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MENAGEMENT OF ROAD INFRASTRUCTURE FOR SUSTAINABLE
DEVELOPMENT OF AGRICULTURE

Author's summery
dissertation for awarding the educational and scientific degree “doctor”at
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GENERAL DESCRIPTION OF THE DISSERTATION

Sustainable development is a new aspiration and necessity of man kind when its future and survival is in question. The uncontrolled exploitation of natural resources is no longer possible under the conditions of growth of the population and its needs. Necessary efforts towards further development no matter how innovative it will be primarily evaluated in relation to the ability to meet one criteria: sustainability. Recent literature indicates the significant role played by rural infrastructure in improving sustainable agricultural development. While the availability and quality of rural infrastructure are never substitutes to efficient macroeconomic and agriculture-specific policies and the effective implementation of such policies, inadequate infrastructure can be a significant constraint to growth and productivity. Rural infrastructure, like other public investments, raises agricultural productivity, which in turn induces growth in the rural areas, bringing about higher agricultural wages and improved opportunities for non-farm labor. The rise in agricultural productivity, which reduces food prices, benefits both urban and rural inhabitants who are net food buyers. Thus, a side from its growth benefits, agricultural productivity has significant poverty reduction effects. Rural roads provide the important connectivity with growing markets adjacent to rural areas; they also lessen input costs and transaction costs of rural producers and consumers.

Subject, goals and tasks of research

Starting from the place and importance of road infrastructure for sustainable agricultural development and the indisputable fact that it is very complex, rich, diverse and the long-term strategy, policy and model of social development in rural areas, the subject of scientific research of the doctoral dissertation is related to road infrastructure connectivity analysis on sustainable agricultural development, with reference to the countries of the Western Balkans.

Therefore, the primary goal of this research is to determine through a descriptive description, analysis of the state and quality of available potentials how agriculture should be developed, with reference to transport infrastructure as one of the most important economic activities in the region. aspects of sustainability in the region are met. The secondary goal is to identify the importance of certain agro-economic factors for the establishment of an adequate regional development policy, which combines the development of agriculture and other activities into one functional unit.

Within the subject of this research, the most important tasks are:

- ☐ defining the current state of agricultural development in the region of the Western Balkans;
- ☐ Identifying possible factors that determine the economic importance of agriculture in the Western Balkans;
- ☐ Determining the impact of certain agro-economic factors of sustainable development within the countries of the Western Balkans;
- ☐ Find and defining the strengths and weaknesses in the Western Balkans countries above in terms of sustainable agriculture and rural development;
- ☐ Proposing a development model that would significantly improve the potential of certain agro-economic factors of sustainable development in the Western Balkans.
 - ☐ The need, importance and development of the national transport policy.
 - ☐ EU policies in financing infrastructure projects in the region.
 - ☐ International factors and EU transport policy.

- Integration of the national regional network, as a basic condition for international integration.
- Valorization of infrastructure projects in the road network in the Western Balkans region.
- Pan-European Transport Corridors and the Regional Context (SEETO)
- The importance of EU investment and funding in road and transport infrastructure.

Hypothetical framework

In this part of the research of the doctoral dissertation, the main and special hypotheses will be elaborated, which will be covered in the further research.

The main hypothesis

The main or basic hypothesis is based on the statement that the development of the road network, through investments in the road network will increase the transport of agricultural products, which will have a positive impact on the overall economic situation in the Western Balkans.

Special hypotheses

- The connection of the road network of the countries of the Western Balkans with the other road networks of the region enables faster integration of the region in the EU, but also economic, social and political connection.

- The lack of cooperation between the countries of the region in the implementation of joint projects in the road infrastructure, negatively affects the further economic development, but also faster integration of the countries in the region in the EU.

- Investing in the development of a modern, up-to-date road network enables greater efficiency and effectiveness of transport, reduction of transport costs and positive impact on the environment.

Scientific methods

In the analysis, research and realization of this doctoral dissertation, the following scientific methods will be applied:

- data collection methods,
- analytical and comparative research method,
- inductive and deductive method of locking,
- classification method,
- method of abstraction, concretization and generalization,
- description method,
- methodology for modeling systems,
- system approach.

The structure of the dissertation

The elaboration of the doctoral dissertation is organized in the following chapters:

In the first part, **Characteristic of Traffic Infrastructure** through a review of the literature, ie a review of what is in the literature by various authors who are interested in this issue will be presented general information about the development of transport infrastructure, such as road and railway traffic. The main emphasis will be placed on the explanation of key terms that are directly related to traffic. This part will be an introduction to the further development of research.

The title of the second part is **Theoretical Assumptions of Sustainable Development**. In these part we is discussed the concept of sustainable development. The factors and principles characteristic of sustainable development are analyzed in detail. We will end this part by explaining the indicators of sustainable development.

In the third part, **Theoretical and methodological approach to agriculture**, the following topics are covered: a brief overview of economic thought for agriculture and agricultural policy, the role of agriculture in the economy, different approaches to defining agriculture, defining the function of the economy. of agriculture, the notion of sustainable agriculture, part dedicated to the strategies for development in agriculture and part dedicated to the challenges for the development of agriculture in the globalized economy.

In the fourth chapter of the dissertation **Strategy for Sustainable Agricultural Development Powered by Traffic Infrastructure**, strategies for sustainable development of agriculture, the role and importance of the rural economy are discussed in the global economy, with an emphasis on promoting sustainable agriculture and of rural development - SARD (Sustainable agriculture and rural development). The main goal SARD is to increase food production in a sustainable way and provide food security. In October 2007, FAO launched the SARD initiative in the mountains regions, the so-called SARD-M, which focuses on sustainable development of agriculture and rural areas in mountainous regions. According to FAO data, the world's mountain population it is at risk of poverty and hunger. Nearly 270 million people in the mountains regions lack food security, and as many as 135 million suffer from chronic hunger. With on the other hand, mountainous areas are rich in strategic resources, such as supplies a supply of fresh water sufficient for half of humanity, as well as rich biodiversity which will make it possible to provide food for the world's population

In the fifth part **The Importance of Roads for development and Trade in Agriculture** is an analytical overview of recent literature that provides evidence on the effect of investment in rural infrastructure on market access, trade and in particular agricultural trade, and on conditions and complementarities pertaining to the maximisation of the benefit to agricultural development and poverty reduction. It gathers evidence suggesting that investments in hard infrastructure (roads, communication and energy supply) are necessary, but not sufficient for successful market integration. In these part we will analysed the issue of the supply of hard infrastructure, in particular roads, and its importance for market integration, development, and trade in agriculture from both a macro and a micro perspective.

The last part of the disertation is **Agriculture and Traffic Infrastructure in the Countries in the Western Balkans**. At the beginning of this chapter we analyzed the agriculture in the countries of the Western Balkans. From the theoretical and practical aspect, this analysis is interested in researching the challenges and implications of the countries of the Western Balkans from the application of the European policy for rural development but also to the Common Agricultural Policy. Furthemore in this chapter we introduces research questions as a reflection of the state of the road network in the Western Balkans. In addition, special attention will be paid to national transport policies and the need for development, but also the importance of a clear national

transport policy. EU policies for financing infrastructure projects in the region are a prerequisite for the integration of the national regional network into the international road network. At the end of this chapter, the valorization of infrastructure projects in the road network in the Western Balkans region was made, with possibilities for joining the Pan - European Corridors in Transport and the Regional Context (SEETO).

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I. CHARACTERISTICS OF TRAFFIC INFRASTRUCTURE

The term traffic can not be defined by simply emphasizing the technical features of the transport process or by simply emphasizing the economic characteristics and the role it plays in the entire economic development of the economy. When defining the term traffic, we must pay attention to three main, but still different meanings, namely:

- In a broader sense it is related to the relationship between people, in a narrower sense it refers to the different forms of interrelationships of economic nature - commodity traffic, foreign exchange traffic and interstate tourism,
- In the narrowest sense it covers transport or transport and
- Other ancillary operations related to the transport of goods, passengers and communications (Панов et al., 2014)

The traffic infrastructure today is the core of the economic infrastructure and consists of roads, various facilities and devices that are placed in certain places and serve for various traffic services. Traffic infrastructure (roads) consists of a structure of traffic systems and its subsystems. The main purpose of traffic is to enable transfer of:

- passengers,
- goods from one place to another desired place and
- exchange of information.

The term transport comes from the Latin word "trans" which means through and the word "portare" which means carry. The term transport has a greater meaning than the term transport. It includes:

- preparation of goods for transport,
- packaging,
- consolidation of goods,
- preparation and issuance of transport documentation,
- ordering vehicles,
- loading,
- transport of goods,
- delivery to the recipient, etc. (Стојиќ, 2010)

The main purpose of traffic is to carry out transportation. Traffic and transport are divided into several basic ones, as follows:

1. Land:
 - road and
 - railway traffic.
2. Water:
 - river,
 - lake and
 - sea traffic (including overseas traffic).
3. Air traffic, etc.

Today, traffic is one of the most important components of the economy and aims to transfer material goods and information, but above all to transfer people from one to another desired destination. Precisely, because of this function of transmission, traffic is a necessary condition for the development and increase of trade, economic development of a country, but above all it is a prerequisite for the modernization of society, ie a country. The development of traffic affects the satisfaction of the internal needs of a country. Without modern traffic we would not have the

development of the economy, ie traffic affects the increase and connection of production and consumption, and thus allows each product to find its consumer.

In each country, traffic has two goals or roles, namely:

- Social - traffic is an important factor in connecting different geographical regions, transporting people from one region to another, as well as connecting different peoples from different regions and countries.

- Economic role - traffic enables the exchange of various goods and services, information, but above all provides consumers with greater opportunities for products and services. Traffic, especially the transport of products of material goods, has a positive impact on the development of economic and social life of the citizens of each country.

Theoretically, improvement in traffic t may enhance economic growth (Deng, 2013). Traffic provision or investment and economic growth can be linked directly or indirectly. The direct effects stem from the saving in transport cost, saving in travel time, improved safety and reduced environmental effects (NZ Transport Agency, 2016). The supply of transport services at low cost is conjectured to have a positive impact on economic growth by stimulating the production of goods and services that use public investment as a significant input factor (Button, 2010). The indirect effects of traffic investment stem as a result of the response of the society to the direct effects (New Zealand Government, 2014); these include increased productivity and output, improved competition between spatial markets through improved accessibility, economy of scale through agglomeration of some economic activities and resources and transfer of technology and knowledge through connecting people and places and allowing for more interaction between economic actors (Lakshmanan, 2007; Deng, 2013; NZ Transport Agency, 2016). The reduced transport costs and prices and improved accessibility directly lower the cost of input factors (Deng, 2013) and permits access to wider markets and subsequently facilitate trade (Berg *et al.*, 2017). There are also multiplier effects emanating from the money spent during the construction and operation of the infrastructure facility from the required construction materials and services (Button, 2010; Pradhan and Bagchi, 2013). However, in developing countries, where the expertise such as engineers and planners and even construction equipment are imported from the developed world and are tied to development aid, this multiplier effect is less substantial in its contribution to the economic growth of the country (Button, 2010).

The impact of traffic can be assessed from a microeconomic and a macroeconomic perspective. On a microeconomic level, the assessment of traffic is linked to producers, consumers and production cost. Macroeconomic-level assessment is linked to the output levels, employment and income within a national economy (Rodrigue and Notteboom, 2013). In both cases the impact is assessed based on the following aspects (Rodrigue and Notteboom, 2013):

- i. network: setting routes that enable new or existing interactions between economic entities;

- ii. performance: an improvement in the cost and time attributes for passenger and freight movement;

- iii. reliability: an improvement in time performance, notably in terms of punctuality, as well as in reduced loss or damage;

- iv. market size: access to a wider market base, where economies of scale in production, distribution and consumption can be improved; and

- v. productivity: an increase in productivity due to access to a larger and more diverse base of inputs (raw materials, parts, energy and labour) and broader markets for outputs (both intermediate and finished goods).

In modern society, road infrastructure has become an essential part of daily life. Individual road users, logistic firms, and public transportation agencies expect reliable and safe road infrastructure for traveling from one location to another and transporting goods and people. Road agencies need to properly plan, build, maintain, and operate road infrastructure for it to create value for road users. In recent decades road agencies have started to use performance measures to evaluate the effectiveness and efficiency of their service provision. Besides legal obligations and resource constraints, the increased attention towards the needs of road users has been a main motivation for implementing performance measures (Burde, 2008). Road user satisfaction surveys at the national and regional network levels have become a common tool for identifying deficiencies in road services, defining performance targets and measuring their achievements. Typically, these surveys often asked about the satisfaction with particular outcomes of road agency activities such as quality of road surface or lighting on roads (e.g. Hyman and Heffner, 2003; Huijgen et al., 2006; McKenzie, 2004). However, they pay less attention to how road users experience the services of road agencies and how these experiences influence the value creation of road infrastructure. Knowledge about the experiences of road users with the activities of road agencies and the perceived contribution of these activities to the value creation of road infrastructure are important for two reasons. First, the perspective of road agencies can differ from the perspective of road users in terms of the importance of activity outcomes for the value-creation process of the user (Levinson, 2003; Sinha et al., 2009). As shown by the study of Bonsall et al. (2005), the view of transport professionals on the seriousness of specified road problems for users can deviate from the road users' experiences of these problems. Second, many road agencies mainly rely on physical road conditions as the basis for decisions, which do not necessarily reflect the performance understanding of road users (Osman, 2012). Despite the need for incorporating the performance view of road users in decisions, there are only few attempts linking condition parameters and user perception of road quality (e.g. Giese et al., 2001; Haas and Hudson, 1996), and only quite recently, research has suggested that the experiences of road characteristics and traffic conditions have an influence on the utility of traveling (Ettema et al., 2013). In order to support user-oriented policy decisions on which activities should be constantly upheld or improved and which performance targets should be set, road agencies should not only develop a more thorough understanding of the experiences of road users with agency activities, but should also consider the influence of these experiences on the value that road infrastructure creates for its users.

The road infrastructure comprises all types of roads in a given area, including various structures and serves to transport passengers and goods. The road infrastructure includes all road categories, facilities, structures, signage and markings, electrical systems, and so on needed to provide for safe, trouble-free and efficient traffic. Extensive network of roads of high quality is essential for trouble-free road transport, which is the most widely-used mode of transport in Slovakia. The advantages of road transport include transporting passengers and carrying goods regardless of distance directly to a destination, the relatively high speed and no time restrictions. Road transport and its infrastructure enable to carry people as well as materials, raw materials, semi-finished and finished products intended for sale. Road infrastructure affects the flexibility and mobility of the workforce, which is reflected in the employment level. Moreover, higher employment level makes the standard of living grow. The degree to which the road infrastructure is developed has an impact on several areas, such as for instance the development of tourism, influx of foreign investments, regional development, etc. Eventually, all the indicators – employment, wages, consumption, savings, investment, benefits of tourism – will have an impact on the volume of gross domestic product, the key macroeconomic indicator, which measures the

economic output of the state. In addition, transport is significant in international context in terms of foreign trade and cooperation in different areas.

With the development of the economy, the mass movement of people and goods, but above all with the progress in the automotive industry, the dynamic development of the road infrastructure began. The great progress in the automotive industry, ie the mass production of cars changed the course and the dynamics of the development of the road infrastructure. The roads at that time were not able to meet the needs of the new situation, the availability of cars for the larger mass of people who were interested in owning one, imposed the need for a new approach to the development of road infrastructure. As the automotive industry progressed, so did the need for a new road network according to the needs of the times. But that was not all, with the dynamic development of the automotive industry, many other challenges opened up that needed to be addressed as soon as possible. Apart from the roads, the need to regulate the road traffic slowly appeared, new hitherto unknown rules and laws for traffic, road signs, persons who will regulate the traffic, etc. had to be adopted.

The modern understanding of the term management, ie management of road networks within the Road Management System (SUP), refers not only to their planning and construction, but also to their maintenance, rehabilitation and reconstruction of already built roads (financially). funds of the second generation) from the first day after the commissioning of the road. Road maintenance means striving to maintain the road for as long as possible in the condition it is in when it is put into operation, without special qualitative changes, which will ensure safety and continuity of traffic flows, as well as reaching the defined level of service. on the way to users. New buildings or reconstructed roads should be properly exploited and maintained. Over time, under the influence of several factors (traffic load, natural impacts, etc.), there are degrading changes in the road network, which further requires taking appropriate measures and returning the roads to their original condition. The complexity of maintenance is observed in the complex process of work, usually without traffic interruption (so-called "work under traffic"), at all times of the year. Road maintenance has its specifics both technically and economically, which affects the organization and technology of works. The ways and methods of road maintenance are usually in function of the adopted policy in the field of maintenance, which is always a reflection of the financial possibilities.

Road maintenance Roads are buildings that aim to enable the transport of people and goods from point A to point B. But they also have a greater social significance, so we can summarize that road infrastructure is the best indicator of the level of development of a society. Roads connect and unite. They connect places, cities, states, continents, civilizations, cultures, ideas, peoples, families, friends, personalities. Road maintenance is a complex engineering-economic task, which presupposes a complex of measures taken in order to enable normal operation, safety of road transport and preservation of the value of the road network and equipment. After the construction of the road and its commissioning, two main factors have a degrading effect on it in synergy, namely the traffic load and the natural impacts. The ways and methods of road maintenance are usually in function of the adopted policy in the field of maintenance, which is always a reflection of the financial possibilities. Road maintenance has its specifics both technically and economically, which affects the organization and technology of works. In order to preserve the roads as well as their use value for safe, comfortable and uninterrupted traffic, it is necessary for the roads to be maintained continuously and with quality. The measures taken for maintenance depend on the rank of the road, ie the function of the road in the network of state roads, the volume

of traffic (PGDS - average annual daily traffic) and the economic or tourist importance average annual daily traffic) and of economic or tourist importance.

The main precondition for economic development, the living standard of the citizens or for the overall development of the society, the countries and the wider region is the development of the transport infrastructure. Appropriate economic policies imply the creation and development of transport policy, especially this has to do with the rounded economic sizes such as the state economy, the economy in the region, etc. In the development of regional economies and transport, development is conditioned by the harmonization of individual and common interests of the countries in the region, because these projects, in addition to economic significance, have political significance and significance for the inhabitants.

The strategy for development of transport and its infrastructure is related to the globalization of the economy in the region. Transport must ensure the rapid movement of people and goods, which will increase regional cooperation and resource utilization, reduce production costs and overall costs. Everyone in the region has an advantage in this way of development, because they are elements that directly affect the development of the transport infrastructure. The level of development of transport infrastructure varies from country to country and region to region, and the need to invest is different.

Comparability of the level of infrastructure development within an economic system or region often has disturbing results due to direct impacts, namely system interdependence. For example, if we compare the Balkan railway and road infrastructure with the European Union system, there is a big change, which conditions the economic changes and so on, as well as prevents the establishment of better relations and the development of comparable regions. The dependence of the economic and social development of the transport infrastructure is obvious, it is best seen in the statistical data on the level of development and investments in the transport infrastructure in the economically developed communities.

If we look at the level of development of transport infrastructure in the economically strong communities that are also the main leaders of the world economic power, we can clearly see the importance of this segment for the overall economic development of these economic communities. The issue of long-term investment policy in this area of strong economic communities is particularly important. The most developed economic communities, which are real leaders in global economic relations and international markets are Japan, the USA and the EU, and have an extremely developed transport infrastructure. The increase in investment in this area in these communities is understandable and obvious.

Overall development plans support the development of transport, as the direct and indirect effects of these investments are clear and financially measurable. Market competition is increasingly demanding a reduction in internal costs, especially transport costs, as they thus provide benefits in market competition and greater profits. The advantages achieved by competition and development do not lurk, and thus investment and their increase in transport infrastructure in developed countries is constant.

Road infrastructure in Japan and the United States is known to be highly developed as a result of its long-term investment policy. The past decade has seen significant progress in regional infrastructure projects and in the Asian continent, such as the ASEAN highway, power and gas connectivity, and the ASEAN Broadband Corridor. The China Road and Belt Initiative enhances regional integration by better connecting China's immediate neighbors, covering more than 100

countries. In Japan, infrastructure projects such as the new high-speed rail line, which will connect Tokyo, Osaka and Nagoya in a single mega-urban region¹.

Europe, need strong transport links to boost trade, economic growth and job creation. places and prosperity. Transport networks depend on continuous and productive functioning and the supply chain, which is the basis of each country's economy. They allow goods to be distributed efficiently, people to move freely and to contribute to a high quality of life. Transport is a cornerstone of European integration and the process as a whole is strongly linked to creating the development of internal trade, which promotes jobs and economic growth.

One of the first common policies in the field of transport of the European Union is the establishment of the Treaty of Rome in 1957², fulfilling three of the four freedoms in a common market. This initiative officially enabled the establishment of the Treaty on European Economic Community (TEEC), as an international agreement that led to the establishment of the European Economic Community (EEC).

The free movement of people, services and goods, communications and transport network did not initially come close to the level needed by the citizens of that time (early years towards the end of World War II) and that is why transport policy has always been aimed at overcoming barriers between member states and there has always been the idea of creating a single European transport area with healthy competition and favorable conditions for the use of transport forms such as land, rail, air and water. Over the past 60 years, EU transport has made significant progress and continues to be a major driver and contributor to prosperity and employment in Europe.

The industry now employs around 10 million people, accounting for 4.5% of total EU employment and creating the same percentage of gross domestic product (GDP). Also available are light transport links which are equally important to the EU economy in terms of its export-water transport (ships), transporting 90% of the EU foreign trade. Many European companies are world leaders in infrastructure, logistics and transport equipment.

EU households now spend 13.5% of their income on the purchase of transport-related goods and services (season tickets, vacations, business flights, etc.), ranking transport costs second only to household costs. .

Over the past decades, developments in Europe and transport policy have helped to further strengthen the EU's internal market, opening up national markets previously dominated by public monopolies such as aviation and railways. In addition, access barriers, unnecessary differences in technical and administrative standards and distortions of competition in EU countries, prices, taxes and other charges are gradually being eliminated and become part of the process of creating a true European transport zone in all forms of travel. . This has been achieved mainly in areas such as aviation, where a market liberalization policy has been launched.

There was a period of great growth in the 1990s, but trade liberalization is not enough to achieve the European Union's goals of improving and enhancing travel opportunities across Europe and providing high quality transport services for both citizens and for business.

EU enlargement, modernization and restructuring cannot be imagined without continuous investment and maintenance of infrastructure which is also essential for creating flow - fluidity of all forms of travel. This is why the Trans-European Network policy was incorporated into the EU Maastricht Treaty³³ in 1992. In addition, the Treaty addresses the environment and transport protection requirements as a tool to assist in completing the internal market. EU transport policy

¹ <http://www.oecd.org/development/asia-forum/1st-international-economic-forum-on-asia-enhancing-regional-integration-and-development-through-quality-infrastructure-and-resilience.htm>

² <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3Axy0023>

also includes assistance and protection for people traveling. Here, one of its achievements was to ensure and support the rights of passengers.

II. THEORETICAL ASSUMPTIONS OF SUSTAINABLE DEVELOPMENT

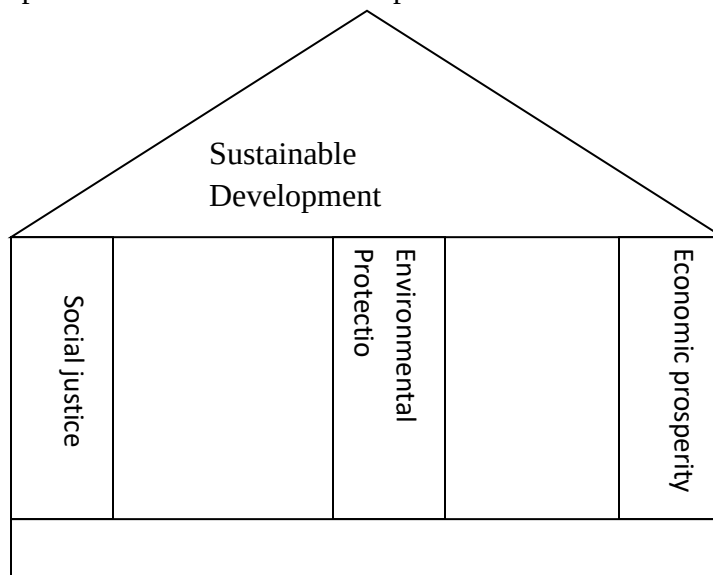
The issue of sustainable development has been topical since the moment when human civilization began to use natural resources more widely. Namely, this primarily refers to the moment when there is a greater exploitation of ores, the use of surface soil resources (especially forests) with constant population growth. Accordingly, it can be observed that the deep roots of non (sustainable) behavior are still present in Mesopotamia (from the 4th century BC to the 6th century BC). During that period, there were serious problems with the irrigation system, which increased soil salinity and reduced yields. Ancient thinkers Plato and Aristotle in their deliberations sought a connection between man's place in nature, as well as his role in the degradation of natural systems. In the Roman period, Strabo and Pliny the Elder contributed through debates on: the impact of improper use of raw materials and deforestation on erosion processes; as well as flooding, wetland formation and reduced soil fertility. Pliny the Elder also pointed out the destructive aspects of human activity in mining and the living environment. In the Middle Ages, the issue of sustainable use of natural resources was mainly related to mining, so the German mining engineer Georg Agricola pointed out the moral and environmental consequences of ore use (Jovanović, 2013)

Within the concept of sustainable development, there are three different sub-concepts, namely: the concept of non-declining wealth; the concept of non-declining natural wealth, and the concept of elasticity (Pearce et al.,1990). The first concept is based on the rule that the total value of capital (created and natural) should have constant values. In order to achieve this, it is necessary to compensate the exhausted resources with investments, so that each future generation would leave the same amount of capital that it inherited. However, in practice the replacement of one type of capital with another has a certain limitation, because there is not always the possibility of replacing one raw material with another. The second concept is based on a constant physical amount of natural capital, but is best suited for renewable natural resources. If this concept is put in interaction with the current rate of population growth, in fact, a situation arises where the available quantities of natural capital per capita are realistically declining. The third concept is based on maintaining the diversity and abundance of ecosystems, and implies the interaction between the economy and the natural environment, without endangering ecosystems. Namely, natural resources according to this concept change to the extent that vital functions are maintained due to disturbances caused by economic factors.

Sustainable development has numerous definitions, depending on which aspect they are defined (environmental, economic and social), and almost all definitions require that this development be viewed as an integral system, ie. a system that connects space (eg diffusion of pollution) and a system that connects time (eg pollution of the environment or the transition to ecological agricultural practice is a long-term process).

As highlighted in Agenda 21, the concept of sustainable development is multidimensional and consists of three factors: environmental protection, social and economic equality. These factors are also called the "three pillars" of sustainable development (Figure 1).

Figure 1. "Three pillars" of sustainable development³



Therefore, this concept is aimed at improving the living standards of individuals, with short-term, medium-term and long-term preservation of the environment. Its goal is threefold: development based on economic efficiency, social justice and sustainable environmental protection. Considering sustainable development based on the division of its components, it is concluded that the concept of sustainability does not exclude further development, but further ways of development are sought.

In the literature, it can be found that within such defined factors of sustainable development there are mutual relations (Figure 2). However, such a graphical representation of sustainable development is criticized for emphasizing the stable state of sustainable development, where the time component is excluded.

Environmental protection includes: use of natural resources, biodiversity, ecosystem integrity, prevention of pollution (water, air, land, waste), etc. The social sphere consists of: justice, participation, social empowerment and mobility, and preservation of cultural identity. The economic sphere consists of: industrial growth, agricultural growth, services, efficient use of labor⁴.

In addition to this, it is important to mention the four-part division of the components of sustainable development into⁵:

- ☐ economy;
- ☐ social development;
- ☐ cultural development

³ <http://www.eoearth.org/view/article/171407/>,

⁴ What is Sustainable Development, The World Bank group: <http://www.worldbank.org/depweb/english/sd.html>,

⁵ The Sustainable Leader, Sustainable Development, dostupno na <http://thesustainableleader.org/sustainable-development/>;

☐ environment.

The principles of sustainable development are also present in the Earth Charter. Namely, it is a declaration on the basic moral principles of human progress in the 21st century⁶. This declaration has been adopted by over 4,500 international organizations (including UNESCO), and over 250 universities. This charter was adopted in March 2000 by UNESCO. The declaration points out that the dominant ways of production and consumption have influenced the pollution of the environment, the consumption of resources, but also the mass extinction of species. In addition, the gap between the world's rich and poor is widening. In general, as a summary of such movements, the human population has burdened social and ecological systems. In this context, the declaration emphasizes that the only choice is to form a global partnership, through the creation of universal responsibility as a common standard for the behavior of all individuals, organizations, companies, governments and transnational institutions on Earth.

Within this declaration, there are 16 principles that are divided into four groups, and they are:

- ☐ Respect and care for life;
- ☐ Ecological integrity;
- ☐ Social and economic justice,
- ☐ Democracy, non-violence and peace.

Within the first group there are four principles, namely:

- ☐ Respect for the planet Earth, life on it and the diversity of its manifestation;
- ☐ Caring for life, as well as building democratic societies that are participatory, sustainable and peaceful;
- ☐ Preserving the wealth and beauty of the Earth for present and future generations.

The second classifies four principles:

- ☐ Protection and preservation of the integrity of ecosystems on Earth with special emphasis on biodiversity and natural processes that support life;
- ☐ Prevention of harm, as the best method for environmental protection, while respecting the precautionary principle in situations where the level of knowledge is limited;
- ☐ Adopting a model of production, consumption and reproduction in a way that preserves the Earth's regenerative capabilities, human rights and social well-being;
- ☐ Progress in the field of environmental sustainability studies and promotion of open exchange and wide application of acquired knowledge.

Within the third group there are four principles:

- ☐ Poverty eradication, as a social and environmental imperative;
- ☐ Ensuring economic activities and institutions at all levels that promote human development in an equal and sustainable way;
- ☐ Affirmation of gender equality, as one of the preconditions for sustainable development, and ensuring universal access to education, health care and economic opportunities;
- ☐ Respect for the rights of all, without discrimination, in a natural and social environment that enables human dignity, physical health, spiritual well-being, with special emphasis on respect for the rights of indigenous groups and minorities.

⁶ http://www.earthcharterinaction.org/invent/images/uploads/echarter_english.pdf

The last group has four principles, and they are:

- Strengthening democratic institutions at all levels, ensuring transparency and accountability of governments, including participation in government and access to human rights institutions;
- Inclusion of lifelong learning in formal education, in order to acquire knowledge and skills necessary for a sustainable lifestyle;
- Treat all living beings with respect and appreciation;
- Promoting a culture of tolerance, non-violence and peace.

In assessing the state of sustainable development, indicators, depending on the observed factors (economic, social and environmental) have a warning function, and serve for preventive action. In general, indicators are statistical variables that help to transform data into relevant (significant) information. Indicators have appropriate meaning within a defined conceptual framework and for a specific analytical or administrative purpose.

Namely, the indicators indicate areas of sustainable development where the links between the economy, society and the environment are weak. Thus, e.g. The OECD defines sustainable development indicators as a statistical measure that provides indications (indications) of environmental sustainability, social and economic development. The 1992 United Nations Conference on Environment and Development highlighted the important role that sustainable development indicators would play. At the international level, during 1995 the UN Sustainable Development Commission (hereinafter CSD) adopted its program of work on sustainable development indicators. The first two sets of sustainable development indicators were developed between 1994 and 2001. They have been thoroughly tested, applied and used in many countries as a basis for developing national indicators of sustainable development. The revised edition of the Sustainable Development Indicators was created in response to the introduction of the Millennium Development Goals⁷. The latest version of the Sustainable Development Indicators contains a basic set of 50 indicators. These basic indicators are part of a larger group of 96 sustainable development indicators, and this broader group of indicators serves to provide a more comprehensive and differentiated assessment of sustainable development depending on the needs of individual countries.

The basic indicators should meet three criteria. First, they cover issues that are important for sustainable development in most countries. Second, they provide key information that is not available with other key indicators. Third, they can be calculated in most countries with the data available, or they can be made available at a reasonable time and at minimal cost. In contrast, indicators that are not part of the core or are relevant only to a small number of countries, provide additional information in key indicators or are not readily available for most countries. These indicators are segmented, and include 14 topics: poverty; management; health, education, demography; natural hazards; atmosphere, land; oceans, seas and coasts; water; biodiversity; economic development; global economic partnership, and consumption and production patterns.

⁷ The Millennium Development Goals are a platform for a UN development program in which the international community seeks to work together to promote human development in all parts of the world and for all groups of people. This platform was adopted by world leaders in 2000, and the time limit for their realization is 2015. The goals are both global and local, and are tailored to the specific needs of each country. The eight Millennium Development Goals contain 21 narrower goals, and their implementation is monitored by over 60 indicators.

Each of these topics is divided into an adequate number of sub-topics, and in accordance with them, basic and additional indicators are given⁸.

The economic aspect of sustainable development can be monitored through two topics: Economic Development and Global Economic Partnership (Table 1). Indicators related to agriculture are bio-technological in nature, where the basic indicator is focused on the expression of arable and arable land, while additional indicators relate to: efficiency of fertilizers, use of agricultural pesticides, and areas under organic production. In addition to international organizations, many countries and economic groups have developed sets of indicators to monitor sustainable development. Members of the OECD Group have developed a simpler set of sustainable development indicators, which are analytically available but lacking because they do not provide full information on socio-environmental relations. These indicators allow for comparability in OECD member countries, and are divided into topics⁹:

- ☐ Ecology - air quality, water resources, energy resources and biodiversity;
- ☐ Human capital - the state of human capital, investment and depreciation of human capital,
- ☐ Economy - means of production, research and development, as well as financial resources.

In addition to these indicators, the set of OECD indicators includes outcome indicators, ie. results, such as: consumption, income distribution, health, employment and education.

Table 1. Economic indicators of sustainable development according to OECD

The theme	Subtopic	Basic indicator	Supplementary indicator
Economic development	Macroeconomic performance	GDP / per capita	Gross savings
		Share of investments in GDP	
		Adjusted net savings	Inflation rate
	Sustainable public finances	Debt to gross national income ratio	
	Employment	Attitude of employees towards the population	Employment of vulnerable groups
		Labor productivity and unit labor costs	
		The share of women in paid employment in the non-agricultural sector	
	Information and communication technologies	Number of internet users per 100 inhabitants	Number of landlines per 100 inhabitants
			Number of mobile subscribers per 100 inhabitants
	Research and development		Gross domestic expenditure on research and development as a percentage of GDP

⁸ Indicators of Sustainable Development: Guidelines and Methodologies October 2007, Third Edition, United Nations, New York, 2007, <http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf>;

⁹ Measuring Sustainable Development by Candice Stevens, Statistic Brief, OECD, <http://www.oecd.org/std/35407580.pdf>;

	Tourism	The contribution of tourism to GDP	
Global Partnership Economic	Trade	Current account deficit as a percentage of GDP	Share of imports from developing countries and from less developed countries
			Average customs barriers imposed on exports from developing and less developed countries
	External financing	Net official development assistance (ODA) is provided or received as a percentage of gross national income	Foreign direct investment (FDI), net inflows and outflows net as a percentage of GDP
			Remittances as a percentage of gross national income

Source: *Indicators of Sustainable Development: Guidelines and Methodologies October 2007, Third Edition, United Nations, New York, 2007*

Table 3. Economic indicators of sustainable development defined by the European Union

The theme	The main indicator	Operational goals and tasks	Stocks / variables
Socio-economic development	Real GDP per capita rate	Economic development - investments by institutional sectors	Dispersion of regional GDP per capita
			Net national income
			Household savings rate
		Innovation, competitiveness and eco-efficiency - real productivity growth per hour of work	Total research and development tasks
			Real effective exchange rate
			Traffic from innovation
			Energy intensity of the economy
		Employment - total employment rate	Employment rate, by gender
			Employment rate, according to the highest achieved level of education
			Unemployment rate, by gender
			Unemployment rate, by age group

Global partnership	Official development assistance, as a share of GDP	Globalization of trade - EU imports from developing countries	EU imports from developing countries by product group
			EU imports from least developed countries by product group
			Aggregate measurement of agricultural support
		Financing sustainable development	Foreign direct investment in developing countries
			Official development assistance
			Joint Official Development Assistance
			Bilateral official development assistance

Source: <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators>

The European Union has a set of sustainable development indicators that serve to monitor the objectives set out in the EU Sustainable Development Strategy (Table 2). There are more than 100 indicators, of which 11 have been identified as main indicators and are divided into ten topics: socio-economic development; sustainable consumption and production; social inclusion; demographic change health protection; climate change and energy; sustainable transport; Natural Resources; global partnership, and good governance¹⁰.

According to their methodology, each of the main indicators of sustainable development is related to operational tasks and objectives, and in accordance with them, actions or variables for calculation are given, and two of the economic indicators are significant: Socio-economic development and Global Partnership. Within the main indicator of resource productivity, production patterns are defined, where three variables are specific for agriculture: areas under agri-environmental obligation, areas under organic production and livestock density.

III. THEORETICAL-METHODOLOGICAL APPROACH TO AGRICULTURE

Agriculture, in the broadest sense of the word, is understood as a group of activities that use land and other natural resources for the production of plant food and animal products that can be used for direct personal consumption or for sale, either as food or as input to processing industry. Forestry, hunting and fishing are commonly involved in agriculture.

Agriculture is a fundamentally different production activity from processing activity (also known as industrial production). What distinguishes it is the inevitable production dependence on its natural environment. Production in agriculture is mainly the result of biological phenomena, which for the most part are beyond the direct influence of man. The production of crops, for example, takes a long time and man can have very little influence to change that fact, given that the growing season of many crops depends on the natural cycle of daylight and the level of temperature. What should be especially emphasized is the fact that the time conditionality of

¹⁰ Sustainable development indicators, Eurostat, dostupno na: <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators>

production and the conditionality of natural conditions (phenomena) have a serious impact on the economic results of agricultural production.

First, agricultural production is far more uncertain than production in any other sector of the economy. Input in the production process takes a long time in advance, and farmers have little or no power to change their choice of inputs when they discover that the yield or value of production will be lower than expected. Flexibility exists only in cases where agricultural products can be stored, for example, to avoid promoting products at a time when there is a low demand for them. But even in such cases, storage is an additional cost. Compare this situation with industry, where production is organized according to cycles that are not dependent on nature and that can adapt to changes in demand.

Second, the layout of the stages in the vegetation cycle of plants and the process of animal husbandry does not allow for the specialization of workers, as is, for example, possible in industrial production. In other words, especially on family farms, workers have to move from one activity to another during the year, so they can not take advantage of the increase in labor productivity inherent in industrial production, where workers specialize in a single operation (activity). An additional fact is that during the year there may be a period in which the need for labor is below the available supply from the family, so this may have negative consequences on the overall productivity of the labor force in agriculture, especially when the employment opportunities outside the farm are limited or non-existent.

The relative weight of the agrarian sector in the economy varies from country to country and generally ranges between 3 and 40% of the value of total production and up to a maximum of 70% of the total labor force.

Why is there such a relationship between the value of agricultural production and the level of income? The answer lies in the so-called Engel's law states that "the poorer a family is, the greater the share of total expenditure that must be used to buy food." While at very low income levels all income must be spent on basic necessities (such as food, clothing, and housing), as the level of personal income increases, less of the income will be spent on basic necessities, and one part will be spent on semi-luxury products (for example: education, communications, transport, personal care, travel, etc.). Another interesting fact is the fact that the share of agriculture in terms of labor is always greater than the share in terms of GDP (what is this fact in terms of the relative level of income of the agricultural producer?).

Agriculture is an important economic activity in any national economy, even for countries with developed market economies. The reasons for this are found in the role of agriculture in the wider economy. Namely, even at the moment when agriculture will be able to provide an abundance of food for the entire population of the country, only then can the country begin the process of achieving economic development. Modern agriculture is usually an important component of the demand for industrial products and other services. Finally, agriculture provides inputs for the food industry. When taken as a whole, agribusiness accounts for more than 30%, even in highly developed industrial economies.

When studying agrarian policies, it is very important to understand the characteristics of the agrarian system. Specifically, how is the production organized in terms of the number and size of farms, the available infrastructure, the technological level of production, the institutional environment, the opportunities for marketing and promotion of agricultural production, the available distribution centers, etc. The reason why it is so important to understand the structure of the agricultural sector is the fact that the same measure of agricultural policy can have very different effects, depending on the organization of the agricultural sector. For example, if there is

a limited infrastructure for processing and transporting vegetable products, then high vegetable prices may not be sufficient to effectively stimulate vegetable production.

Agriculture as an economic activity and activity within each national economy is related to other economic activities and activities, and especially to industry and thus directly and indirectly participates in the creation of the gross domestic product of a country. In the field of production, agriculture provides food for the population, raw materials for the development of many industries, then participates in foreign trade, and also for its development procures products from other sectors in the national economy. In addition to the exchange of goods and services, agriculture, along with other sectors, participates in the creation of GDP and national income. Agriculture is also of great importance through the transfer of agricultural population to other sectors of the national economy.

IV. STRATEGY FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT POWERED BY TRAFFIC INFRASTRUCTURE

Transport networks link producers to markets and provide access to social and administrative services. An effective transport system supports economic growth through reduction in travel time, reduction in accident cost and transport cost savings (Button, 2010). The indirect effects of transport investments may ultimately include lower prices for commodities and increased productivity. Rural transport networks and transport operations are particularly important for rural development and the agricultural sector, as it provides access to farm inputs (fertilisers, herbicides/pesticides and improved seeds) and outputs (agricultural produce), as well as other socio-economic activities for the rural population. The improved accessibility, in turn, may lead to increased production of agricultural products.

Conventional road economic evaluation tools such as the Highway Development and Management tool (HDM-4) and the Roads Economic Decision tool (RED) are used to capture the economic benefit of rural road improvement projects. These tools measure the savings of the proposed alternative over a default or base scenario. Savings are made up of, among other factors, reduced vehicle operating costs, shorter travel time and lower accident costs, i.e. the direct benefits. A rural road improvement project is beneficial if these savings exceed the costs of construction and maintenance of the new alternative (Kerali, 2003). The approach followed is often referred to as the consumer surplus approach, as the savings accrue to the road user or the “consumer” of the road. Producers of agricultural commodities, which include farmers, are assumed to benefit from the lower costs of transport through the lower tariffs or transport prices.

Transport prices, fares or tariffs, are the rates charged by a transport company or operator to the end user. Normally transport prices comprise of several transport cost components, as well as a profit margin (Figure 4.1). Transport costs are all the costs a transport operator incurs when transporting cargo or passengers, and includes vehicle operating costs (VOC) and overhead costs (Hine, 2014). Bennett and Greenwood (2001) do not differentiate between transport cost and VOC; they include overhead costs in VOC. In this research, therefore, the terms transport cost and VOC are used interchangeably. However, the term transport cost referred to in this research should not be confused with term total transport cost which includes road construction and maintenance costs as well as road user costs (i.e. VOC, accident cost and travel time cost).

Upgrading and improving rural roads should lead to lower vehicle operating costs, as road conditions have a direct and strong impact on transport costs (Kerali, 2003). Not surprisingly, a considerable amount of research has been done to establish the relationship between road

improvement and transport cost reduction (Kerali et al., 2006). Less research has been done on the exact relationship between road conditions and transport price (Hine and Chilver, 1991).

The agricultural community, among others, is expected to benefit from the reduction of transport price which will accrue to them in the form of an increased price of farm produce (i.e. through reduced distribution costs) and reduced production cost (i.e. through lowering the price of agricultural input). In turn, this may allow for an increased net income to the farmers and an increased crop production; this situation is expected to improve the well-being of the agricultural community. Should transport prices not reflect transport costs after a road improvement, the economic evaluation may overestimate the benefits to the agriculture community, and thus also the economic developmental benefits

Even if transport prices decrease as the transport costs decrease after an improvement, only relying on the vehicle operating costs savings for the specific road segment may underestimate the benefits. Improved road conditions in rural areas often allow for longer trip distances and thus better vehicle utilisation, and this may also lead to the use of higher capacity vehicles (capable of carrying larger loads) (see Headicar, 2009; Lançon et al., 2014).

Both of these outcomes have significant impacts on transport prices but are not always included in the economic analysis. They potentially lower the transport price, as they impact on the distribution (i.e. cost per km) of the fixed vehicle cost component.

Given the potential impact of transport prices on agricultural development, the effect of a road improvement on transport prices and transport services should be explored (Hine & Chilver, 1991; Hine, 2014). An assessment of the changes in transport price following road improvement will raise awareness about the magnitude of the possible wider benefits. These wider benefits are not always directly captured by conventional road appraisal methods, which focus mainly on VOC savings associated with a specific vehicle fleet and for a specific road segment.

Road conditions are an important factor in determining transport costs and prices. Hine and Ellis (2001) used data from Zambia in comparing transport price to road roughness. Transport price was twice as high on a poor-quality earth road in comparison to transport price on a good-quality gravel road. A survey conducted in Tanzania found that, over a 50 km section of road, an increase in roughness of 50 percent would increase truck charges by 16 percent and increase pickup (light duty truck) charges by 100 percent (Ninin, 1997 as cited in Hine and Ellis, 2001). The situation becomes worse during the wet season. In Madagascar for example, the passenger fare for taxis, commonly known as “taxis-brousses”, is 70 percent higher on poor-quality roads during the wet season than during the dry season (Hine and Ellis, 2001).

Several studies suggest that one of the significant constraints for agricultural development in rural areas is the poor condition of rural infrastructure. In their study done in the Mhlonto local municipality in South Africa, Chakwizira et al. (2010) point out that one of the key constraints to sustainable agricultural and rural development is the poor state of the basic rural infrastructures, including transport and irrigation infrastructure. The poor road condition also affects the transport price of agricultural products. Ikejiofor and Ali (2014) conducted a study in Nigeria and concluded that poor road condition is one of the prominent causes that impede the marketing of agricultural products.

Another study conducted in Nigeria by Akangbe et al. (2013) indicated that over 70 percent of the study's participants confirmed that the poor road condition and road seasonality were the reasons for the high transport prices of agricultural produce. In the same study, road conditions and the remoteness of the area were mentioned as reasons which deny farmers access to the various agriculture-related goods and services. Roughly 78 percent of the respondents were reported not

to have access to markets, agricultural extension services, agricultural inputs, agricultural credit and the usage of modern farming techniques and equipment (Akangbe et al., 2013).

Yaro, Okon and Bisong (2014) argued that in an area where accessibility was good, the access to farm inputs was 5.9 percent more than in an area with poor accessibility. Hine et al. (1983) conducted a study in Ghana and found no evidence to suggest that villages with less accessibility suffer any disadvantage in obtaining agricultural inputs. However, they pointed out that poor accessibility may adversely affect agriculture through the inability to obtain finance. Two related reasons explained the inability to obtain loans i.e. (i) physical measurement of the field/farm (a necessary part of the finance application process) was difficult due to remoteness; and (ii) the difficulty and higher cost of making follow-up trips for the loan progress. Hine et al. (1983) also indicate that villages located further from major markets experienced lower farm-gate prices¹⁶ due to higher transport charges.

Tracey-White (2005) pointed out that improved road and transport services provide several advantages for rural populations, such as:

- better access to collection centres and markets of agricultural produce within and outside the village;
- reduced transportation time spent by family members;
- rapid and timely delivery of commodities;
- reduced spoilage and losses of crops, especially perishable crops, during transportation;
- reduced vehicle operating costs; and
- provision of better and more cost-effective access to social services, such as schools and health facilities.

Hine and Ellis (2001) argued that if the transport cost is equivalent to 30 percent of the farm-gate price, a 20 percent reduction in the transport cost fully passed to the farmers will result in a 6 percent increase in farm-gate price, and thus increased income to the farmers. They also point out that if the agricultural production elasticity is +1 (i.e. one percent increase in farm-gate price leads to one percent increase in agricultural production), normally ranges from 0 to 1.5, then agricultural outputs are estimated to rise by 6 percent. The results of a study conducted by Dorosh et al. (2010) on crop production and road connectivity in Sub-Saharan Africa indicated that a one percent reduction in travel time to the nearest city would increase crop production by between 1.6 and 4.8 percent, depending on the population of the nearest city and the type of technology employed in crop production. Their study's regression results also suggested that there was a much greater concentration of production in regions surrounding large cities than in regions surrounding smaller cities.

Road infrastructure is the backbone of many rural and urban transport systems. In rural areas, among the strategies often adapted to stimulate agricultural development is the provision of proper and adequate transport. Crossley et al. (2009) state that transport is a basic component of the agricultural sector; it provides assurance for the supply of the agricultural inputs and facilitates the delivery of the farm outputs to the market. Transport can also be a decisive factor for the success or failure of agricultural activities. Improvement of the rural roads and transport services are essential to ensure price reduction of agricultural inputs, improvement of market access for agricultural produce, and improvement of access to agricultural extension services (Hine, 2014). Improved road infrastructure and transport services allow for lower transport costs and prices and subsequently increased agricultural production (Banjo et al., 2012). There is a need to improve the connectivity between the collection points, markets and agro-industries through an improved and well-maintained road network. It will also improve the access to the wider market and reduce losses

and delays in moving the farm produce (Ikejiofor and Ali, 2014). If the agricultural produce reaches the market in time, in good quality and at low transport price, the situation will attract more money for the producers (Ikejiofor and Ali, 2014).

Improved transportation allows for the diffusion of new technology and techniques (Banjo et al., 2012). It also provides benefits outside the agricultural sector, such as better access to social amenities and public facilities, increased mobility and reduced isolation (Ikejiofor & Ali, 2014).

Although improved road infrastructure and transport services are necessary, they are not the only factors to ensure agriculture development and sustainable poverty reduction in rural areas (Chakwizira et al., 2010). Road infrastructure investment should preferably complement other rural development programmes such as improvement in irrigation systems, post-harvest storage technology, provision of extension services and financial support.

The literature reveals that the condition of the road affects transport cost of vehicles transporting goods and passengers as well as the price charged by the transport operators (Hine & Ellis, 2001; Tracey-White, 2005). Transport costs and prices, and the level of accessibility of a rural area, also play a significant role in the development of agricultural sector (Dorosh et al., 2010; Akangbe et al., 2013; Ikejiofor & Ali, 2014; Kiprono & Matsumoto, 2014).

V. THE IMPORTANCE OF ROADS FOR DEVELOPMENT AND TRADE IN AGRICULTURE

Empirical studies show that deficiencies in infrastructure could be a critical development constraint. The (Asian Development Bank, 2007) finds that poor infrastructure and lack of investment in infrastructure have constrained growth. Poor infrastructure, a major factor for increasing the cost of doing business, has significant adverse impact on the perceived competitiveness and attractiveness of the Philippines as an investment destination.

That there is a critical link between infrastructure and regional growth has been indicated in causality tests showing that the direction of causation runs from infrastructure to economic growth, and that regional imbalance in infrastructure availability has a negative impact on a region's economic growth prospects (Llanto, 2007). Differences in availability of infrastructure have led to differences in regional growth in the Philippines (Basilio, and Gundaya, 1997). There is evidence that infrastructure could be a key variable in regional convergence (Cuenca, 2004).

In addition to reducing the cost of acquiring inputs, better access to markets reduces the impact of shocks and provides new opportunities for more profitable on- and off-farm activities. Many theoretical and empirical studies in the development literature have addressed the issue of transportation and transaction costs, in particular by looking at the link between market access and poverty, and more generally the impact of roads and infrastructure on development dynamics (e.g. Fan, 2008; Fan and Hazell, 2001; Platteau, 1996). Some studies have demonstrated that roads encourage agricultural development (e.g. Van de Walle, 2002; Ulimwengu et al., 2009).

Various studies from the end of the 20th and the beginning of the 21st century argued that, despite a general consensus on the importance of rural roads for development (Gannon and Liu, 1997), there was very little evaluation of the extent of this impact. The limitations relative to the evaluation of impacts at the micro level are the same as at the macro level, with inherent difficulties in estimating the magnitude of the effects attributable to infrastructure, due to the endogeneity of much infrastructural development. Road investments are often targeted, making it difficult to isolate causal impacts from placement effects. Also, it is often difficult to accurately capture the impacts on a diffuse beneficiary group and account for substantial differences in road quality.

Nevertheless, an increasing number of evaluations using household surveys and various indicators provide evidence on the factors influencing the extent of the benefits of investing in roads, including these roads' size and nature. Among others, Gannon and Liu (1997), Escobal and Ponce (2004), Lokshin and Yemtsov (2005), Dercon et al. (2006) and Khandker et al. (2009) provide evidence about the positive welfare effect of rural roads. Rural roads, by reducing transport costs and prices, may allow farmers in remote and often poor rural areas to get higher prices for their output and/or reduce the prices they face for inputs and consumer goods.

In Indonesia, Kwon (2001) shows that a 1% increase in road investments is associated with a 0.3% decrease in the incidence of poverty. Jalan and Ravallion (2002) find that road density was one of the significant determinants of household-level prospects of escaping poverty in rural China: for every 1% increase in the number of kilometres of roads per capita in poor regions in China, household consumption rises by 0.08%. Dercon et al. (2006), drawing from previous analysis (Dercon 2004; 2006) examine the impact of roads on poverty reduction in Ethiopia. They find that access to all-weather roads or quality roads – defined as roads capable of supporting (1) truck traffic and therefore trade and (2) bus traffic, therefore facilitating the movement of people in all seasons – increases consumption growth by 16.3% and reduces the incidence of poverty by 6.9%. Dillon et al. (2011) provide evidence about the welfare-improving effects of rural investments in roads in Nepal on households, measured by land values, consumption growth, poverty reduction or agricultural income growth.

Other analyses look more specifically at agricultural production and productivity. Fan et al. (2000) relate country- or regional-level public expenditure data to changes in agricultural productivity. An advantage of this approach is that it can form the basis of establishing benefit-cost ratios and thus allows researchers to compare investments in infrastructure with other forms of public spending. Fan et al. (2000) find that in rural India, public investment in rural roads had the largest positive impact on agricultural productivity growth. Other studies based on household data look at the effect of road connectivity on input use, crop output and household income, such as Chamberlin et al. (2007) in Ethiopia and Stifel and Minten (2008) in Madagascar, and suggest that isolation – defined as travel time during the dry season from a rural community to the nearest urban centre – implies lower agricultural productivity, increased transport and transaction costs, increased insecurity, and a reduction in per capita consumption. In other words, these studies find a relationship among isolation, poverty and agricultural productivity at the household level: Stifel and Minten (2008) observe that distance to a passable road and the cost of transporting rice significantly decrease the use of fertiliser in rice production. Controlling for soil fertility, which they link to the non-random placement of roads, they demonstrate that crop yields for the three major staples in Madagascar – rice, maize and cassava – are lower in isolated areas. However, Dercon et al. (2006) highlight that these approaches do not tell which component of infrastructure spending generates these benefits. Moreover, Raballand et al. (2010) believe that, even if many of these analyses use sophisticated econometric analysis, they still share severe limitations that lie in the absence of any or sufficient treatment of the endogeneity bias in the poverty equation with non-random road placement, i.e. that roads might be constructed in already more productive areas.

Using geographic information systems, Ulimwengu et al. (2009) and Dorosh et al. (2010) look at the link between road connectivity and agricultural production in the Democratic Republic of Congo and sub-Saharan Africa. They estimate the long-run relationship between market access and agricultural production. Although the results are of a much lower intensity in the former study, both analyses show that agricultural production is highly correlated with proximity to urban

markets as measured by time travel, not physical distance to the market. In other words, reducing travel time to major cities has significant effects on agricultural productivity in sub-Saharan Africa.

Renkow et al. (2004) develop a conceptual framework for quantifying fixed transaction costs faced by semi-subsistence maize farmers in Kenya. Their analysis shows that, on average, the households they analysed face fixed transaction costs that are equivalent to a 28% ad valorem tax, and that both remoteness and infrastructure quality have significant impacts on transaction costs. But, more importantly, if transaction costs are higher for poor households, these authors believe that public investment in infrastructure to lower transaction costs is more likely to increase the welfare of households already participating in input and output markets rather than to change the situation of autarkic households. Therefore, they conclude that for public investment in infrastructure to provide direct support to the poor, it needs to be specifically targeted at supporting autarkic households.

Fan and Chan-Kang (2005), Fan et al. (2000) and Fan and Hazell (2001) discuss where and how to better allocate investments in infrastructure. Their conclusion is that donors' investments should be directed to the construction and maintenance of low-quality rural roads and not to roads for trucks, which they consider irrelevant to attempts to cope with the issue of rural poverty. They note that the predominant view is that, even though investing in what they define as less-favoured or low-potential rain-fed areas might have a greater impact on the poor people living in these areas, social returns were the highest for investments in irrigated and high-potential rain-fed lands. One popular hypothesis is also that benefits are highly dependent on the local human capital endowments needed to take advantage of the opportunities provided by new roads. Fan and Hazell (2001) look at both India and China, two countries that have biased their past public investments toward high-potential areas. Although these investments allowed both countries to achieve large productivity gains in those specific high-potential areas, less-favoured areas are still lagging behind. Fan and Chan-Kang (2005) investigate the cost-benefit ratio for gross domestic product (GDP) of investment in low-quality (mostly rural) roads versus high-quality roads. They find that the former is about four times greater than the latter. Moreover, they show that in China, while high-quality roads do not have a statistically significant impact on agricultural GDP, low-quality roads generate 1.57 yuan of agricultural GDP for every yuan invested. Finally, they find that investments in low-quality roads have a much larger impact on poverty rates per yuan invested than high-quality roads.

A related question is whether infrastructure investments should focus on a 'transport corridor' development strategy or on a 'rural feeder road' strategy. There is consensus in the literature on the fact that investments in corridors do not have large effect on smallholders and agricultural production. Rather, as reported by Byers and Rampa (2013) in a study of corridors in Tanzania and Mozambique, these routes are likely to be 'corridors of power' that benefit relatively few rather than 'corridors of plenty', with 90% of smallholders likely to be left out of value chains. Byers and Rampa (2013) conclude that additional opportunities and support should be provided to smallholders to help them to benefit from corridors by linking those large infrastructure developments with the upgrading of feeder roads and storage facilities.

Van de Walle (2002) and Mu and Van de Walle (2011) also examine how rural road investment projects should be selected when the specific objective is assumed to be poverty reduction. A second issue relating to the appraisal of the benefits of investment in rural infrastructure is that a sizable share of such benefits cannot be measured in monetary terms so as to be aggregated consistently with monetary measures of other benefits and costs. The acknowledgement of this issue by development institutions led them to adopt hybrid road-investment appraisal methods combining the usual cost-

benefit methods with cost-effectiveness calculations. Mu and Van de Walle (2011) look more specifically at the determinants – geographic, community and household factors – explaining the variations in the impact of rural road rehabilitation on market development in rural Vietnam. On average, they confirm the significant impacts of such projects on rural communities and the development of rural markets, but also show that the impacts are significantly higher for poorer communities due to lower levels of initial market development.

The importance of transportation in the development of economies around the world cannot be overemphasized. Transportation, according to (Tunde, and Adeniyi, 2012), improves the operations of the manufacturing industry, retail, labor, and housing markets through improved accessibility to both geographical and economic regions. In the rural areas particularly where the major source of income for residents is farming, transportation facilitates the transfer of farm produce to the markets, encourages increased production, distribution and marketing and increases the livelihood opportunities available to local farmers (Ajiboye and Afolayan, 2009). Following this, one could presume that transportation plays a key role in the growth of both developing and developed economies. In developed countries, the optimum performance of industrial sectors and economic growth recorded was due to the fact that full capacity in the area of transportation was reached, a good example of such is China (Felloni, et al., 2001). Olubumehin, (2012) also stressed that since agriculture forms the major element of the gross domestic product of many developing or low-income economies, the achievement of economic growth would depend on transportation. This was explained by the bulky, highly perishable but low priced nature of the agricultural products which makes it necessary for the products to be transferred from the production area to the final consumption area (markets) within a short period of time and with a minimum cost. In line with these, there has been a generalization from developed to developing economies that investment in transportation, especially on road transport which is the predominant mode of transportation linking villages to market centers are for offsetting the high transaction costs on sales of agricultural products, reducing poverty, reducing the unemployment rate and achieving agricultural development.

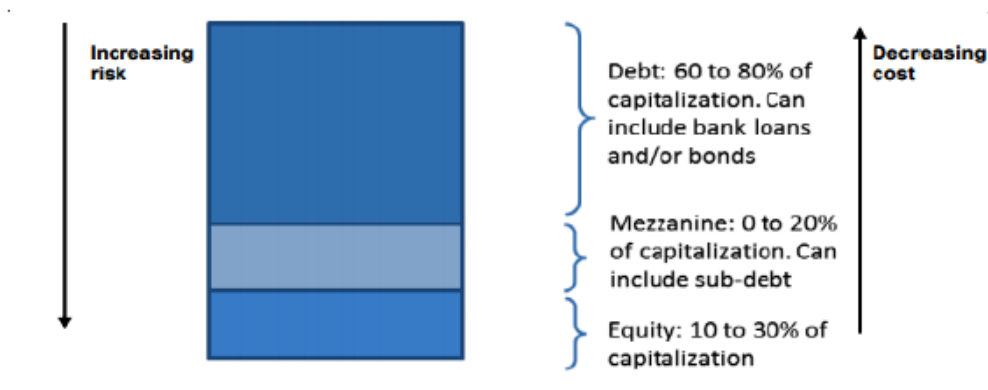
Existing literature on road transport infrastructure and agricultural sector development, however, remain controversial in academics. While (Lokesha, and Mahesha, 2016), found that road transport infrastructure has a significant impact on agricultural sector development, (Ulimwengu, et al., 2009), concluded that road transport infrastructure has minimal effect on agricultural sector development. Whereas (Ighodaro, 2009), noted that availability of good road transport infrastructure enables an efficient movement of agricultural products, raw materials, finished or semi-finished products, services from the point of production to the market centers. Consequently, this would affect the production, distribution, marketing, consumption, and influence the cost of the commodity consumed and the purchasing power of the consumers. Ulimwengu et al. (2009), explained that availability of road transport infrastructures may not be enough to influence agricultural development as there may be other factors responsible for this influence, although the inadequacy and low quality of road transport infrastructure in many communities have serious implications on the agricultural sector development in the country. Nigeria's rural road network, for instance, is one of the least developed in sub-Saharan Africa. In some regions of the country, most of the roads where major farming operations are carried out are inaccessible; the roads are un-surfaced, narrow, poorly drained and winding thereby making it difficult to move produce from the farm to the marketplace. Even when such roads are in a fair condition, there is a problem of poor maintenance, lack of adequate execution capacity, lack of suitable materials and management problems.

In the absence of good road network, farmers would not want to produce in large quantities because of the fear of the perishable nature of their farm produce, since they might not get to the point of sale before their expiration. If agriculture will respond to the growing demand of the increasing population, it will be necessary to ensure a good road network to reduce the cost of flow of agricultural commodities to the urban areas, provide the necessary information needed for rural services to enable the agricultural sector to contribute meaningfully to the general economic growth. This will help to accommodate the increased traffic flow of input and output moving from rural areas to urban centers

VI. AGRICULTURE AND TRAFFIC INFRASTRUCTURE IN THE COUNTRIES IN THE WESTERN BALKANS

The financing of major infrastructure projects reflected in the possible sources of funding is undoubtedly one of the main priorities of the European Union (EU). Infrastructure projects often have a higher level of support or support than non-infrastructure investments, given the lower volatile monetary inflows and the willingness of sponsors to accept higher levels of debt in infrastructure projects (Beeferman and Wain, 2012). Debt instruments historically accounted for 70-90% of the total capital of infrastructure projects (Figure 4).

Figure 4. - Financial instruments



Nowadays, various forms of financing infrastructure projects are known around the world, for example through donations, loans, loans, financing through the use of PPP (public-private partnership) with special emphasis on the advantages and disadvantages of the financial system-PPP, etc.

The countries in the region are striving to join the EU and are committed to building their own national road network alongside EU-approved plans, such as the Trans-European Transport Network (TEN-T) development plans until 2020. EU transport development plans call for the development and improvement of multimodal corridors to accommodate the expected growth in transport (such as the projected increase in freight transport by more than 2/3 of 2020), and a reduction in traffic density in traffic. The feasibility study for infrastructure facilitation for the

Western Balkans¹¹ is undoubtedly a strong contribution to the further development of road infrastructure throughout the region. Within these large investments in the region, the future of Kosovo is certain only if the government is committed to protecting the environment, as well as natural and cultural values, consequently respecting them and adhering to international standards and recommendations for careful and prudent use. of the necessary space for the construction of the road network.

In view of the above, the authors Dol and Essen (2008) published an important study that analyzed in order and in detail the costs of building a motorway for eight European countries. Austria as a country, given its geographical location, is a country with the highest cost of road construction. The report confirms that the construction of motorways in Austria costs around 13 million euros on average per kilometer. It is known that the second country follows Hungary with over 11 million euros per kilometer, followed by Slovakia with around 10 million euros per kilometer, while the Czech Republic owes 9 million euros per kilometer.

On the other hand, in Denmark, the average cost of building a motorway has halved to around 6 million euros per kilometer. Croatia and Slovenia are ranked higher at around 7 million euros per kilometer, while in Germany the average cost of building highways is around 8 million euros per kilometer. The specific terrain, which is mountainous and inaccessible, increases the costs for the construction of motorways, and analogously, the price for the construction of a motorway can reach up to 26 million euros per kilometer, as is the case in Germany, or 25 million euros in the case of Austria. elaborate in detail the "chashflow" or cash flow for servicing the loan, the interest, the possibilities for potential financing of the creditors and the financial relations.

The financial plan as well as the financing strategy are undoubtedly the basic documents for the decision for allocating funds for the project, while as a key factor in decision making is the level of risk covered by the project. The lower the risk, the more profitable the projects and vice versa. The goal is based on eliminating risks completely, minimizing them as much as possible.

From the above, the financial elements and economic or technical elements will be clearly represented. However, potential borrowers, before making a decision, want to know about the capital structure, the current participation of shareholders or companies, planned resources and financing, credit provision, political and legislative regulations, detailed cash flow, etc.

From the brief review of literature the following questions are raised in this paper:

- Is rural infrastructure a significant determinant of agricultural productivity?
- How does rural infrastructure affect agricultural productivity?
- What type of rural infrastructure has the most pronounced impact on productivity?
- Can rural infrastructure explain regional differences in agricultural productivity?
- What explains the present state of rural infrastructure?
- What policy and investment levers may be tapped to address the gap in the provision of infrastructure?

To handle these questions and conduct, Andersen and Shimokawa's analytical framework shown in Picture 7.

Picture 7 describes the causal relationship between physical infrastructure and agricultural productivity. Other factors determining or influencing agricultural productivity such as agricultural research and technology, institutions, civil society organizations and farmers' behavior, are also shown. These other factors influence agricultural output and productivity in

¹¹ Projekti për Lehtësimin e Infrastrukturës në Ballkanin Perëndimor IPA 2011-WBIF-IPF3 WB11-KOS-TRA-01 Dhjetor 2016

varying degree, given certain contextual factors such as agro-ecology, climate, cultural, legal, political and social factors.

Physical infrastructure has both direct and indirect effects on agricultural productivity. Physical infrastructure may be divided into two groups: (a) water supply and sanitation sectors and (b) other sectors, e.g., irrigation, energy, telecommunications and transportation sectors because infrastructure affects agricultural development through different channels. Water supply and sanitation influences the health status of rural dwellers and their productivity.

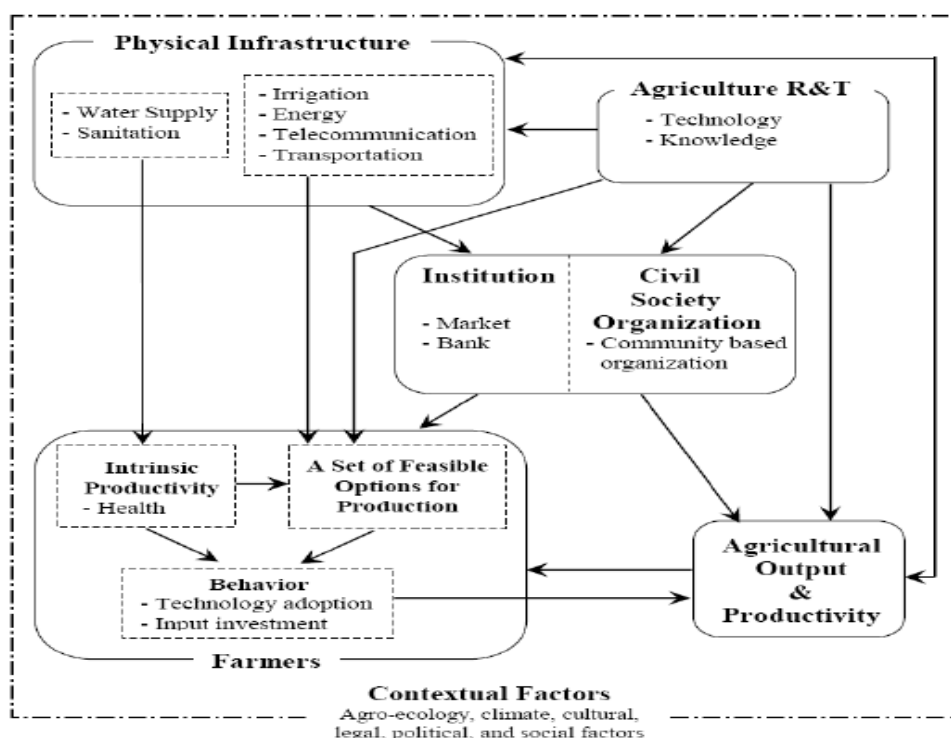
Consumption of safe water and a healthy environment of the household through sanitation will contribute to the physical well-being of rural dwellers and the improvement of rural human capital that contributes to higher worker (agricultural) productivity.

The second group of infrastructure (electricity, telecommunications, irrigation and transportation) directly impacts on productivity by providing farmers and rural households with feasible options for production, processing, marketing and distribution. Investments in these production-enhancing types of infrastructure create the conditions for improved agricultural productivity.

Physical infrastructure affects agricultural output and productivity through the facilitation of the creation of institutions such as domestic markets and financial institutions that enable rural inhabitants to have easier access to input and output markets and liquidity and credit, respectively. Community-based organizations such as farmer organizations will find it easier to assist farmers because of the mobility and ease of transportation and communications provided by good rural infrastructure. Better roads lower the transactions costs of farmers as inputs become more accessible and farm produce are more easily marketed. Greater mobility through physical infrastructure including telecommunications, which facilitates communication between consumers and producers, permits entry into new and possibly more profitable opportunities.

Microfinance institutions will be encouraged to provide credit to hard-to-reach areas, which have been excluded from the formal credit markets because of their inaccessibility. Because of improved rural roads and transport, and access to telecommunications facilities banks will find it easier to establish rural branches to provide financial services to farmers and other rural clients. In short, good infrastructure will contribute to improve rural financial intermediation. Community-based organizations such as farmers' organizations, agriculture based cooperatives etc. can better assist farmers and other rural-based clients with information, and technical assistance in marketing, distribution and others that those clients need to exploit growth potentials in the countryside.

Picture 7 How Physical Infrastructure Promotes Agricultural Development



Source: Andersen and Shimokawa (2007)

It is estimated that to feed its expected 9.3 billion population by the middle of this century, the world will need to raise global food production by around 70% Food and Agriculture Organization of the United Nations. (2009). A food-secure world requires that those currently living in rural poverty become able to produce agricultural surpluses, allowing them to sell the excess for income, to invest in better agricultural practices and to insure against the bad seasons that will inevitably come, from time to time, and raise themselves from poverty KENDAT, IFRTD & TCP International (2013). Both agriculture and transport sectors face climate resilience challenges. Some 450 million smallholder farmers around the world face poor marketing linkages. Additionally, the farming practices are characterized by low productivity due to dependence on family labour, lack of access to affordable capital, resources and inputs such as seeds, fertilizers, irrigation equipment and machinery. Small holders remain dispersed and non-aggregated DGDA. (2012).

Significant improvements in rural transport infrastructure and transport services need to be achieved to allow these substantial challenges to be met. Effective and more resilient rural transport infrastructure and services will be the essential ‘enabler’ for agricultural production and other rural activities. Increasing access to domestic and regional markets is seen as key to poverty reduction, food security, and economic growth, as well as a necessary step to improve the continent’s capacity to trade with the rest of the world (Romanik, 2008). Better rural transport infrastructure and services will be required to improve rural access and urban linkages, improve access to markets, lower transport costs, reduce crop wastage, increase food security and increase production on a diminishing global land resource, depleted by nutrient flows to the urban centres. Improved rural transport will allow investments and rural based value chains (agroindustries) with

associated rural employment and economic development leading to more self-reliant rural communities. Transport needs analysis must consider the complete transport chain encompassing inputs to the farms and all linkages and activities between the farming units (especially ‘first/last mile’) and the consumer.

A study in China (Fan, et al.,2002) also found that the poverty-reduction effect per unit of additional agricultural R&D investment ranked second only to investment in rural education. Government spending on rural infrastructure (roads, electricity, and telecommunications) had substantial impact in reducing poverty and inequality as well, owing mainly to improved opportunities for non-farm employment and increased rural wages. Transport is a major constituent of the final market price of produce, and high prices affect both the producer and the consumer. For consumers, reducing transport costs can reduce the price consumers pay. Should food become unaffordable, it becomes inaccessible and food security ceases to exist. On the producer side, transport costs vary according to factors such as commodity type, distance, efficiency, perishability, but typically constitute 3.5% to 25% of the market price. Farmers tend to only receive 30% to 50% of the final market price and the difference goes to transport costs²⁵. If transport supply fails producers, large losses can result. It is estimated that in Tanzania, typically 10% to 40% of the harvest remains stranded and as much as 89% of this is due to inadequate supply of transport.²⁶ Improved access roads and transport leads to increased income and food security.

A key finding of a review of Rural Transport in Sub Saharan Africa (Banjo et al.,2012). is that there is now an emerging convergence between the agricultural and rural development and transport communities in their understanding and approaches to making smallholder and rural households the direct targets of efforts to promote rural growth. This cooperation could be further enhanced by the adoption of proven agricultural tractor technology, in appropriate circumstances, to unpaved rural road maintenance. An AfCAP study in Zambia concluded that there are clear cost and sustainability advantages for the introduction of such approaches (Intech Associates and Clanview Civils, 2016). The utilization of the low-capital investment equipment could be raised to commercially viable levels in the typical high credit charge (and scarce credit availability) economies of the developing world; benefiting both the agricultural and rural transport sectors with lower unit costs. Improved agricultural production can reduce hunger by supplying both urban and rural areas with nutritious and sufficient food all year round. Improving rural access can lead to lower costs for farm inputs and lower transport costs for marketed outputs (e.g. ‘First/last mile’ transport), thus increasing the margins and incentives for the farmer and raising agricultural production. Improvement in rural transport will lead to better knowledge application for good practice, reduced crop wastage, higher yields, enhanced production and development of local agro-industry which can improve food security. It will also promote rural employment and economic development with more self-reliant rural communities. Close cooperation and mutual understanding of the agricultural and rural transport sectors will be a vital factor to stimulate the needed increase in food security and global food production. Coordinated efforts across the sectors are required for inter alia: Improved all season access for rural communities (especially ‘first/last mile’); Improved, appropriate and affordable rural transport services to reduce transport costs;^λ Knowledge and affordable access to resources for both improved and sustainable agricultural^λ production and marketing, and the efficient transportation of inputs and outputs; Cross-sector dialogue and cooperation to optimize the use of available resources and synergies, and increase food production efficiently and sustainably, providing producers with an equitable livelihood;

The economic development of the Western Balkan countries is closely related to the development of the transport infrastructure, primarily the road infrastructure. In the past few years,

the countries of the Western Balkans have invested a lot of money in improving the road infrastructure, especially in connecting the countries of the Western Balkans with their neighbors with modern highways. Unfortunately, the cost of building highways in the Western Balkans is almost the highest in Europe, which for many experts is an indicator of housework and spending budget money.

Tenders for the construction of public highways in the Western Balkans should be public and published in well-known economic journals, before concluding any agreement should consider all possible options and combinations for possible partnerships with certain foreign companies that are interested in construction of highways. The opportunity for partnership in the future management and maintenance of the highway should be offered, where in return the company that will build the highway will have its own benefit, but also to offer the citizens favorable prices for using the highway, as the most modern conditions. , safety and comfort while driving on the highway.

In addition to highways, the Western Balkan countries need to pay more attention to local roads, which are in very poor condition. Investments in local roads are much needed and inevitable. Governments should, in partnership with local self-government, find solutions to all the problems facing most municipalities in the Western Balkans today. The lack of financial means and resources today only worsens the already bad situation. Many municipalities are not able to invest in the construction of new roads, so they switch to the option of restoring the old roads, which in the end results only in a waste of money. It often happens that after the recovery of the old holes, after a while they appear, so the problem is not only not solved, but also causes revolt among the citizens. Local governments must cooperate with the central government in order to find a possible solution to the problem, a possible investor, projects that will be funded by the EU, the World Bank, donors, etc.

Investments in road infrastructure will have a positive impact on the overall economic situation in the Western Balkans, but will also have a positive impact on increasing the efficiency and effectiveness of transport companies. Reducing travel time to the desired destination, reducing fuel costs, increasing traffic safety, are just some of the benefits that companies, but above all the citizens of these countries will benefit from investments in road infrastructure. The development of road infrastructure is a positive signal for foreign investors, who in the future will want to invest in the Western Balkans. One of the key conditions for investing in a country is exactly the road infrastructure, access to a larger market, etc. The countries of the Western Balkans in recent years have seen a positive trend of increasing foreign direct investment, which is a direct indicator of the impact that investments in road infrastructure in the past 10 years have had on attracting investors.

As for the overall development of traffic infrastructure, the Western Balkan countries must adopt strategies for the future development of traffic infrastructure in accordance with national interests, but also in line with EU interests for the development of traffic infrastructure in the Western Balkans. The countries of the Western Balkans must work much harder to move closer to EU standards, in order to achieve the average level of development of transport infrastructure in EU countries. The accession of the Western Balkan countries to the EU is also a priority of all Governments, but only with common projects and interests, the Western Balkan countries will slowly approach the doors of the EU.

One of the opportunities for the development of the transport infrastructure of the Western Balkan countries is the cooperation with other countries, the formation of joint projects, all with an interest in closer and increasing cooperation, be it in the field of economy, education, culture,

etc. . Exactly these projects are interesting for the EU, so with joint traffic projects for connection and cooperation, it is easier to get EU development funds.

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One of the key problems facing the Western Balkans today is corruption. Kosovo government institutions have long been the target of criticism from the international community, the EU, the United States, as well as international organizations. The fight against corruption is very difficult. The countries of the Western Balkans must in the future pay much more attention to eradicating this negative phenomenon, laws must be enacted to punish this act. In recent years, many experts, whether domestic or foreign, have widely criticized governments for corruption-related investments in road infrastructure. The cost of construction of highways in the Western Balkans are among the highest in Europe, also the price for the construction of the same has been changed several times or more precisely increased, so the final price to be much higher than the original, agreed. Only by eliminating corruption can Kosovo hope for projects funded by the EU, the World Bank, donors, and so on. Corruption negatively affects the overall picture of the Western Balkans.

Conclusion

Agriculture is a primary economic sector that is essential for the development and survival of a country. The well-being of the population is an obligation of every state, and the provision of a sufficient amount of food that will be of adequate quality and will meet the nutritional needs of the human body is a basic condition for the health of the population and the prosperity of the state. Agriculture is an important source of raw material for industry, primarily for the processing industry, but also for the textile industry. The development of agriculture has a favorable impact on the development of agritourism, foreign trade through the export of agricultural products, which indirectly contributes to the development of the national economy. The European Union has long recognized the importance of agriculture, and in order to take timely measures to support agriculture in 1958 has introduced the Common Agricultural Policy, which is in constant reform and improvement. The support provided by the Common Agricultural Policy is about 40% of the Union budget. Despite the fact that in recent years this percentage has a steady downward trend, it is still at a high level and represents a significant support to agricultural producers.

Thanks to new technologies, mechanization, agrochemicals, specialization of production, as well as the implementation of appropriate agricultural policies, production has been maximized. However, with the growth of productivity in agriculture, there was pollution of the environment, a decrease in the number of agricultural holdings with a simultaneous increase in the area per farm, but also a breakdown of economic and social living conditions in rural areas. The key question that arises reflects the need to stop such devastating processes. Consequently, the answer should be sought in the new role of agriculture on a sustainable basis. Sustainable agriculture strives to ensure adequate management of human resources, with appropriate management of natural resources. Human resource management includes consideration of social responsibility, such as the working and living conditions of agricultural workers, respect for the needs of rural

communities, and the health and safety of consumers. Natural resource management implies the preservation or improvement of these vital resources for long-term use.

Sustainable agriculture is the efficient production of high quality, safe agricultural products in a way that protects and improves the natural environment, social and economic conditions for farmers, agricultural workers and local communities with health and welfare measures of all kinds. Sustainable agriculture is best described by the following scheme. characterized by four main pillars: agricultural systems, economy, social and environmental.

The central part is made up of sustainable agricultural systems, and is a major element of sustainable agriculture. The economic pillar indicates that agriculture should ensure the economic sustainability of agricultural systems at the local level, ie. at the farm level. This implies that there should be an adequate net income of agricultural holdings that would be in function of the optimal living standard of farmers, but also to provide annual investments for the growth of productivity of land, water and other resources. The sustainability of agriculture is closely related to the social conditions of farmers and the rural community, where it is important to improve social relations between farmers and rural areas, create a strong rural social infrastructure, reduce poverty and provide new jobs in rural communities.

The issue of the importance of improving rural infrastructure, and in particular rural roads, is not new in the development community. This topic has long been at the centre of development policies, supported by the popular assumption among development theorists that remote areas' disadvantageous position vis-à-vis economic opportunity and social welfare could be remedied with road building. Investments in rural infrastructure were considered to have important positive effects on agricultural production and trade, and governments and donors invested heavily in the development of rural roads and transport corridors. Yet – perhaps because the importance of such infrastructure for development seemed so obvious – there has for some time been little formal evidence on how and under what conditions roads benefited rural households and agricultural development. By the end of the 20th century various studies nonetheless showed that the causality between road building and rural development should be more nuanced. The World Bank 1994 World development report on infrastructure for development highlighted that focusing solely on increasing the quantity of installations was not adequate: more should be done on the quality and efficiency of related services.

The role of transport as a complementary sector of the economy is especially important expressed through the role of traffic infrastructure which is a general condition for development and functioning economy, so that traffic manifests itself as a system of total social infrastructure.

Traffic infrastructure is a very important source of goals and content economic policies of society, because at the same time it is a means of functioning traffic and the general condition for the development of the economy and its infrastructure. Direct traffic effects infrastructures are manifested by traffic functions. Traffic infrastructure enables the functioning of traffic as a process of transportation by movement means of transport. Thus, it performs the function of a component of transport capacity, together with the means of transport. Indirect effects of traffic infrastructure they are manifested in non-traffic functions and only partially in traffic functions. Only in railway traffic, the infrastructure serves exclusively for traffic functions, so the functioning of railway traffic mainly expresses its direct effects. Infrastructure in other branches of transport, especially in road and river, has distinct non-traffic functions. Roads, in road traffic, also serve various purposes social, cultural, sports and other events. Roads also make it easier access to large areas in agriculture, and thus more rational use agricultural land, forests and pastures. Rivers, among other things, serve in various ways for transport purposes (for industrial

water consumption, for the supply of urban settlements, for various water sports, etc.). Airports, in air traffic, too enable the organization of various sports and other events. Thus, traffic infrastructure is manifested by a series of direct, quantitatively measurable effects, as well as indirect, immeasurable effects that are reflected in other sectors of the economy and non-economic activities.

Accordingly, the traffic infrastructure in its development could not remain only the subject of consideration of its direct users (transport organizations) it is already in good condition for its construction, development and maintenance in order to achieve direct and indirect effects interested in the first place, the entire social community, ie. country. The territories through which important traffic routes lead have great potential for development. Industrialization has shown that traffic is the best is crucial for economic growth and development of all sectors of the economy, as well as for social development.

Traffic infrastructure is of special importance for the economy because it is for her construction is consumed by large quantities of various products of other sectors of the economy. Cross-sectoral the relations between traffic and other economic branches are two-way, since traffic has its own services and function enables the development of other sectors, and absorbs from those other sectors large quantities of products and stimulates their development. This is especially pronounced in development traffic infrastructure as a general basic condition for the realization of traffic functions, because large quantities of various building materials are used in its construction type, then products of the steel industry, electronics industry and other branches.

On the other hand, it is developing through the accompanying industries of rail vehicles, the automobile industry with a wide circle of cooperative activities, aircraft industry, shipbuilding, a wide network of service and other organizations for repair and maintenance of infrastructure and means of transport.

Impulses of society within the economic policy, in terms of traffic development, they are logically reflected in all sectors of the economy. It shows traffic that has a lot significant impact on the development of structural relations of a large number of industries such as energy, industry, agriculture, tourism, etc.

From these functions of transport and its role in the economy and society clearly emerges what its significance is. In the modern, developed economy, traffic comes even more expression as a basic condition of the normal course of the process of social reproduction. Therefore, according to modern economic theory, the efficiency of each country's economy is measured precisely efficiency of the traffic system.

Poorly developed infrastructure, outdated transport capacities, inadequate organization transport, security and environmental protection are major economic barriers growth, increasing productivity and competitiveness. The goal is to form a traffic system which with its new organization, improved infrastructure and transportation by means of power to compete with the traffic of European countries.

Improving connectivity within the Western Balkans, as well as between the Western Balkans and the European Union, is a key factor for growth and job creation and will contribute to clear benefits for the region's economy and citizens. However, it is not just the infrastructure that will improve connectivity. Similarly, it is important to implement technical standards and other mitigation measures, such as harmonization and simplification of border crossing procedures, railway reforms, information systems, security and pasture maintenance systems, railway sharing and access to others. customers. This is a very positive work from the economic

aspect, and the main reason why the Balkan countries are economically underdeveloped is that they are far from the markets and economic centers.

The reform moves of the countries of the Western Balkans have made certain in the last ten years shifts in some modes of transport, but numerous weaknesses, problems and development constraints. Funding for reforms is one of the leading transitional ones problems faced by all transition economies.

Basic characteristics of the inherited traffic system in Serbia, as well as in other countries in transition, have been influenced by the orientation towards heavy industry and energy, collectivism, rapid urbanization, without market efficiency criteria and with all the shortcomings inefficient centralized planning, with limited and controlled flows international exchanges. The infrastructure in them lags behind in terms of quality developed western European countries.

Private sector participation was relatively small, but on the rise, the conditions of competition are quite uneven, and there is a great lack of investment funds. Competition can hardly be called free, given to large inherited distortions and unequal obligations and the position of companies and branches in the market.

Users theoretically have freedom of choice, but the offer of traffic services is weak not only in terms of quality, and sometimes in terms of quantity, and most often the prices do not reflect the costs provision of services. Apart from newer, mostly private companies, traffic companies are formally commercially independent, but also burdened with poor material resources position, inherited poor transport capacity and outdated management methods, which results in poor service and low efficiency. Resources in traffic inadequately evaluated, which causes further distortions, coordination in the domain transport policy and infrastructure development based on objectifying research and methods is underdeveloped.

The countries of the Western Balkans have embarked on radical changes in transport sector, changing general regulations and restructuring and transport companies are working increasing their efficiency and introducing clear economic criteria in business.

Improving the connection with the most developed European countries, as well as among the Balkan countries themselves (expanding the regional market) is the most important step to increase their economic potential. The "Connection Agenda" provides capital investments in the connection of transport infrastructure (road, rail, river, port and airport) and energy.

They are combined with technical support from SEETO and the Secretariat of the Energy Community.

REFERENCE FOR CONTRIBUTION

The Phd thesis “MENAGEMENT OF ROAD INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT OF AGRICULTURE” contains the following core offering ideas and solutions for the theory and practice of management:

1. The main definitions and processes are defined and clarified by using marketing approache in rural tourism.
2. The main factors of the risk are established which firm are faced offering tourist service in rural areas.
3. There are analyzed the benefits and costs of rural tourism in development of rural areas.
4. It is made a strategic framework of rural tourism management in rural areas in Kosovo.

LIST OF PUBLICATIONS IN THE TOPIC

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