Rubizmo

Report on socio-economic and environmental analysis

AUTHORS: ARKADIUSZ DYJAKON, STANISŁAW MINTA

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[1] PU = Public
PP = Restricted to other programme participants (including the Commission Services)
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Document history

V	Date	Beneficiary	Author
1	31.10.2019		First draft
1.1			Revised version from earlier experience with other projects
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3.2			

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Summary

The objective of this document was the analysis of selected business cases in terms of socio-economic and environmental aspect. The analysis was performed basing on the data obtained during the direct interviews with the representatives of the company. For the collected data describing the business cases, different economic, social and environmental indicators were defined and applied. In the report 40 business cases were evaluated. The obtained data and general calculations of the used indicators revealed that the selected group included various enterprises taking into account such criteria as: staff headcount, value of generated annual revenues (turnover), balance sheet total, type of business or geographical location. However, the common feature of these enterprises was their location in rural areas of the European Union. In the selected business cases dominated micro-enterprises (67.5%). The share of small enterprises amounted to 27.5%, and the remaining 5% were large enterprises. The RUBIZMO project adopted the division of enterprises into three groups (sectors): FOOD, BIO-BASED VALUE CHAINS, ECO-SYSTEM SERVICES. In the FOOD group, 40% of the analysed business cases were included, 30% of enterprises each were in the Bio-Based Value Chains group as well as in the ECO-System Services group.

The average share of the family members (SFM) and external employees (SEE) in the company structure is 40% and 60%, respectively. Such proportion seems to be normal as most of the business cases with replicable potential are micro and small size. Taking into account the Rubizmo project focusing on the rural areas development it is significant that more than 80% of employees in the evaluated business cases are from rural area. At the same time, nearly 90% of employees come from the local area.

Moreover, the considered business cases are very active in rural areas and have a significant impact on local development in many areas, including social aspects. The cumulative social return on investment (SROI) is over 18 and should be considered very satisfactory, although it has no direct financial value. Important are also the high values of partial indicators directly related to the job creation ($SROI_{JC}$ = 5.70) and employment of people from rural area (SROIMLA = 3.30). Furthermore, the indicator related to employment of women and men from rural area by companies operating in this region can be noted positively ($SROI_{ND}$ = 1.98), as well. As none of the companies carries out heavy industrial activity, the overall rate of impact on global warming (environmental impact) is not high (GWPIRP=0.24 $tCO_2eq/1000$ EUR). Additionally, a positive impact from an environmental point of view, has a share of renewable energy in energy consumption amounted to 22%.

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Definitions

NoE – Number of employees related to the full time work.

FtE – Full time employment.

CO_2eq (carbon dioxide equivalent) - is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

kWh - is a unit of energy equal to 3.6 MJ. If energy is transmitted or used at a constant rate (power) over a period of time, the total energy in kilowatt hours is equal to the power in kilowatts multiplied by the time in hours.

UAA (Utilized Agricultural Area) - is the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by the holding, regardless of the type of tenure or of whether it is used as a part of common land.

toe (tonnes of oil equivalent) - is a normalized unit of energy. By convention it is equivalent to the approximate amount of energy that can be extracted from one tonne of crude oil. It is a standardized unit, assigned a net calorific value of 41 868 kJ/kg and may be used to compare the energy from different sources.

Rural area – the urban-rural classification is based on data for 1 km^2 population grid cells. The cells with a population density that is (usually) less than 300 inhabitants per km^2 and/or settlements (small towns, villages) with a population of less than 5,000 inhabitants belong to the rural area (Eurostat 2018).

Local area - municipality (town, village) where company is located and neighbour municipalities around this location. Mainly, it is a distance about not more than 15-30 km from the localization of the company. It depends on countries and their Local Administrative Units (LAUs). However, Local Administrative Units are compatible with NUTS (Nomenclature of Territorial Units) (Eurostat 2019a).

SME – Micro, Small and Medium sized Enterprise. The belonging to this group of entrepreneurs depends on the number of employees, turnover and balance sheet total (Table 1)

Table 1. Definition of SMEs (EC 2018a)

Company Category	Employees	Turnover	Balance sheet total
Micro	< 10	< €2 million	< €2 million
Small	< 50	< €10 million	< €10 million
Medium-sized	<250	< €50 million	< €43 million

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1. Data collection

The data acquisition has been collected openly during the interview 2 with the person entitled to provide information related to economic, social and environmental issues of the company.

The participant (company) was provided with detailed information on the purpose the data are collected for. Moreover, the participant has been informed about the right to make corrections or provide additional data related to the performed interview 2.

The obtained data has been not verified by Rubizmo partners. The Rubizmo partners relied on the trust and best knowledge of the interviewed person. Therefore, the data provided and results should be treated with care.

Due to the sensitive nature of the data, most companies did not agree to the public disclosure of company data. Hence, the company names were hidden and the simplified letter term BC (Business Case) with the appropriate numbering was used. This coding method allowed the development of selected economic, environmental and social indicators and the presentation of results respecting the anonymity of individual enterprises.

2. Introduction

In the past, rural areas were mainly used for farming activities to meet the food needs of people. However, since the 1960s, more and more attention has been paid to other goals, such as: landscape protection, land protection and other activities that respect the environment and its natural resources (Paniangua and Baker 2010). Recently, development of rural areas has changed significantly, because rural areas have moved from being mostly a production space to a multifunctional consumption space for leisure, recreation, working and living (Halfacree 2006, Markantoni and van Hoven 2012). The territory of the rural areas in EU is varied in different regions. There are regions with less than 20% of rural area in total territory, but there are also regions where rural area are much more important and their surface is more than 80% of total territory (Figure 1).

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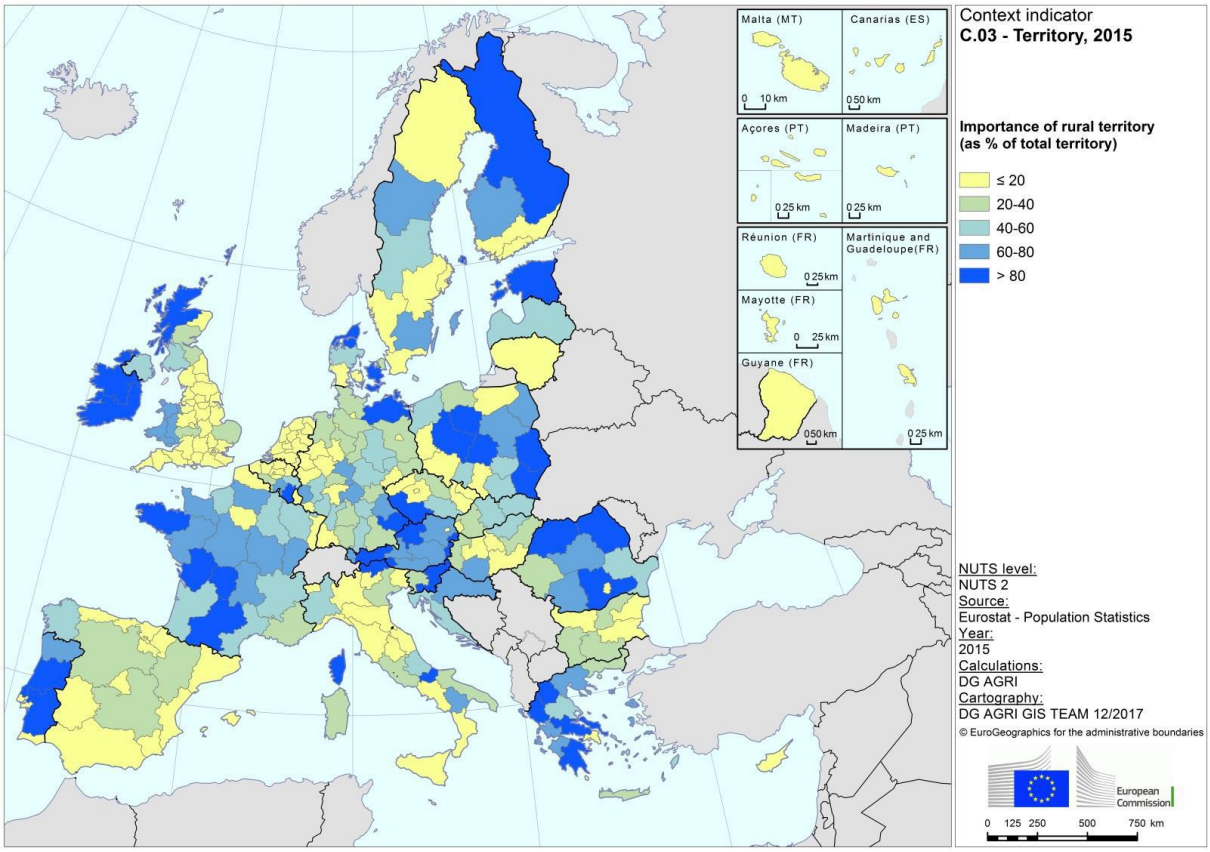

Figure 1. The importance of rural territory in NUTS 2 regions (EC 2018d)

The importance of rural areas is indicated by the fact that on average 44% of the EU's area is rural. Intermediate regions (urban-rural) are also 44%, and typical urban areas are only 12% of the total EU territory. Predominantly rural regions represent around 80% and more of the territory in Ireland, Finland, Estonia, Portugal, and Austria. From the other hand because of the classification method based on NUTS 3 regions, Cyprus, Luxembourg and Malta do not have got any predominantly rural region (EU 2018).

Nevertheless, rural areas are facing numerous challenges, such as a structural change in farming, environment pollution, a decrease in population or the natural disasters (Mölders 2013). Nowadays, entrepreneurship is a key factor of rural development that can help rural areas to develop better and overcome challenges they face. The notion of entrepreneurship is disputed in the study of rural development (Kitchen and Marsden 2009, Korsgaard et al. 2015, Niska et al. 2012, Müller and Korsgaard 2018).

Rural development is a part of socio-economic development of each economy and it is understood as the expansive processes through which rural areas change over time (McDonagh 2017). Rural areas are of great importance for development processes in society. This is due to the fact that rural areas perform many different functions: production (mainly agricultural and forestry), housing, recreation, construction, protection, water management, labor resource reservoir (Szymańska 2002).

The rural area is a large resource of natural and cultural assets. These resources are available to the entire society and constitute a strategic element in the structure of the economy. This means that rural development should be multi-functional. The challenge become to prevent degradation of the rural landscape, which is associated with maintaining production functions through the use of appropriate agricultural

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practices (Staniak 2009). In the face of changes in previous functions of agriculture and their visible shift from the sphere of production towards the sphere of consumption, the role of social factors conditioning these changes increases significantly. A holistic view of agriculture and rural areas reveals the complexity of the phenomenon, while pointing to the role of the most creative factor of change, which are people and their cultural heritage (Kozera 2012).

One of the most relevant factors towards success in the development and implementation of projects and innovative initiatives in rural areas is precisely the existence of innovative environment, characterized (among other factors), by a network of economic, institutional and social actors (Esparcia 2014). According to the contemporary paradigm in economics of innovation, new products are mainly the result of cooperation and interaction between actors forming innovation systems (Freeman 1991, Ozer and Zhang 2015, Di Minin and Rossi 2016). This concept arise from an interactive model of innovation, in which innovations are seen as a result of synergy between people and their environment. A driving force for cooperation and innovation is proximity, analysed not only from geographical, but also cognitive, organizational, social and institutional perspectives (Boschma, 2005). Regional cohesion is neither a necessary nor a sufficient condition for effective innovation process, however, it may play a complementary role in building and strengthening other dimensions that are important in the process of sustainable development based on interactive learning. Innovation system at the regional level is stimulated by the interactions between actors, proper cooperation, networking which creates the opportunities to apply policy instruments at the regional level incorporating 'joined up' approach considering economic, social and environmental factors.

Contemporary economic, environmental and social challenges mean that a new management model is being sought, which should be human-friendly, does not harm nature and helps to build social well-being. These activities must be based on a new development paradigm, which is one of the basic concepts for the development of today's civilization. It is about sustainable development, whose main goal is to improve the quality of life through economic growth, but maintaining social equality, biodiversity and the abundance of natural resources (Dobrzański 2002). The essence of the concept of sustainable development is the integration of three spheres: social, economic and environmental. When trying to assess sustainability, all these spheres and their integration should be taken into account (Gibson 2006).

Economic activity carried in accordance with the principles of sustainable development should give positive economic effects, while at the same time take care of the natural environment and limit excessive use of resources so that they can be used by the next generations. Sustainable development can also be seen as equalizing opportunities between regions with high development potential and weaker regions, which often include rural areas (Minta et al. 2013). Sustainable development means that economic growth leads to an increase in social cohesion (including, among others, reducing social stratification, equalizing opportunities, counteracting marginalization and discrimination) and improving the quality of the natural environment through, among others reduction of the harmful impact of production and consumption on the state of the environment and protection of natural resources (Piontek 2001). Sustainable development is important for rural areas, where human existence with nature is very close. Rural development activities cover three spheres: economic, social and environmental. These spheres should be interrelated and complementary without interfering with the socio-economic development of rural areas in accordance with the concept of sustainable

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development, striving for integrated order as the primary goal of this concept (Adamska 2015).

2.1. Sustainable development of rural areas

The sustainable development is a process taking place at the same time with the complex and sustainable agricultural development (Orboi 2012). Sustainable development is a multi-dimensional one including multi-faceted challenges concerning economic growth, social development as well as protecting natural resources and the environment (Robinson 2008). The concept of sustainability when applied to rural communities has tended to be used mainly in terms of the health of a local economy or the protection of a local culture. Official rural development documents adopt a holistic approach to the definition of sustainability that involves environmental, economic, social, and cultural dimensions. Supporting local development in rural areas considering social and cultural factors consists in building social capital by activating residents, contributing to the creation of new jobs in rural areas, as well as improving the management of local resources and their valorisation, among others through the creation and development of local processing incubators, local products, sales markets as well as the development of tourist, recreational, cultural and technical infrastructure.
In the European Union, 19% of the population (almost 97 million people) live in predominantly rural areas, 36% (almost 184 million people) in intermediate areas (urban-rural). The remaining 45% (around 228.5 million people) live in predominantly urban areas. At the same time, it is important to note the large differences between EU-15 and EU-N13. In the "new EU" countries, more than a third of the population lives in the rural area, and together with intermediate areas (urban-rural), it is 79% of the population. For comparison, in the EU-15 only 15% of the population lives in predominantly rural areas, and when counting the population together with urban-rural areas it is 49%. The exact quantitative distribution of population by different types of areas in the European Union is shown in Figure 2.

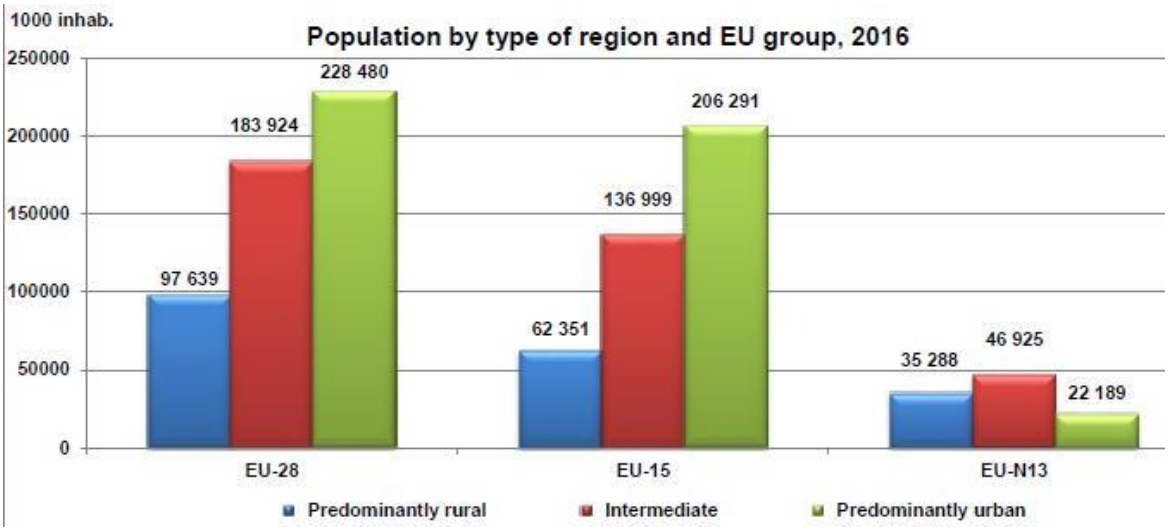

Figure 2. Population by type of region and EU group, 2016 (EC 2018d)

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Within these two broad areas there may be allied concerns for many separate facets of rural life, including maintenance of social networks, religion, heritage, agriculture and ecology. The concept of sustainable rural development is based on creating the proper conditions for the progress of various sectors and business environment and respecting the cultural and environmental values (Orboi 2012). Such approach shall constitute an integral part of a sustainable rural development paradigm where agricultural production is seen to be intimately combined with the socio-economic health of rural areas and is recognised as an economic sector that must be integrated into the wider economy (Morgan et al. 2010) giving the importance of forms of social, economic, and environmental capital. Strong multifunctionality is predicated on 'ensuring the protection of the environment, healthy farming and rural communities' (Wilson, 2008). Multifunctionality is perceived as a promising framework of analysis of transformations in agriculture and rural areas (Cairol et al. 2008, Knickel and Renting 2000, Wilson 2007). In such context, the development of multifunctionality has a strong impact on rural development, not only because it contributes to improving the reputation of the area, but also because the strong interconnection among the local actors, determined by the various activities, stimulates the productive capacity of the entire rural system. However, implementing the agricultural multifunctional system requires analytical tools capable of distinguishing the various territories, so as to be able to direct support on the basis of local characteristics (Casini et al. 2012).

The discussion about sustainable development is often based on measurable indicators that cover economic, social and environmental aspects. Relevant indicators and assessment based on them are treated as a powerful tool supporting the decision-making process (Waas et al. 2014, Czyżewski et al. 2018). Indicators help to visualize phenomena and identify trends, as well as simplify, quantify, analyze and convey complex and complicated information in an easier way (Singh et al. 2009). Indicators are needed for activity planning and policy making. Thanks to indicators, it is easier to analyze and study the relationships between variables, get to know the state of the environment or assess models of socio-economic development (UNESCO 1976). European Environment Agency defines 'an environmental indicator is a measure, generally quantitative, that can be used to illustrate and communicate complex environmental phenomena simply, including trends and progress over time — and thus helps provide insight into the state of the environment' (EEA 2005). Environmental indicators are key tools for assessing environmental trends, tracking achievement of goals and assessing policy effectiveness, and helping ordinary people understand what is happening in the environment (EEA 2014).

Indicators for environmental, social and economic analysis occur in a large number and the problem often arises which of them to choose and how to interpret the results of measurements. Therefore, indicators should take into account local specificities and the current context of the social, economic and environmental situation. In general, indicators can be used to educate farmers and other stakeholders about sustainable production, as well as to compare different economic actors in terms of social, economic and environmental aspects. The indicators also inform decision-makers (authorities) about the current state and trends of changes in the analyzed features, which may improve the political decision-making process. Furthermore, indicators can help and stimulate society to discuss the state of the environment, the economy and social relations (Hayati et al. 2010).

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2.2. Economic aspects in rural areas activities

Small- and medium-sized enterprises (SMEs) are one of the most important forces for economic development. Around the world, SMEs are recognized as the key entities in stimulation innovation, economic growth, job interactive model of innovation, in which innovations are seen as a product of interactions between people, organisations and their surroundings.
Two-thirds of people working in the EU are employed by the SME enterprises. It confirms that the SMEs are responsible for a significant share in employment on European Union labour market (Figure 3).

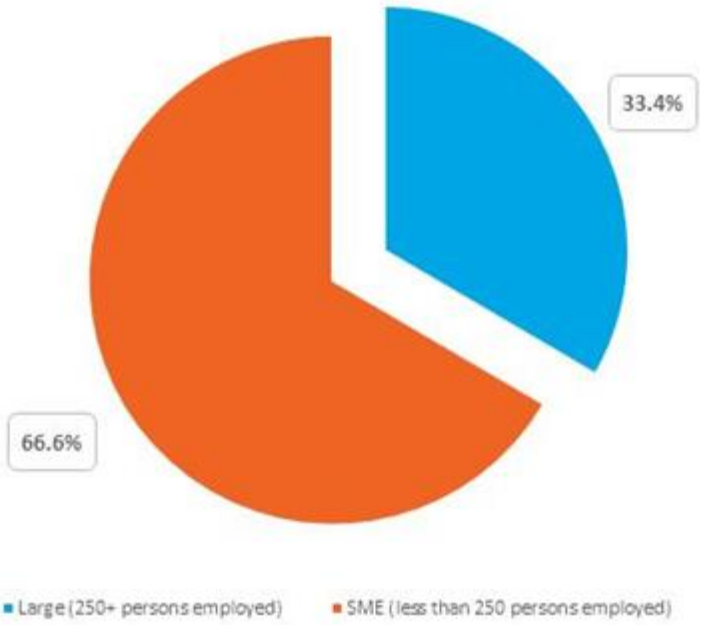

Figure 3 . Enterprise size class analysis of employment in EU-28 in 2016 (Eurostat 2019b)

In 2017, there were over 24.5 million enterprises in the EU. Above 93% of this number were Micro SMEs, Small SMEs were 5.8% and Medium-sized SMEs were 0.9%. Only 0.2% of total number of enterprises were large companies. The significant importance of SMEs is also demonstrated by the information that almost 57% of the total EU added value comes from this group of enterprises (Table 2).

Table 2. Number of enterprises (divided by size) in the EU-28 of non-financial business sector in 2017 and their value added and employment (EC 2018c)

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	Micro SMEs	Small SMEs	Medium-sized SMEs	All SMEs	Large enterprises	All enterprises
Enterprises						
Number	22,830,944	1,420,693	231,857	24,483,496	46,547	24,530,050
%	93.1%	5.8%	0.9%	99.8%	0.2%	100.0%
Value added						
Value in € (trillion)	1,525.6	1,292.1	1,343.0	4,160.7	3,167.9	7,328.1
%	20.8%	17.6%	18.3%	56.8%	43.2%	100.0%
Employment						
Number (in 000)	41,980,528	28,582,254	24,201,840	94,764,624	47,933,208	142,697,824
%	29.4%	20.0%	17.0%	66.4%	33.6%	100.0%

Cooperating firms may search technology broadly and may access the different types of resources and capabilities possessed by their partners either by having many partners that possess unique resources, or a few partners with diverse resource profiles (Gnyawali and Srivastava 2013). In practice, the SMEs create the opportunities to poverty reduction (Kamal and Flanagan 2014). SMEs play a significant role also in the rural development. Expansion of SMEs in rural areas is of great importance for the restructuring and modernization of the rural areas. It can influence on improving the living conditions, creation of new jobs and self-employment of labour force (Radović-Marković 2010). Especially, that there is a potential of manpower in rural areas. For example in every year of period 2006-2016, the employment rate on rural areas has been lower than in cities, towns and suburbs (Figure 4).

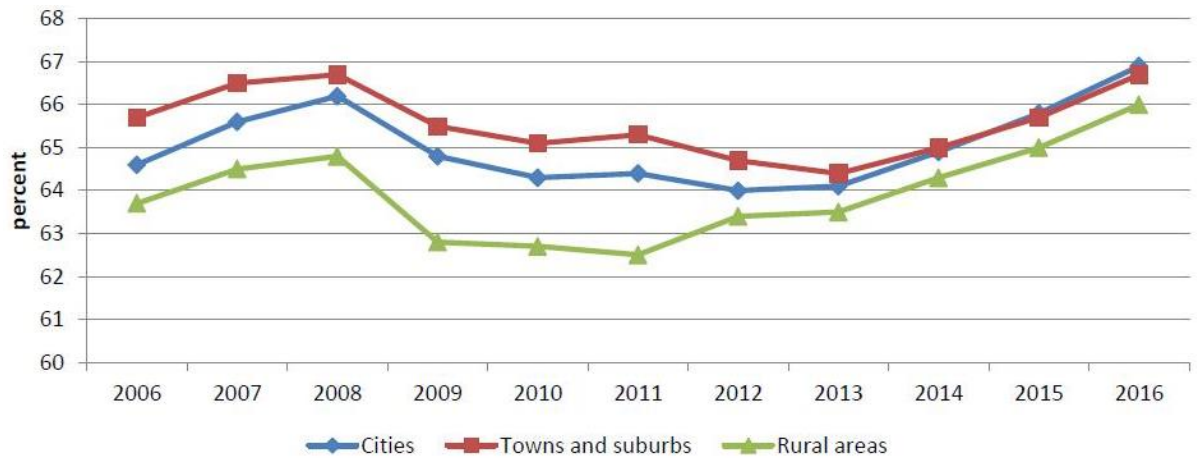

Figure 4. Employment rate in the EU-28 by degree of urbanisation (2016-2016) (EC 2018d according to Eurostat)

Rural areas have a much lower GDP per capita than urban areas. In rural areas, GDP per capita is around 71-72% compared to the EU average. By contrast, GDP per capita in urban areas is between 121 - 124% of the EU average (Figure 5).

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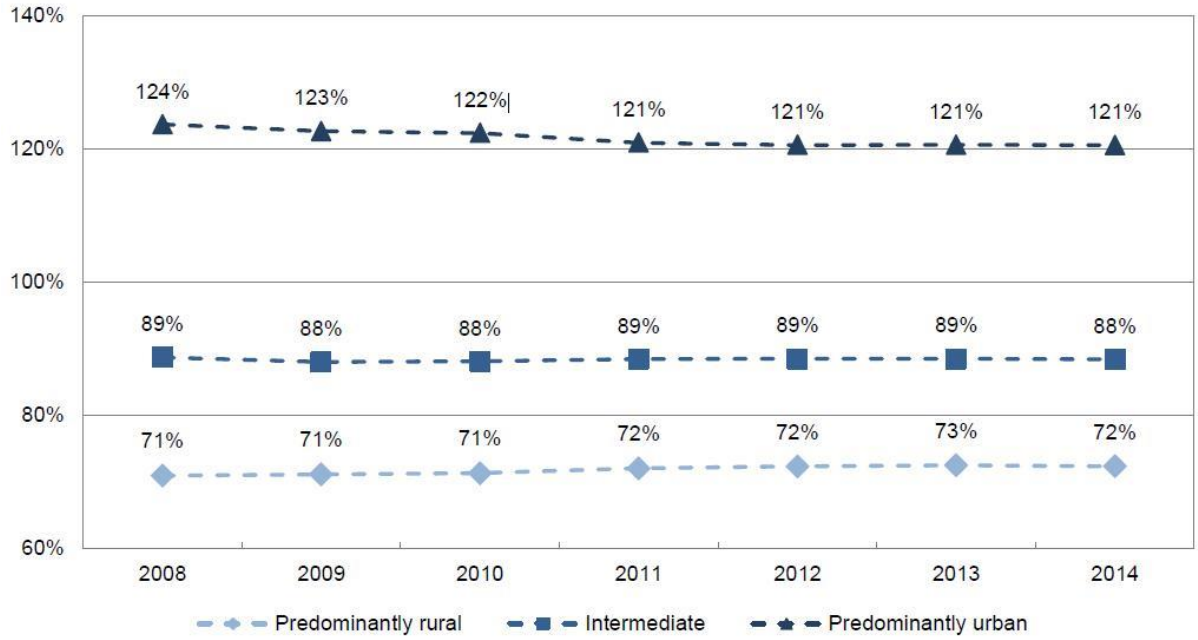

Figure 5. GDP per capita by type of region in relation to the EU-28 average – years 2008 - 2014 (EC 2018d according to Eurostat)

Significant differences between rural and urban areas can be seen in the structure of Gross Value Added according to the division into three sectors (primary, secondary, tertiary). The primary sector (including agriculture, forestry and fisheries) generates 4.2% of the value added in rural areas, and in urban areas it is only 0.6% (Figure 6). The specificity of rural areas means that the share of primary and secondary sector in creating GVA is there about 34.9% and is higher than in urban and urban-rural areas - in the case of intermediate it is 31.1%, and in predominantly urban areas it is 20,7% (EC 2018d according to Eurostat)).

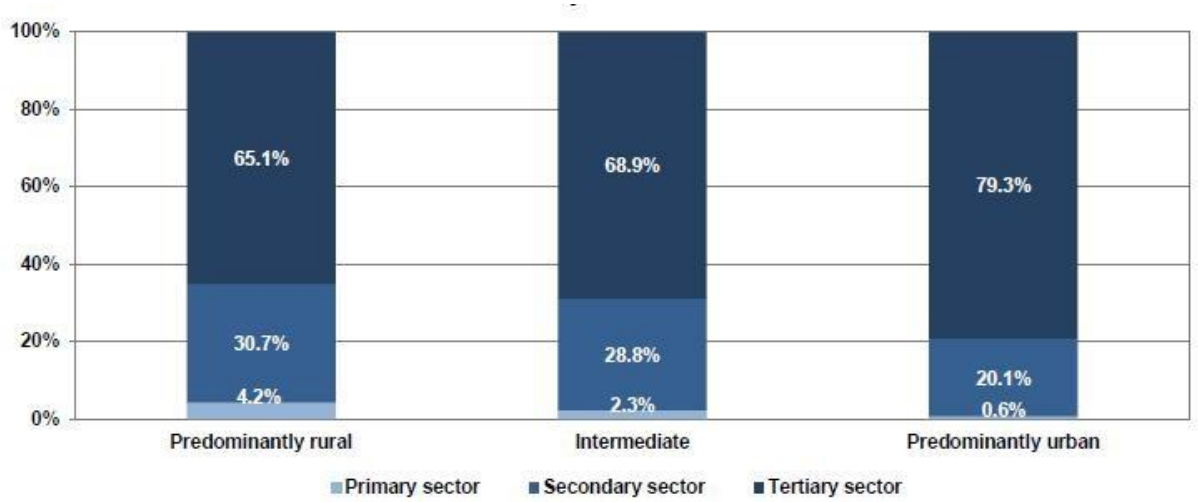

Figure 6. Gross value added by sector in EU-28, 2014 (EC 2018d according to Eurostat)

Observing data from the period 2005-2014, it can be seen that the share of employment in agriculture, forestry and fisheries is falling – especially on rural areas (Figure 7). This is a signal that the process of diversification is taking place in the

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economy and the importance of other sectors in the employment structure is growing.

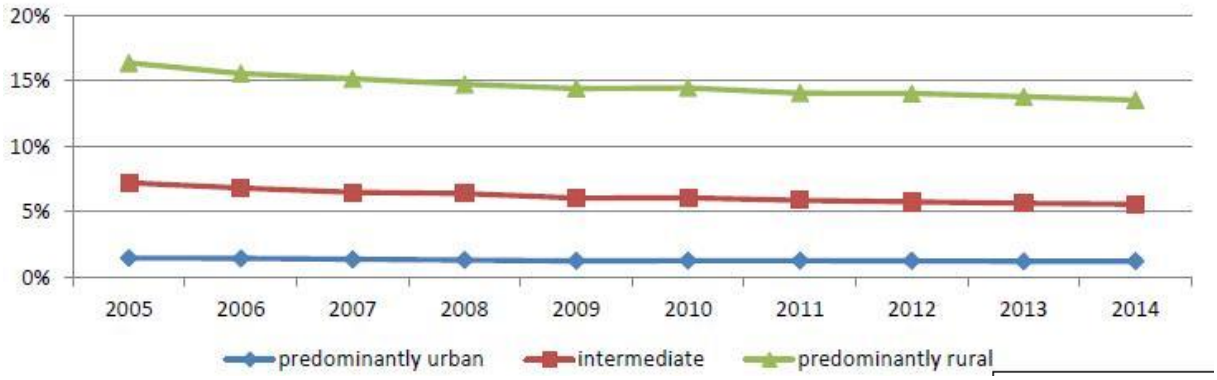

Figure 7. Share of employment in agriculture, forestry and fishing in the EU by type of region (EC 2018d according to Eurostat)

The share of agriculture, forestry and fisheries in rural economies is decreasing, which results in the search for other sources of income. For this reason, the importance of diversifying gainful activities in rural areas is growing. On average, in the EU, almost 7% of households had at least one other source of income. This diversification has varied levels in individual countries and for example in Cyprus it is only 1% of farms, and in Denmark it is about 60% (Figure 8).

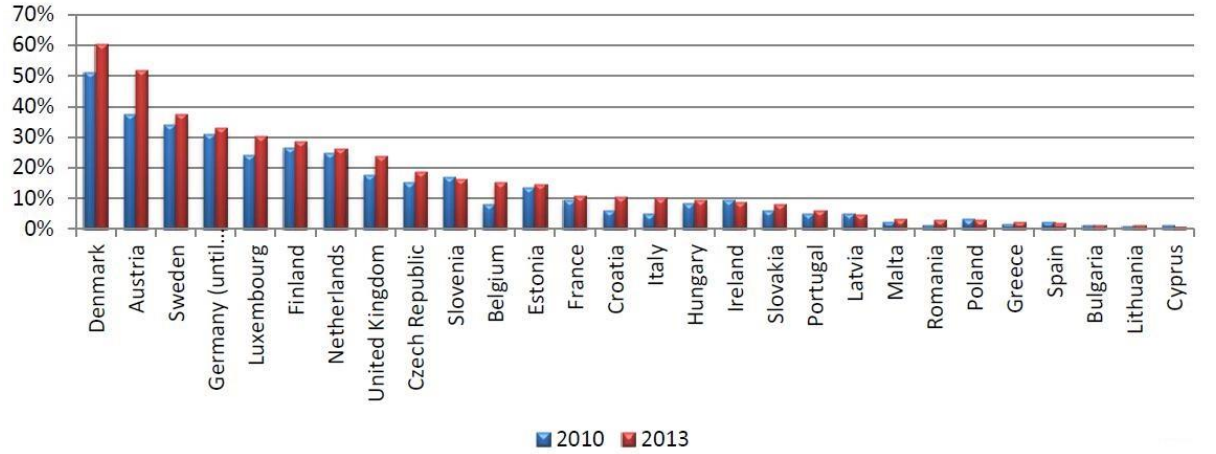

Figure 8. Percentage of holdings with other gainful activities (EC 2018d according to Eurostat)

Changes in the economic environment force the inhabitants to look for alternative directions of activity in rural areas. Typical agricultural activities cannot provide sufficient jobs and income that will satisfy the growing expectations of the population. Creating additional jobs, acquiring new sources of income and, in general, diversifying business activities can help reduce economic differences between rural and urban areas, which is why it is justified to support such initiatives and show examples of how this can be done successfully.

2.3. Environmental aspects in rural areas activities

From an environmental perspective, the innovative entrepreneurship development considerably contributes in generating the mainstream of good practices in terms of achievement of broader climate, sustainability and rural development local targets.

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Crucial effects can be registered in the energy and resource management sector, where the mainstream of these practices registers positive outcomes due to an improved efficiency in the use of resources, sustainable agriculture and the shift towards a more circular system. The EU's pursuit to achieve its 2020 energy and climate targets already delivered new industries, European jobs and increased technological innovation, driving down technology costs (A Clean Planet for all, A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, EC 2018b). In European Union in 2014 the Green Action Plan (GAP) for SMEs was adopted and its main aim is to present opportunities how to turn environmental challenges into business opportunities. One of the objectives of GAP is to prevent environmental damage and moving towards a low carbon economy is a societal challenge which also offers new business opportunities for enterprises that bring green products and services to the market. SMEs need a favourable business environment in which green ideas can be easily developed, financed and brought to the market (EC 2019).
The care for the natural environment is also reflected in the environmental awareness of consumers and their preferences when purchasing goods or using services. It means that the companies should control their impact on the environment or consider some changes in their activity to follow the expectation of the consumers. The conclusion for enterprises is that we should make products and services with positive influence on environment because this is a strong need of customers and they want to buy and pay for such a kind of goods. Ignoring this trend may cause problems with the sale of products that are not environmentally friendly. This is very important because based on GlobalData survey we know that 46% of European customers are searching for products friendly for environment or animal welfare and only 12% of respondents do not care about this aspects (Figure 9).

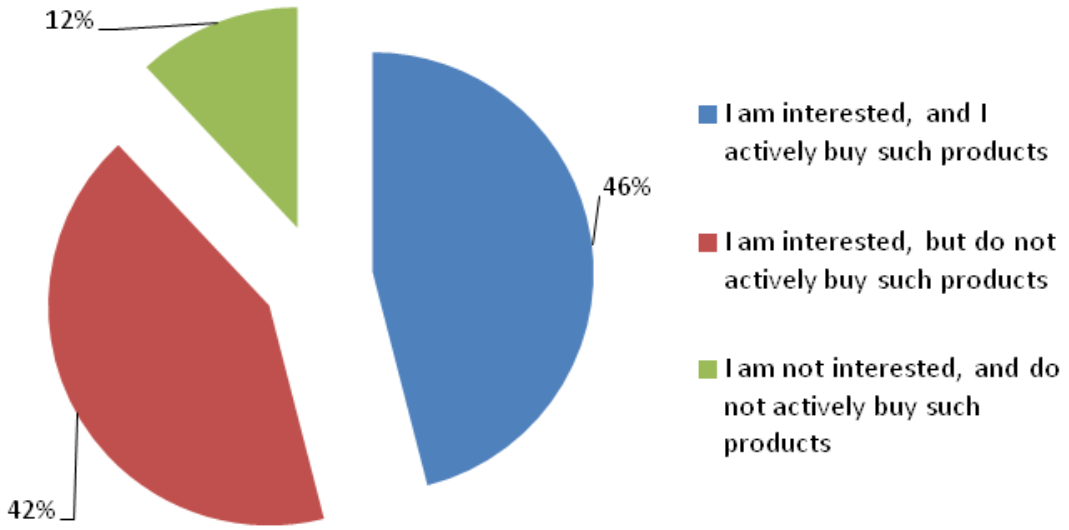

Figure 9. Preferences of the European consumers about buying of products that are better for the environment or animal-friendly (GlobalData 2019)

The capacity of plants to absorb the greenhouse gas CO2 and soils to sequester carbon should favour agriculture as a sector that could in the long term theoretically provide enough food in a climate neutral way and, in the short term, even sequester more CO2 than it emits. Unfortunately, the agricultural sector is one of the world's most significant sources of anthropogenic greenhouse gas emissions (Figure 10). The

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main activities responsible for the devastating carbon footprint of food production are the clearing of forests and the conversion of grassland into arable land. Other drivers are the emission of extremely potent greenhouse gases such as nitrous oxide from the decomposition of mineral fertiliser, methane from rice production and the digestive process of ruminants in livestock farming.

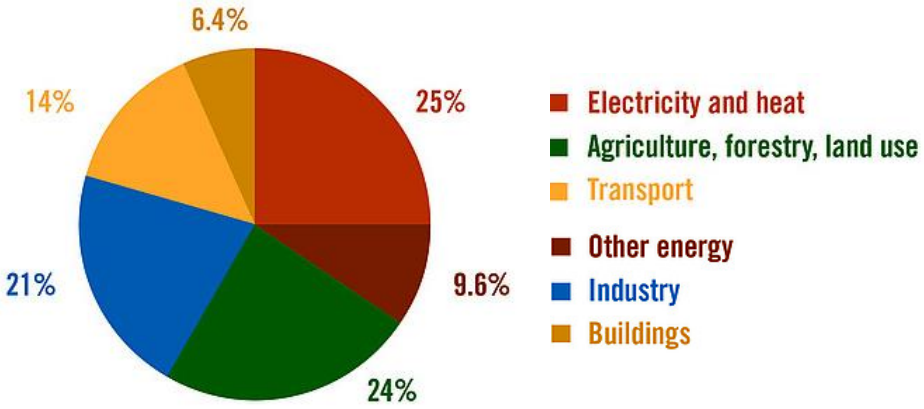

Figure 10. The anthropogenic greenhouse gas emissions by sector (IPCC, 2014)

In Europe, to face with a problem of environment protection, a set of 28 Agri-Environmental Indicators (AEIs) was developed by the Commission in close collaboration with Member States following the last Commission Communication on Agri-environmental indicators of 2006. These indicators track the integration of environmental concerns into the Common Agricultural Policy (CAP) at EU, national and regional levels. Among these indicators should be highlighted such as energy use, water abstraction, renewable energy production, and greenhouse gases.
The EU's agricultural sector accounted for 10% of the EU's total GHG emissions (Figure 11) in 2015, producing 426 473 kilotonnes of CO2 equivalent of non-CO2 greenhouse gases (Eurostat 2017b).

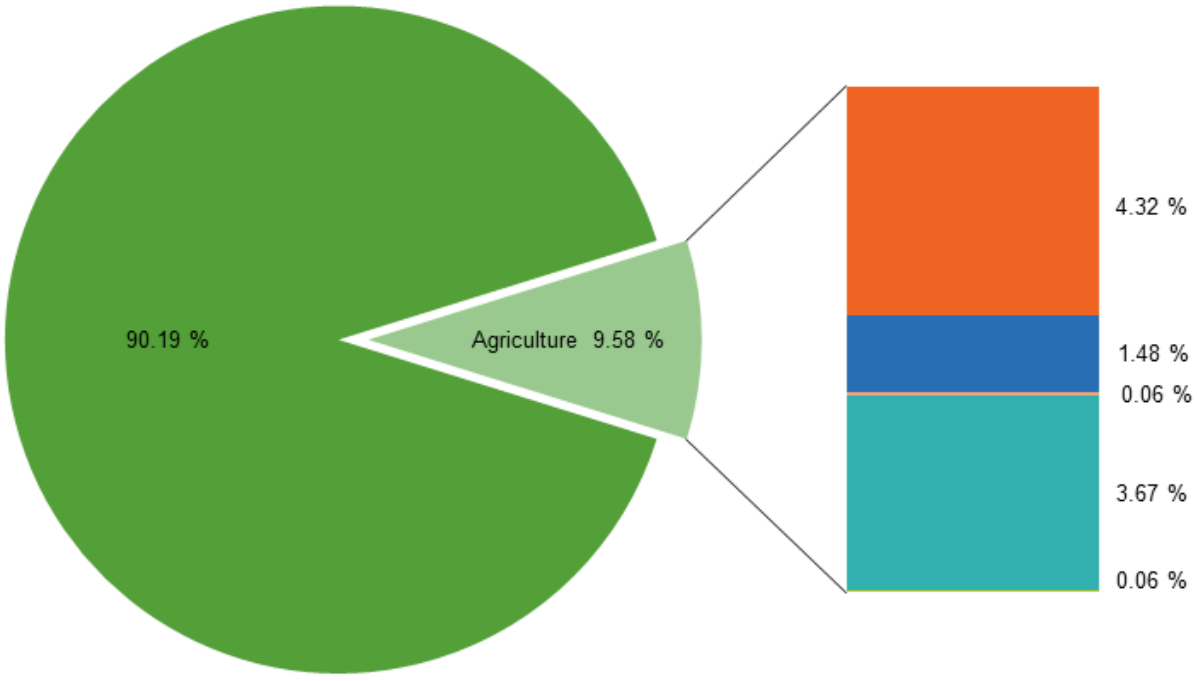

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Figure 11. Contribution of agriculture to total GHG emissions in EU-28 in 2015 (Eurostat 2017b)

Concerns about climate change have increased interest in agricultural efficiency and energy usage. Modern agriculture requires energy input at all steps of agricultural production. Direct usages of energy include farm machinery, water management, irrigation, cultivation, or harvesting processes. Additional energy is required for food and waste processing, storage and in product transport to final consumers. The final energy consumption by the agricultural sector in EU-28 is ca. 2.2% (Eurostat 2016a). However, agriculture is a disproportionately high contributor to climate change, adding 10% of total EU-28 greenhouse gas (GHG) emissions [EEA 2017). Agriculture, forestry, and fishery have the second highest GHG intensity factor (the ratio of greenhouse gas emissions to gross value added) in the EU-28. In 2014, this index was estimated to be 2.7 kg of CO_2 equivalents per euro (Eurostat 2017a). Therefore, the activity of the companies (business cases) in rural areas or related to agricultural activity should be focused not only on financial profits but also on low negative impact on the environment, especially CO_2 emission. It should be marked that energy use by agriculture across EU countries is unevenly distributed (Figure 12).

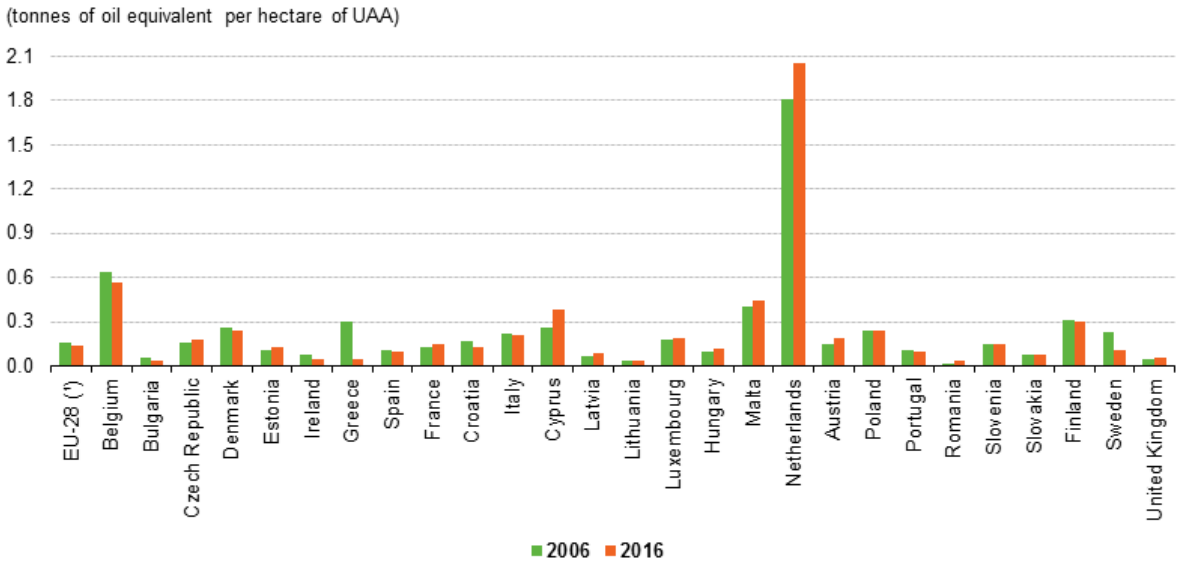

Figure 12. Energy consumption by agriculture in EU countries (Eurostat 2016b)

The use of machinery and mineral fertilisers enable to increase agricultural productivity and food supply. However, agriculture, as an energy user, contributes also to the depletion of non-renewable energy sources (Figure 13), and to global warming through energy-related emissions (like CO2 emissions from utilisation of fossil fuel). In contrast, agriculture is also an energy producer through renewable resources such as biogas, biomass, wind and solar energy. Moreover, the share of RSE (Renewable Energy Sources) in agricultural sector is growing (Figure 14).

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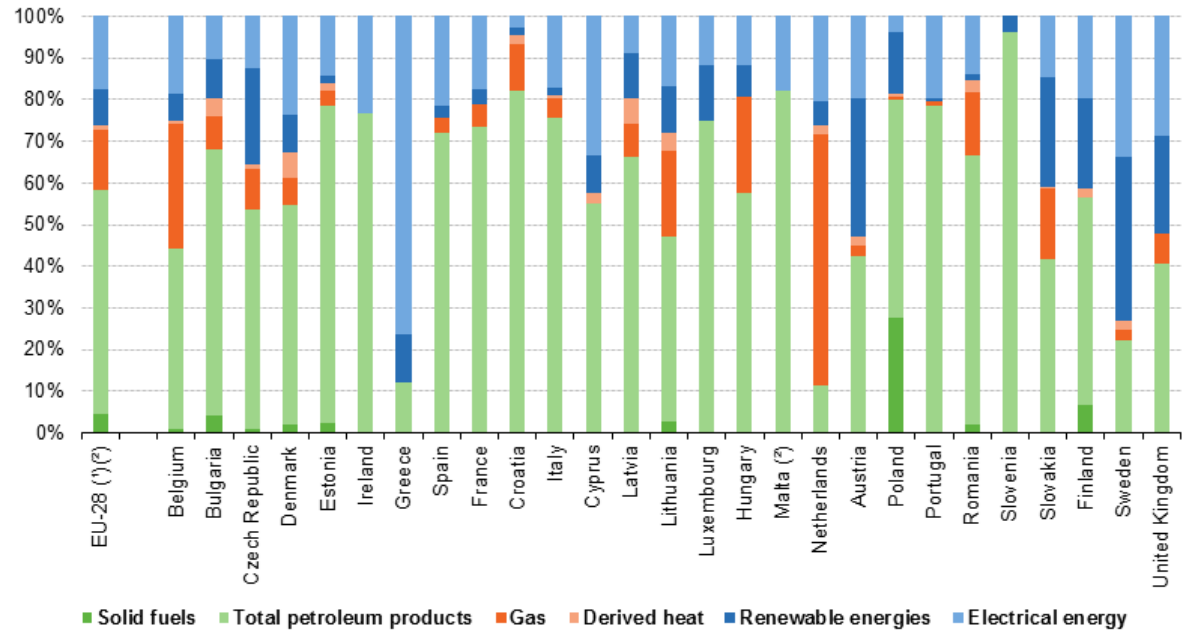

Figure 13. Share of fuel type in energy consumption by agriculture in 2016 (Eurostat 2016b)

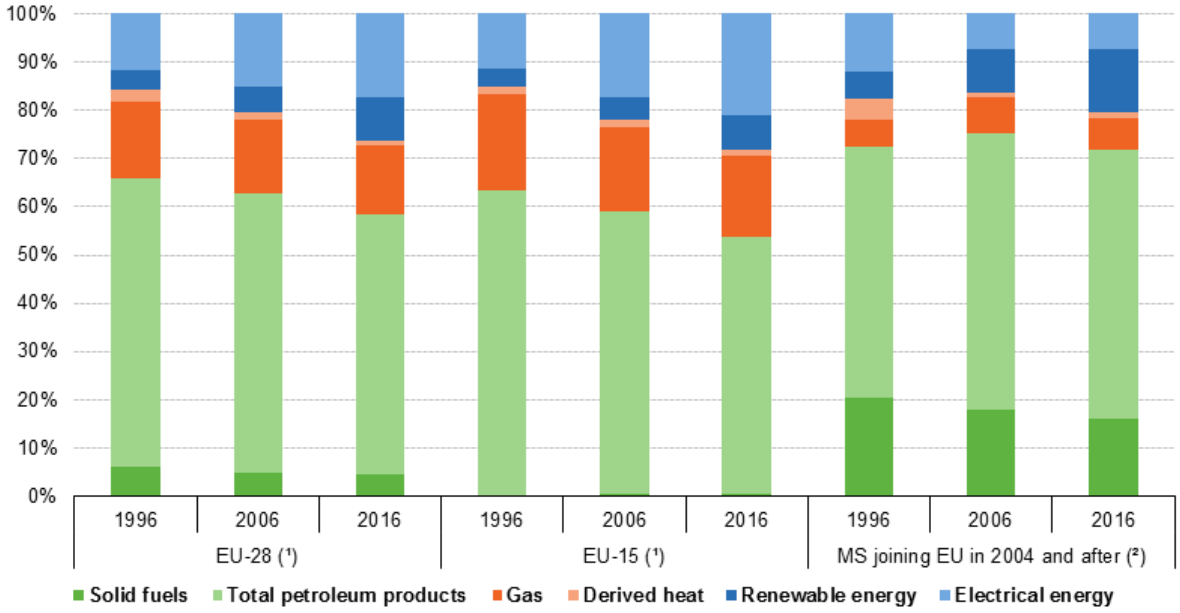

Figure 14. Share of fuel type in energy consumption by agriculture in years 1996 and 2016 (Eurostat 2016b)

Agriculture is also a significant user of water in Europe, overall accounting for around a quarter of total freshwater abstracted (EEA 2012). Predominantly this water is used for irrigation to enhance the yield and quality of crops. In large parts of southern France, Spain, Portugal, Italy, Greece and Cyprus, irrigation enables crop production where water would otherwise be the limiting factor (EEA 2012). In more humid and temperate regions of Europe, irrigation helps regulating the seasonal variability in water availability to better match the agricultural needs. The total abstraction of freshwater across Europe (excluding Turkey) is around $182 \cdot 10^9$ m^3 per year. Overall, 39% of the total abstracted is for energy production, 22.5% for agriculture, 26.5% for the public water supply and 12% for industry, although strong regional variations are

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apparent (EEA-ETC 2012). As a result, on 23 October 2000, the "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" or, in short, the EU Water Framework Directive (or even shorter the WFD) was finally adopted (EU WFD 2000) to point the importance water saving and force actions to reduce water consumption in all sectors.

2.4. Social aspects in rural areas activities

There are different analysis taking into consideration social aspects. The main methods are social life cycle assessment (SLCA) and social return on investment (SROI).
The SLCA is a social impact (and potential impact) assessment technique that aims to assess the social and socio-economic aspects of products and their potential positive and negative impacts along their life cycle encompassing extraction and processing of raw materials, manufacturing, distribution, use, re-use, maintenance, recycling, and its final disposal (Benoit and Mazijn 2009). The social aspects do not relate strictly to the business case (company) but also to the whole surrounding/environment in which the company exists (Figure 15).

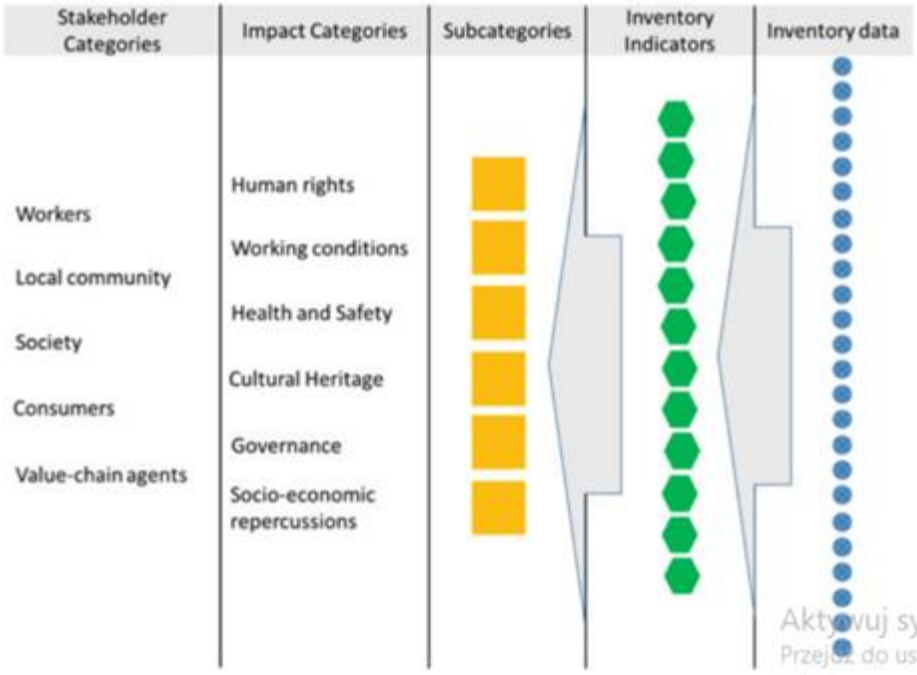

Figure 15. Classification of social impact categories related to the social impact pathway (Benoit and Mazijn 2009)

The SROI comes from ROI analysis (Return On Investment), which are quite straightforward and commonplaces within many organizations all around the world. The SROI analysis add to typical financial analysis another, new activities evaluated as “social value”. Social value refers to social, environmental and economic costs and benefits taken into consideration simultaneously. By taking these values into consideration the social impacts may be evaluated, which are consequences of

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positive or negative pressures on social endpoints (i.e. well-being of stakeholders). The general formula of SROI can be presented as:

$$SROI = \frac{SB}{INV} \quad (1)$$

where:
SROI – Social return on investment, -,
SB – Sum of social benefits, EUR,
INV – Annual (yearly) Investment, EUR.

The SROI indicator is dimensionless and informs how much social benefits will be created for 1 EUR of investment. For instance, if the SROI=3, it means, that 1 EUR invested in the business case (company, project etc.) may result in 3 EUR of social benefits. However, it should be underlined, that in fact there is no direct monetary additional incomes as in economic calculation. These additional two Euros are only the illustration of the increase of society wellness, health, satisfaction etc.. In the specific case, the economic analysis might have negative results (NPV<0, no profits for entrepreneurs without the external support), whereas the performed social analysis can results in very positive effects (i.e. SROI=24). In this case, the subsidies might be recommended and justified, but social benefits should remain only a decision supporting factor. Not every social benefit can be taken to the social analysis (SROI) calculation. The calculation is limited to the indicators which can be evaluated in EUR (have a financial value). Additional social benefits which cannot be reflected in EUR are also important and should be taken into consideration as well, but they may serve only as other supporting factors. Based on (Clark et al. 2008) the general value chain for evaluated business cases is shown in Figure 16.

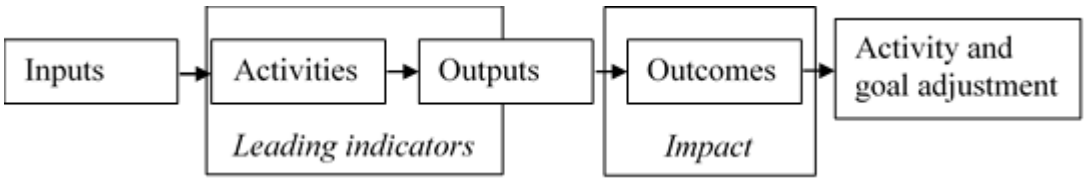

Figure 16. Impact value chain (Clark et al. 2008)

Inputs (Figure 16) includes all the elements which are put into venture (for example, machinery, land, logistics, buildings, and know – how). Activities are venture's primary activities, like: goods production, services, etc.. Impact value chain allows to differentiate between outputs and outcomes. Outputs are results that a company can measure or assess directly. Outputs could include the number of workplaces created, saved energy or benefits of the use of renewables, associated with sustainable development. Social impact indicators are specific operational outputs that can be measured by meeting their social benefit objectives. Outcomes are the changes in society. Impact refers to the portion of the total outcome as a result of the business case (activity of the company).
There can be also negative aspects as well, for instance a danger of accidents or pollutants emission increase caused by the activity of the company. Social outputs are all transactions and activities coming from logistic chain implementation (negative like injuries, and positive like job creation) which value can be measured and expressed in Euro. According to the SROI analysis there are also other effects coming from outputs, called as "social outcomes". Social outcomes are indirect benefits from enterprise like: integration of society thanks to the new business case

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(company), increase of local society's environmental awareness, improved welfare thanks to new jobs, rise of practical skills of local community (by involving the society to new tasks and responsibilities), better health (lower GHG emission), or finally higher responsibility of consumers health and safety, because consumers and producers belong to the same local community. In Figure 17 the exemplified connections between different actors of the given activity and their interactions are presented.

The term "social impact" is defined as the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society (ICPGSIA 2003). The origin of Social Impact Assessment (SIA) comes from the environmental impact assessment (EIA) model, which were first implemented in the 1970's in the U.S, as a method to assess the impacts on society of different projects (Barrow 2000). The term also includes "cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society" (ICPGSIA 2003). The common opinion about SROI is, that this analysis could be ambiguous, while it is basing on social value, which refers to social, environmental and economic costs and benefits.

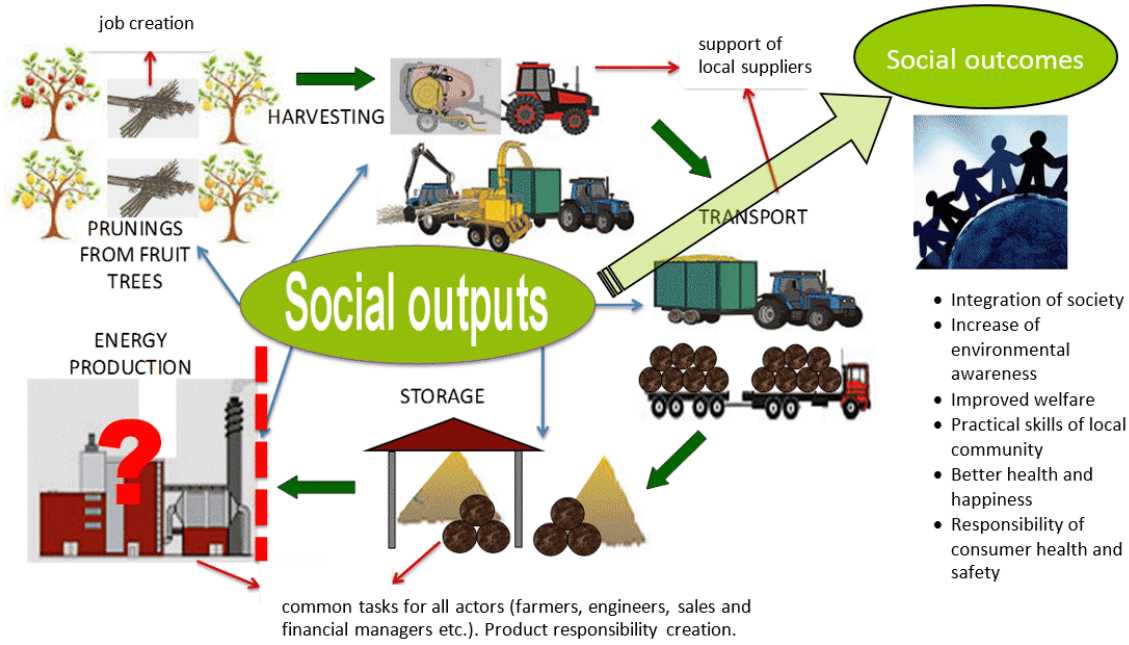

Figure 17. The social scope within the EuroPruning project (adapted from Dyjakon et al. 2014)

The social criteria are concerned with the ways in which society (and particularly citizens of rural areas) would be influenced by the new business case (activity of the company) as part of their everyday lifestyles. As a result, in described methodologies the main groups of social criteria are (Lewandowski et al. 2018):

- human rights,
- labour practices and decent work conditions,
- social,
- product responsibility.

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Human rights are taking into consideration problems like: non-discrimination (composition of employees according to gender, age, disabled, part-time workers), freedom of association and collective bargaining or child labour threat, including hazardous child labour.
Labour practices and decent work conditions are very important for employees. Wages, including equal remuneration on diverse groups, regular payment, length and seasonality of work and minimum wages, benefits, including family support for basic commodities and workforce facilities, and finally physical working conditions, including rates of injury and fatalities, nuisances, basal facilities and distance to workplace will highly affect the social impact.
To the social aspects belong: development support of rural areas and positive actions towards society, including job creation, support of local suppliers, general support of developing countries, investments in research and development, infrastructure, and local community education programs. Additionally, the local community acceptance (such as complaints from society, and presence of communication channels) and ensuring of commitment to sustainability issues from and towards business partners seems to be vital, as well.
The product responsibility is difficult to estimate, but it influences the social impact, as well. It is important to society the integration of consumer health and safety concerns in product, such as content of contaminants, other threats/benefits to human health due to the product/service use.

3. Assumptions Used In The Analysis

One of the key assumptions during the implementation of the task was to enable both the entrepreneur himself and other interested parties in a relatively easy way to assess the operation of the project not only in the economic context, but also taking into account the potential impact on the natural environment and the social dimension of its functioning in a rural area. Therefore, in this study the data related to the consumption of electricity, heat, water, energy production from renewable sources, as well as fuel consumption for transport purposes were collected. The listed parameters are possible to be obtained by the owner of the enterprise on their own, and their application in the proposed indicators allows to identify trends or changes in the areas discussed. As a result, they can support the decision-making process regarding the further development of the enterprise, taking into account economic, environmental and social aspects. Thanks to this, the entrepreneur may be more aware of the decisions taken, which should favour the implementation of sustainable development principles in rural areas in practice.

Due to the main objective of the implemented project focusing on the presentation and assessment of replicable business models throughout Europe, it was necessary to harmonize environmental indicators on a global scale, hence the following assumptions were made:

- the analysed business models operate in a given location because of the potential / attractiveness of the rural area, and not because of the source of electricity supplied by the external power grid operator (depending on the capabilities and potential of the country).
- for electricity production the value of the CO_2 equivalent includes the whole life cycle of the applied technology (table 3),

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Table 3. Life cycle CO_2 equivalent for electricity production from selected technologies (IPCC 2014a, IPCC 2014b)

Electricity providing technology	Life cycle CO2 equivalent
	gCO2eq/kWh
Coal (PC)	820
Biomass (Cofiring with coal)	740
Biomass (Dedicated)	230
Wind Offshore	12
Wind Onshore	11
Solar PV (Utility scale)	48
Solar PV (Rooftop)	41
Geothermal	38
Concentrated solar power	27
Hydropower	24
Gas (combined cycle)	490
Nuclear	12

- as in many EU countries (and outside Europe) the coal is still a main fuel for electricity production, the CO2 indicator for coal was adopted,
- the efficiency of electricity production from coal in power plants is 35%,
- for individual investments in renewable energy sources the value of the GWP (Global Warming Potential) indicator (expressed as equivalent of kilograms of CO_2 released during 1 kWh production) for an applied technology was adopted, accordingly.
- for heating the value of the CO_2 equivalent includes the whole life cycle of the applied technology (table 4),

Table 4. Life cycle CO_2 equivalent for heat production from selected technologies (WEC 2014, IEA 2011, TPOST 2016, JRC 2017)

Heat providing technology	Life cycle CO2 equivalent	
	gCO2eq/kWh	gCO2eq/GJ
Coal boiler	520	1.87
Oil boiler	430	1.55
Natural gas boiler	295	1.06
Biogas boiler	60	0.22
Biomass boiler	100	0.36
Solar thermal	60	0.22
Groud heat pumps	130	0.47
Air heat pumps	170	0.61
Geothermal	50	0.18
Electricity (from coal)	820	2.95

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- for petrol and diesel used in transportation the value of the CO_2 equivalent includes the whole life cycle of the applied technology, and amounts (Helmersa et al. 2019, Kawamoto et al. 2019): 2.45 $kgCO_2eq/dm^3$ for diesel, 1.74 $kgCO_2eq/dm^3$ for petrol,
- the cost of avoided (reduced) CO_2 emission to the environment is 20 EUR/tCO_2 (ERCST 2019),
- the lower heating values for different energy sources are shown in table 3,

Table 5. Lower heating values for different fuels (Francis 1980, Kordylewski et al. 2008)

Type of fuel	Unit	Lower Heating Value (LHV)
Coal	MJ/kg	26.0
Light oil	MJ/kg	42.6
Natural gas	MJ/m3	36.1
Propane	MJ/m3	92.0
Butane	MJ/m3	128.5
LPG	MJ/kg	46.0
Biomass	MJ/kg	18.0
Diesel (for cars)	MJ/dm3	36.1
Petrol (for cars)	MJ/dm3	38.0

Some of indicators are common for all considered aspects: environmental, economic and social analysis. For instance, CO_2 reduction influences the environmental effect (i.e. decrease of global warming), economic analysis (cost of 1 Mg of CO_2 emission to the atmosphere), and social (i.e. health of society).

4. Economic, Social And Environmental Indexes

To perform a common evaluation of the proposed business cases different indicators were applied.

4.1. Economic indexes

4.1.1. Gross profit

The gross profit is determined from the following equation:

$$GP = TR - TC \tag{2}$$

where:
GP – Gross profit, EUR,
TR – Total revenues, EUR,
TC – Total costs, EUR,

4.1.2. Total cost level indicator

The total cost level indicator is determined from the following equation:

$$TCL = \frac{TC}{TR} \times 100\% \tag{3}$$

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where:
TCL – Total cost level indicator, %,
TC – Total costs, EUR,
TR – Total revenues, EUR.

4.1.3. Gross profit margin

The gross profit margin is determined from the following equation:

$$GPM = \frac{TR-TC}{TR} \times 100\% \quad (4)$$

where:
GPM – Gross profit margin, %,
TC – Total costs, EUR,
TR – Total revenues, EUR.

4.1.4. Gross return on assets

The return of assets is determined from the following equation:

$$GROA = \frac{GP}{AV} \times 100\% \quad (5)$$

where:
GROA – Gross return on assets, %,
GP – Gross profit, EUR,
AV – Assets value, EUR.

4.1.5. Share of sales to the local market in the value of revenues

The share of sales to the local market in the value of revenues is determined from the following equation:

$$SSLM = \frac{TR \times LMS}{TR} \times 100\% \quad (6)$$

where:
SSLM – Share of sales to the local market in the value of revenues, %,
TR – Total revenues, EUR,
LMS – Share of sales to the local market, -.

4.1.6. Work productivity

The work productivity is determined from the following equation:

$$WP = \frac{TR}{TNoE} \quad (7)$$

where:
WP – Work productivity, EUR/prs,
TR – Total revenues, EUR,
TNoE – Total number of employees (related to FTE), prs.

4.1.7. Work gross profitability

The work gross profitability is determined from the following equation:

$$WGP = \frac{GP}{TNoE} \quad (8)$$

where:

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WGP – Work gross profitability, EUR/prs,
GP – Gross profit, EUR,
TNoE – Total number of employees (related to FTE), prs.

4.2. Social indexes

4.2.1. Share of external employees

The share of external employees (no family members) in the employment structure is determined from the following equation:

$$SEE = \frac{NEE}{TNoE} \times 100\% \quad (9)$$

where:
SEE – Share of external employees, %,
NEE – Number of external employees (FTE), prs,
TNoE – Total number of employees (FTE), prs.

4.2.2. Share of family members

The share of family members in the employment structure is determined from the following equation:

$$SFM = \frac{NoFM}{TNoE} \times 100\% \quad (10)$$

where:
SFM – Share of external employees, %,
NoFM – Number of family members (FTE), prs,
TNoE – Total number of employees (FTE), prs.

4.2.3. Share of employees from rural area

The share of employees from rural area in the employment structure is determined from the following equation:

$$SERA = \frac{NERA}{TNoE} \times 100\% \quad (11)$$

where:
SERA – Share of employees from rural area, %,
NERA – Number of employees from rural area, prs,
TNoE – Total number of employees (related to FTE), prs.

4.2.4. Share of employees from local area

The share of employees from local area in the employment structure is determined from the following equation:

$$SELA = \frac{NELA}{TNoE} \times 100\% \quad (12)$$

where:
SELA – Share of employees from local area, %,
NELA – Number of employees from rural area, prs,
TNoE – Total number of employees (related to FTE), prs.

4.2.5. Social impact of non-discrimination index in the company

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The indicator refers to the balance in gender employment (women, men) and a 50/50 share is preferred. Deviation from the optimal value causes the indicator to decrease. For instance, if the employment's share of the men in the company is 60%, the difference between median and real value is M_{ND}=10%. As a result, the balance in gender employment is not W_{ND}=1.0, but W_{ND}=0.8 (as the difference between the genders shares in the employment is 20%. The social return on investment in terms of non-discrimination in employment structure in the company is determined from the following equation:

$$SROI_{ND} = W_{ND} \times \frac{TS}{INV} = \frac{100\% - 2 \times M_{ND}}{100\%} \times \frac{TS}{INV} \quad (13)$$

where:
$SROI_{ND}$ – Social return on investment in terms of non-discrimination in employment, -,
W_{ND} - Balance in gender employment, -,
TS – Total salaries in the company, EUR,
M_{ND} – difference between median and real value of the discrimination in employment, %,
INV – Yearly investments, EUR.

4.2.6. Social impact of job creation index in the company

The social return on investment in terms of **job creation by the company** is determined from the following equation:

$$SROI_{JC} = \frac{TS}{INV} = \frac{TNE \times A_S}{INV} \quad (14)$$

where:
$SROI_{JC}$ – Social return on investment in terms of job creation, -,
TS – Total salaries in the company, EUR,
TNE – Total number of employees (FTE), prs.
A_S – average yearly salary in the company, EUR/prs.,
INV – Yearly investments, EUR.

4.2.7. Social impact of income for owner/entrepreneur

The social return on investment in terms of income for owner (company) is determined from the following equation:

$$SROI_{IO} = \frac{GP}{INV} \quad (15)$$

where:
$SROI_{IO}$ – Social return on investment in terms of income for owner (company), -,
GP – Gross profit, EUR,
INV – Yearly investments, EUR.

4.2.8. Social impact of manpower from rural area

The employment of manpower from rural area is crucial to stop the migration of people to the urban area. Therefore, the optimal value of the index is 100% (all employees are from rural area). The social return on investment in terms of manpower from rural area is determined from the following equation:

$$SROI_{MLA} = \frac{W_{MLA}}{100\%} \times \frac{TS}{INV} \quad (16)$$

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where:
$SROI_{MLA}$ – Social return on investment in terms of manpower from rural area, -,
W_{MLA} – Index of manpower from rural area, %,
TS – Total salaries in the company, EUR,
INV – Yearly investments, EUR.

4.2.9. Social impact of manpower from local area

The employment of manpower from local area is very important in terms of the unemployment and the increase of the live standard of the local society. Therefore, the optimal value of the index is 100% (all employees are from local area). The social return on investment in terms of manpower from local area is determined from the following equation:

$$SROI_{LA} = \frac{W_{LA}}{100\%} \times \frac{TS}{INV} \quad (17)$$

where:
$SROI_{LA}$ – Social return on investment in terms of manpower from local area, -,
W_{LA} – Index of manpower from local area, %,
TS – Total salaries in the company, EUR,
INV – Yearly investments, EUR.

4.2.9. Social impact of CO_2 reduction

The reduction of CO_2 emission thanks to the investment in production of heat and/or electricity from renewable energy sources (RES) influences the social benefits as it improves the environment and the company's image (environment protection). The social return on investment in terms of CO_2 reduction is determined from the following equation:

$$SROI_{CO2} = \frac{AE_{CO2} \times C_{CO2}}{INV} \quad (18)$$

where:
$SROI_{CO2}$ – Social return on investment in terms of manpower from local area, -,
AE_{CO2} – Avoided emission of CO_2 equivalent per year, tCO_2eq,
C_{CO2} – Cost of CO_2, EUR/tCO_2eq,
INV – Yearly investments, EUR.

4.2.10. Total social return on investment

The total social return on investment in terms of considered parameters is determined from the following equation:

$$SROI = SROI_{ND} + SROI_{JC} + SROI_{IO} + SROI_{MLA} + SROI_{LA} + SROI_{CO2} \quad (19)$$

where:
SROI – Total social return on investment, -,
$SROI_{ND}$ – Social return on investment in terms of non-discrimination in employment, -,
$SROI_{JC}$ – Social return on investment in terms of job creation, -,
$SROI_{IO}$ – Social return on investment in terms of income for owner (company), -,
$SROI_{MLA}$ – Social return on investment in terms of manpower from rural area, -,
$SROI_{LA}$ – Social return on investment in terms of manpower from local area, -,

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$SROI_{CO2}$ – Social return on investment in terms of manpower from local area, -,

4.3. Environmental indexes

4.3.1. Energy use in revenues production

The energy use in revenues production is determined from the following equation:

$$EURP = \frac{TEU}{\frac{TR}{1000}} \quad (20)$$

where:
EURP – Energy use in revenues production, GJ/1000 EUR,
TEU – Total energy use in the company, GJ/year,
TR – Total revenues, EUR/year.

4.3.2. Share of renewable energy use

The share of renewable energy use in total energy utilization by the company is determined from the following equation:

$$SRE = \frac{RE}{TEU} \times 100\% \quad (21)$$

where:
SRE – Share of renewable energy use in the company, %,
RE – Renewable energy use, GJ/year.
TEU – Total energy use in the company, GJ/year,

4.3.3. Global warming potential input in revenues production

The global warning potential input in revenues production by the company is determined from the following equation:

$$GWPIRP = \frac{GWPI}{\frac{TR}{1000}} \quad (22)$$

where:
GWPIRP – Global warming potential input in revenues production, kg CO_2 eq./1000 EUR,
GWPI – Global warming potential input by the company, kg CO_2 eq./year,
TR – Total revenues, EUR/year.

4.3.4. Water usage in revenues production

The water usage in revenues production by the company is determined from the following equation:

$$WURP = \frac{WU}{\frac{TR}{1000}} \quad (23)$$

where:
WURP – Water usage in revenues production, m^3/1000 EUR,
WU – Water usage, m^3/year,
TR – Total revenues, EUR/year.

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5. Business cases analysis

In the report 40 business cases were analysed in terms of economic, social and environmental aspects. The selected group included various enterprises taking into account such criteria as: staff headcount, value of generated annual revenues (turnover), balance sheet total, type of business or geographical location. However, the common feature of these enterprises was their location in rural areas of the European Union. The structure of the analysed business cases according to their size (in accordance with the criteria of division into micro, small, medium and large enterprises in force in the European Union) is shown in Figure 18.

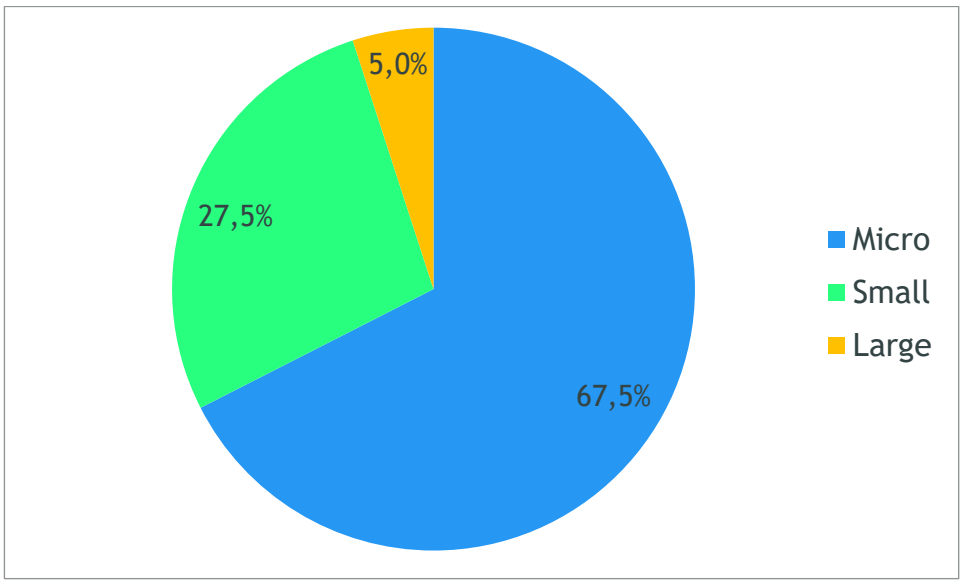

Figure 18. Structure of the surveyed enterprises by their size (own elaboration based on data from selected business cases)

Micro-enterprises (67.5%) prevailed in selected business cases. The share of small enterprises amounted to 27.5%, and the remaining 5% were large enterprises (this was not due to the number of employees, but this was determined by the value of annual turnover exceeding the limits allowed for enterprises in the SME sector). There were no enterprises in the analyzed group that could be qualified to medium size (Figure 18).
The RUBIZMO project adopted the division of enterprises into three groups (sectors): FOOD, BIO-BASED VALUE CHAINS, ECO-SYSTEM SERVICES. The structure of selected business cases according to this division is presented figure 19.

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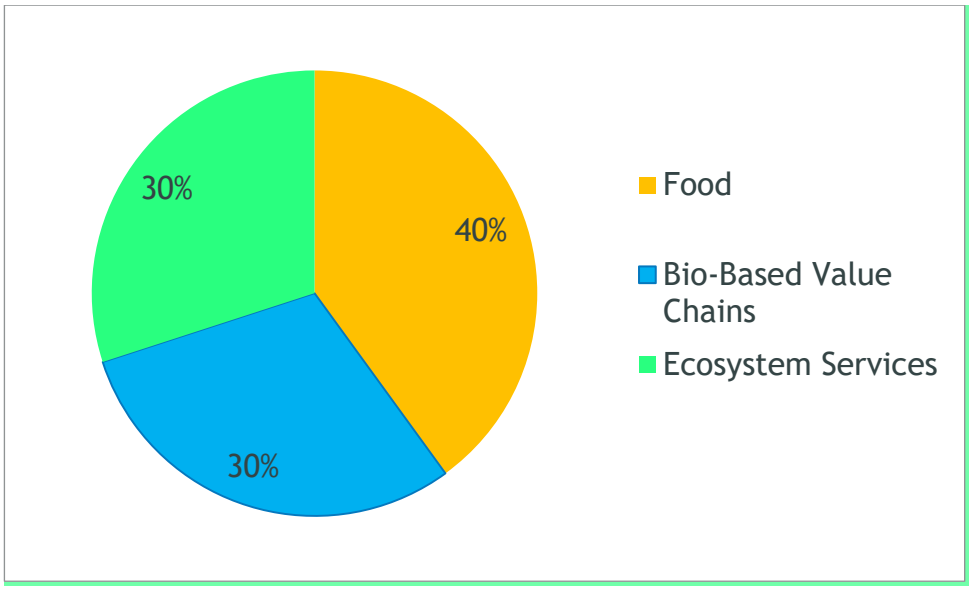

Figure 19. Structure of the surveyed enterprises by sectors adopted in the RUBIZMO project (own elaboration based on data from selected business cases)

In the FOOD group, 40% of the analysed business cases were included, 30% of enterprises each were in the Bio-Based Value Chains group as well as in the ECO-System Services group (Figure 19).
In order to generalize the conclusions and preserve the anonymity of individual business cases selected for research, in the presented analysis it was decided to show the results in years 2016, 2017 and 2018 divided into groups of enterprises by their size. Selected economic data characterizing the analysed enterprises are presented in tables 6-8.

Table 6. Economic indexes of selected case studies in the group of micro-enterprises in 2016-2018 (own elaboration)

Specification	Unit	Year		
		2016	2017	2018
Total Revenues (TR)	EUR	117 913	261 937	263 441
Total Costs (TC)	EUR	114 931	198 823	196 252
Gross Profit (GP)	EUR	2 981	63 114	67 189
Total cost level indicator (TCL)	%	97.47	75.90	74.50
Work Productivity (WP)	EUR/prs	39 195	65 992	47 844
Work Gross Profitability (WGP)	EUR/prs	994	15 898	12 194
Share of sales to the local market	%	83.70	75.90	77.20
Share of sales to the external market	%	16.30	24.10	22.80

Table 7. Economic indexes of selected case studies in the group of small enterprises in 2016-2018 (own elaboration)

Specification	Unit	Year		
		2016	2017	2018
Total Revenues (TR)	EUR	2 620 906	3 589 980	2 871 995
Total Costs (TC)	EUR	2 319 203	3 264 491	2 524 521
Gross Profit (GP)	EUR	301 703	325 489	347 474
Total cost level indicator (TCL)	%	88.49	90.93	87.90

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Work Productivity (WP)	EUR/prs	57 729	77 705	63 353
Work Gross Profitability (WGP)	EUR/prs	6 705	7 076	7 722
Share of sales to the local market	%	65.60	65.80	66.30
Share of sales to the external market	%	34.40	34.20	33.70

Table 8. Economic indexes of selected case studies in the group of large enterprises in 2016-2018 (own elaboration)

Specification	Unit	Year		
		2016	2017	2018
Total Revenues (TR)	EUR	47 659 791	55 899 577	50 711 000
Total Costs (TC)	EUR	41 704 827	50 031 490	45 377 852
Gross Profit (GP)	EUR	5 954 963	5 868 087	5 333 148
Total cost level indicator (TCL)	%	87.51	89.50	89.48
Work Productivity (WP)	EUR/prs	296 946	311 418	274 856
Work Gross Profitability (WGP)	EUR/prs	36 987	32 600	28 828
Share of sales to the local market	%	82.50	82.00	78.50
Share of sales to the external market	%	17.50	18.00	21.50

To complement the picture of the economic situation, figures 20 and 21 present gross margin and gross return on assets indicators in the examined groups of enterprises.

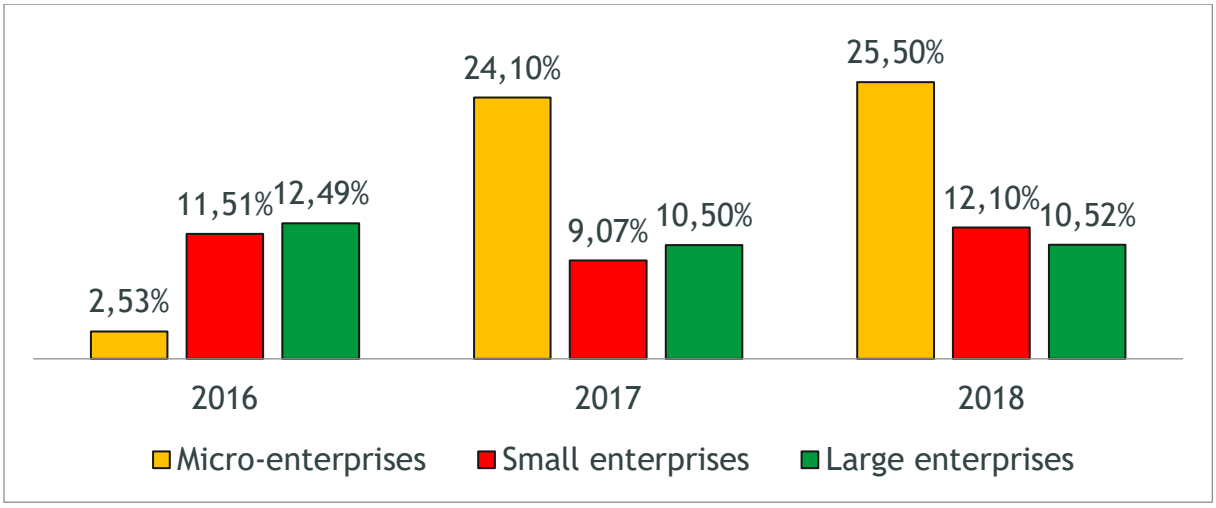

Figure 20. Average gross profit margin in selected case studies by size of enterprises in 2016-2018 (own elaboration)

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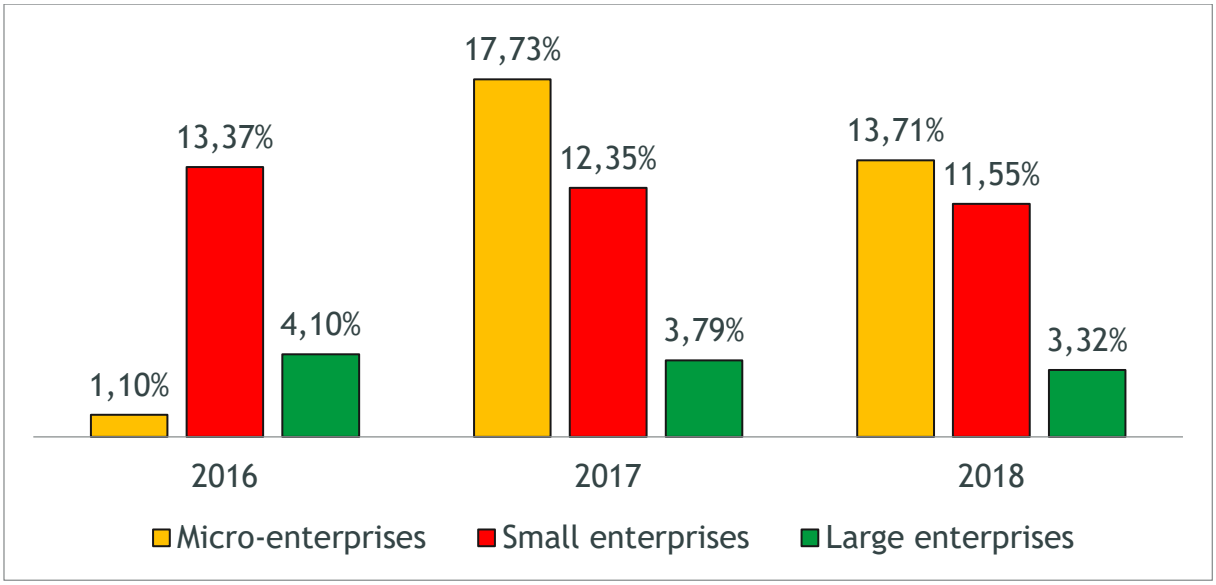

Figure 21. Average gross return on assets in selected case studies by size of enterprises in 2016-2018 (own elaboration)

The activity of enterprises has an impact on the social sphere and the labor market around the area where the plant is located. Selected social indicators for the analyzed business cases are presented in Table 9.

Table 9. Chosen social indexes of selected case studies by size of enterprises in 2016-2018

Specification	Unit	Year		
		2016	2017	2018
Average in the group of micro-enterprises				
Share of external employees (SEE)	%	34.9	53.0	64.2
Share of family members (SFM)	%	65.1	47.0	35.8
Share of employees from rural area (SERA)	%	91.7	98.1	90.9
Share of employees from local area (SELA)	%	97.2	96.2	90.9
Average in the group of small enterprises				
Share of external employees (SEE)	%	93.4	93.5	94.5
Share of family members (SFM)	%	6.6	6.5	5.5
Share of employees from rural area (SERA)	%	70.1	72.8	70.6
Share of employees from local area (SELA)	%	79.3	80.9	83.4
Average in the group of large enterprises				
Share of external employees (SEE)	%	99.7	99.7	99.7
Share of family members (SFM)	%	0.3	0.3	0.3

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Share of employees from rural area (SERA)	%	40.8	38.7	43.4
Share of employees from local area (SELA)	%	62.3	64.6	60.7

The results presented in Table 9 confirm the thesis that micro enterprises primarily provide employment opportunities for members of their own families. As the size of the enterprise increases, the share of external employees increases because family labor resources are insufficient. Selected case studies also have a great impact on regional development, because they give jobs primarily to people from local areas, and also what is particularly important from the point of view of the RUBIZMO project - for the inhabitants of the surrounding villages, which are located near these companies. The data show that micro-enterprises have the greatest impact on job creation in rural and local areas (in the surveyed micro-enterprises it was over 90% of jobs).
In relation to all considered cases some general numbers corresponding to the social and environmental indexes can be indicated (Table 10). The average share of the family members (SFM) and external employees (SEE) is 40% and 60%, respectively. Such proportion seems to be normal as most of the business cases with replicable potential are micro and small size. Taking into account the Rubizmo project focusing on the rural areas development it is significant that more than 80% of employees in the evaluated business cases are from rural area (SERA=80.45%). At the same time, nearly 90% of employees come from the local area (SELA = 87.22%).

Table 10. The average value of social and environmental indicators of analysed business cases (BC)

SOCIAL INDICATORS	Unit	Average value
Share of external employees (SEE)	%	60.01
Share of family members (SFM)	%	39.99
Share of employees from rural area (SERA)	%	80.45
Share of employees from local area (SELA)	%	87.22
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	1.98
Social impact of job creation index in the company ($SROI_{JC}$)	-	5.70
Social impact of income for the company ($SROI_{IF}$)	-	3.71
Social impact of manpower from rural area ($SROI_{MLA}$)	-	3.30
Social impact of manpower from local area ($SROI_{LA}$)	-	3.52
Social impact of CO2 reduction ($SROI_{CO2}$)	-	0.001
Total Social return on investment (SROI)	-	18.21
ENVIRONMENTAL INDICATORS	Unit	Average value
Energy use in revenues production (EURP)	GJ/1000 EUR	186.38
Share of renewable energy use (SRE)	%	22.02
Global warming potential input in revenues production (GWPIRP)	tCO2eq./1000 EUR	0.24
Water usage in revenues production (WUPR)	m3/1000 EUR	15.62

It can be concluded that the considered enterprises do their business and are very active in rural area and have a significant impact on local development in many areas, including social ones. The cumulative SROI is over 18 (SROI = 18.21) and should be considered very satisfactory, although it has no direct financial value. It is worth emphasizing the high value of partial indicators directly related to the job creation ($SROI_{JC}$ = 5.70) and employment of people from rural area (SROIMLA = 3.30).

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Furthermore, the indicator related to employment of women and men from rural area by companies operating in this region should also be perceived positively ($SROI_{ND}$ = 1.98). As none of the companies carries out heavy industrial activity, the overall rate of impact on global warming (environmental impact) is not high (GWPIRP=0.24 tCO_2eq/1000 EUR). In addition, a 22% share of renewable energy in energy consumption (SRE=22.02%) has a positive impact from an environmental point of view.

It should be marked that the company's activities can have different social impacts and will depend on many factors. In order to present the possibility of interpreting the data of a given undertaking by the entrepreneur himself or another interested entity, for detailed analysis, there were selected the examples of business cases from each area defined as part of the Rubizmo project, namely: FOOD, ECO-System Services and Bio-Based Value Chain.
Based on the partial indicators of the business example BC1 (Table 11), operating in the area of ECO-System Services, the negative value of total SROI index in 2016 can be observed. This is mainly due to lower profits in relation to capital expenditures incurred and the lack of employment of additional people. A significant improvement in economic indicators in 2017 caused also a change in social indicators. The indicator covering the growth of revenues for the $SROI_{IF}$ enterprise has improved particularly, from the negative value of $SROI_{IF}$ = -0.52 changed to $SROI_{IF}$ = 1.30. The consequence of good financial results was also the employment of external employees (2 persons), which resulted in a change in the indicator related to the increase in employment from $SROI_{JB}$ = 0 to the level of $SROI_{JB}$ = 0.52. Moreover, the simultaneous employment of people from the local and rural areas translated into obtaining positive values of indicators: $SROI_{LA}$ = 0.52 and $SROI_{MLA}$ = 0.52, respectively.

Table 11. Social indicators for BC1 (ECO-System Services group, Poland).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	0.00	50	60.00
Share of family members (SFM)	%	100	50	40
Share of employees from rural area (SERA)	%	100	100	100
Share of employees from local area (SELA)	%	100	100	100
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	0	0.52	0.75
Social impact of job creation index in the company ($SROI_{JC}$)	-	0	0.52	0.94
Social impact of income for the company ($SROI_{IF}$)	-	-0.52	1.30	2.70
Social impact of manpower from rural area ($SROI_{MLA}$)	-	0	0.52	0.94
Social impact of manpower from local area ($SROI_{LA}$)	-	0	0.52	0.94
Social impact of CO2 reduction ($SROI_{CO2}$)	-	6.37229E-08	4.411E-07	4.411E-07
Total Social return on investment (SROI)	-	-0.52	3.38	6.26

The maintenance of a good gender balance in employment also contributed to the increase of the $SROI_{ND}$ parameter; from $SROI_{ND}$ = 0 to $SROI_{ND}$ = 0.52 (Figure 22). The $SROI_{CO2}$ social indicator related to carbon dioxide emissions is small due to the relatively low energy consumption of the company. As a result, the total SROI index amounted to SROI = 3.38. In the following year (2018), a further increase in the total value of SROI to the level of SROI = 6.26 can be observed, which was associated with a further increase in the income of BC2 and the engagement of another employee from the rural area. It can be concluded that BC1's activities have a positive impact on the local social development of the rural area.

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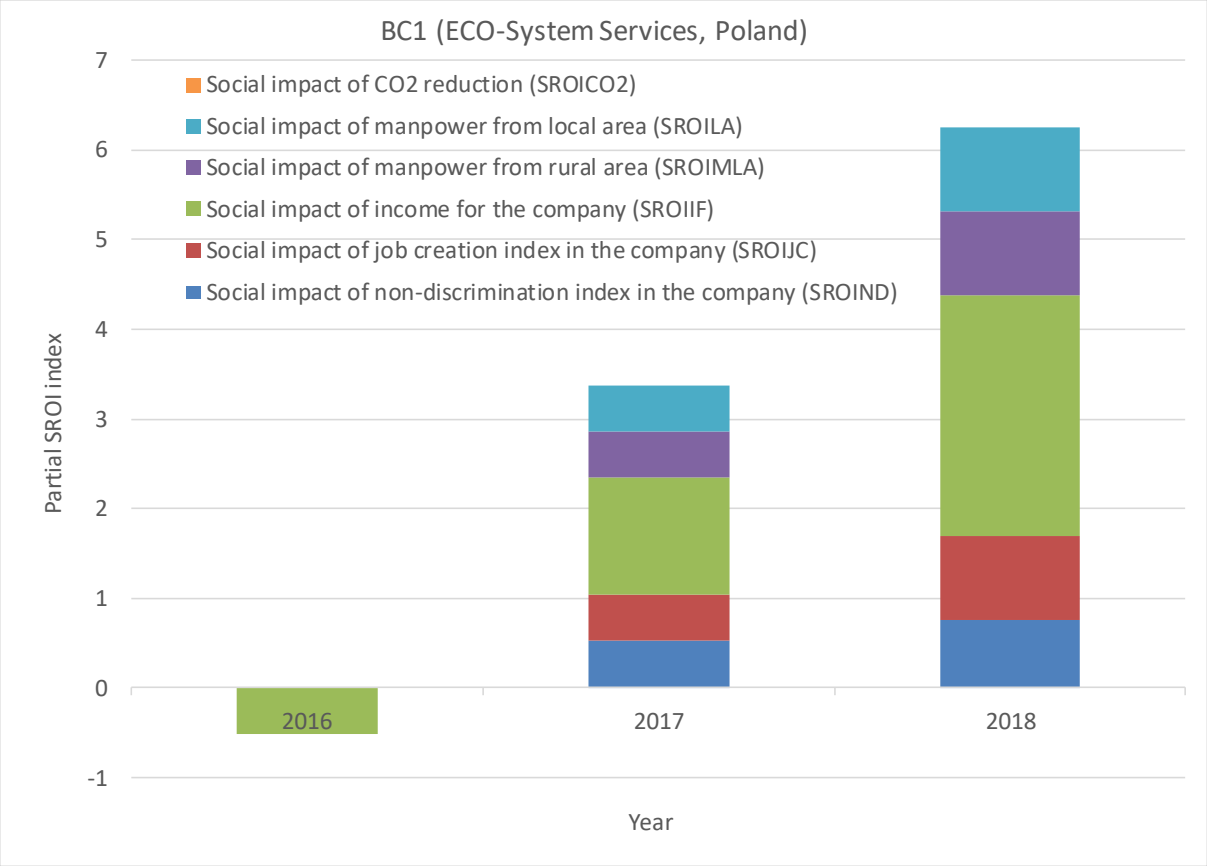

Figure 22. SROI index for a company assigned to ECO-System Services group (Business Case BC1, Poland)

Another example is the BC18 business case operating in the FOOD area (Figure 23). Also in this case, in 2016, the SROI total index was small and resulted from low income and in the employment mainly of family members. In the following years, most indicators improved. Revenues from operations increased, which is confirmed by $SROI_{IF}$ = 3.0 (2017) and by $SROI_{IF}$ = 2.1 (2018). The company has created two full-time positions for employees from a rural area, while the work input of family members has been reduced (Table 12). As a result, the total value of SROI in 2017 and 2018 was around SROI = 4.1 and SROI = 3.2, respectively.

Table 12. Social indicators for BC18 (FOOD Group, Greece).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	25.00	66.67	66.67
Share of family members (SFM)	%	75.00	33.33	33.33
Share of employees from rural area (SERA)	%	25.00	66.67	66.67
Share of employees from local area (SELA)	%	75.00	33.33	33.33
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	0.003	0.15	0.16
Social impact of job creation index in the company ($SROI_{JC}$)	-	0.006	0.46	0.48
Social impact of income for the company ($SROI_{IF}$)	-	0.416	3.00	2.10
Social impact of manpower from rural area ($SROI_{MLA}$)	-	0.002	0.31	0.32
Social impact of manpower from local area ($SROI_{LA}$)	-	0.005	0.15	0.16
Social impact of CO2 reduction ($SROI_{CO2}$)	-	1.6563E-06	4.1423E-06	8.285E-06
Total Social return on investment (SROI)	-	0.43	4.09	3.21

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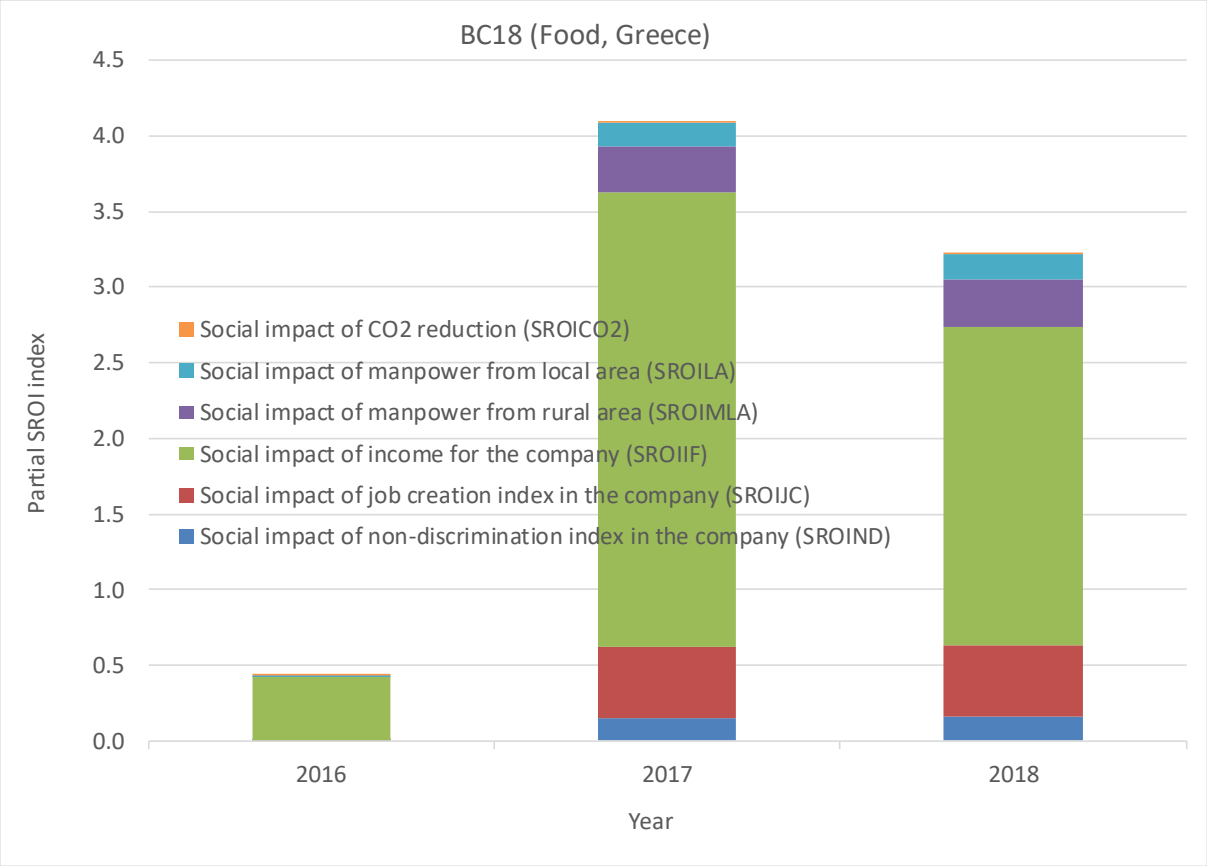

Figure 23. SROI index for a company assigned to FOOD group (Business Case BC18, Greece)

An interesting example is also the business case BC16 (Bio-Based Value Chain area), in which the employment profile is based only on external employees (Table 13).

Table 13. Social indicators for BC16 (Bio-Based Value Chain group, Spain).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	100.00	100.00	100.00
Share of family members (SFM)	%	0	0	0
Share of employees from rural area (SERA)	%	100	100	100
Share of employees from local area (SELA)	%	100	100	100
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	2.40	2.40	4.80
Social impact of job creation index in the company ($SROI_{JC}$)	-	4.80	6.00	7.20
Social impact of income for the company ($SROI_{IF}$)	-	0.86	1.52	0.87
Social impact of manpower from rural area ($SROI_{MLA}$)	-	4.80	6.00	7.20
Social impact of manpower from local area ($SROI_{LA}$)	-	4.80	6.00	7.20
Social impact of CO2 reduction ($SROI_{CO2}$)	-	9.072E-09	1.452E-08	1.814E-08
Total Social return on investment (SROI)	-	17.66	21.92	27.27

In this case, the shares of individual social indicators are differently distributed (Figure 24). The highest partial values of the SROI indicator are those that are associated with the employment of people from the local and rural area (increase in employment) and the creation of jobs for both women and men. The increase in the number of jobs in the enterprise ($SROI_{JC}$) each year has contributed to a gradual increase in the total SROI, from SROI = 17.7 in 2016 to SROI = 22.3 in 2018.

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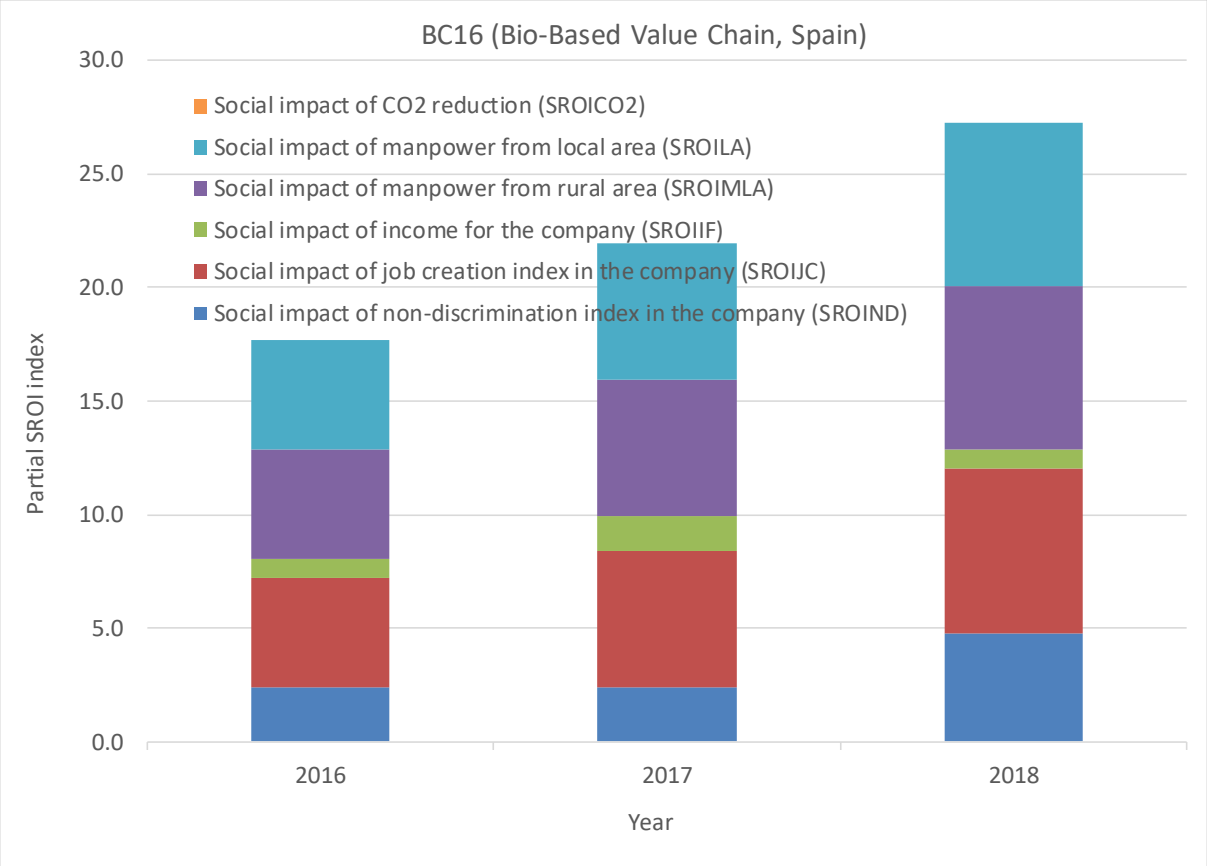

Figure 24. SROI index for a company assigned to Bio-Based Value Chain group (Business Case BC16, Spain)

The analysis of social indicators can also be carried out based on the size of the enterprise (Micro Company, Small Company, Large Company).
In the case of the BC22 business case from the Micro Company group, the distribution of some social indicators in the enterprise in 2016-2018 changed (Table 14). In 2016, the positive value of SROI = 18.8 was mainly due to the fact of employing people and maintaining salary, despite the negative financial balance ($SROI_{IF}$ = -2.4). In the following years, the positive SROI indicator was mainly due to the reduction of expenses and obtaining a positive financial result. The share of other component indicators decreased due to the maintenance of low employment typical for Micro companies (Figure 25).

Table 14. Social indicators for BC22 (Micro Company, Sweden).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	16.67	16.7	16.67
Share of family members (SFM)	%	83.33	83.3	83.33
Share of employees from rural area (SERA)	%	100	100	100
Share of employees from local area (SELA)	%	100	100	100
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	4.46	1.08	1.26
Social impact of job creation index in the company ($SROI_{JC}$)	-	5.57	1.34	1.58
Social impact of income for the company ($SROI_{IF}$)	-	-2.39	10.75	14.90
Social impact of manpower from rural area ($SROI_{MLA}$)	-	5.57	1.34	1.58
Social impact of manpower from local area ($SROI_{LA}$)	-	5.57	1.34	1.58
Social impact of CO2 reduction ($SROI_{CO2}$)	-	2.516E-07	2.516E-07	2.516E-07
Total Social return on investment (SROI)	-	18.78	15.85	20.89

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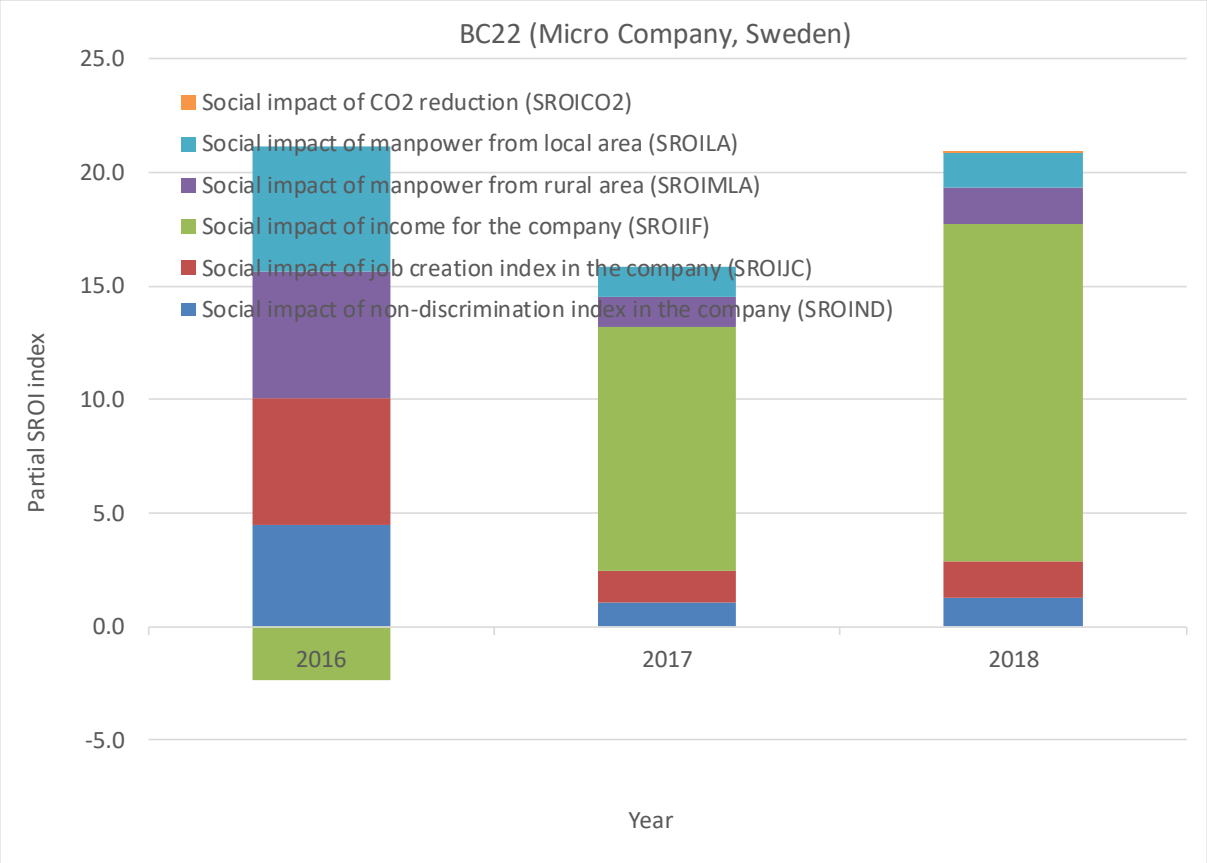

Figure 25. SROI index for a company assigned to Micro Company (Business Case BC22, Sweden)

An example of a company from the Small Company group that employs almost 50 employees is the business case BC10. Attention should be paid to a fairly even distribution of social indicators over the analyzed years of the enterprise's operation and a high percentage of employees from the rural area, which at this level of employment is particularly important (Table 15, Figure 26).

Table 15. Social indicators for BC10 (Small Company, Romania).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	96.30	95.74	95.45
Share of family members (SFM)	%	3.70	4.26	4.55
Share of employees from rural area (SERA)	%	93	92	91
Share of employees from local area (SELA)	%	76	72	86
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	1.82	1.84	1.72
Social impact of job creation index in the company ($SROI_{JC}$)	-	2.46	2.41	2.23
Social impact of income for the company ($SROI_{IF}$)	-	1.96	1.84	7.73
Social impact of manpower from rural area ($SROI_{MLA}$)	-	2.28	2.22	2.03
Social impact of manpower from local area ($SROI_{LA}$)	-	1.87	1.73	1.92
Social impact of CO2 reduction ($SROI_{CO2}$)	-	0	0	0
Total Social return on investment (SROI)	-	10.38	10.04	15.63

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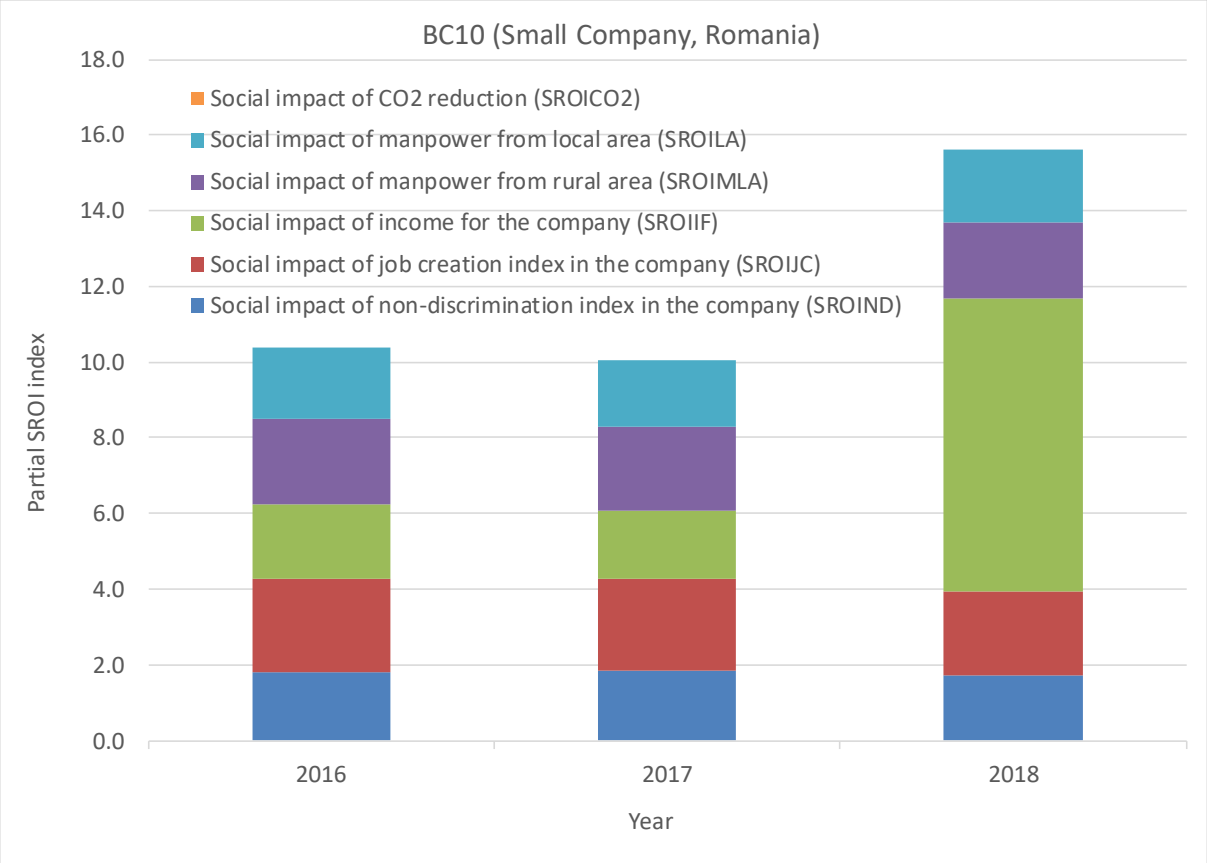

Figure 26. SROI index for a company assigned to Small Company (Business Case BC10, Romania)

In the case of a large enterprise (BC15), a dominant share of the social indicator related to revenues for the company can be observed ($SROI_{IF}$ in the range 5.44-6.05 over the years 2016-2018). The employment rate of employees from the local area ($SROI_{LA}$ = 1.52-1.73) is five times higher than the employment rate of people from the rural area ($SROI_{MLA}$ = 0.30-0.37). This state of affairs can be explained by the close presence of the urban centre from the production plant, which limits somehow the possibilities of maintaining a high level of employment of people from a rural area (Table 16, Figure 27).

Table 16. Social indicators for BC15 (Large Company, Spain).

SOCIAL INDICATORS		2016	2017	2018
Share of external employees (SEE)	%	98.04	98.36	98.59
Share of family members (SFM)	%	1.96	1.64	1.41
Share of employees from rural area (SERA)	%	19.61	19.67	21.13
Share of employees from local area (SELA)	%	100	100	100
Social impact of non-discrimination index in the company ($SROI_{ND}$)	-	1.06	1.10	1.38
Social impact of job creation index in the company ($SROI_{JC}$)	-	1.52	1.57	1.73
Social impact of income for the company ($SROI_{IF}$)	-	5.44	6.05	5.44
Social impact of manpower from rural area ($SROI_{MLA}$)	-	0.30	0.31	0.37
Social impact of manpower from local area ($SROI_{LA}$)	-	1.52	1.57	1.73
Social impact of CO2 reduction ($SROI_{CO2}$)	-	0.0006	0.0006	0.0007
Total Social return on investment (SROI)	-	9.84	10.61	10.65

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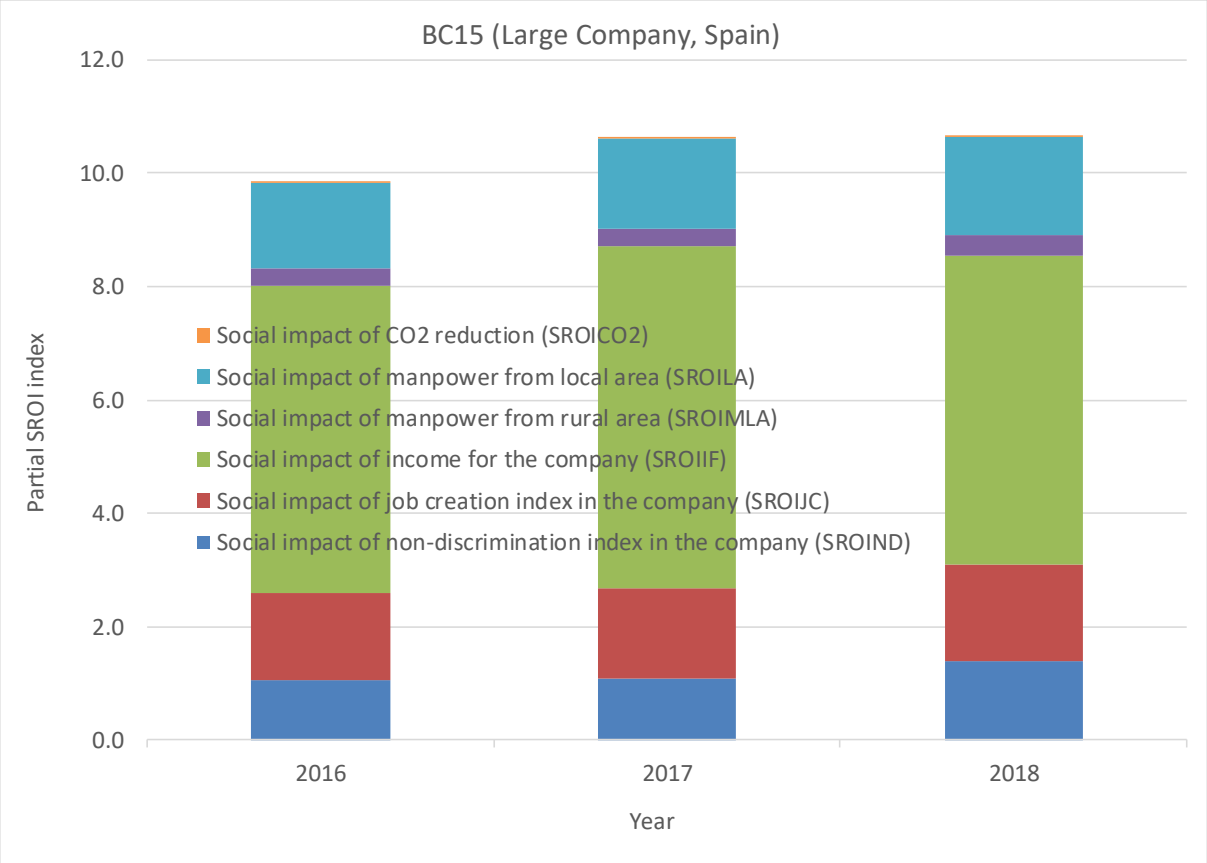

Figure 27. SROI index for a company assigned to Large Company (Business Case BC15, Spain)

Selected environmental indicators also allow to assess to some extent the company's impact on the environment. What's more, it gives the opportunity to analyse the current situation and plan changes in order to improve certain indicators or look for the causes of negative impact on the natural environment in selected aspects.
An example from the FOOD group is the business case BC32 in Germany (Figure 28). It can be seen that the company makes extensive use of renewable energy sources, which cover about 45% of energy needs. In addition, the company managed to reduce specific energy consumption in relation to revenues. This ratio decreased from EURP = 77.5 GJ/1000 EUR to the level of EURP = 51.1 GJ/1000 EUR. As a result, the indicator of impact on global warming expressed as CO_2 emission equivalent has also decreased (change from GWPIRP = 1.08 tCO_2eq/1000 EUR to GWPIRP = 0.86 tCO_2eq/1000 EUR). However, attention should be paid to an increase in water consumption in 2018 by about 20% compared to 2016.

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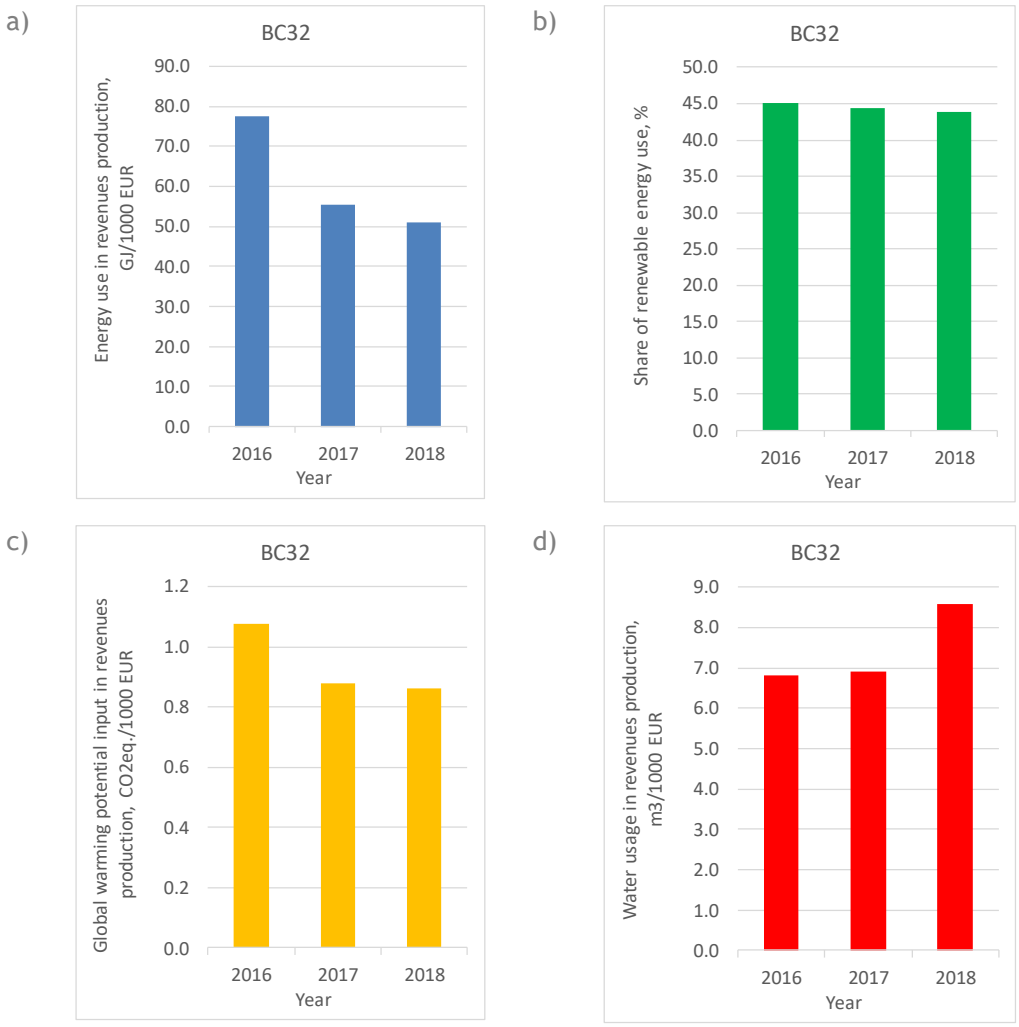

Figure 28. Environmental indicators for a company assigned to FOOD group (Business Case BC32, Germany)

Another example is BC11 from the ECO-System Services group (Figure 29). In this case, the relatively equal environmental indicators in 2016-2018 can be found. However, the company does not use the potential of renewable energy sources (SRE = 0). In this case, the company may start measures to reduce the company's burden on the environment and thus reduce the global warming index amounting to GWPIRP = 0.06 $tCO_2eq/1000$ EUR in 2018.

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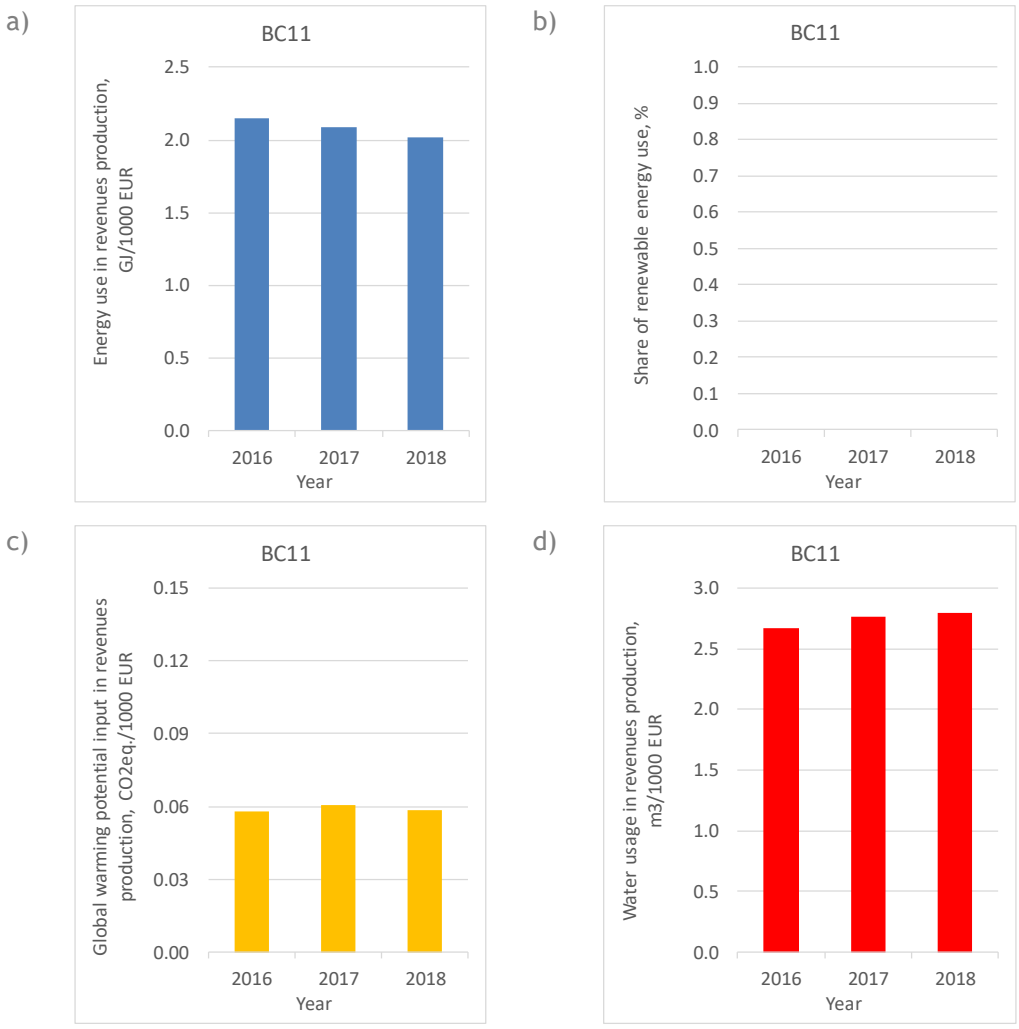

Figure 29. Environmental indicators for a company assigned to ECO-System Services group (Business Case BC11, Romania)

A slightly different example is the BC13 business case belonging to the Bio-Based Value Chain group (Figure 30). In 2018, the company recorded a significant increase in energy and water consumption in relation to unit revenues. Regardless of the reasons (increase in production, weather conditions, company's development etc.), the company recorded an increase in the burden on the natural environment as a result of the GWPIRP increase to 0.07 tCO_2eq/EUR 1000. If the company wants to maintain the GWPIRP value at the 2016 level (0.02 tCO_2eq/1000 EUR) or generally reduce its value, the company could consider the investments in renewable energy sources. Especially, since the company has not used this opportunity in practice so far.

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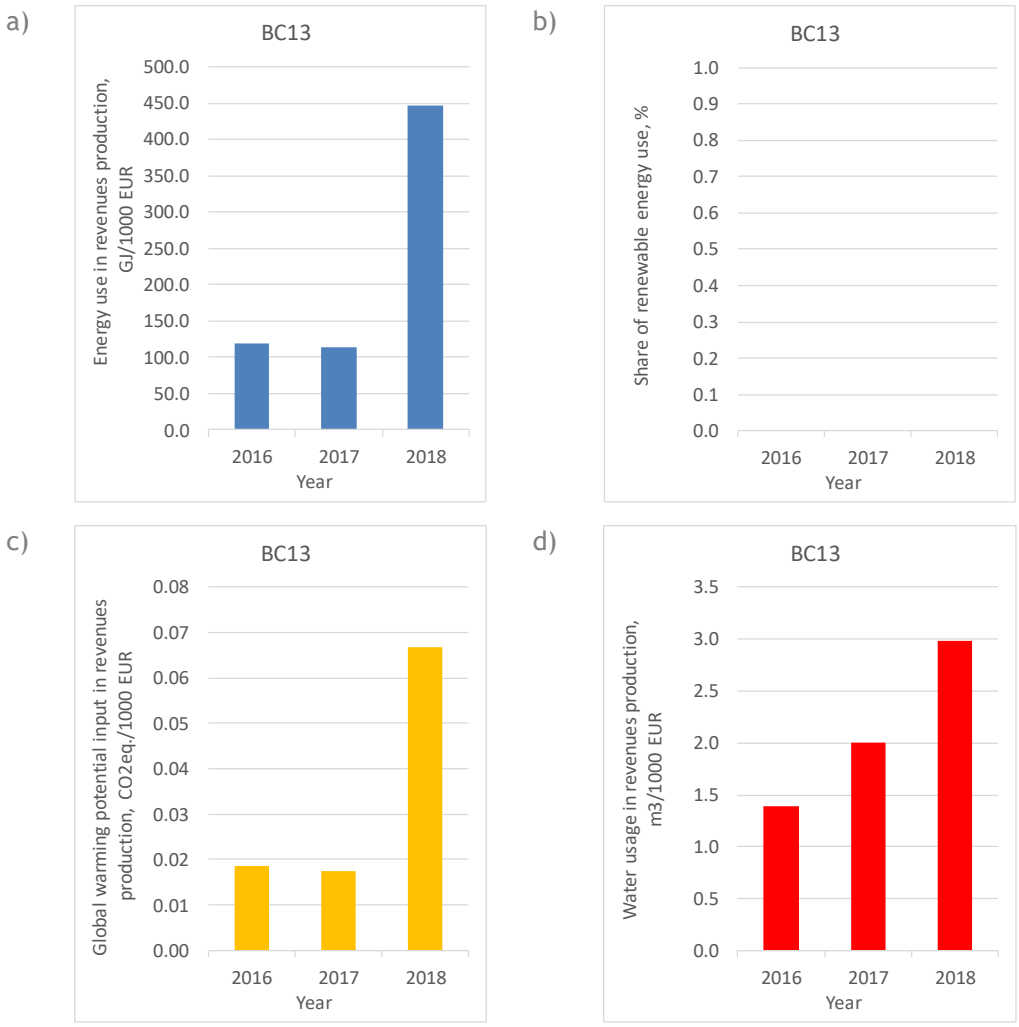

Figure 30. Environmental indicators for a company assigned to Bio-Based Value Chain group (Business Case BC13, Spain)

6. Conclusions

Currently, economic activity in rural areas (or other areas) should not only bring financial benefits to the owner, but also contribute to positive local social changes with the lowest possible negative impact on the natural environment.

Enterprises selected for analysis differ significantly in size and belong to various sectors of the economy, but they all operate in rural areas and contribute to the development of the economy at the local level. This is manifested primarily in generating profits from activities that use the potential of rural areas and in creating jobs for the local community, in particular for people living in rural areas near the analysed business cases. Financial indicators confirm that a larger scale of operations favours greater labour productivity, but from a social point of view it is important that in micro and small enterprises despite their smaller assets, lower generated profit per enterprise or lower labour productivity per employee, their activity is important because of its positive impact on the local labour market. The obtained results confirmed this thesis, because in the surveyed micro-enterprises the percentage of employees from nearby rural areas and towns exceeded 90%. With the

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increase in scale of activity, the share of local employees in the employment structure decreased (in business cases classified as large enterprises, the share of local employees was slightly over 60%, and employees living in rural areas about 40%, although these companies are located in these areas). This can be explained by the fact that large companies need more qualified personnel, which is why they do not have such a strong impact on the local labour market and are looking for specialists who are not in the immediate vicinity of the company.

It should be noted also that despite the lower value of gross profit per 1 micro enterprise compared to larger enterprises, in 2017 and 2018 the gross profit margin and gross return on assets were higher in micro enterprises compared to larger enterprises. This demonstrates the good economic efficiency of the smallest business entities and indicates their significant development potential, which allows them to look calmly at their future and further development.

Research indicates that selected enterprises, irrespective of their size, mostly supply products and services to the local market, which should be considered positive, as they thus raise the standard of living in rural areas by being able to meet the needs of local residents to a greater extent. On the other hand, between 16 and 35% of the sales value of the surveyed companies goes to external markets. It shows firstly that their range of activity can be much larger than the local market, and secondly it confirms that doing business in rural areas is not a barrier to attract customers who are further away from the company.

Analysis and evaluation of the impact on the social aspects and the social value of a given investment (business model development) are still not a popular analysis applied in Europe. However, EU legislation and the practice of developed countries (including the U.S.) support the implementation of these analyses. They are important from local community and rural areas development point of view, therefore their importance is growing. SROI analysis take into account the social aspects, i.e. impact on the condition and the satisfaction of the local community (social impact). It should be mentioned that SROI analysis are not strictly economic analysis. For instance – double counting is possible, when concerns different actors. Social effect is not an income (for a worker, farmer or energy producer in EUR), but a good feeling of society members, that the rural area develops, that they have a job, interesting work in the nature, but also better health (measured in CO_2 environmental impact), or they can be proud of their own ecologic product (product responsibility). All of these social benefits can be added and expressed in EUR, but most of calculated cash flows do not include these values.

In terms of the environmental aspects, the analysis provides information about the influences/trends of the company's activities on the environment. The owner being conscious of the need to take care about the nature and positive image of the company can start some actions to eliminate or reduce the negative impact. From the other site, doing some changes in the company, the owner can observe the changes of the indicators to control the progresses from the made investments.
Summarizing, the economic, environmental and social indicators set for the analysed business cases allow the entrepreneur himself to learn about the impact of his business on the wide understood external environment and be helpful in further decisions-making in this area. On the other hand, external entities or people wanting

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to use certain patterns can analyse cause-effect relationships and apply results when developing their own activities in rural areas.

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