study of prospects and obstacles to its development and the impact of independent factors on the willingness to pay for the use of quality natural conditions, environmentally friendly recreation, and food in the context of individual and organised ecological tourism of Ukrainian Carpathians forest fund. The questionnaire contained

twenty main questions on socio-economic aspects of the prospects for the development of ecological tourism and five questions on basic information about respondents who took part in the survey.

To determine the willingness to pay we used a scale. Every factor that affects the willingness to pay is translated into points. For example, age categories: 18–25 – 1 point; 26–35 – 2 points; 36–45 – 3 points; 46–59 – 4 points; 60–70-year-old – 5 points.

Similarly, we divide the gender of the respondent: 1 point – woman, 2 points – man; place of residence: urban – 1 point, urban-type settlements – 2 points, rural areas – 3 points; education and personal income – from 1 to 4 points; distance to the Ukrainian Carpathians – from 1 to 5 points.

In our research, we chose a linear model to determine the impact of key indicators on the willingness of respondents to pay for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation, and nutrition in the conditions of organised and individual ecological tourism on the territories of Ukrainian Carpathians Forest fund because  $R^2$  indicator in that model is the largest.

An economic and mathematical model was constructed in a form of

linear multiple regression equation using regression analysis. It assessed the impact of independent factors ( $X_1, \dots, X_n$ ) on the amount of willingness to pay for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the context of organised ( $Y_1$ ) and individual ( $Y_2$ ) ecological tourism. After receiving the respondents' answers, the information was summarised and analysed.

## Results and Discussion

It follows from the study, that most of the surveyed citizens of Ukraine (64 %) were ecological tourists. The share of respondents interested in ecological tourism is 86.3 %. This indicator shows its popularity and the need for its development.

The survey involved 235 respondents aged from 18 to 70 years, including 50.8 % of women and 49.2 % of men. The age structure is shown in Figure 1. Most respondents by place of residence are urban (50.4 %), 26.3 % live in urban-type settlements, and 23.3 % – in rural areas.

The study that used CV method was conducted on the territory of all regions of Ukraine. The Western region of Ukraine includes: Lviv, Ivano-Frankivsk, Ternopil,

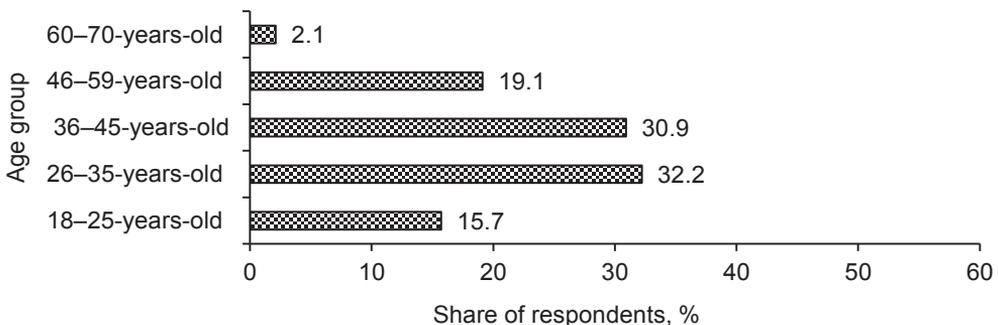


Fig. 1. Age structure of respondents.

Volyn, Rivne, Khmelnytsky, Chernivtsi, and Zakarpattia; the North: Zhytomyr, Kyiv, Chernihiv, and Sumy regions; the South: Zaporizhia, Kherson, Odesa, Mykolaiv regions; the East: Kharkiv, Donetsk and Luhansk regions; the Central – Vinnytsia, Dnipro, Kirovograd, Poltava and Cherkasy regions (Anonymous 2018).

The educational level of respondents is very high (Fig. 2).

Our study shows that 66 % of respondents traveled on the territories of the Ukrainian Carpathians forest fund, and 34 % did not. In addition, 74 % prefer to rest in forests in protected areas (national nature parks, recreational areas, botanical gardens, etc.). This indicator proves that tourists are interested in recreation on the territory of the forest fund in the conditions of ecological tourism, the aesthetics and purity of these objects, get acquainted with local traditions, and in living in the unchanging natural conditions of the Ukrainian Carpathians. Thus, the successful development of ecological tourism on these territories will be facilitated by effective economic and legal regulation of ecological tourism. At the same time, 75.3 % of respondents believe that it is necessary to adopt a Law 'About ecological tourism'. It should be noted that 71.5 % of respondents believe that a tour operator that carries out ecological

tourism in the forest fund should pass a certification system, and only – 28.5 % do not agree. The result of certification is obtaining a certificate of compliance with the level of safety of services provided and is one of the key factors in the development of ecological tourism.

According to the survey, 55.3 % of respondents prefer an individual way of ecological tourism, namely plan their trips, and 27.7 % – prefer an organised way of ecological tourism, and only 13.6 % – carry out both.

Among the surveyed citizens, the largest share (49.8 %) in the conditions of income was made up of respondents with the average monthly family income per person ranged from 180 to 250 USD. In 27.7 % of respondents income ranges from 250 to 350 USD. The income of 18.7 % of respondents is more than 350 USD, and the rest – 3.8 %, have an average monthly income of up to 180 USD per person.

With CV method, the willingness to pay for the potential value of ecological tourism development on the territories of the Ukrainian Carpathians forest fund was determined. In the conditions of organised ecological tourism (Fig. 3) the most respondents (49.8 %) are willing to pay 20–35 USD per day.

As for the willingness to pay for the use

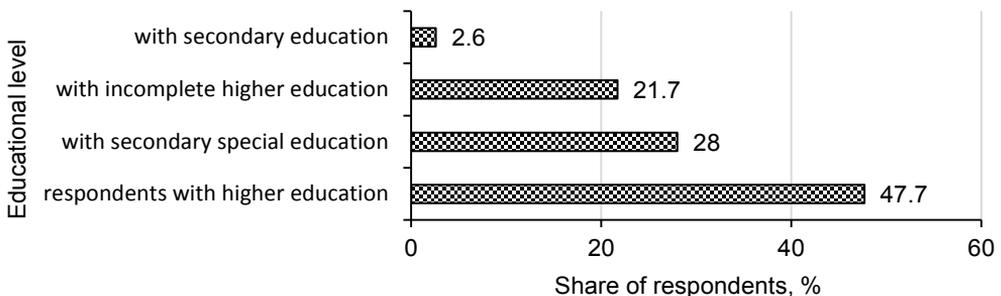


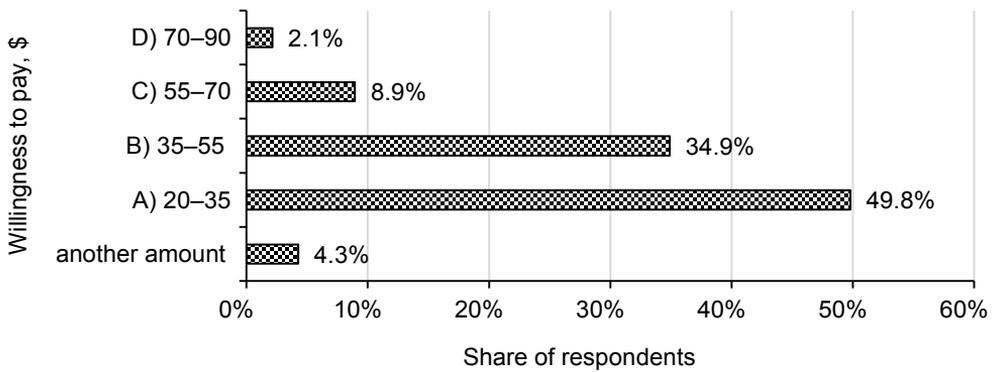
Fig. 2. Share of respondents by levels of education.

of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition of Ukrainian citizens in the conditions of individual ecological tourism, 50 % of respondents are willing to pay 10–20 USD per day (Fig. 4).

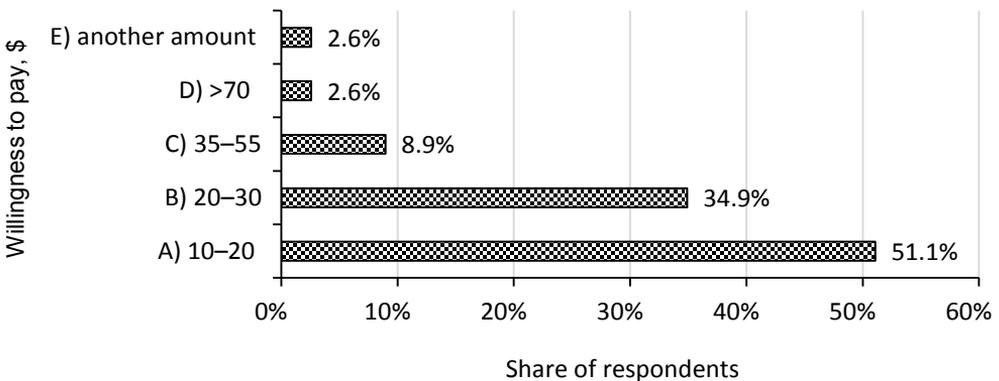
The average value was 35 USD in the conditions of organised ecological tourism and 10 USD per day in the conditions of individual ecological tourism.

Using 'Data Analysis' Excel package spreadsheet, we construct ANOVA anal-

ysis of variance table to estimate the regression coefficients for the variables  $X_1-X_{14}$ . The dependence of willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of organised ecological tourism (USD) on a number of factors, such as sex ( $X_1$ ), age ( $X_2$ ), average monthly family income per person ( $X_3$ ), distance to Ukrainian Carpathians ( $X_4$ ), place of residence (urban, urban – type



**Fig. 3. Willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation, and nutrition of respondents in the conditions of organised ecological tourism.**



**Fig. 4. Willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of individual ecological tourism.**

settlements, rural areas) ( $X_5$ ), level of education ( $X_6$ ), practicing ecological tourism ( $X_7$ ), interest in ecological tourism ( $X_8$ ), travel to the territories of the Ukrainian Carpathians forest fund ( $X_9$ ), travel to nature protection objects ( $X_{10}$ ), hotel policy on environmental protection ( $X_{11}$ ), visiting eco-hotels ( $X_{12}$ ), obligation for tour operators carrying out ecological tourism on the territory to pass the certification system ( $X_{13}$ ), possibility of ecological tourism to become a priority for the tourism industry development in the Ukrainian Carpathians ( $X_{14}$ ) is determined by constructing a linear econometric model.

The econometric model of willingness to pay for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of organised ecological tourism was analysed according to the following indicators: multiple coefficient is equal to 0.9, which indicates a strong correlation between the studied variables; coefficient of determination ( $R^2$ ) is equal to 0.84. This means that the dependent variable ( $Y_1$ ) is 84 % explained by the independent ones ( $X_1$ – $X_{14}$ ). The other 16 % remain unexplained (they are influenced

by unknown factors); normalized  $R^2$  is equal to 0.83 and is adjusted for the number of observations.

The linear equation of multiple regression of willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of organised ecological tourism on the territories of the Ukrainian Carpathians forest fund has the formula (1):

$$Y_1 = 54.30X_1 + 13.53X_2 + 612.14X_3 - 62.56X_4 - 7.32X_5 + 36.99X_6 + 38.84X_7 + 5.43X_8 + 84.84X_9 - 13.28X_{10} + 5.34X_{11} + 7.25X_{12} + 88.84X_{13} - 3.81X_{14} - 1082.83 \quad (1)$$

To assess the significance of the coefficients, we find the critical values of Student's distribution for significance level 0.05 and the number of degrees of freedom  $df = n - k - 1 = 235 - 14 - 1 = 220$ . Critical value can be found in Student's table,  $t_{220; 0.05} = 1.96$ . The actual value of t-statistics should be compared to the value in the table. If  $|t_{\text{fact}}| > t_{\text{table}}$ , then hypothesis  $H_0$  is rejected (i.e., the parameter estimation is different from 0). In this case, the actual value of t-statistics of variable  $X_1$  does not exceed the table value ( $1.722 < 1.96$ ), so the coefficient is insignificant (Table 1).

**Table 1. Results of significance of the factors for both linear equations of multiple regression.**

Factors	$Y_1$			$Y_2$		
	Coefficients of regression	t-statistics	Significance of factor	Coefficients of regression	t-statistics	Significance of factor
Intercept	-1082.83			-805.50		
$X_1$	54.30	1.722	insignificant	21.76	0.922	insignificant
$X_2$	13.53	0.864	insignificant	0.41	0.035	insignificant
$X_3$	612.14	29.869	significant	462.00	30.125	significant
$X_4$	-62.56	4.418	significant	-51.46	-4.857	significant
$X_5$	-7.32	-0.404	insignificant	-4.13	-0.304	insignificant
$X_6$	36.99	1.938	insignificant	40.99	2.870	significant
$X_7$	38.84	0.923	insignificant	20.26	0.644	insignificant
$X_8$	5.43	0.094	insignificant	-8.61	-0.199	insignificant
$X_9$	84.84	1.874	insignificant	63.93	1.888	insignificant

Factors	$Y_1$			$Y_2$		
	Coefficients of regression	t-statistics	Significance of factor	Coefficients of regression	t-statistics	Significance of factor
$X_{10}$	-13.28	0.271	insignificant	-6.00	-0.163	insignificant
$X_{11}$	5.34	0.227	insignificant	-1.02	-0.057	insignificant
$X_{12}$	7.25	0.171	insignificant	-4.89	-0.154	insignificant
$X_{13}$	88.84	2.127	significant	130.79	1.186	insignificant
$X_{14}$	-3.81	0.127	insignificant	-9.15	-0.409	insignificant

Therefore, we can conclude that there are statistically significant variables  $X_3$ ,  $X_4$  and  $X_{13}$ . That is, the willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition a statistically significant effect have the average monthly family income per person, distance to the Ukrainian Carpathians, and the obligation of a tour operator that carries out ecological tourism in the forest fund to pass the certification system.

Fisher's F-test is used to check the significance (adequacy) of the multiple regression equation. We put forward the null hypothesis and the alternative hypothesis: not all regression coefficients are equal to zero at the same time. We choose the level of significance  $\alpha = 5\%$ , therefore, the confidence level is 0.95. Tabular value  $F_{0.05; 14; 220} = 1.55$ . The actual value of  $F = 84.614$ . And the significance  $F = 2.94E-80$  is less than 0.05. Thus, we can conclude the statistical significance of the model.

Examining the influence of independent factors on the willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of organised ecological tourism, using regression analysis, we can conclude that the respondents with the highest income are most willing to pay, and the longer the distance to the Ukrainian Carpathians, the less the respondents

are willing to pay for the use of high-quality natural conditions. Also, the willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation, and nutrition per day in the conditions of organised ecological tourism will increase if mandatory certification of the tour operators is introduced.

To study the influence of independent factors on the willingness to pay, regression analysis was performed. The dependent variable ( $Y_2$ ) is the willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of individual ecological tourism (USD), independent variables ( $X_1, \dots, X_{14}$ ), as in organised ecological tourism. Analysing the influence of independent variables on the willingness to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of individual ecological tourism, it follows that there is a strong correlation between the studied values (multiple correlation coefficient is equal to 0.92). The coefficient of determination ( $R^2$ ) is equal to 0.85 and indicates that the value of the variable  $Y$  (willingness to pay per day in the conditions of individual ecological tourism) is 85% explained by variables  $X_1-X_{14}$ . The other 15% remain unexplained, they are influenced by unknown factors.

Tabular value  $F_{0.05; 14; 220} = 1.55$ . The actual value of  $F = 86.896$ . And the significance  $F = 2.53E-81$  is less than 0.05. Thus, we can conclude the statistical significance of the model.

The linear equation of multiple regression of the amount of willingness to pay per day in the conditions of individual ecological tourism has the formula presented by equation (2):

$$Y_2 = 21.76X_1 + 0.41X_2 + 462X_3 - 51.46X_4 - 4.13X_5 + 40.99X_6 + 20.26X_7 + 8.61X_8 + 63.93X_9 - 6X_{10} - 1.02X_{11} - 4.89X_{12} + 130.79X_{13} - 9.15X_{14} - 805.50 \quad (2)$$

Comparing the values of t-statistics of independent variables  $X_1 - X_{14}$  with tabular value  $t_{220; 0.05} = 1.96$  it is concluded that statistically significant are: average monthly family income per person, USD ( $X_3$ ), distance to the Ukrainian Carpathians ( $X_4$ ), and level of education ( $X_6$ ) (Table 1).

We can conclude that the respondents with the highest income are most willing to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of individual ecological tourism, and the longer the distance to the Ukrainian Carpathians, the less the respondents are willing to pay for the use of high-quality natural conditions. Also, the higher the level of education, the more the respondent is willing to pay.

Our study showed that 70 % of respondents believe that this type of tourism can become the dominant type of tourism on the territories of Ukrainian Carpathians forest fund as an alternative to mass tourism. Respondents believe that the main factors that will contribute to the successful development of ecological tourism there are:

1) effective economic and legal regulation of ecological tourism (this is the opinion of 30 % of respondents);

2) arrangement of special recreational zones on the territory (26 %);

3) construction of ecological tourism complexes, which will follow special rules and instructions (19 %);

4) introduction of mandatory certification and accreditation of tour operators engaged in ecological tourism (19 %).

The conducted sociological research provides an opportunity to better understand how society perceives the ecological tourism, as well as to study the weaknesses and prospects for the development of this type of tourism.

In our opinion, the answers of respondents are not always sufficiently scientifically substantiated about ensuring legal regulation, formation of culture of ecological tourism, environmental protection, etc. Therefore, it is more effective and expedient to conduct sociological survey from those questions among specialists in the field of ecological tourism.

To create effective conditions for the development of ecological tourism in the Ukrainian Carpathians, it is necessary to solve infrastructural problems. Effective development of ecological tourism is possible with a proper understanding of the concept of 'ecological tourism', development of strategies and specific plans for the development of ecological tourism, as well as relevant legislation and regulations in the field of ecological tourism.

The effective development of ecological tourism in the Ukrainian Carpathians requires a comprehensive science-based approach. Scientific research creates prospects for further developments in the field of ecological tourism in this region.

## Conclusions

The conducted sociological survey provides an opportunity to better understand how society perceives the ecological tourism, as well as to study the weaknesses and prospects for the development of this type of tourism. Our socio-economic study shows that the majority of surveyed citizens of Ukraine (86.3 %) are interested in ecological tourism. In addition, 74 % of respondents traveled to environmental facilities. This indicator shows that tourists are interested in ecological tourism on the territories of Ukrainian Carpathians forest fund.

The main problems of effective ecological tourism development on the territory of the Ukrainian Carpathians forest fund are: potential visitors are not informed about the possibility of ecological tourism there and lack of its effective economic and legal regulation.

Theoretical-methodological and scientific-practical research has shown that the successful prospects development of ecological tourism in Ukrainian Carpathians forest fund main factors are: the effective economic and legal regulation of ecological tourism, in particular, the adoption of a Law of Ukraine 'About Ecological Tourism'; a tour operator that carries out ecological tourism on the territory of the forest fund must pass a certification system; the development of tourist facilities should comply with the concept of sustainable development. For the effective development of ecological tourism in the Ukrainian Carpathians, first of all, we need a proper understanding of the concept of 'ecological tourism', to develop the strategies and specific plans of its development, as well as to solve infrastructural problems of the region in this sphere.

According to the regression analysis,

we can conclude that the respondents with the highest income are most willing to pay per day for the use of high-quality natural conditions, receipt of environmentally friendly services of recreation and nutrition in the conditions of organised and individual ecological tourism, and the longer the distance to the Ukrainian Carpathians, the less the respondents are willing to pay for the use of high-quality natural conditions. Also, the willingness to pay will increase if the mandatory certification of the tour operator is introduced.

Perspectives of further theoretical-methodological and scientific-practical research are to study the impact of climate change on the prospects of ecological tourism, as well as to identify additional factors not previously taken into account in the regression model on which depends the willingness to pay per day for organised and individual ecological tourism on the territories of Ukrainian Carpathians forest fund.

## References

- ADAMU A., YACOB M.R., RADAM A., HASHIM R. 2015. Factors determining visitors' willingness to pay for conservation in Yankari game reserve, Bauchi, Nigeria. *International Journal of Economics and Management* 9 (spec. Dec.): 95–114.
- ANONYMOUS 2018. Environmental protection and citizens of Ukraine. Survey of Practice, Values and Judgments. 33 p. (in Ukrainian). Available at: <http://www.rac.org.ua/uploads/content/481/files/envportraitpollreport2018.pdf> (Accessed on 11 September 2020).
- BARAL N., STERN M.J., BHATTARAI R. 2008. Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development. *Ecological Economics* 66(2–3): 218–227.

DOI: 10.1016/j.ecolecon.2008.02.004

- BATEMAN I., CARSON R., DAY B., HANEMANN M., HANLEY N., HETT T., JONES-LEE M., LOOMES G. 2002. Economic valuation with stated preference techniques: A manual. Edward Elgar, Cheltenham, UK. <https://doi.org/10.4337/9781781009727>
- BLANGY S., WOOD M.E. 1993. Developing and Implementing Ecotourism Guidelines for Wild Lands and Neighboring Communities. In: Lindberg K., Hawkins D.E. (Eds). Ecotourism: a Guide for Planners and Managers. The Ecotourism Society, North Bennington, vol. 1: 32–54.
- BLUSHCHAK H.M., SOLOVIY I.P. 2009. Ecological and economic evaluation of social functions of forests within the urbanized territories. Scientific Bulletin of UNFU 19(3): 68–73 (in Ukrainian).
- BOO E. 1993. Ecotourism planning for protected areas. In: Lindberg K., Hawkins D.E. (Eds). Ecotourism: a Guide for Planners and Managers. The Ecotourism Society, North Bennington, vol. 1: 15–31.
- BOTTRILL C.G., PEARCE D.G. 1995. Ecotourism: Towards a key elements approach to operationalising the concept. Journal of Sustainable Tourism 3(1): 45–54.
- BOYLE K.J. 2003. Contingent valuation in practice. In: A primer on nonmarket valuation. Dordrecht, Champ P.A., Boyle K.J., and Brown T.C. (Eds), Germany, Kluwer: 111–169.
- BRM (Business Research Methodology) 2020. Ecotourism: benefits and value. Web site. Available at: <https://research-methodology.net/ecotourism-benefits-and-value> (Accessed on 17 September 2020).
- CABINET OF MINISTERS OF UKRAINE 2019. About approval of the Concept of development of mountain territories of the Ukrainian Carpathians. Web site (in Ukrainian). Available at: <https://ips.ligazakon.net/document/view/kr190232?an=59> (Accessed on 27 August 2021).
- CHEN W.Y., JIM C.Y. 2012. Contingent valuation of ecotourism development in country parks in the urban shadow. International journal of sustainable development and world ecology 19(1): 44–53.
- DEYNEKA A.M., KOPACH M.I. 2001. Problems and prospects of recreational use of forests in Lviv region. Regional Economy 2: 171–175 (in Ukrainian).
- DMYTRUK O.YU. 2004. Ecological tourism: modern concepts of management and marketing: a textbook. Kyiv, Alterpress. 192 p. (in Ukrainian).
- DUBOVICH I., FOMICHEVA T. 2020. Modern problems of economic and legal regulation of ecological tourism in Ukraine. Scientific journal 'Scientific notes of Tavriya National University named after VI Vernadsky. Series: Economics and Management', volume 31(70), No 4: 42–46 (in Ukrainian). Available at: [http://www.econ.vernadskyjournals.in.ua/journals/2020/31\\_70\\_4/31\\_70\\_4\\_2/9.pdf](http://www.econ.vernadskyjournals.in.ua/journals/2020/31_70_4/31_70_4_2/9.pdf)
- HAINES-YOUNG R.H., POTSCHEIN M.B. 2009. Methodologies for defining and assessing ecosystem services. Final Report, JNCC, Project Code C08-0170-0062. 69 p.
- HALASIUK S.S. 2011. Standardization, certification of tourist services and licensing of tourist activity: a textbook – Odessa, Astroprint. 163 p. (in Ukrainian).
- HANLEY N., MOURATO S., WRIGHT R. 2001. Choice modelling approaches: a superior alternative for environmental valuation? Journal of Economic Surveys 15(3): 435–462. <https://doi.org/10.1111/1467-6419.00145>
- KRAVTSIV V.S., BORSHCHEVSKIY V.V., ISHCHUK S.O., MIKULA N.A., SADOVA U.YA., STORONYANSKA I.Z., SHEVCHUK L.T., SCHULTZ S.L. 2013. The Carpathian region: problems and prospects. Lviv: State Institution 'Institute of Regional Research named after M. I. Dolishniy of the NAS of Ukraine'. 336 p. (in Ukrainian).
- PELYUKH O.R., ZAHVOYSKA L.D. 2018. Investigation of Lviv region population's preferences regarding recreational forests using choice experiment method. Scientific Bulletin of UNFU 28(9): 73–80. (in Ukrainian). <https://doi.org/10.15421/40280915>
- PUCENTEILO P.R. 2007. Economics and organization of tourist and hotel business. Tutorial. Kyiv: Center for Educational Literature. 344 p. (in Ukrainian). Available at:

- [https://tourlib.net/books\\_ukr/pucentejlo34.htm](https://tourlib.net/books_ukr/pucentejlo34.htm) (Accessed on 16 September 2020).
- REYNISDOTTIR M., SONG H., AGRUSA J. 2008. Willingness to pay entrance fees to natural attractions. An Icelandic case study. *Tourism Management* 29(6): 1076–1083. DOI: 10.1016/j.tourman.2008.02.016
- SAFRU (State Agency of Forest Resources of Ukraine) 2019. *Forestry of Ukraine. Brochure, State Agency of Forest Resources of Ukraine*. 48 p. (in Ukrainian) Available at: [http://ekoinform.com.ua/wp-content/uploads/2019/01/Brosura\\_DALR\\_2019-UA-web.pdf](http://ekoinform.com.ua/wp-content/uploads/2019/01/Brosura_DALR_2019-UA-web.pdf) (Accessed on 7 September 2020).
- WEAVER D.B. (Ed.) 2001. *The Encyclopedia of Ecotourism*. eBook. Oxon, UK; New York, NY: CABI Publishing. 688 p. Available at: [http://www.microlinkcolleges.net/elib/files/undergraduate/Tourism%20&%20Hotel%20Management/The%20Encyclopedia%20of%20Ecotourism%20\(2001\).pdf](http://www.microlinkcolleges.net/elib/files/undergraduate/Tourism%20&%20Hotel%20Management/The%20Encyclopedia%20of%20Ecotourism%20(2001).pdf) (Accessed on 12 September 2020).
- TIES (The International Ecotourism Society) 2020. *What is ecotourism?* Web site. Available at: <https://ecotourism.org/what-is-ecotourism> (Accessed on 12 September 2020).
- VYSHNEVE CITY COUNCIL 2020. *Carpathians-incredible beauty of Ukraine*. Web site (in Ukrainian) Available at: <https://vyshneve-rada.gov.ua/arhiv/3756-2014-06-27-05-27-02.html> (Accessed on 27 August 2020).
- VYSHNEVSKY V. 2015. *Ecological tourism*. Interpress LTD. 140 p. (in Ukrainian).
- WESTERN D. 1993. *Defining Ecotourism*. In: Lindberg K., Hawkins D.E. (Eds). *Ecotourism a Guide for Planners and Managers*. The Ecotourism Society, North Bennington, vol. 1: 7–11.