Value Chain Analyses: South-West Region

Manufacturing, ICT, Sustainable Tourism

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2. Introduction

The following document will present the three selected value chains for the South-West planning region. The value chains also include the territory of the municipality of Resen.

2.1. Economic indicators

The South-West planning region covers 3,604.63 km^2 or 14.17% of the total territory of the country, inhabited by 219,379 inhabitants, which is 10.56% of the total population in the country.

The South-West is the third least developed region in the country with a development index of 0.81 after the Vardar and North-East regions.

The GDP of the South-West region has increased from 46,818 million MKD in 2015 to 56,848 million MKD[1] in 2019. However, at the same time its share in the national GDP decreased from 8.4% in 2015 to 8.2% in 2019. The GDP per capita of the South-West region has increased in absolute value from 212,913 MKD in 2015 to 259,131 MKD in 2019. When compared with the GDP per capita of the country it slightly decreased from 78.9% in 2015 to 78.1% in 2019, making it the third lowest in the country after the North-East and Polog regions.

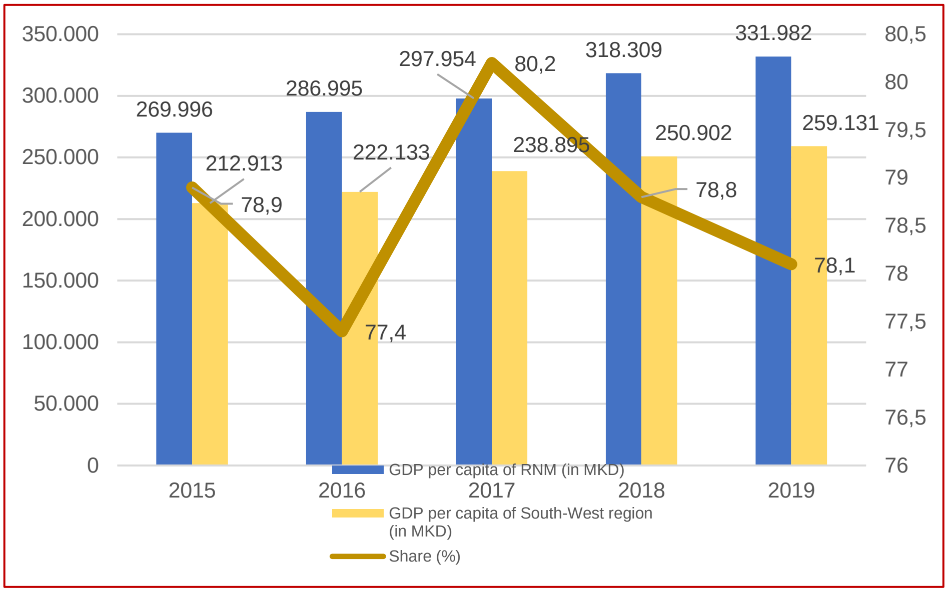

Figure 1: GDP per capita 2015 – 2019[2]

Overall, the contribution of the South-West region to the national economy fell about 1.56%. The agriculture sector decreased its share of the regional GDP from 4.88% in 2015 to 3.73% in 2019, while the share of the sectors mining and manufacturing (electricity, gas and water supply, sewerage, waste management, remediation activities) decreased from 9.44% in 2015 to 6.96% in 2019.

In the development of the overall economy of the South-West planning region, the sectors wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, and the accommodation and food service activities, are the most significant economic activities.

[1] 1 EUR = 61,5 MKD

[2] State Statistical Office, makstat database

Their share in the regional economy has **increased** from 26% in 2015 to 30.6% in 2019. Other sectors that have double-digit shares in the regional GDP are: Real estate activities, mining, manufacturing and other, public administration and defence, compulsory social security, education, human health, and social work activities.

Investments in fixed assets in the South-West planning region increased from 13,540 million MKD in 2015 to 15,377 million MKD in 2019. The total increase of investments in fixed assets in the South-West region in 2019 is 13.6% compared to 2015 and that was higher than the increase on national level of 9.6%. (In the same period, the share of the regional investments in fixed assets at national level increased slightly from 10.16% in 2015 to 10.53% in 2019).

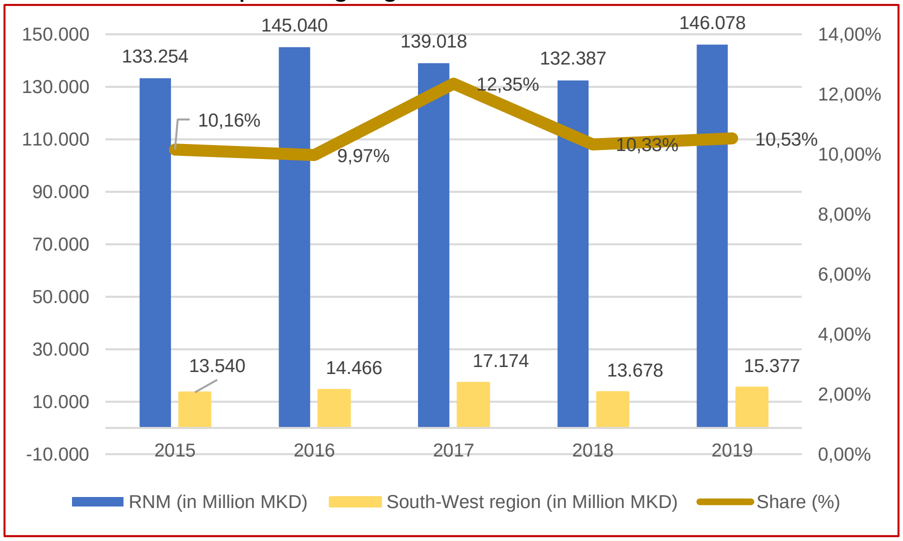

Figure 2: Investments in fixed assets, 2015 – 2019 [3]

The increase in the investments in fixed assets can be attributed mainly to the sectors of agriculture, forestry and fishing, and construction. In the period 2015 – 2019, the biggest increase of the investments in fixed assets of almost 5.1 times was seen in the sector information and communication (ICT) as well as the sector of financial and insurance activities.

According to the data of the State Statistical Office, the number of active business entities in 2019 in the South-West region is 7,520 and represents 9.91% of the total number of active business entities in the Republic of North Macedonia (75,914). For comparison, 10.56% of natural persons (citizens) have a residence in the South-West region.

The number of active business entities per 1000 inhabitants in South-West region is 34.31, and by this is ranked as 5th region in the country. The MSMEs make up 99.8% of the total number of companies with 92.8% of those being micro companies.

The ratio of number of companies' deaths and the number of newly established businesses is almost 93% in 2018, and this is higher than the ratio on national level (77.45%).

The largest number of active business entities in 2020 is in the Municipality of Ohrid 2,654 (36,52%), followed by the Municipality of Struga with 2,138 (29.42%) and Kichevo with 1,462 (20.12%). In these three municipalities are almost 86% of the active business entities in the region.

The largest number of companies are in wholesale and retail trade, and the repair of motor vehicles and motorcycles with 2,375, followed by manufacturing with 748 and construction with 747 companies.

[3] State Statistical Office, makstat database

The value of exports from South-West region increased from 81.75 Million EUR in 2015 to 225.17 Million EUR in 2019.

Exports	South-West region (in Million EUR)	Share of South-West region (%)[4]
2015	81,75	2,0
2016	100,98	2,3
2017	170,63	3,4
2018	211,41	3,6
2019	225,17	3,5

Figure 3: Exports from South-West region, 2015-2019[5]

In the same period, imports in South-West region have increased from 110.22 Million EUR in 2015 to 261.67 Million EUR in 2019 (increase of 2.37 times).

Imports	South-West region (in Million EUR)	Share of South-West region (%)[6]
2015	110,22	1,9
2016	135,88	2,2
2017	191,38	2,8
2018	230,29	3,0
2019	261,67	3,1

Figure 4: Imports in South-West region, 2015-2019[7]

The biggest contribution to the exports from the South-West region comes from the following sectors: Motor vehicles, trailers and semi-trailers with share of 38.8% of total exports from the sector at national level; Electrical equipment with share of 20.6%, Wearing apparel with share of 8.9% and Fabricated metal products, except machinery and equipment with share of 8.6%.

Only 4.47% of the approved projects by the Fund for Innovation and Technological Development (FITD) were those of applicants from the South-West region or 23 projects out of 514 in total (12 in Ohrid, 7 in Struga, 3 in Kichevo and 1 in Debar) with total volume of 3,763,049 EUR. The dominant sectors were IT with 6 projects, Machine industry & Engineering with 5 projects, and Agriculture with 3 projects. The South-West region has received the fourth lowest support through IPARD of all regions in amount 3,029,198 EUR.

The largest number of employees work in the sector wholesale and retail trade, and repair of motor vehicles and motorcycles, followed by the manufacturing sector, construction,

[4] Republic of North Macedonia = 100%

[5] State Statistical Office, makstat database, Regions in the Republic of North Macedonia 2020, Estimates of the project team

[6] Republic of North Macedonia = 100%

[7] State Statistical Office, makstat database, Regions in the Republic of North Macedonia 2020, Estimates of the project team

accommodation and food service activities, public administration and defence, compulsory social security, and education. The average gross salary in South-West region is continuously increasing, but it is also continuously lower than the national average (82.7% in 2019).

The highest gross salary in the South-West region in 2019 was earned the employees in financial and insurance activities (81.7% higher than the regional average), followed by the sector electricity, gas, steam and air conditioning supply (57,4% higher than the regional average), and the sector other service activities (almost 41% higher than the regional average).

The productivity of labour in South-West region in 2019 amounts to 0.63 Million MKD per employee when expressed as Gross Value Added per employee, and 0.72 Million MKD per employee when expressed as GDP per employee.

2.2. Environmental indicators

There are not many relevant environmental indicators on the regional level. The following Table (figure 6) provides information of the water supply, use and protection against pollution in industry and mining in the South-West region. It is obvious that different indicators in the South-West region in 2019 account for very low percentages with exception of water supply.

	2015	2016	2017	2018	2019
Water supply	2.184.214	2.669.772	153	74.124	695.473
(%)	51,01	71,78	0,01	2,19	29,76
Water used for technological purposes	2.182.399	2.668.439	153	32.985	29.286
(%)	51,05	72,15	0,01	1,48	1,82
Discharge of unpurified water	2.184.182	2.669.253	83	28.503	26.856
(%)	51,05	72,74	0,01	1,55	2,02
Discharge of purified water	263	107	27	1.737	1.108
(%)	1,62	0,85	0,01	0,49	0,45
Discharge of wastewater	144.150	97.902	110	30.241	27.964
(%)	51,34	44,97	0,01	1,38	1,77

Figure 5: Water supply, use and protection against pollution in industry and mining in South-West region, in 000 m3, 2015 – 2019[8]

None of the municipalities in the South-West region have any strategies with regards to climate change prepared.

2.3. Social indicators

The following social indicators for South-West region in 2019 have been extracted from the strategy for regional development 2021–2031 and show a rather challenging situation:

- Activity rate of those with unfinished primary education is 14.3% (2019)

[8] State Statistical Office, Regions in the Republic of North Macedonia, various editions

- Employment rate of those with unfinished primary education is 6.2% (2019)
- Employment rate of women is 33.5% (2019) / Unemployment rate of women is 26.4% (2019)
- Unemployment rate of youth is 37.1% (2019)
- Rate of poor people as % of the population in South-West region is 14% and the rate of poor or socially excluded people (AROPE) is 26%

In the period 2015-2019, the activity rate in the South-West planning region was lower than the national average. Even though the activity rate is continuously increasing since 2016, it has the fourth lowest activity rate (active working population) of 57% in 2019.

The South-West region has the third lowest employment rate of 43.1% in 2019 of all regions in the country. Despite the fact it is continuously increasing, it is under the national average for the whole period 2015-2019.

The unemployment rate in South-West region has significantly decreased from 33.9% in 2015 to 24.4% in 2019. However, that rate remains the third highest of all regions in the country.

The total number of male employees is significantly higher than female. The ratio of total number of male to female employees is 1.55, while this ratio for the employees at the age between 15-40 is 1.49. The highest number of men are employed in the Trade and Construction sector, while the highest number of women are employed in Trade and Manufacturing sectors. The highest number of men and women under 40 years old are employed in the Trade sector.

The demand for labour is monitored through a special vacancy survey that includes companies selected according to the NACE Classification and which have three or more employees. The number of vacancies and the vacancy rate in percent for the South-West region for the four quarters in 2019 in 2020 are shown in the adjacent table (figure 7).

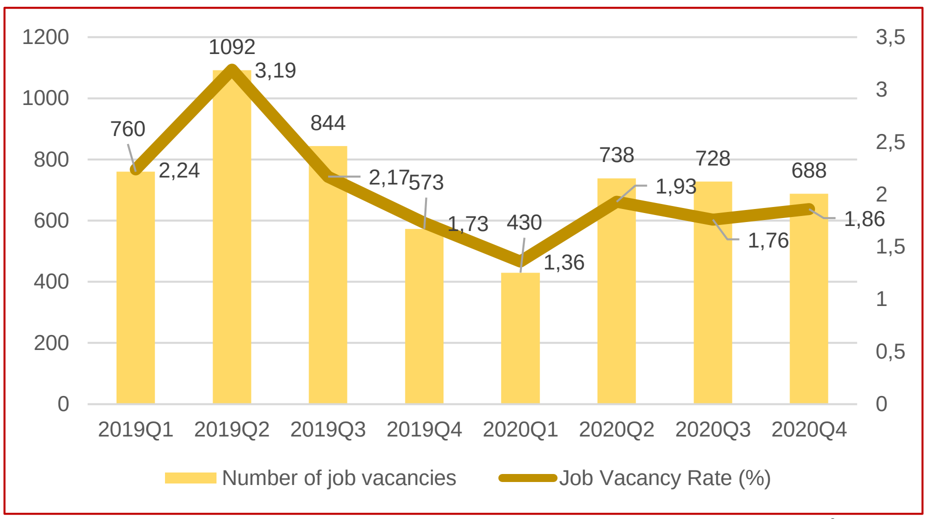

Figure 6: Number of job vacancy and job vacancy rate per quarter in 2019 and 2020[9]

The Employment Service Agency is conducting a labour market skills survey which aims to provide short-term indicators of employers' expectations regarding new employment and the needed skills in order to be competitive in the labour market. It is based on 188 surveyed employers in the South-West region. Based on the survey conducted in November 2019 the priority for new employments will be given to persons with the various skills in the South-West region.

The indicators related to education are provided in the tables that follow. The number of enrolled

[9] State Statistical Office, makstat database

students in primary and secondary education have decreased.

Indicator	2015/16	2016/17	2017/18	2018/19	2019/20
Number of enrolled pupils in primary schools	18.279	18.491	18.384	17.860	17.447
Number of enrolled pupils in secondary schools	7.785	7.035	6.621	6.789	6.573

Figure 7: Total number of enrolled pupils in primary and secondary schools 2015/16 – 2019/20[10]

The number of graduated students in the South-West region shows small variation with slightly positive trend in the analysed period. The South-West region had in total 804 graduated students and 3.6 graduated students per 1000 inhabitants in the school year 2018/2019.

Indicator	2014/15	2015/16	2016/17	2017/18	2018/19
Number of graduated students[11]	771	786	785	669	804
Number of graduated students per 000 inhabitants	3,5	3,6	3,6	3,0	3,6

Figure 8: Analysis of the indicators related to higher education 2015/16 – 2018/2019, [12]

3. Value Chain Selection

The sustainable **tourism** sector was chosen as tourism in the region is considered of local and national importance and it is a major employer and contributor to the regional GDP. 38% of all visitors to North Macedonia visit the SW region due to its national Hot-Spots (such as Ohrid & Prespa Lakes and the surrounding area) and offer many opportunities in terms of green and inclusive businesses. 813 companies in the tourism sector employ 6,777 people (around 10% of all companies and 10% of all employees). Therefore, it is expected that the tourism value chain to be a value chain that allows both an increase in the value of the services and products offered. In addition, the Value Chain can be connected to many other sectors (Agriculture, Infrastructure, ICT), and has significant potential/need for improved resource and energy efficiency, and is, therefore, able to bring an economic and social increase to the whole ecosystem.

The **ICT** sector is the fastest-growing sector in the country and the region with good, stable growth. There are 117 ICT companies in the South-West Region and four in the Municipality of Resen. Exports of information and computer services have been growing steadily over the past few years, which was not hampered by the pandemic. There is great potential because the ICT sector can be used as a driving force to increase ICT companies' innovation and integrate IT solutions with other industries. Two IT faculties in the region are creating human power. According to MASIT, ICT companies are the most significant part of the start-ups in North Macedonia.

According to the 2020 state statistical data, the **manufacturing sector** is one of the leading employers in the region, 740 manufacturing companies are employing 10,028 people, which is

[10] State Statistical Office, makstat database, Regions in the Republic of North Macedonia, 2015 - 2020

[11] Number of graduated students is based on their place of residence.

[12] State Statistical Office, makstat database, Regions in the Republic of North Macedonia. 2015 – 2020

13% of all employed people in the SW region, and therefore brings a great potential of hiring more people and increasing the income for a large number of companies. The opportunities for increased use of technology, innovation and improvement of production processes leading to resource and energy efficiency, the reduction and reuse of waste materials, and the potential of expansion and integration of local companies into the manufacturing supply chain all highlight the importance of the sector to the regions' future growth.

3.1. Selection Matrix

The following matrix describes and rates the selection criteria for the three different Value Chains and provides an overview over the multiple criteria. In the next section the key criteria of the selected value chains within the relevant dimensions (Economic, Environmental, Social) are presented in more detail.

3.1.1. Activity Type

	Innovative nature	Expected Market Disruption	Expected Additional Income	Local Job Creation (esp. Target Groups)	Contribution to Circular Economy	Overall Assessment
Sustainable Tourism	**	**	***	***	***	***
ICT	***	***	***	**	**	***
Manufacturing	**	***	***	***	***	***

Sustainable Tourism

- **Innovative nature:** The sector has untapped/underdeveloped potential but needs to develop new tourism services (and experiences to increase tourism season, to expand tourism services in rural areas, and to link tourism with the ICT sector (Smart energy-efficient buildings, Self-Booking, Contactless Technologies, Virtual Assistants, etc.).
- **Expected Market Disruption:** New initiatives in the selected value chain will have a positive market impact, increasing number of visitors, new tourism services, blend of business travel and leisure, culture tourism, attracting IT nomads, etc.
- **Expected Additional Income:** Increasing sales by adding new innovative services, increasing tourism season, number of foreign visitors, also by decreased running costs, involve local farmers (organic fruits and vegetables) and food processors in the supply chain.
- **Local Job Creation (esp. Target Groups):** investments in new services, innovative initiatives, new services in rural areas, links with local suppliers, organic agriculture products will contribute to new employment.
- **Contribution to Circular Economy:** the significant impact is expected to be in this segment by decreasing pollution, energy efficiency measures, renewable energy sources, and reducing water use.
- **Overall Assessment:** This selected value chain is essential for the South-West region and Resen municipality; the proposed initiatives will increase the value chain's competitiveness and contribute to the additional income for the hotels, tourism agencies, farmers, rural areas.

ICT

- **Innovative Nature:** To increase creative thinking of the sector, to integrate ICT with other value chains by developing new solutions and improve existing ones, to provide training on topics such as innovation, digitalization, innovation intelligence, intellectual property.
- **Expected Market Disruption:** The ICT sector is the fastest-growing sector, the last five years, the average export growth of the ICT sector was 12.5%, and this positive trend is expected in the coming years. The use and integration of technology into other sectors has the ability to change and/or introduce new products, services, and experiences that have major potential for market disruption in all fields.
- **Expected additional income:** The expectations are that the ICT sector will increase growth. The additional income is expected by export increase, helping ICT documents with direct links with foreign ICT companies, new innovative products and services, and integration of the ICT sector with local value chains.
- **Local Job Creation:** The ICT sector has a high potential to create new, higher value jobs. Two ICT faculties in the SW region are creating a new, highly educated workforce, but the sector also supports the personal development of its existing employees. It is positive that the ICT sector contributes employment of young people, young females, and vulnerable groups.
- **Contribution to the Circular Economy:** The sector contribution can be by using renewable energy for telecommunication base stations and own electricity consumption. Also, integration ICT sector with other sectors projects such as artificial intelligence, automatization, E-waste collection and recycling, intelligent buildings, smart energy control, etc.
- **Overall Assessment:** The selected value chain is very important for the South-West region and Resen municipality; the proposed initiatives will increase the value chain's competitiveness, innovations and contribute to the additional income for the ICT companies, new employment, and increased earnings.

Manufacturing

- **Innovative Nature:** To increase the creative activity of the manufacturing sector creation of new innovative produces, adoption of new innovative production processes and technologies. Also, to link manufacturing and ICT value chains together with join forces to improve existing production processes and to develop new products.
- **Expected Market Disruption:** It is expected that interventions in the sector will make positive market trends, that will decrease import and increase export of manufactured goods produced in the SW region and Resen municipality.
- **Expected Additional Income:** will be expected by new innovative products, improved production processes that will improve efficiency and running costs. Other sector investments like tourism will increase sales of local manufacturing companies.
- **Local Job Creation:** The sector needs new employments not only people who will work on production lines, also highly educated workforce, engineers, creative people, designers, sales and marketing managers, etc.
- **Contribution to Circular Economy:** The project will target companies who have environmental protection as high priority, companies who want to do better raw material utilization, can contribute waste reduction, invest in energy efficiency and renewable energy projects, catalyse Green Industry and Green Manufacturing
- **Overall Assessment:** The selected value chain is very important for the South-West region and Resen municipality; the proposed initiatives will increase the value chain's competitiveness, innovations and contribute to the additional income for the manufacturing

companies, new employments, and increased earnings.

3.1.2. Sector type

	Circular and Green Economy	Innovation and IT	Highly Competitive Economic Sector	Rural development Business Development Services	Export Potential/ Import Substitution	Overall Assessment
Sustainable Tourism	***	**	***	***	***	***
ICT	**	***	***	**	***	***
Manufacturing	**	***	***	***	**	***

Sustainable Tourism

- **Circular and Green Economy:** To decrease the use of energy and resources using own produced energy from renewable sources, to increase energy efficiency, to increase hot water generation from solar sources, to decrease water use, waste, and littering.
- **Innovation and IT:** The sector can initiate cooperation with the ICT sector, for example, intelligent buildings that can decrease energy consumption during heating or cooling, Self-Booking, Contactless Technologies, Virtual Assistants, etc.
- **Highly Competitive Economic Sector:** Tourism is a highly competitive sector, but also tourists need new destinations and the SW region and Resen are unique destinations that are worth to visit and explore. By diversifying and improving the tourism offer, including new and higher value/quality experiences, the season and coverage can be extended, and the earning potentials improved.
- **Rural development Business Development Services:** There is the initiative within the region to move tourism in rural areas, with new services, experiences, and accommodations. There are two good reasons for that, development of the rural regions and to decrease pressure on cities infrastructure, especially in high peak season, and the local earning potential and integration of supply chains will be extended, benefitting more people and communities.
- **Export Potential/Import Substitution:** the export potential is expected to be more significant with high value-added experiences, locations, products (local organic fruits and vegetables, wine) and new innovative services attracting more visitors and tourism spend originating from outside the region.
- **Overall Assessment:** The selected sector is very important for the SW region and Resen municipality. The proposed activities will increase sector competitiveness as a unique destination and services.

ICT

- **Circular and Green Economy:** The ICT sector has the potential to offer solutions within the green and circular economies when integrated with other sectors; The ICT sector can contribute by decreasing energy and other resource use through smart sensors, and controls and through an increase of E-waste recycling activities. By linking ICT with other sectors, it can help with reducing waste and increasing energy efficiency initiatives.
- **Innovation and IT:** It is critical for the sector to increase innovation activities; the ICT can be a drive force of innovations in ICT and other sectors.
- **Highly Competitive Economic Sector:** ICT is a highly economically competitive sector with so many companies and products. But the fourth industrial revolution focuses 90% on ICT activities.
- **Rural development Business Development Services:** Remote work is becoming the new standard. The sector is attracting IT nomads that can work anywhere. SW region is an attractive destination for nomads all over the world.
- **Export Potential/Import Substitution:** The ICT sector is the highest growing sector with export potential. This trend will continue with a high % of ICT companies being export oriented.
- **Overall Assessment:** The selected sector is critical for the SW region and Resen municipality, because will increase the innovation in the region, will support innovative activities in other industrial sectors, there are two IT educational institutions that create new work force and most important stronger ICT sector will contribute decrease of brain drain of young educated people.

Manufacturing

- **Circular and Green Economy:** Integration with other sectors, better raw material utilization, composting industrial organic waste and increasing recycling activities of the industry.
- **Innovation and IT:** Integration of manufacturing and ICT sector by automatizing process, artificial intelligence, etc.
- **Highly Competitive Economic Sector:** Manufacturing is a very competitive sector. New investments are needed in new technologies, that will increase the competitiveness, decrease waste, decrease energy consumption and decrease running costs.
- **Rural development Business Development Services:** Most of the manufacturing companies are located out of the cities, with that they play important role of development of rural areas, by employing local people. Factories need infrastructure (water, electricity, roads) that local inhabitants have benefit by using the infrastructure.
- **Export Potential/Import Substitution:** Currently there is a negative import to export balance, but with project interventions that will result by increased innovations, competitiveness and goodwill of the companies there is the potential sector to have positive export to import balance.
- **Overall Assessment:** The selected sector is very important for the SW region and Resen municipality, because of number of companies and employed people. Investments are needed in new technologies, workforce education to use new technologies, and innovative products and processes.

4. Value Chain Sector Grids

Dimensions	Key Criteria	4.1. Sustainable Tourism Value Chain for the South-West Region & Resen Municipality Key Criteria findings
ECONOMIC	Market demand prospects (local and/or export)	The South-West Region experiences a regular increase of visitors. In the period from 2017 to 2019 the number of domestic tourists increased 18% while the number of foreign tourists increased 23%. The region suffered a heavy decrease of 45% during the year 2020 (Covid-Crisis). Among foreign tourists in 2019, the most common country of origin was Turkey followed by Serbia, Greece and Bulgaria. The most common non-Balkan country was Poland. It is expected for the sector to continue its growth after the Covid Crisis and therefore creating a steadily increasing market demand
	Opportunities for employment creation	According to the State Statistical Office, the accommodation facilities and food service activities sector in the South-West region employs 6'777 people in 2020. Up until the COVID crisis the employment trend was positive for the preceding 6 years. There is a positive trend of female employees in the accommodation facilities and food service activities. The working population in the South-West region is 182'639 people, of which 24.4% are currently unemployed. Therefore, there is enough available labour force for the sector's growth. However, it is unclear how many of the unemployed people are suitable (skilled) to work in the tourism sector. There is a higher unemployment rate among women, 26.4%, versus 23.1% unemployed men. In the rural areas the women unemployment rate is even higher, 25.4% versus 21.3%. By carrying out the support to improve and diversify the tourism offer higher quality, non-seasonal jobs should be created.
	Comparative advantage of production Level of competitiveness (in comparison to competing producers)	The South-West Region and Resen Municipality are unique tourism destination because: • Renowned tourism destination with internationally recognised brand including UNESCO recognition • The region's importance in religious history (churches and monasteries), natural resources, for different kinds of tourism, favourable climate conditions, and good geographic location of the country with many neighbouring countries and potential tourists within reach. • The private sector has sufficient management skills and technical capacity. There seems to be good will to improve the accommodation capacities and to invest in energy efficiency and renewable energy projects.

ENVIRONMENTAL	Impact of the value chain functions on the environment	There are several negative environmental impacts from the value chain: • Urban and rural expansion into the Ohrid basin (Hotels, Infrastructure etc.) and increased demand for drinking water as well as increased pressure on water treatment system (collecting and treatment system) especially during the tourism season • Increasing boat traffic on the lakes (pollution) • Overexploitation of fisheries, illegal net fishing for the restaurant’s needs (e.g. Ohrid Trout) • Intensively used and polluted agricultural areas in the Lake Ohrid and Prespa lake surroundings due to the use of nutrients, pesticides, herbicides and sediment input • Solid waste pollution and littering. The South-West region generates equal solid waste amount as the Skopje region, but only 26.5% is collected. Inadequate landfills (Struga and Ohrid) for waste disposal
	Impact of the environment on value chain functions vulnerability of the value chain to environment and climate change.	The current tourism offer is season and depends on good weather for the majority of visitors. As tourism is also dependent upon the attractiveness and cleanliness of the environment and negative aspects, such as air/water pollution, litter and improper disposal of waste etc has a negative effect and could result in reduced tourist numbers. From the environmental protection point of view, the main activities should be focused on the protection of all resource potentials and their full valorisation, balanced sustainable development, development of different types of tourism, application of appropriate agro-technical measures, improvement of communal infrastructure and raising the awareness of the local population for the protection of environment as well as the use of renewable energy sources. As the weather becomes more unpredictable due to climate change, more, non-weather dependant activities and attractions need to be developed. • As the environment is the main tourist attraction it is crucial for the future income creation through tourists in the region. It needs to be protected and maintained for the region to remain attractive to tourists • If no water for irrigation is available, it will also affect other sectors (agricultural) • If no fish can be caught in the lakes, gastronomy will suffer and loose one of its local trademarks • If the lakes, mountains, rivers are polluted then tourists will not come to visit the region anymore • As the whole value chain depends on the environment, the impact the environment has on it is significant
	Green opportunities	Investment in sustainable tourism offers both environmental benefits and opportunities to generate significant returns, notably in the areas of: • **Decrease Energy use** – in hotels and other accommodation there is considerable scope for investment in energy-efficient features and services. These include improvements to refrigeration, television and video systems, air conditioning & heating, and laundry. Such investments are often driven by rising energy costs; likely carbon surcharges; increasing expectations of customers; technological advances with low-carbon technology; and in some cases, government incentives. • **Decrease Water use**– internal water efficiency and management programmes, and investments in water-saving technology in rooms, facilities and attractions reduce costs. Greater efficiency and improved management allow for the increase of number of rooms/visitors in water-constrained destinations. Investments in water-saving systems, grey water reuse and rainwater collection and management systems can help reduce the volume of water consumption by approximately one quarter per guest per night.

		• **Decrease Waste** amount– lower levels of waste generation improve financial return for private sector actors, while better management of that same waste creates opportunities for jobs and enhances the attractiveness of destinations. • **Ecotourism** – promote sustainable tourism accommodation (Ohrid, but also in Resen combined with agritourism)
SOCIAL	(Prospects for) Inclusion of disadvantaged groups (poor, women, youth, refugees, minorities, handicapped, …)	There is limited information for the social inclusion of disadvantaged groups in the face of the developments in tourism sector in South-West region and Resen municipality. However, the following prospects can be pursued: • Collaborate with the employment service agency to include people with disabilities in the businesses active in the tourism value chain • Include the vocational schools and universities in vocational training programs to include young people in the value chain • There are women working in this sector however the part of female employees needs to be increased from today 26%. • Tourism entrepreneurship should be more focused on integrating women.
	Impact of the value chain on surrounding communities	The value chain has the possibility of including more than only Ohrid, but the whole of the region since it is a closed system where various people and sectors can profit from one another. For example: • **Responsible gastronomy** – if locally produced foods are processed and served then not only the restaurants can profit from the guests, but also local producers in the SW region and Resen municipality. • **Preserving and promoting the local culture and heritage -** this can contribute to the conservation and sustainable management of natural resources, the protection of local heritage and cultural arts and crafts. • **Strengthening communities -** events and festivals of which residents have been the primary participants and spectators are often rejuvenated and developed in response to tourist interest as positive example is Ohrid summer festival. • **Revitalization of customs and art forms and the preservation of heritage -** many tourists will visit the destination specially to see its local heritage. It is for this reason that many destinations will make every effort to preserve its heritage • **Agrotourism** – can be another mean to generate additional income to people staying at apple farms and visiting the orchards or the production sights etc. • The tourism needs **investments in infrastructure**, that indirectly will improve life of local inhabitants. • The sector employs and has the ability to employ more females in the workforce **increasing household incomes**.

INSTITUTIONAL	Evidence of private sector, government and/ or donors having plans for investment in the value chain	**Donors** • **Local and Regional Competitiveness Project (LRCP)**[13] financed with a grant from the European Union (IPA II). LRCP is based on a holistic approach to tourism development and destination management and provides investment funding and capacity building to support sector growth, investment in destinations, and specific destination prosperity. Up to now, there are 14 financed projects and the total projects' value is 2.47 million €. • **Support to Economic Diversification of Rural Areas in Southeast Europe (SEDRA)**[14] is jointly implemented by the Standing Working Group for Regional Rural Development in South-Eastern Europe (SWG RRD) and GIZ. It aims at strengthening mountain tourism as an important source of income and employment, by increasing tourist arrivals, spending and the involvement of rural households in tourism services. • **The Increasing Market Employability Programme (IME**) is aimed at strengthening the business sector in the Republic of North Macedonia. IME mission is to create an enabling environment for our identified high-growth target sectors. IME strategic focus on adventure tourism[15] is aimed to unlock North Macedonia's potential as a top destination for hiking, biking, winter sport, paragliding and rock climbing, as well as food & wine and agro-tourism. • **The Smart Specialization Strategy**[16], started in March 2018, when the letter of commitment from the country's government on starting the development of the National Research and Innovation Strategy for Smart Specialisation (RIS3) reached the Joint Research Centre (JRC). • **Sustainable management and treatment of Bio Wastes** by using biofuel production methods - the project value is 1,046,455 € **Municipalities** • The municipality of Struga has urban planning for the tourist zone Kalishta. The municipality investment will be in the infrastructure for potential investors in tourism. The budget will depend on the individual investor's needs. Also, Struga has 4 infrastructure projects worth 870,000 €, two donor funded projects worth 978,000 €, and the budget for tourism promotion is 65,000 €/year. • The municipality of Resen five-year-budget for the development of tourism is 34.4 million€. At the moment they have implemented: "Support to Local Events in Prespa" funded by the Existing Working Group for Regional Rural Development (SWG) in Southeast Europe and GIZ with a total budget of 10,000€; "Strengthening tourist services through adaptation of tourist path under national park Pellister and Green transport", financed by Cross Border Cooperation IPA, the total budget is 372,277 €. The municipality of Resen is planning eight infrastructure projects that are related with the local tourism development.

[13] https://lrcp.mk/en/

[14] https://www.giz.de/en/downloads/016_RP_SEDRA_EN.pdf

[15] https://ime.org.mk/adventure-tourism/

[16] https://s3platform.jrc.ec.europa.eu/north-macedonia

		• The municipality of Vevcani completed five infrastructure projects which total value is 1,857,000 €. They are planning nine infrastructure projects with a total value of 2.2 million € and one social project worth 71,000 €. The annual tourism promotion budget is 32,000 €. **Government** • Infrastructure: Highway Kičevo-Ohrid, investment worth 600 million €. • Agency for Promotion and support of Tourism: the annual budget is 156,000 € for all regions
	Sector (promotion) policies and regulations are in place and effective (keep it)	• The **Tourism Development Strategy** on the national level- 2019-2021[17] with main activities: increase promotional activities, development of new brand strategy, development of lead projects for tourism, the establishment of a fund for tourism development • The **National Strategy for Rural Tourism** expired as the last document was for the 2012-2017 period. The **National Strategy for the Development of Health Tourism** expired in 2018 • Local and Regional Competitiveness Project (LRCP) **- Tourism Development Plan** for Ohrid, Struga, Prespa and Surroundings[18] • Some laws regulate tourism activities, such as the **Law on Mountain Trails**[19], the **Law on auto camps**[20], the **Law for Tourism Development Zones** • The Ministry of Economy does not have an updated **National Strategy for the Development of Health Tourism** and **Rural Development Tourism Strategy**. These two strategies have to be an umbrella strategy so that the municipal tourism development strategies and donor projects can comply with the state development strategies. • The win-win situation will be for the Ministry of Economy to establish development strategies, screen the tourism development actors, integrate their present activities in the development strategies, and organize stakeholders' meetings in order to coordinate state agencies, municipalities, donors, NGOs', associations, clusters, etc. If there is coordination of the activities the impact will be higher • The **Ohrid tourism strategy 2020-2025** has been completed, but not approved by the municipal council. **Resen** has a proper **tourism strategy for 2019-2024**[21], and the total budget is 34,4 million €. Struga, Debar, Plasnica, Makedonski Brod, and Vevcani do not have tourism development strategies.

[17] https://www.economy.gov.mk/Upload/Documents/BER_Tourism%20Strategy%20Macedonia_FINAL%20REPORT_16%2004_MK%20Edit%202018.pdf

[18] https://lrcp.mk/lrcp-uploads/2019/04/Destination-1-Ohrid-Struga-Prespa-and-their-surroundings_EN.pdf

[19] https://www.uklo.edu.mk/filemanager/HORIZONTI%202020/Serija%20A%20vol%2026/20..pdf

[20] https://www.ugostitelstvo.mk/wp-content/uploads/2014/11/Zakon_za_avtokampovi_13_23012013.pdf

[21] http://resen.gov.mk/wp-content/uploads/2021/02/%D0%A1%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D1%98%D0%B0-%D0%B7%D0%B0-%D1%82%D1%83%D1%80%D0%B8%D0%B7%D0%B0%D0%BC-2019-2024.pdf

		Although there are multiple strategies and policies in place, it seems that they are currently still not fully implemented and delivering the desired effect.
	Chain actors / government / donors / support organizations' readiness to change, to collaborate and to align interventions	**Government institutions** • Ministry of Economy[22] • Agency for Promotion of Entrepreneurship of the Republic of North Macedonia[23] • Fund for innovation and technological development[24] • Agency for Promotion and Support of Tourism[25] **Business Associations** • Economic Chamber of Tourism of Macedonia[26] • Association of hotels and restaurants of North Macedonia (HOTAM) • Tourism Cluster (TC) of Southwest Macedonia (EDEN)[27] **Donors** • Delegation of the European Union to the Republic of North Macedonia[28], GIZ[29], USAID[30], SECO[31], JICA[32] The general perception of the stakeholders which were met in the process of the ecosystem mapping seemed to be willing to change and/or to collaborate with EU4G in order to promote (sustainable) tourism in the South-West region.

[22] https://www.economy.gov.mk/

[23] http://www.apprm.gov.mk/AboutUs

[24] https://fitr.mk/en/

[25] http://tourismmacedonia.gov.mk/?lang=en

[26] https://www.mchamber.mk/Default.aspx?mId=31&lng=2

[27] https://eden.mk/our-region/southwest-macedonia-eden-on-earth/ohrid/

[28] https://eeas.europa.eu/delegations/republic-north-macedonia_en

[29] https://www.giz.de/en/worldwide/301.html

[30] https://www.usaid.gov/north-macedonia

[31] https://www.seco-cooperation.admin.ch/secocoop/en/home/laender/complementary-measures/north-macedonia.html

[32] https://www.jica.go.jp/north_macedonia/english/index.html

	Feasibility of the intervention	Sustainable tourism has a significant potential contribution to the South-West region and the Resen municipality economy, and there is a critical number of firms with the development potentials and there are Business Support Organizations that can support the Tourism Value chain with sufficient capacity and financial resources. **Possible Interventions** • The project types that can improve the tourism value chain are rural, village, and mountain tourism, considering that the growth rate of these activities in the domestic market (before and even during the Covid Crisis) reached rates of 30-40% compared to the 4% in the field of mass tourism • For the development of sustainable tourism, the necessary measures might have to be taken in the energy efficiency and renewable energy, marking of mountains' paths, cycling paths around the lakes, strengthening of the local tourism supply chain (locally organic grown fresh and preserved fruits and vegetables, a slaughterhouse that will supply hotels and restaurants with fresh meat, also provided from local farmers), rural tourism projects, adoption of old houses in villages and municipalities • It is essential to implement tourism as an activity to develop innovative solutions for rapid, sustainable tourism growth. In perspective, the tourism sector should support research and innovation activities that will focus on social innovation based on rich cultural heritage and local creativity by promoting a complex of environmentally friendly activities and consumer-friendly services that will consider sustainable use of natural resources and introduction of Innovative Tourism programs. In addition, tourism activities create an entrepreneurial environment and increase SME opportunities and job opportunities. Equally important are the options created by the increasing demand for local products, especially concerning the domestic tourism sector (using ecotourism as a tool to foster the transition to organic farming) • Integrating people from different sectors (ICT, Agriculture etc.) for example due to the creation of tourism applications, smart energy-efficient buildings, Self-Booking, Contactless Technologies, Virtual Assistants, and agritourism or supplying the gastronomy through local farmers. **Feasibility** The above-mentioned interventions are feasible. However, a lot of the interventions also depend on the will to change of the local entrepreneurs and actors. A network must be established and maintained, and success stories need to be used to promote the activities

Dimensions	Key Criteria	4.2. Information and Communication technologies (ICT) value chain for South-West Region & Resen Municipality Key Criteria findings
ECONOMIC	Market demand prospects (local and/or export)	Exports of information and computer services have been growing steadily over the past few years, and is a sector that was not negatively affected by the pandemic. The share of the ICT industry in the total export of the country in 2019 is 3,58%, but what is more significant is this industry is a net exporter, due to which it has the potential to increase the added value of the Macedonian exports and reduced the trade deficit in foreign exchange. The Macedonian ICT industry is servicing customers in 37 countries in Europe, North America, Asia, Australia, and the Middle East. Most ICT companies in North Macedonia see the most significant potential as export destinations in Scandinavian countries, Central and Eastern Europe, followed by the current number one choice North America. The ICT sector is one of the most dynamic and fastest-growing sectors in the Republic in the last decade. A major part of the Macedonian ICT companies in the software development sub-area have applied business model based on delivering software solutions and outsourcing software services for other multinational ICT companies, while a small part of them bases their business activities on development of own IT solutions to the end consumers. This data shows that the ICT Value Chain operates in a field with high market demand and good prospects for further growth.
	Opportunities for employment creation	The number of employees in the ICT sector is 16'262 (2019 data). There is a constant growing demand for employees which is reflected in the increased number of jobs in the industry. The number of employees in the South-West region and Resen municipality varies, but it shows constant growth. According to the MASIT survey, most companies believe that there is not enough qualified workforce in North Macedonia, but there are two ICT faculties in the South-West region: St. Paul the Apostle (375 graduated students since 2014) and the International University of Struga (no data available about the graduated students), that SW region does not have big shortage of skilled workforce. From 2014 to 2019, the percentage of male/female graduated students in ICT changed from 60%/40% to 53%/47%.

	Comparative advantage of production Level of competitiveness (in comparison to competing producers)	Several factors make the Macedonian ICT sector competitive: • There is a growing trend among Western European and American companies to outsource labour intensive software-related tasks and activities to countries with a high skilled workforce combined with (relatively) lower labour costs, thereby creating substantial market opportunities and an advantage for software and IT services companies in North Macedonia. • Additional advantages are the well-functioning telecommunication infrastructure, good English skills of the young people working in the sector and low corporate taxes. • The Southwest Region offers a lifestyle choice attractive to digital nomads and young entrepreneurs. There is a growing population in Ohrid and the region that bring new ideas, technology, and networks into the developing ecosystem.
ENVIRONMENTAL	Impact of the value chain functions on the environment	Telecommunication base stations are the major Green House Gases (GHG) producers because they use electricity or diesel generators for electricity production because the telecommunication base stations are in remote areas and not connected to the grid. Considering that in the South West Region, plus Resen Municipality, there are 247 BTSs, 187 are connected on the grid, 60 BTS use diesel generators. All 247 BTSs produce 3,408 tons of CO2 gases, where 60 BTS, using diesel as an energy source (24.3%), produce 1,860t CO2 gases or 54.6%. According to the “Waste Management System for the South-West Region” study, the South-West region generates 56’224 tons of waste on the annual level from which the average waste composition of Waste Electrical and Electronic Equipment (WEEE) is 0,72% or 404,8t of electronic waste every year that, unfortunately, is not properly collected and recycled. This electronic waste degrades soil and water.
	Impact of the environment on value chain functions (Low) vulnerability of the value chain to (degraded) environment and climate change.	The environment can have an impact in increasing the need for using the technology in different other sectors such as food industry, agriculture etc, production, retail etc. ICT can support be included in providing more efficient irrigation systems and other smart Agri/aggrotech solutions based on the climate changes needs. It can support monitoring and measurements of humidity in different crops. etc. As a result, the project could provide support intervention to provide solution through ICT in other sectors. Similar situation could apply in different production sectors
	Green opportunities	The ICT can be regarded as a horizontal area of extreme importance for the growth of the entire industry, by developing interconnectivity, utilizing new software, better business processes and models, digitalization, and automation of the industry creating new added-value products and services, using the unique potentials of blockchains, improve safety with cybersecurity in mind. • There are opportunities in constructing intelligent systems for cooling and heating, lighting systems, intelligent systems for monitoring and control, digitalization, and automatization of the production processes, that is, management of industrial processes. Additionally, there is the rapid growth of demand for e-services in the business and public sector, medicine

		(e-health services), trade (e-commerce), education (e-education), tourism and culture (e-tourism, creative industries), government (e-government), etc. • The crisis caused by the Covid-19 pandemic increased the global and domestic demand for ICT services, especially the need for digitalization of the businesses, society, and the public sector. • ICT Solutions therefore can be used to reduce energy consumption and resources by making processes and production more efficient. Through an increase in mobile working possibilities commuting, travelling and additional office space is becoming more and more neglectable and therefore also possibly contributing to a reduction in emissions.
SOCIAL	(Prospects for) Inclusion of disadvantaged groups (poor, women, youth, refugees, minorities, handicapped, …)	There is no official statistical data about the number of female employees in the ICT sector but according to the ICT Chamber of Commerce MASIT, the ratio of male to female is significantly far from being equal with about 65% / 35% of the surveyed companies. • People with disabilities can be easier included in the value chain, because no or only minimal work-space adaption is needed to create a productive environment. Therefore, inclusion should be enforced in this value chain. • Inclusion of young people is on the rise, because the sector is experiencing growth and university graduates are recruited directly from the colleges.
	Impact of the value chain on surrounding communities	Strong ICT value chain indirectly will have positive impact on surrounding communities such as: • Increase **growth and productivity**, by expanding the **start-up society** and boost **innovation** of ICT and other industries • Attracting **investment** and contributing to public finances, • New **employment**, has a positive effect on mainly **young people** graduating from the university • **Reduce poverty**, as powerful instrument to provide people with economic opportunities, knowledge and services that can alleviate poverty in all its dimension • The ICT needs **investments in infrastructure**, broadband and mobile internet speed that indirectly will improve environment of other business and life of local inhabitants • With a growing ICT sector, the demand for ICT related products, office space and other industry related sectors can profit, such as production and manufacturing, agriculture can profit from locally created smart-solutions. • ICT value chain can help to **reduce waste** (by collecting and recycling E waste), **CO2 reduction** (investing in renewable energy for telecommunication Base stations), smart applications that can control energy use in buildings.

INSTITUTIONAL	Evidence of private sector, government and/ or donors having plans for investment in the value chain	• One of the agencies dedicated to entrepreneurship development in the country is **APPRM**[33]-Entrepreneurship Support Agency. The agency's primary purpose is to implement the Government policies for SMEs and other related projects/programs adopted by the Government to support entrepreneurship, competitiveness, and innovation. The budget for 2021 for the competitiveness of SME' is 338'000 €. • **NCDIEL**[34] - The National Centre for developing innovation and entrepreneurial learning, is developed under the recommendations of the South-East Europe Co-operation of Innovation and Finance Agencies project. This network seeks to strengthen the capacity to effectively provide innovative, technological and financial support to micro, small and medium enterprises. • The only support programme available for the South-West Region is the **Innovation hub**[35]. The cross-border project called Innovation Eco-System in the CBC area (CBC INNOV8) financed by EU. This project consists of the establishment of innovation support infrastructure for the transfer of know-how technologies among Start-Ups and SMEs in the Cross-Border Communities between the Republic of North Macedonia and the Republic of Albania. The project budget is 389,028.69 €. • The **Smart Specialization Strategy**, started in March 2018, when the letter of commitment from the country's government on starting the development of the National Research and Innovation Strategy for Smart Specialization (RIS3) reached the Joint Research Centre (JRC). • **Fund for innovation and technological development** (FITD): co-financed grants for newly established start-ups and spin-off companies. Up to now FITD has supported 514 projects (the total budget is 70,38 million €) from which 155 projects or 30,16% (the total budget is 18.8 million) has been in the ICT sector. In the South-West region there only 6 supported ICT projects (3.87% from all the ICT supported projects). • The Increasing **Market Employability Programme** (IME) is aimed at strengthening the business sector in the Republic of North Macedonia. IME mission is to create an enabling environment for identified high-growth target sectors, Information and Communication Technology[36] (ICT) with priority to catalyse the emerging ICT sector toward furthering innovation in value-added product development. **European Union Funding** • Besides the domestic supply of finance, the EU funding is also an available and very important support for the Macedonian ICT companies. The European Commission has set up an Executive Agency for Small and Medium-sized Enterprises **EASME**[37]**,** is the most important agency to monitor all events, as it coordinates projects (COSME, SME Instrument, EIC

[33] http://apprm.gov.mk/default.aspx

[34] https://ncdiel.mk/homepage/

[35] https://www.innov8cbc.com/

[36] https://ime.org.mk/ict/

[37] https://wayback.archive-it.org/12090/20210412123959/https://ec.europa.eu/easme/en/#pillar-smesupport

		Fast Track to Innovation, Horizon 2020 INNOSUP, etc.) and initiatives that are of major importance for financing, grants, and support to SMEs and organizations that mediate between companies and European agencies. **Private Sector** • They are providing on the job trainings according to their needs, however not on a general level. There is ambition in investing and enhancing their business, however in the interviews it came clear, that administrative (or other) barriers are often hindering the private sector investments.
	Sector (promotion) policies and regulations are in place and effective (keep it)	On the website of the Ministry of Information, Society and Administration the following two strategies can be found. However, it is unclear if there are any current programs in place since the listed ones are outdated. • As a support for the ICT Industry, the **National Short-Term ICT Strategy**[38] has been issued (2016-2017), but it has not been fully implemented or updated. Yet, the dynamics of the development of the ICT Industry in every economy to some extent depend on the state policies that directly impact the level of competitiveness and attractiveness of the industry. • The **National Cyber Security Strategy**[39] (2018-2020) is a strategic document that fosters the development of a safe, secure, reliable, and resilient digital environment, supported by high-quality capacities, based on cooperation and trust in the field of cybersecurity
	Chain actors / government / donors / support organizations' readiness to change, to collaborate and to align interventions	**Government institutions** • The **Ministry of Information Society and Administration**[40] performs tasks related to the development and promotion of the information society, Fund for innovation and technological development **Business Associations** • The ICT value chain is well organized thanks to the ICT Chamber of Commerce **MASIT**[41], Innovation Hub **Donors** • Delegation of the European Union to the Republic of North Macedonia, GIZ, USAID, SECO, JICA The actors seem to be very open to change and to cooperation with EU4G as well as the local business support organizations.

[38] https://mioa.gov.mk/?q=en/node/2385

[39] https://mioa.gov.mk/?q=en/node/2379

[40] https://www.mioa.gov.mk/?q=en

[41] https://masit.org.mk/en/

	Feasibility of the intervention	**Interventions** • To support ICT start-ups by accelerator programme - prepare training curriculums, organize training, establish mentoring programme. Links to investments into R&D, Incubation, and Acceleration activity. • To strengthen the cooperation between the academia and the private sector in building the capacities to develop own software IT solutions to final consumers, instead delivering outsourcing ICT services exclusively. • To increase the cooperation between academia and business in the field of ICT by working on joint projects. • To increase the profitability of the ICT companies by organizing training for mature ICT companies on marketing and sales skills and facilitating links with the foreign ICT companies. **Feasibility** It is believed that the above-mentioned interventions are feasible as they are a crucial part of the EU4G project approach.

Dimensions	Key Criteria	4.3. Manufacturing value chain for the South-West Region & Resen Municipality Key Criteria findings
ECONOMIC	Market demand prospects (local and/or export)	There are 8'011 manufacturing companies in all country from which 779 (9,72%) are in the SW region (748) and Resen municipality (31). According to 2017 state statistical data, the manufacturing sector has negative export (154,3 Mio €) versus imports (184,8 Mio €) balance of 16,52%. Most exported products categories are Motor vehicles, trailers, and semi-trailers 65,8 Mio € (42,6%), Electrical equipment 39,9 mm €, (22,6%), Fabricated metal products, except machinery and equipment 14,6 mm € (9,5%) and Wearing apparel 15 mm € (9,8%). There is possible demand and a large potential, especially in the establishment of local supply chains for international companies active in North Macedonia. However due to the strict requirements of the multinational companies, it is often difficult for local suppliers to become engaged with them. Furthermore, the manufacturing sector consists of various sub-sectors and therefore support needs to be tailor-made.
	Opportunities for employment creation	The manufacturing sector in the South-West region, employs 10'028 people in 2020. The sector has shown a constant growth over the last five years, which reflects the possibility for additional job creation. Unskilled labour is available but highly trained professionals are in demand but not found on the local labour market. There is a potential in increasing production, improve value-added, and reducing costs in the production lines of various companies by becoming more efficient or use less resources. By improving the production process and increasing the skill levels this would help to increase salaries of the workforce of the companies.
	Comparative advantage of production Level of competitiveness (in comparison to	The 2020 UNIDO, CIPI report states that in all Western Balkan countries, except of North Macedonia, the manufacturing value added is a result mainly of technological improvement. This signals that if the country plans to be competitive then technology and processes need to be modernised and changes in the industrialization intensity in North Macedonia are required. Having said that, The presence of a number of foreign/multi-national companies provides opportunities for other manufacturers in the region to benefit directly as part of the manufacturing supply chain, for which there are a number of Government incentives, as well as indirectly through the increased skills base and support services available due to the investor's presence. There is the added advantage of becoming a known location for quality manufactured goods.

	competing producers)	Linking the manufacturing sector with ICT and the academic institutions/schools is a key aspect of the project intervention to address the needs of technological development and to create greener, more efficient and competitive manufacturing businesses.
ENVIRONMENTAL	Impact of the value chain functions on the environment	**Hazardous and non-hazardous waste** According to the Waste Management Strategy[42] the industrial non-hazardous waste is 2'120 Mio. t/year (8,15% of the national total), Industrial hazardous waste represents 0,0775 Mio. t/year (0,3% of the total). The collection of non-separated municipal and non-hazardous industrial waste and non-separated non-hazardous and hazardous waste fractions is a standard practice. However, there is no reliable source of data about the actual practice. Furthermore, there is no regional statistical data for industrial waste available, which makes it difficult to estimate the waste management of the manufacturing sector in the South-West region. **Water consumption** The manufacturing sector in the SW region uses 29,28 Mio. m^3 water (1,82 % of the total consumption), from which only 1,1 Mio. m^3 (3,75 %) is treated. This is posing a huge threat to the environment mainly affecting the groundwater and the pollution of rivers and lakes in the region – which again affects the population of the region as well as the Tourism Value Chain. No additional statistical data regarding environmental impacts could be found, however it is believed that there are other fields where the manufacturing value chain has an impact on the environment (energy consumption, proper waste management etc.)

[42] https://www.moepp.gov.mk/wp-content/uploads/2014/12/Waste-Management-Strategy-of-the-RM-2008-2020.pdf

	Impact of the environment on value chain functions vulnerability of the value chain to environment and climate change.	North Macedonia is characterized by a variable climate, which, combined with rising temperatures and more extreme weather events, such as floods and drought (due to climate change) can have a certain impact on the production. The need to reduce greenhouse gases, and to become more resource efficient should drive the change in processes and practices within the manufacturing sector. Favourable local conditions for the use of solar power and the presence or potential of other renewable energy sources such as biogas, and waste to energy should be harnessed to make the sector less vulnerable to climate change.
	Green opportunities	Private sector companies may be involved in waste management of commercial and industrial waste management, expecting high quality and efficient services including composting of industrial organic waste combining with agriculture waste and organic waste from public and private green surfaces. Proper management of biodegradable waste representing a significant fraction in municipal waste and in waste from wastewater treatment, agriculture waste and in food and beverage industry waste can significantly contribute to the reduction of greenhouse gas emissions. Their redirection from landfill to any other material/energy recovery processes and control of emissions to the air from existing landfill facilities may give a substantial contribution to some local measures against global climate changes and create new jobs in the field of manufacturing. The recycling market for plastic in SW region is underdeveloped. However, there is a well-established network of collectors and/or brokers, as well as a strong and stable market for recovered scrap metals. Adopting of Integrated Pollution and Control (IPPC) directives, are efficient measures of the waste minimization at source, i.e. more efficient utilization of raw materials and energy, more intensive internal or external recycling of the production material streams, utilization of less hazardous substances in manufacturing of products, immobilization of hazardous substances in waste before landfill and strictly separate final disposal of hazardous and non-hazardous waste.
SOCIAL	(Prospects for) Inclusion of disadvantaged groups (poor, women, youth, refugees, minorities, handicapped, …)	The manufacturing sector employs more male 57,6% employees versus females 42,4%, but there is a positive trend of female employees in the manufacturing industry. 59,4% of women employees are older than 41 years, 31,1% are aged between 30 to 40 years old. The working population in the South-West region consists of 182’639 people (24,7% unemployed). There is a higher unemployment rate among women (26,4%) versus men (23,1%). Moreover, in rural areas women unemployment rate is even higher (25,4% versus 21.3% men). There is no data about employed disabled people in the SW region and Resen municipality. Employment service agency provides incentives for companies to employ disabled people including salary support, non-refundable funds for workplace adaptation, and job training,

	Impact of the value chain on surrounding communities	Strong manufacturing value chain indirectly will have positive impact on surrounding communities such as: Growth of the manufacturing sector will contribute growth in the country **GDP** Job creation: Directly employing young educated people and indirectly because many local manufacturing companies use local subcontractors in their supply chain and by improving their business it will have a positive effect on the **creation of new employments**. In order to be more competitive, the manufacturing companies must have **increased R&D activities**. Quality of live: Due to an **increase of good infrastructure** supported and financed by the government (if the value chain develops positively). Opportunity to for **pollution decrease**: Through the promotion of recycling and reusing material a circular economy can be achieved and less resources are needed. Opportunity to **decrease the energy use**: Industrial energy consumption can be reduced through providing trainings about energy efficiency solutions.
INSTITUTIONAL	Evidence of private sector, government and/ or donors having plans for investment in the value chain	**Donor funded Projects** **The SME Competitiveness Support Programme**[43] Republic of North Macedonia was developed specifically to assist privately owned SMEs to meet the new regulations and to understand the improvement requirements in the field of environmental protection, occupational health and safety and product quality and safety. The Western Balkans Investment Framework (WBIF)[44] supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic investments. It is a joint initiative of the EU, financial institutions, bilateral donors and the governments of the Western Balkans. **The Smart Specialization Strategy**, started in March 2018, when the letter of commitment from the country's government on starting the development of the National Research and Innovation Strategy for Smart Specialisation (RIS3) reached the Joint Research Centre (JRC). **Local support** One of the agencies dedicated to entrepreneurship development in the country is **APPRM[45]**-Entrepreneurship Support Agency. The agency's primary purpose is to implement the government policies for SMEs and other related projects/ programs adopted by the Government to support entrepreneurship, competitiveness, and innovation. The budget for 2021 for the competitiveness of SME' is €338,000.

[43] https://web-sme-csp.com/republic-north-macedonia/en/

[44] https://wbif.eu/storage/app/media/Library/1.%20Governance/WBIF%20at%20a%20Glance_May2020.pdf

[45] http://apprm.gov.mk/default.aspx

		NCDIEL[46]**-** National Centre for developing innovation and entrepreneurial learning, is being developed under the recommendations of the South-East Europe Co-operation of Innovation and Finance Agencies project. This network seeks to strengthen the capacity to effectively provide innovative, technological, and financial support to micro, small and medium enterprises. Fund for innovation and technological development (**FITD**): co-financed grants for newly established start-ups and spin-off companies. In the South-West region there only 17 supported manufacturing projects (10,56% from all the manufacturing supported projects). **The European Union Funding** Besides the domestic supply of finance, the EU funding is also an available and very important support for the Macedonian ICT companies. The European Commission has set up an Executive Agency for Small and Medium-sized Enterprises **EASME**[47]**,** is the most important agency to monitor all events, as it coordinates projects (COSME, SME Instrument, EIC Fast Track to Innovation, Horizon 2020 INNOSUP, etc.) and initiatives that are of major importance for financing, grants, and support to SMEs and organizations that mediate between companies and European agencies. This agency is of the utmost importance for the entire entrepreneurial eco-system in the country. All the above-mentioned actors are in involved in supporting or investing in the manufacturing value chain.
	Sector (promotion) policies and regulations are in place and effective (keep it)	• Industrial Strategy of the Republic of North Macedonia (2018-2027)[48] • Industrial Strategy with a focus on the Manufacturing Sector[49] • Economic growth plan[50] • National Strategy for Small and Medium Enterprises (2018-2023)[51] • National Strategy for Sustainable Development (2009-2030)[52]

[46] https://ncdiel.mk/homepage/

[47] https://wayback.archive-it.org/12090/20210412123959/https://ec.europa.eu/easme/en/#pillar-smesupport

[48] https://www.economy.gov.mk/doc/2581

[49]https://konkurentnost.mk/index.php/download/industrial-strategy-with-a-focus-on-the-manufacturing-sector-republic-of-macedonia-june-2018/?wpdmdl=4574

[50]https://vlada.mk/PlanEkonomskiRast

[51] https://economy.gov.mk/Upload/Documents/Strategija%20za%20MSP%20-%20finalna%20verzija%2003%2004%202018%20.pdf

[52] https://www.moepp.gov.mk/wp-content/uploads/2014/12/Nacionalna-Strategija-za-Odrzliv-Razvoj-vo-RM-NSSD-Del-1.pdf

		There are many strategies in place, however according to the people working in the manufacturing sector improvements in terms of policy implementing and enforcing still are required to ease the way of doing business in an efficient and transparent matter.
	Chain actors / government / donors / support organizations' readiness to change, to collaborate and to align interventions	**Government institutions** • Deputy Prime Minister in charge of economic affairs, coordination with economic departments and investments[53], Ministry of Economy, Invest North Macedonia[54], Agency for Promotion of Entrepreneurship, Fund for innovation and technological development, LED offices and municipal stakeholders in the South-West region and Municipality of Resen. **Business Associations** • Economic Chamber of North Macedonia[55], Macedonian Chambers of Commerce[56], Chamber of Commerce of North-West Macedonia[57], The Macedonian Association of Processors[58], Textile Trade Association[59], Small Business Chamber[60] **Donors** • Delegation of the European Union to the Republic of North Macedonia, GIZ, USAID, SECO, JICA It seems that on the municipal level there is will and readiness to change and to collaborate with the sector in order to align and improve interventions. However, there are no experiences in working together with municipalities.

[53] https://www.vicepremier-ekonomija.gov.mk/

[54] https://investnorthmacedonia.gov.mk/

[55] https://www.mchamber.mk/default.aspx?mid=1&lng=2

[56] https://chamber.mk/

[57] https://oemvp.org/en/

[58] http://www.map.org.mk/index.php/en/

[59] https://tta.org.mk/en/

[60] http://www.sbch.org.mk/

	Feasibility of the intervention	The following interventions were deemed to be feasible and suited to integrate in the value chain: • Support Fast Growing SMEs with technological development • Support investments in skills, innovation and technology transfer and in linkages between foreign and local firms • Deepen efforts to promote exports of domestic products. • Catalyse green industry and green manufacturing- Increase low-carbon manufacturing production, increase % of clean/renewable energy use in manufacturing sector, streamline supply chain processes to reduce waste, • Reduce pollution as result of manufacturing production • More efficient utilization of raw materials and energy, more intensive internal or external recycling of the production material streams, utilization of less hazardous substances in manufacturing of products, immobilization of hazardous substances in waste before landfill and strictly separate final disposal of hazardous and non-hazardous waste. **Feasibility** It is believed that the above-mentioned interventions are feasible as they are a crucial part of the EU4G project approach.