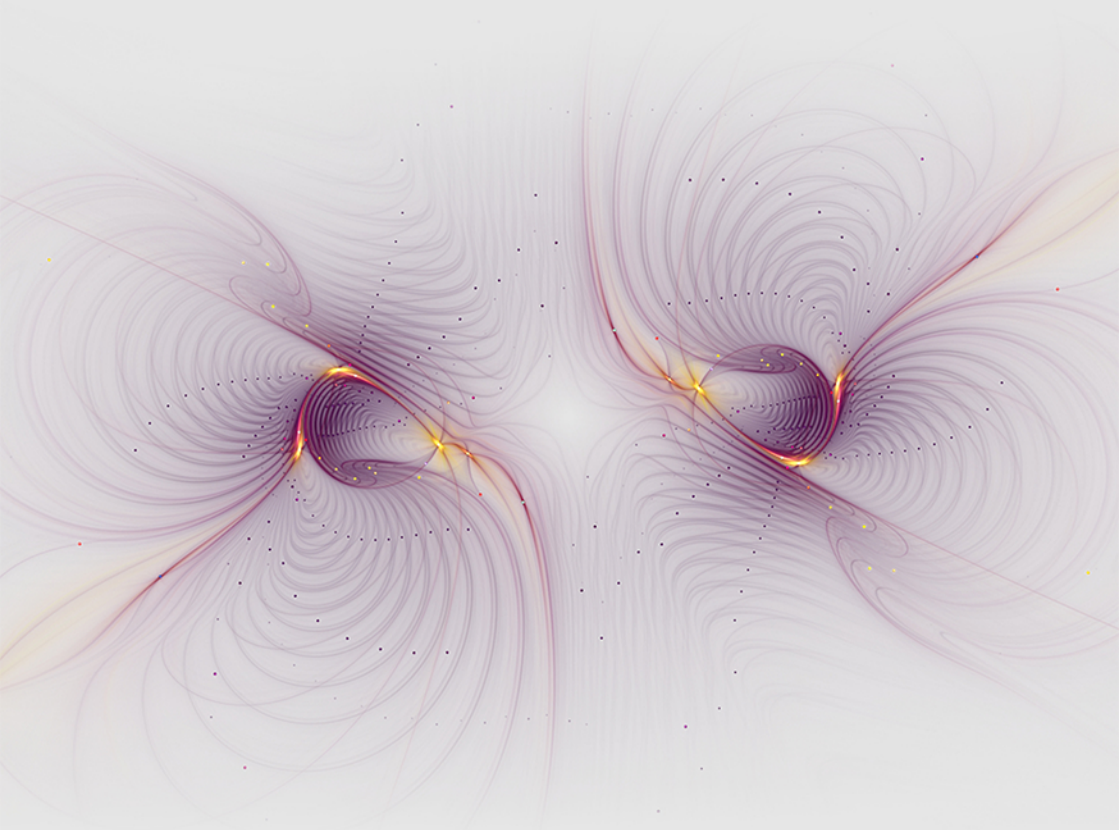


3rd International Scientific and Practical Conference

INNOVATIVE RESEARCH: TECHNOLOGY AND NATURAL SCIENCES

Prague November 10, 2023



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“THE POTENTIAL OF MEDICINAL AND AROMATIC PLANTS IN THE MALËSIA E MADHE REGION (ALBANIA)”: A TERRITORIAL INNOVATION APPROACH

Abstract. This research examines the concept of territorial innovation on the medicinal and aromatic plant sector in rural areas. Territorial innovation has tremendous potential to improve competitiveness, employment, and well-being in these regions. The medicinal and aromatic plant sector is significant in the Albanian economy, offering great opportunities for exports and serving as an important source of traditional medicines. In rural areas, territorial innovation can influence the medicinal and aromatic plant sector in several ways. Enhancing technology and production methods can increase the efficiency and quality of medicinal and aromatic plant production, making it more competitive in international markets. The utilization of new marketing and trade tools can facilitate entry into international markets and attract new customers. Collaboration and coordination among various stakeholders in the rural area can also be enhanced through territorial innovation.

Keywords: territorial innovation, rural areas, medicinal plants, environmental services, economic development.

Introduction

Malësia e Madhe Region is an important rural area in Albania, with significant natural resources for the development of the medicinal and aromatic plant sector. Agriculture is a key activity in this area, and the production of medicinal plants is gaining attention from specialists.

The production of medicinal plants in the Malësia e Madhe Region can be considered a traditional activity in this region and has been consolidated in several villages. Medicinal plants such as wormwood, gentian, parsley, and red flowers are produced in the Malësia e Madhe Region. These plants have wide usage in traditional medicine and have significant potential in international markets.

In this area, producers of medicinal plants are benefiting from the assistance of specialists and organizations that promote and develop this sector at the national and international levels. In this way, they are changing their traditional production methods and using new technologies and more efficient methods to produce medicinal plants with higher quality and lower costs.

To become more competitive in international markets, producers of medicinal plants in the Malësia e Madhe region can utilize new technologies and improve their marketing and trade methods. By doing so, they can change their marketing tactics and find new customers in international markets.

Overall, the production of medicinal plants is a sector with great potential in the Malësia e Madhe Region and throughout Albania. If medicinal plant producers employ territorial innovation technologies and methods, they can increase their efficiency and competitiveness in international markets and contribute to the development of rural areas.

In the Malësia e Madhe Region, according to studies conducted by local institutions and experts, the cultivation of medicinal plants is an important activity for several villages and is gaining increasing importance in the local economy. These plants have been traditionally used for medicinal and aromatic purposes and have significant potential in international markets.

Local government units for planning purposes are divided into territorial systems as follows: natural, agricultural, urban, water, and infrastructure.

- The natural system is the dominant system in the municipality's territory, particularly in the northeastern and southeastern parts, mainly in mountainous areas, covering a total area of 77,293 hectares.
- The agricultural system is characteristic of this territory, as it is spread throughout the municipality, concentrated in the plain area but also extending into mountainous areas. With agriculture being one of the priority sectors for development, its presence covers approximately 15,000 hectares.
- The urban system covers an area of 3,570 hectares. This system has undergone significant changes since the 1990s due to migration from isolated mountainous areas to areas closer to the town of Koplik and other areas with more employment opportunities.
- The water system covers an area of 600 hectares, including rivers, streams, reservoirs, and a large area of Lake Shkodra.
- The infrastructure system occupies an area of 256 hectares in the territory. This system includes road transportation, railway, water supply network, irrigation canal network, electricity network, telecommunications, etc.

The Malësia e Madhe Region rank first in terms of the quantity of cultivation and gathering of medicinal plants, primarily due to the

traditions of the local inhabitants. Wormwood and lavender constitute the main business in the Malësia e Madhe Region.

The role of the territory innovation in the production of medicinal plants

Territorial innovation is a relatively new concept in rural development and has tremendous potential to improve the medicinal and aromatic plant sector. This type of innovation focuses on developing the potentials and resources of a region, using an integrated approach to enhance competition, employment, and well-being in these areas.

The medicinal and aromatic plant sector holds particular importance in the Albanian economy, being a significant source of traditional medicines and offering great export opportunities. In this regard, territorial innovation can influence the development of the medicinal and aromatic plant sector in various ways.

One of the key ways in which territorial innovation can impact the medicinal and aromatic plant sector is through the improvement of technology and production methods. In rural areas, the production of medicinal and aromatic plants can be slow and costly, making this sector less competitive in international markets. Enhancing technology and production methods can increase the efficiency and quality of medicinal and aromatic plant production, making it more competitive in international markets.

Another way that territorial innovation can impact the medicinal and aromatic plant sector is through the use of new marketing and trade tools. Rural areas may face difficulties in terms of accessing international markets and finding new customers. In this regard, territorial innovation can aid in the development of new trade and marketing channels, utilizing new technologies and establishing new connections with international markets. Another advantage of territorial innovation

in the medicinal and aromatic plant sector is the improvement of collaboration and coordination among different actors in the rural area.

Territorial innovation is a concept that involves the use of innovation in territorial development. The development of a territory and the role of business in innovation are closely intertwined. A thriving business sector can help drive economic growth and development in a region, while a supportive environment can foster innovation and entrepreneurship (Jana, K., et al., 2023).

One of the most significant impacts of territorial innovation in rural areas is the increase in productivity in the agricultural sector and the creation of new opportunities to boost profits and generate new jobs. Territorial innovation can help improve production technology, utilize information and communication technologies to enhance market access and connectivity, and employ new business strategies to increase efficiency and competitiveness.

Literature review

Territorial innovation systems involve interconnected enterprises in specific sectors, along with the appropriate suppliers and service sector, as well as a range of supporting institutions (Minga, A et al., 2023). In fact, it is simplistic to think that the production and dissemination of knowledge occurs through “simple probabilistic contact mechanisms.” The factors determining higher innovativeness in one area compared to another are, in fact, much more complex. Innovation plays decisive roles in the geographic transformation of economic activity (Storper & Walker, 1989). The factors determining higher innovativeness in one area compared to another are, in fact, much more complex. In addition to physical proximity, we must consider cultural proximity, meaning a sense of belonging to an area, the ability to interact with others, and shared values, which, in short, determine relational capital (Dedeire & Minga, 2021). And it is precisely

relational capital, composed of various forms, that comes into play. Another approach focuses on the process of capital accumulation in which territorial change results from the creative destruction and innovation tendencies of industries as they seek new spaces for investment, resources, markets, and growth (Storper & Walker, 1989).

The medicinal plant sector is a broad field of study that encompasses all aspects of medicinal plants, including classification, use, processing, their healing effects, and safety. K. Sathish Kumar and R. Gopinath (2011) have provided an extensive review of medicinal plants, including a description of their usage, quality, healing properties, and their impact on the human body. Manish Gautam and Shweta Sharma (2014) have focused on the antiviral properties of medicinal plants, including plants that have effects on different viruses such as herpes and HIV. Sanaa Rostami et al. (2017) have analyzed the role of medicinal plants in the prevention and treatment of chronic diseases such as diabetes, hypertension, and cancer.

SWOT Analysis of the Malësia e Madhe Region

The SWOT analysis is a method used to evaluate a municipality's competitive strengths and is a tool to help local authorities focus their resources on making the most of their territorial advantages and finding effective solutions to problems. This is done to achieve sustainable development and ensure adaptability over time.

Strengths refer to the natural assets and potential benefits of the municipal area, including landscapes, regional and international connections, favorable weather conditions, tourism potential, strong banking systems, investment opportunities, efficient municipal management, and social and infrastructural services.

Weaknesses are factors that hinder the city's growth, such as insufficient infrastructure, ineffective municipal management, complicated administrative procedures, and poor traffic control.

Opportunities can arise from national or international projects that create jobs and business possibilities, while threats may emerge from environmental issues or human resource limitations.

A SWOT analysis is used to identify and evaluate the competitive advantages and potential of the Malësia e Madhe Region. It also examines future development prospects in terms of supply and demand and identifies necessary actions to minimize the impact of threats. This analysis should not be limited to physical aspects but should also consider economic assessments related to quality of life, the environment, and investment climate, as well as the management of urban and rural areas, new challenges faced by local government, and the socio-economic context.

Conclusions and Recommendations

The level of technological advancement is low in the farms of Malësia e Madhe. As a result, they require a high labour intensity. A significant proportion of these farms have outdated machinery, as well as inadequate agricultural buildings and storage facilities. The low capital turnover intensity from production has resulted in low productivity, relatively high production costs, low quality, and minimal profits.

In the Malësia e Madhe Region, there is no evidence of innovation in the sense of inventions, such as developing a patent and turning it into a business. However, there are cases of innovation related to the introduction of new management processes at the business level. Foreign buyers are a source of information not only for markets but also for technologies. Innovation in the medicinal plant sector in the Malësia e Madhe Region is essential to meet contemporary demands.

In the case of medicinal plants, there is a significant natural resource that is not fully utilized. To harness this resource to its fullest potential, cooperation with other parties and actors within the value

SWOT Analysis of the Malësia e Madhe Region

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> - Agricultural products in the flat and hilly areas that have a good market with specific regional advantages and optimal profit compared to other agricultural crops. - Suitable climatic and soil conditions for the development of medicinal and aromatic plant sectors, agriculture, and livestock based on macrozones suitable for agricultural and livestock production diversity. - The territorial composition of the municipality within the national framework provides an opportunity for supplying agricultural and livestock products to the municipality itself, partly to the Shkodra Municipality, and especially for meeting the needs and demands of mountain tourism and agrotourism in the Alpine region and its surroundings. - The structure of agricultural farm production is profitable and prioritizes the 	<ul style="list-style-type: none"> - High fragmentation of agricultural land and insufficient infrastructure for agriculture. - Lack of agricultural and livestock trade structures in the municipality's territory. - A reduced number of collectors compared to the reserves of agricultural and livestock production in the municipality's territory. - Lack of knowledge about marketing, selection, packaging, and preservation of fresh and non-fresh agricultural and livestock products. - Weak irrigation schemes in the agricultural lands of the Malësia e Madhe Municipality, with only about 15% of agricultural land being irrigated. - Lack of equipment for collection, transportation, and processing of agricultural and livestock products, as well as processing points 	<ul style="list-style-type: none"> - Favorable climatic and soil conditions in the region's territory for the growth and cultivation of medicinal and aromatic plants, agricultural crops, and the breeding of small livestock. - High potential for increasing the production of agricultural and livestock products, medicinal and aromatic plants, chestnuts, and tobacco as a result of the region's good traditions. 	<ul style="list-style-type: none"> - Non-functioning water canal network throughout the municipality's territory. - Risk of flooding in some flat areas of the municipality as a result of the malfunctioning drainage system. - Risk of non-trading and overstocking of key products due to non-functional contractual agreements with domestic and foreign markets.

<p>cultivation of crops suitable for the available land qualities, climate conditions, and grazing of livestock, for both the flatland and fruit tree areas, vineyards, and small livestock in hilly areas.</p> <ul style="list-style-type: none"> - The beginnings of interest group organization in the medicinal and aromatic plant production sector and the development of this sector as a priority in the municipality's agricultural structure. - Stabilization of the population over recent years, especially when compared to the significant depopulation of the 1990s. - Strategic position of the Malësia e Madhe Municipality: presence of Lake Shkodra and the Albanian Alps, proximity to the cities of Shkodra and Podgorica, and three border points with Montenegro. - Existence of old villages and the preservation of unique characteristics of village formation, traces of old fortifications, and cultural heritage sites. 	<p>for agricultural products, as well as rural roads connecting production centers with urban centers and mountain tourism and agrotourism points.</p> <ul style="list-style-type: none"> - Still weak organization of the community of agricultural and especially livestock collectors in the municipality's territory. - Construction not based on plans, resulting in a questionable aesthetics of the area alongside legal informality. - Deteriorated village connections that hinder development and lead to isolation. - Unresolved property registration issues that impede development. - Lack of social and cultural activities, especially in rural areas. - Seasonal and short-term tourism. 	<ul style="list-style-type: none"> - Increasing demand in both domestic and foreign markets for products from the municipality's territory. - Sufficient and supportive human capacities for increasing local production.
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chain is necessary. These actors need to be analyzed to identify the best varieties that offer better quality, lower costs, higher prices, a better image of the final product, and sanitary conditions within the allowable processing standards.

The increasing demand for medicinal and aromatic plants poses a challenge for the industry producing these plants, which must manage the quantity required while maintaining quality. Cultivating and growing medicinal plants requires dedication for long-term success and assurance of their sustainability.

In Albania, medicinal plants are an important source of traditional medicine and have been used for centuries as remedies for various ailments. In recent years, there has been a growing interest in and use of medicinal plants worldwide, and Albania has the potential to produce high-quality medicinal plants for export to international markets.

However, the medicinal plant sector in Albania faces several challenges and difficulties. Some of these challenges include:

- The lack of investments and financial resources for the development of the sector;
- The absence of a clear strategy for the development of the medicinal plant sector;
- The lack of an appropriate system for licensing and registering medicinal plant products;
- The absence of modern processing and production technology and equipment for medicinal plants;
- The absence of a specialized center for processing and analyzing medicinal plants.

One of the main challenges for cultivators and processors of medicinal and aromatic plants has long been the need for larger storage facilities to protect the plants from contamination, which reduces their quality and value in the market.

More investments are needed and expected in this sector in the future, especially in equipment for drying, cleaning, distilling, and packaging medicinal plants. Additionally, interventions are required to improve technology and enhance market access, market identification, and negotiation strategies for market entry.

The Malësia e Madhe Region has a high potential for improving the performance of the medicinal plant sector, considering its climate and geographical characteristics. This area has a favorable climate for growing medicinal plants, with ample sunshine and regular rainfall. At the same time, the Malësia e Madhe Region boasts rich biodiversity, including a wide variety of endemic and rare plants that have been historically used for medicinal purposes. Moreover, this region has a rich tradition of using medicinal plants by the local population and a large number of traditional healers involved in processing and distributing plant-based products.

If this potential is effectively utilized, the medicinal plant sector in the Malësia e Madhe region can grow significantly. Some steps that can help improve the performance of this sector in the Malësia e Madhe region include:

- Identification of important medicinal plants that can be successfully cultivated in this region;
- Building the capacities of local producers to prepare them for the medicinal plant market at both local and international levels;
- Promotion of the medicinal plant sector at both local and international levels to increase demand for products from this sector.

Establishing processing and distribution networks for medicinal plant products to ensure a sustainable and secure market for local producers.

References:

1. “The Discipline of Innovation”. Harvard Business Review. August, 2002.
2. Dedeire, M., Minga, A., (2021). Booklet of Didactic Material. Module 2: Territory innovation and action. [Technical Report] Université Paul-Valéry – Montpellier 3 (UM3), FRA.; University of Korça Fan S Noli; CIHEAM Montpellier. 2021. Booklet of Didactic Material – Archive ouverte HAL
3. Sathish K. Kumar and Gopinath R. (2011). “Medicinal Plants: A Review.” Journal of Plant Pathology and Microbiology. – Vol. 2(5). – P. 1–6. URL: <https://doi.org/10.4172/2157-7471.1000113>
4. Jana, K., Minga, A., Muaremi, L. (2023). The Role of the Business in the Development of the Territory European Academic Research. – Vol. XI. – Issue 1. April 2023. Reliability and Safety Geotechnical of a Combined Pile Raft Foundation (euacademic.org)
5. Manish Gautam and Shweta Sharma. (2014). “Medicinal Plants: A Treasure Trove of Antiviral Agents.” Journal of Antivirals & Antiretrovirals. – Vol. 6(2). – P. 47–53. URL: <https://doi.org/10.4172/jaa.10000115>
6. Minga, A., et al. 2023. Local development through social and territorial innovation: A case study of Puka Region. European Academic Research. – Vol. X. – Issue 10. – January, 2023.
7. Sanaa Rostami et al. (2017) “Medicinal plants in the prevention and treatment of chronic diseases.” Journal of Traditional and Complementary Medicine. – Vol. 7(4). – P. 360–378. URL: <https://doi.org/10.1016/j.jtcme.2016.12.007>
8. Strategic Document ‘For an Integrated, Innovative and Sustainable Development of Region – 3. 2017–2020.
9. Walker, R., & Storper, M. (1989). The capitalist imperative: territory, technology and industrial growth (Vol. 2). – Oxford: Basil Blackwell.

Section 2. Architektur

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*Analytic and Graphic Dependencies
to Determine the Pressure Forces of the Wheels Vehicle*

ANALYTICAL AND GRAPHICAL DEPENDENCIES FOR DETERMINING THE PRESSURE FORCES OF THE WHEELS OF A VEHICLE

Abstract. The possibility of determining the forces of wheel pressure on the road using the technical characteristics of the vehicle from the manufacturer is considered. On the example of a vehicle including a KAMAZ 65221 tractor and a C93901 semi-trailer, analytical and graphical dependencies have been developed that allow, in the absence of weight control, to quickly determine the axle loads with sufficient accuracy, as well as the position of the center of gravity of the load on the semi-trailer during transportation on roads for various purposes.

Keywords: technical characteristics of the vehicle, load on the axles of the tractor and semi-trailer, graphic dependencies of loads

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АНАЛИТИЧЕСКИЕ И ГРАФИЧЕСКИЕ ЗАВИСИМОСТИ ДЛЯ ОПРЕДЕЛЕНИЯ СИЛ ДАВЛЕНИЯ КОЛЕС ТРАНСПОРТНОГО СРЕДСТВА

Аннотация. Рассмотрена возможность определения сил давления колес на дорогу с использованием технической характеристики транспортного средства от завода-изготовителя. На примере транспортного средства, включающего тягач КАМАЗ 65221 и полуприцеп С93901, разработаны аналитические и графические зависимости, позволяющие в условиях отсутствия весового контроля оперативно с достаточной точностью определять нагрузки на оси, а также положение центра тяжести груза на полуприцепе при транспортировке по дорогам разного назначения.

Ключевые слова: техническая характеристика транспортного средства, нагрузка на оси тягача и полуприцепа, графические зависимости нагрузок.

В работе [1] рассмотрена возможность определения нагрузок на оси колесного транспортного средства (ТС), состоящего из тягача и полуприцепа, с помощью уравнений равновесия. При этом для расчетов используются только технические характеристики, представленные заводом-изготовителем. Эти уравнения позволяют решать различные задачи, связанные с организацией загрузки ТС. Однако если требуется срочно определить положение груза на полуприцепе при известных допускаемых нагрузках на оси, времени на расчеты может и не быть. В этом случае могут оказаться полезными графические зависимости между искомыми и задава-

емыми величинами, с помощью которых можно приблизительно, но с достаточной степенью точности решать поставленные задачи: определять реакции полотна дороги на оси ТС (равные по величине нагрузкам на оси колес) и координаты центра тяжести груза на полуприцепе. Эти зависимости строятся на основе уравнений равновесия ТС, записанных для полуприцепа и тягача в соответствии с расчетными схемами, представленными на (рис. 1–3).

Технические характеристики полуприцепа:

- масса перевозимого груза, т 30,0
- снаряженная масса, т 7,7
- полная масса, т 37,7
- распределение нагрузки от полуприцепа с тягачом:
- на седельно-сцепное устройство, тс 14,6
- на дорогу, тс 23,1

Технические характеристики тягача:

- снаряженная масса, т 11,55
- распределение нагрузки от тягача снаряженной массы по осям:
- на переднюю, тс 5,7
- на заднюю (тележку), тс 5,85

Замечание: 1 тс = 10 кН.

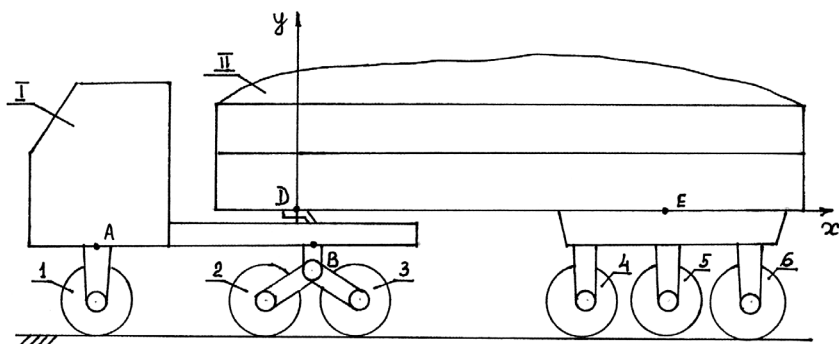


Рисунок 1. Схема транспортного средства:
I – тягач КАМАЗ 65221; II – полуприцеп С93901 с грузом

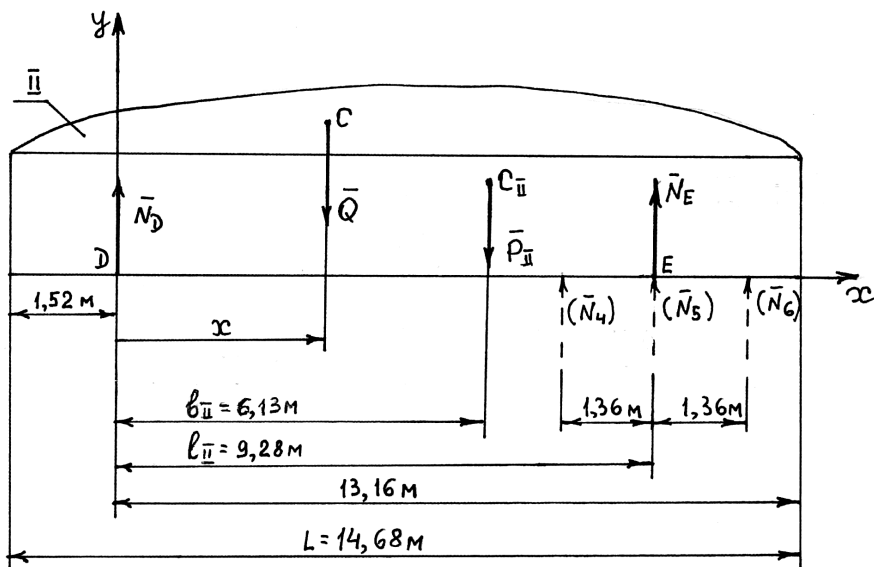


Рисунок 2. Расчетная схема для полуприцепа

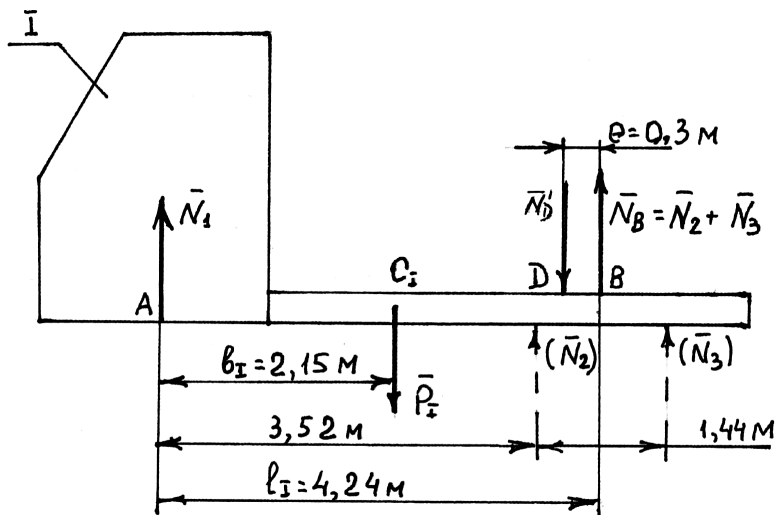


Рисунок 3. Расчетная схема для тягача

Принятые на рисунках и в расчетах обозначения и числовые значения:

I – тягач КАМАЗ 65221;

II – полуприцеп С93901 с грузом;

P_I, P_{II} – силы тяжести тел I и II ($P_I = 11,55$ тс, $P_{II} = 7,7$ тс);

C_I, C_{II} – центры тяжести тел I и II;

b_I, b_{II} – размеры, определяющие положение точек C_I, C_{II} ;

$b_I = 2,15$ м, $b_{II} = 6,13$ м (определение значений b_I и b_{II} см. ниже);

C – центр тяжести груза;

\vec{Q} – сила тяжести груза;

1, 2, 3, 4, 5, 6 – оси с колесами;

$\vec{N}_1, \vec{N}_2, \vec{N}_3, \vec{N}_4, \vec{N}_5, \vec{N}_6$ – реакции горизонтальной дороги, по модулю равные давлению на оси; принято $N_2 = N_3$, $N_B = N_2 + N_3$, $N_4 = N_5 = N_6$, $N_2 = N_3$, $N_E = N_4 + N_5 + N_6$;

\vec{N}_D – реакция седла тягача, приложенная к полуприцепу;

\vec{N}'_D – реакция полуприцепа, приложенная к тягачу ($N'_D = N_D$, $\vec{N}'_D = -\vec{N}_D$);

A, B, C, D – точки приложения сил;

Dx, y – оси координат;

x – координата центра тяжести груза;

$\sum F_{kx}, \sum F_{ky}$ – суммы проекций сил на оси x и y ;

$\sum M_A(\vec{F}_k), \sum M_D(\vec{F}_k)$ – суммы моментов сил относительно точек A и D ;

$l_I = 4,24$ м, $l_{II} = 9,28$ м, $L = 14,68$ м, $e = 0,3$ м – конструктивные размеры.

Замечание. Принято: сила тяжести тележки равна 0,7 тс, приложить ее можно в точке E . Сила тяжести кузова полуприцепа (без тележки) равна 7,0 тс и приложена посередине длины кузова. При этих допущениях для полуприцепа без груза из условия $\sum M_D(\vec{F}_k) = 0$ получим:

$$7,7 \cdot b_{II} = 7,0 \cdot 5,82 + 0,7 \cdot 9,28, \quad b_{II} = 6,13 \text{ м.}$$

Расчетная часть. Рассмотрим равновесие ТС с грузом.

Уравнения равновесия [2] для полуприцепа (рис. 2):

$$\sum F_{kx} = N_D + N_E - P_{II} - Q = 0; \quad (1)$$

$$\sum M_D(\vec{F}_k) = N_E l_{II} - P_{II} b_{II} - Qx = 0. \quad (2)$$

Уравнения равновесия [2] для тягача (рис. 3):

$$\sum F_{kx} = N_D + N_E - P_{II} - Q = 0; \quad (3)$$

$$\sum M_D(\vec{F}_k) = N_E l_{II} - P_{II} b_{II} - Qx = 0. \quad (4)$$

Рассмотрим на примерах основные задачи, которые могут встретиться при размещении груза на полуприцепе.

Пример 1. При загрузке ТС нужно выполнить условия: значение $N_E = \text{const}$ должно равняться допустимому в соответствии с категорией дороги, по которой будет следовать ТС. При этом максимальное значение $N_{E_{\max}} = 23,1$ тс (из технической характеристики на полуприцеп). Для примера выберем одно значение $N_E = 18,0$ тс. Числовые значения N_D при этом будут меняться, но не превышать $N_{D_{\max}} = 14,6$ тс (из технической характеристики на полуприцеп).

Из уравнений (1)–(4) запишем уравнения (5)–(10), с помощью которых составим таблицу 1, где $x = x_{\max}$ для каждого значения Q при $N_E = 18,0$ тс = const:

из уравнения (1)

$$N_D = Q + (P_{II} - N_E); \quad (5)$$

из уравнения (4)

$$N_B = \frac{1}{l_{II}} [P_I b_I + N_D (l_I - e)]; \quad (6)$$

из уравнения (2)

$$x_{\max} = \frac{N_E l_{II} - P_{II} b_{II}}{Q}; \quad (7)$$

из уравнения (3)

$$N_I = P_I + N_D - N_B. \quad (8)$$

При этом силы давления колес 2–6:

$$N_2 = N_3 = N_B / 2; \quad (9)$$

$$N_4 = N_5 = N_6 = N_E / 3. \quad (10)$$

С помощью таблицы 1 построим графические зависимости $x_{\max}(Q), N_1(Q), N_2(Q)$, представленные на (рис. 4).

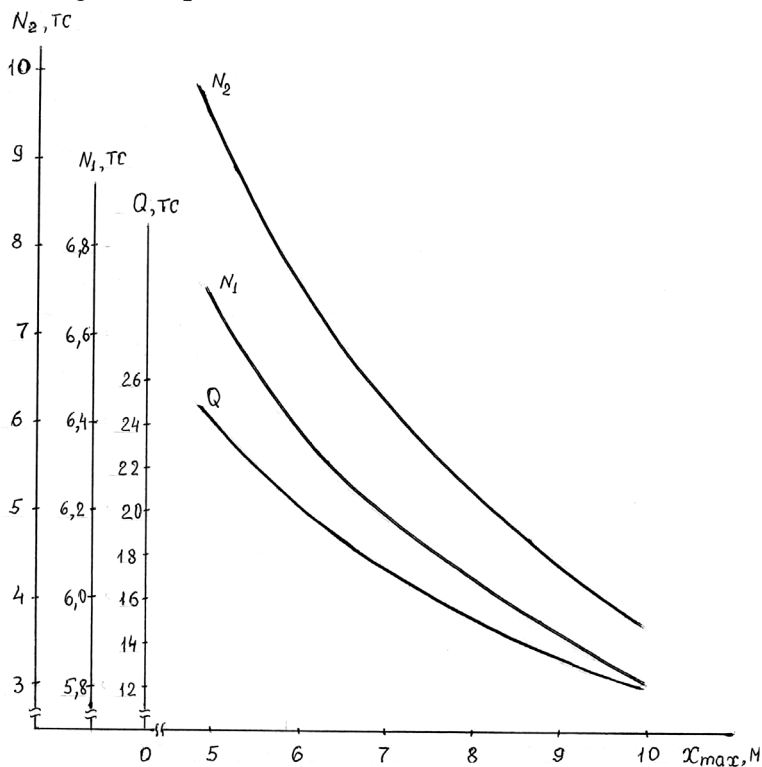


Рисунок 4. Зависимости $x_{\max}(Q), N_1(Q), N_2(Q)$ при $N_E = 18,0$ тс = const, $N_{D\max} = 14,6$ тс

Таблица 1. – Числовые значения параметров для (рис. 4 $N_E = 18,0$ тс = const)

Q , тс	N_D , тс	N_B , тс	x_{\max} , м	N_1 , тс	$N_2 = N_3$, тс	$N_4 = N_5 = N_6$, тс
1	2	3	4	5	6	7
11,0	0,7	6,5	10,9	5,7	3,3	6,0
12,0	1,7	7,4	10,0	5,8	3,7	6,0
14,0	3,7	9,3	8,6	6,0	4,7	6,0
16,0	5,7	11,2	7,5	6,1	5,6	6,0

1	2	3	4	5	6	7
18,0	7,7	13,0	6,7	6,2	6,5	6,0
20,0	9,7	14,9	6,0	6,4	7,4	6,0
22,0	11,7	16,7	5,5	6,5	8,4	6,0
24,0	13,7	18,6	5,0	6,7	9,3	6,0
24,9	14,6	19,4	4,8	6,7	9,8	6,0
25,0	14,7	19,5	4,8	6,7	9,8	6,0

Пример 2. Соблюдая условие $N_{D_{\max}} = 14,6 \text{ тс} = \text{const}$, можно определить минимальные значения координаты x_{\min} для данного веса груза Q . Необходимые для расчета формулы получим из уравнений (1)–(4):

из уравнения (1)

$$N_E = Q + P_{II} - N_D, \text{ или } Q = N_D - P_{II} + N_E; \quad (11)$$

из уравнения (2)

$$x_{\min} = \frac{N_E l_{II} - P_{II} b_{II}}{Q}; \quad (12)$$

из уравнения (4)

$$N_B = \frac{1}{l_{II}} [P_I b_I + N_D (l_I - e)] = 19,42 \text{ тс} = \text{const}; \quad (13)$$

из уравнения (3)

$$N_1 = P_I + N_D - N_B = 6,7 \text{ тс} = \text{const}. \quad (14)$$

При этом

$$N_2 = N_3 = N_B / 2 = 9,7 \text{ тс} = \text{const}; \quad (15)$$

$$N_4 = N_5 = N_6 = N_E / 3. \quad (16)$$

Формулы (11) и (12) позволяют подготовить (табл. 2), с помощью которой можно построить графические зависимости $N_4(x_{\min})$ и $x_{\min}(Q)$ при $N_{D_{\max}} = 14,6 \text{ тс} = \text{const}$.

С помощью этих графиков, соблюдая принятые условия перевозки, можно быстро приближенно определить максимальную координату центра тяжести груза x_{\max} на полуприцепе

и силы давления осей N_1 , N_2 и N_3 , а также зависимость координаты x_{\max} от веса груза Q . При этом $N_E = 18,0 \text{ тс} = \text{const}$
 $N_{D\max} = 14,6 \text{ тс}$; $N_4 = N_5 = N_6 = N_E/3$.

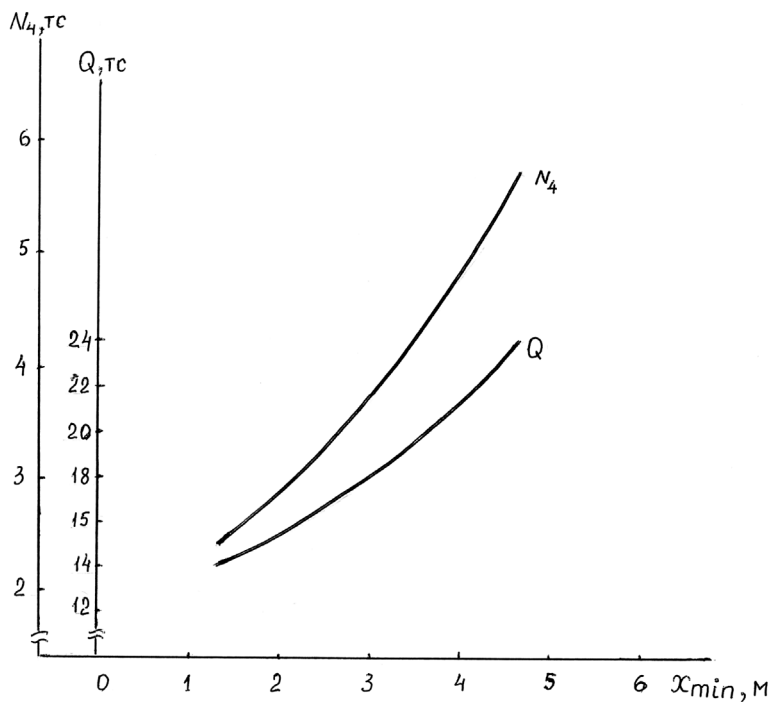


Рисунок 5. Зависимости $N_4(x_{\min})$ и $x_{\min}(Q)$
 при $N_{D\max} = 14,6 \text{ тс} = \text{const}$

Таблица 2. – Числовые значения параметров
 для рис. 5 ($N_D = 14,6 \text{ тс} = \text{const}$)

$Q, \text{ тс}$	$N_E, \text{ тс}$	$x_{\min}, \text{ м}$	$N_2 = N_3, \text{ тс}$	$N_4 = N_5 = N_6, \text{ тс}$
14,0	7,1	1,3	9,7	2,4
16,0	9,1	2,3	9,7	3,0
18,0	11,1	3,1	9,7	3,7
20,0	13,1	3,7	9,7	4,4
22,0	15,1	4,2	9,7	5,0
24,0	17,1	4,6	9,7	5,7
25,9	18,0	4,6	9,7	6,0

Вывод. Если, например, необходимо разместить на полуприцепе груз весом 21,0 тс, не превышая установленную заводом-изготовителем техническую характеристику для ТС ($N_{D_{\max}} = 14,6$ тс) и суммарную силу давления колес полуприцепа на дорогу (например, для $N_E = 18,0$ тс или $N_4 = N_5 = N_6 = 6,0$ тс), то с помощью примеров 1 и 2 получим приблизительные значения: из примера 1

$x_{\max} = 5,17$ м, $N_1 = 6,5$ тс, $N_2 = N_3 = 7,9$ тс, $N_4 = N_5 = N_6 = 6,0$ тс;
из примера 2

$x_{\min} = 3,9$ м, $N_1 = 6,7$ тс, $N_2 = N_3 = 9,7$ тс, $N_4 = N_5 = N_6 = 4,6$ тс.

Таким образом, при размещении на полуприцепе груза, для которого x изменяется в интервале $x_{\min} \dots x_{\max}$, максимальная сила давления от задних колес тягача будет составлять $N_2 = N_3 = 7,9 \dots 9,7$ тс.

Заключение. Определение сил давления колес ТС на дорогу и положения груза на полуприцепе можно проводить сравнительно быстро, если подготовить графический материал для этих целей. Приблизительные значения определяемых величин обеспечивают достаточную степень точности и позволяют соблюдать правила перевозки грузов, не допуская превышения установленных требований.

Графические зависимости, используемые для этих целей, могут быть построены исключительно на основе технической характеристики ТС завода-изготовителя и удобны в условиях отсутствия какого-либо весового контроля.

Возможность применения таких графических зависимостей показана на примере для одного ТС. Однако предлагаемая методика может быть использована и для других ТС.

Список литературы:

1. К расчету осевых нагрузок колесного транспортного средства // Аспирант и соискатель. 2020. – № 2 (116). – С. 34–37.
2. Никитин Н. Н. Курс теоретической механики: учебник для машиностроительных спец. вузов. 5-е изд., перераб. и доп. – Москва, Высшая школа, 1990. – 607 с.

Section 3. Geography

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PUBLIC PERCEPTION ON NATURAL AND CULTURAL HERITAGE IN DEVOLL MUNICIPALITY, CHALLENGES AND OPPORTUNITIES FOR TOURISM DEVELOPMENT

Abstract: Public perception studies have a great importance in local and regional studies. Devolli municipality lies in the south-eastern part of Albania on the border with the Republic of Greece. It has many natural and cultural assets that offer opportunities for the development of tourism; however this sector is almost undeveloped. The purpose of the work consists in promoting the natural and cultural heritage of Devoll Municipality, studying the public perception on the recognition of these values as well as providing opportunities for the creation of a strategy for their good management in function of sustainable development. The use of literature review, field work, statistical and analytical methods was necessary

for the realization of this study. Through using Google Forms, was created a questionnaire which was completed by the residents of the Devolli municipality. The results and conclusions will make possible a comparison of the real natural and cultural potentials and the level of informing the population about these potentials. This study will influence the undertaking of promotional and incentive policies for the development of tourism in the Devoll municipality.

Keywords: Devolli municipality, public perception, natural heritage, cultural heritage, development, tourism.

Introduction

Tourism today is one of the most massive and important sectors of the Global Economy [1; 2]. Natural and Cultural heritage have a great important role in the development of tourism in the World. The community's perception of tourism development, based on natural and cultural values, play an important role in undertaking long-term policies for tourism development [3; 4]. Devoll municipality is a part of the Korça region. It is located in the southeastern part of Albania and has an area of 453. 43 km² [5]. The municipality of Devoll in the Northeast, East, Southeast, and South has international borders with the Republic of Greece. It has an important geographical position; important trade routes have passed through its territory [6].

Devolli municipality is surrounded by five rural administrative units with 44 villages; only one urban center who is Bilisht city. The population of the municipality are 42388 inhabitants [7; 8]. It is located at an altitude of 900 m above sea level. The climate of the municipality of Devolli is sub-mountainous SE Mediterranean. The average annual temperature is 10.6 °C [9; 10]. Climatic conditions, water resources and fertile lands make Devolli populated since early times; the main evidence is the Train Cave, one of the Middle Neolithic settlements [11; 12; 13]. Devolli municipality has

a various number of objects of natural and cultural heritage. Some of the protected areas in this municipality are: The southern part of the National Prespa Park, Managed Nature Reserve Cangonji, Nikolica Protected Landscape [14; 15].

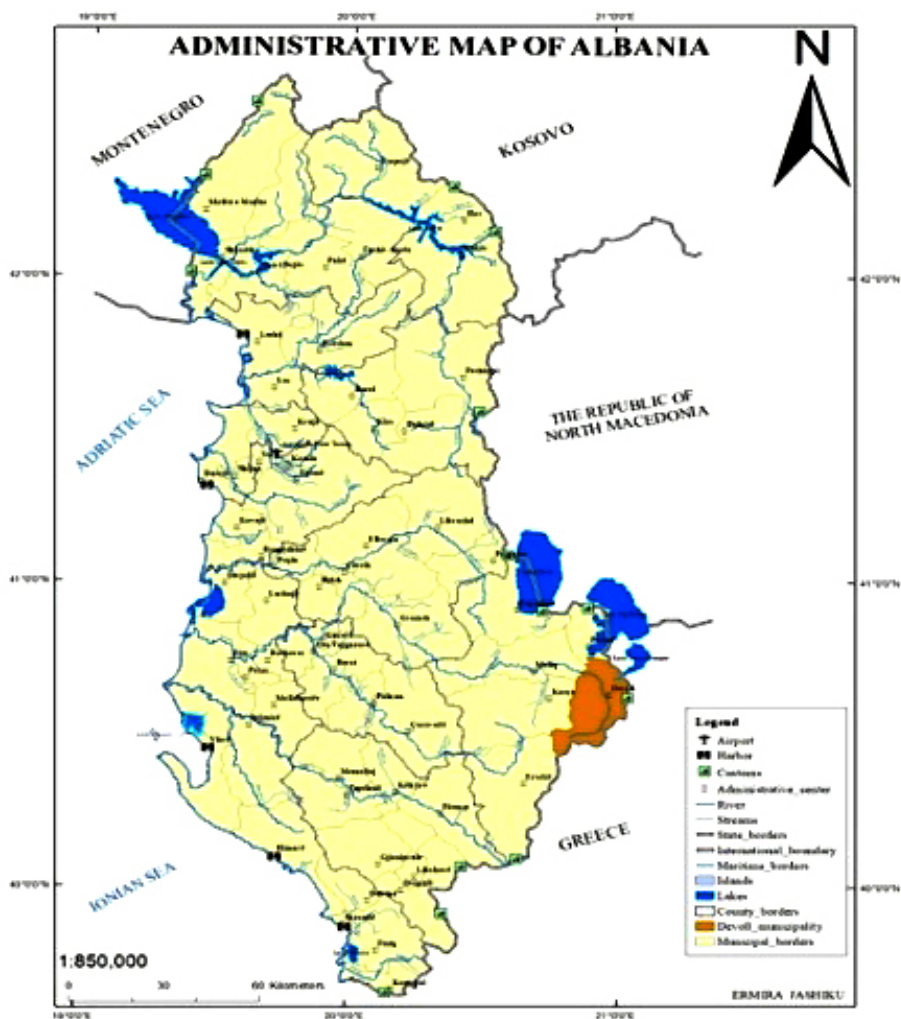


Figure 1. The geographical position of Devoli Municipality, in Albania country

Natural monuments such as: Train Cave, Stone of Mumje, Stone of Ariu, Spring of Progri, 5 bio monuments such as: *Ahishtja e Saint Konstandin*, *Forest of Saint Thanas*. *Ahishta e Bradvicës*, *Dushkaja e Dobërgorës*, *Poplars of Pilur* [5; 13; 14; 15]. In the territory of Devolli, there are also 13 archaeological and architectural monuments that belong to the first category of protected areas. They are: Gradishta e Shuecit, the Castel of Trajani (22 ha), Castel of Ventroku, Castel of Bilishti the prehistoric settlement of the Treni cave etc.[16].

Devolli has a number of religious, ethnographic, traditional kitchen and other cultural objects who offer many opportunities for the development of different types of tourism. Despite these conditions; the tourism sector is one of the most underdeveloped sectors in Devoll Municipality.



Figure 2. A. Small Prespa Lake; B. Prehistoric Picture of Spile C. Cave of Treni D. Rainfall of Sinica

Research method

The research is based on both quantitative and qualitative methodologies to investigate the community's perceptions through the literature review, fieldwork, and survey questionnaires. The major method used to collect data and information was the survey. Surveys are particularly useful to study the perceptions of communities in local development. To achieve the aim of the study a structured questionnaire with 35 questions was created in Google Forms and was completed by 144 residents of different administrative units of this municipality.

The questionnaire designed for the article was organized in four sections, where the *first section* were 7 questions about the general information of the population (age, gender, education, employment, emigration status), the *second section* were questions about information on natural and cultural heritage of Devolli municipality that they have or not (10 questions) the *third section* focused on problems who hinder the development of tourism in Devoll Municipality (11 questions) and the *four section* there are questions about the management of natural and cultural heritage. The collection and processing of data have revealed the lack of information on the protected areas of the municipality of Devoll as well as the lack of their utilization in the function of tourism development. Informing the population about natural and cultural values and their awareness of the importance of these values requires significant improvement in local government policies for a better development of the municipality in the future.

Results and discussions

The study was conducted during the period May-September 2023. According to the data collected by 144 residents of Devoll Municipality, 63% (90) of them were female and 37% (54) of them were male.

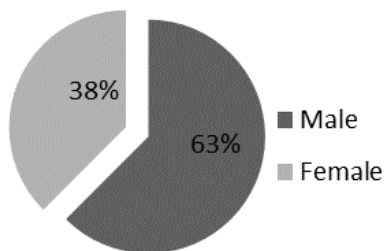


Figure 3. The gender of the respondents

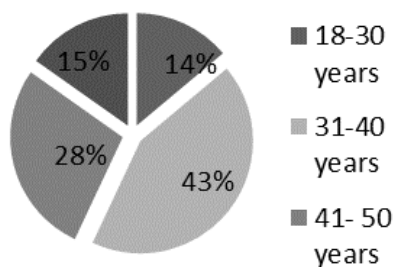


Figure 4. The age of the respondents

The age of the respondents is generally young, 14% (20) of the respondents are between 18–20 years old; 43% (62) of them are between 31–40 years old; 28% (40) are between 41–50 years old and only 15% (22) of them are over 50 years old. Regarding, their education the majority of the respondents 87% (126) have graduated from university, 10% (14) of them have a high school diploma and 3% (4) of them have a primary school.

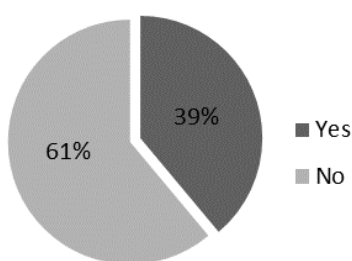


Figure 4. Have you been in emigration?

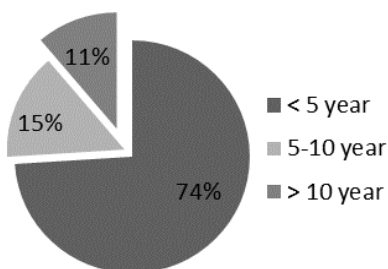


Figure 5 How long time?

According to the question “Have you been in emigration? The majority of them answered no, 61% (88) and 39% (56) of them answered yes. According to the question of the time of stay in emigration the majority 74% of the residents who were in emigration have stayed up 5 years; 15% of them have stayed in emigration between 5 to 10 years and only 11% of them were in emigration more than 10

years. Asked whether emigration has influenced the development of tourism in a different perspective, majority, 65% of the responds answered yes, they see tourism in a different perspective as a result of emigration; 26% of them answered “I don’t know” and 9% of them answered no. 132 out of 144 respondents answered the question of what you mean by natural values and majority of them answered that natural values are the environment that offers opportunities for the development of life, mentioning various natural objects such as mountains, plants, animals, water, air, etc. A small part of respondents included cultural values in natural values.

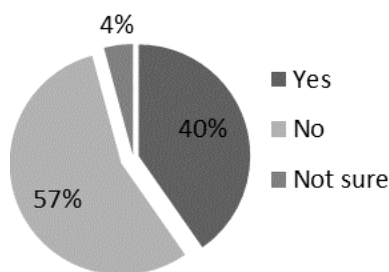


Figure 6.

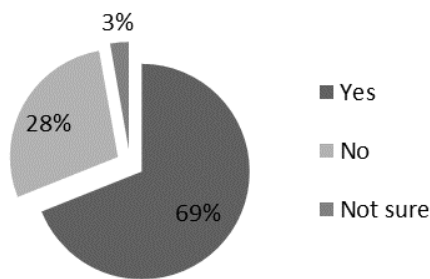


Figure 7.

The know about natural heritage The know about cultural heritage According to the question if they know about the natural heritage objects, most of responds 69% (100) answered yes; 28% (40) of them no and only 3% (4) of them answered not are sure. Asked if they know about the cultural objects in Devoll municipality which are protected by law, most of them 57% (82) answered no; 40% (57) of them answered yes and 4% (5) of them answered not sure. Meanwhile, the respondents who answered yes listed some protected natural objects such as: Prespa Park, Cangonji Reserve, Train Cave, Morava Mountains, while they have not mentioned at all. To the question of what do you mean by cultural values, the respondents listed answers such as: customs, traditions, art, characteristic songs, traditional dishes, music, language, cultural objects etc. Meanwhile, the respondents

who answered yes listed some protected cultural objects such as: Guri i Ariut, Kalaja e Trajanit, Shtepia Muze e Marigose, Shtepia e Dritero Agollit, Vallja Devollite etj. By comparing the graphs of recognition or not of natural and cultural objects it turns out that people have more information about natural objects than cultural ones.

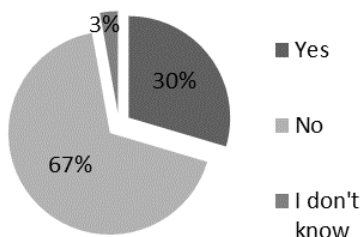


Figure 8. Have you been in any training?

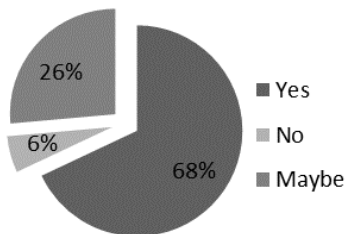


Figure 9. Do you want to participate in training?

According to the question if they are informed about the natural and cultural values of the area, the majority 67% (96) of them responded no; 30% (43) of them were answered yes and only 3% (4) of them answered no. Asked if they would like to be part of any program; training; the recognition of natural and cultural heritage activity with it, the majority of responds 68% (98) of them answering yes; 26% (20) answered maybe and 6% (8) of them answered no. These data show that the majority of the population has not participated in trainings or other events to inform about the values of the area, but the majority of residents also want to participate in various events on natural and cultural heritage information.

According to the question "How important are natural and cultural values in the development of tourism?" most of the surveyed people 79% of them answered that they are very important; 18% of them answered that they are important and only 3% of them answered that they are little important. This shows that people know that these values are of great importance for the development of tourism.

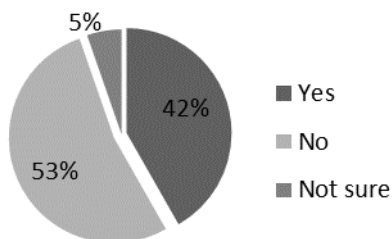


Figure 10. Do you know about historical monuments?

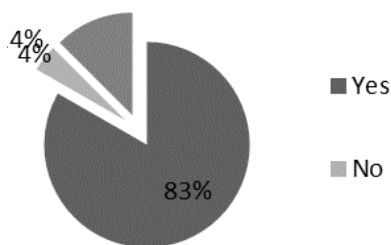


Figure 11. Has Devolli lack of information about natural and cultural heritage?

According to the question whether local residents know about historical monuments, majority 53% (77) of them answered no; 42% (60) of them answered yes and only 5% (7) of them answered not sure. The respondents, who answered that they know the historical objects of history by law, listed that historical monuments such as the house of Dritero Agolli, the Train Cave, the Poplars of Bilishti, the House of Marigo, the Castle of Trajan, etc. Nga pergjigjet e lartper-mendura duket se ka nje konfizion mbi njohjen e objekteve historike.

According to the questions about knowledge of historical values, the majority of respondents answered with definitions such as: historical past, archaeological monuments, castles, events, cults, war documents. Asked if in Devolli municipality has a lack of public information on the values of the area, most 83% (120) of them answered yes; 12.5% (18) answered they don't know and only 4.2% (6) of the respondents answered no. These data show the necessity of informing and promoting the population of the area about protected natural and cultural objects. According to the question which are the institutions that can provide information about natural and cultural heritage, most of them answered the Ministry of Tourism and Culture and after that local government, social media, cultural institutions, organizations and educational institutions.

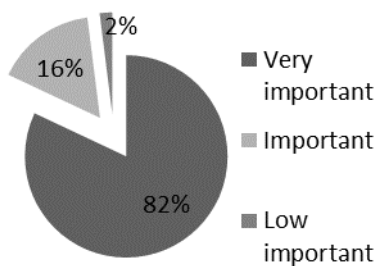


Figure 13. How important is to inform the population?

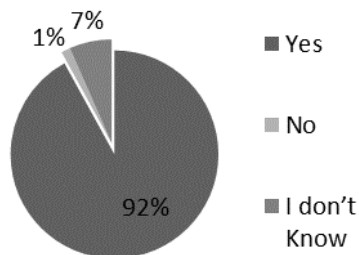


Figure 14. Does Devolli municipality have opportunities for tourism development?

Asked how important it is in your opinion to inform the population about the values of the area where they live? the majority; 82% (118) answered it is very important; 16% (24) answered that it is moderately important and only 1% (2) of them answered that informing the population is a little important. Asked if Devolli has opportunity for tourism development, the majority, 92% (132) of the respondents answered yes, Devolli has opportunity for tourism development, 7% (10) of them answered they do not know if Devolli has opportunity for the development of tourism and only 1.4% (2) of the respondents answered that Devolli has no opportunity for the development of tourism.

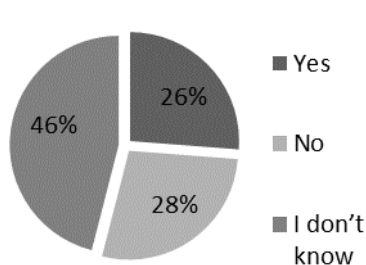


Figure 15. Initiatives taken for the development of tourism

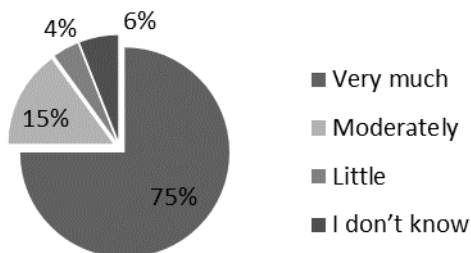


Figure 16. Has Devolli people lack of information?

According to the question if have been taken whether initiatives for the development of tourism in your municipality, most of the respondents 46% (68) answered that they do not know; 28% (42) of them answered no and 24% (34) of them answered yes. Asked if the people who live in Devoll had lack of information for natural and cultural values majority, 75% (101) of them answered that very much, the people in Devolli municipality had a lack of information for the natural and cultural values. 15% (23) of them answered moderately, 6% (8) of them answered “I don’t know” and 4% (5) of them answered no, the people who lives in Devoll have information about natural and cultural heritage.

According to the question “How much the lack of information about the values of the area affects in the development of tourism?” majority; 75% (110) of the respondents answered that the lack of information has affected the development of tourism. 15% (22) of them expressed themselves sufficiently, 5% (7) of them answered that they do not know and 4% (5) of them answered that the lack of information has little impact on the development of tourism.

In the question of who should take the initiative for the development of tourism, the respondents ranked the local government in the first place, the central government in the second place, the businesses in the third place and the population in the fourth place. A small part of the respondents also mentioned government organizations or educational institutions as initiators of tourism development.

Conclusions

According to the results of the questionnaires, most of the inhabitants do not have enough information for the natural and cultural heritage. They have general information on the natural and cultural objects of Devoll Municipality, but they do not know details about them. According to the answers, it seems that residents often confuse cultural heritage with natural heritage. The respondents listed some of

the villages that have more opportunities for tourism development, mentioning mountain villages as a result of the natural value and the architectural characteristics of the houses, such as Qyteza, Sinica, Grapshi, Nikolica, Bradvica; the settlements around of Small Prespa Lake such as Shyeci, Zagradeci, Rakicka, Treni, which have natural landscape, cultural and historical values and Menkulas. Hoçishti, Ziçishti for reasons of historical and cultural values. Devolli municipality offer many opportunities for the development of mountain tourism, cultural, historical, gastronomic, geo tourism, etc. Devolli also has opportunities for the development of agro tourism. Lack of infrastructure, lack of investment in the tourism sector and lack of attention from local and central government institutions are some of the problems listed by respondents as obstacles to the development of tourism in the municipality of Devolli.

The promotion of the natural, cultural and historical values of the area as well drafting policies for the use of natural and cultural potentials through sustainable development; Needed policies for the improvement of infrastructure and services; Drafting of policies for the promotion of the area's values and investments for the development of tourism; Investment absorption and projects for the development of agriculture are some of the solutions for tourism development and to increase the well-being of the population of this municipality.

References:

1. Dhimiter Doka, B. D. (2005). *Gjeografia e Turizmit*. – Tiranë.
2. UNWTO. (2019). *International Tourism Highlights*. – Madrid:
3. Hussain, Sh., Mabool, R., Hussain, A. & Ashfaq, S., (2022), *Assessing the social-economic impacts of rural infrastructure project on community development*, Buildings, 2022. – 12(7). – 947. URL: <https://doi.org/10.3390/buildings12070947>

4. Ming Su, M., Wall, G. *Community Participation in Tourism at a World Heritage Site; Mutianyu; Great Wall, Beijing China*, (2014), International Journal on Tourist Research.
5. Agjensia Kombëtare e Planifikimit të territorit/ Plane të Përgjithshme Vendore/ Bashkia Devoll. <https://planifikimi.gov.al/>
6. Jashiku E., Kreka A., (2020). *Rrugët tregëtare ndër shekuj dhe ndikimi i tyre në zhvillimin ekonomik të Rajonit Juglindor, Vjetari Shkencor 6, FEF, Korçë*, – P. 87–98.
7. Plani Operacional i Zhvillimit (2016). Bashkia Devoll.
8. Administrative data from the official sources of the Municipality
9. Qiriaz, P. (2006). *Gjeografia Fizike e Shqipërisë*. Tiranë: Botimet Ideart.
10. Qiriaz, P. (2019). *Gjeografia Fizike e Shqipërisë*, Tiranë: media-print.
11. Pano, N. (2015). *Pasuritë ujore të Shqipërisë*. Akademia e Shkencave të Shqipërisë, – Tiranë.
12. Aliu, S. (2011). *Vlerat arkeologjike të Shqipërisë Juglindore*,. Revista e Shkencave Sociale – Nr. 21. Korçë, – P. 141–164.
13. Aliu, S. (2017). *Natural and Archeological Values of Treni Cave*, Vjetari Shkencor FEF – Nr. 5/1. – P. 263–337.
14. Menkshi, E. (2020). *Trashëgimia natyrore dhe kulturore e qarkut të Korçës, Studim Monografik*, Korçë: Promo Print.
15. Qiriaz, P., Sala, S. (2006). *Monumentet e Natyrës të Shqipërisë*. Ministria e Mjedisit, Pyjeve dhe e Administrimit të Ujërave. Tiranë, Albania.
16. Qirjazi, P. (2017). *Trashëgimia natyrore e Shqipërisë, (Vlerat, rreziqet dhe menaxhimi)* Tiranë.

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