# Mapping and understanding the innovation potential of bio-economy businesses in the partner regions.

# The case of Western (Dytiki) Macedonia, Greece, focused in Agri-Food sector.

## 1st Draft Version, October 2016

# Introduction

## Purpose of this task and links to the feasibility actions and the regional action plans

BRIDGES project regional partners have all RIS3 strategies which include bioeconomy industries. For these industries to speed up their innovation and growth potential, regions should encourage (inter alia) those segments of the industries that have the highest potential to absorb innovation and invest in it. BRIDGES project focuses on this type of businesses. We expect to identify, within the BRIDGES partnership, some 100 businesses in total, depending on the size of the regional economies and the regional population. The regional maps will reveal the level and type of innovation that can be best absorbed by the regions.

The innovation absorption potential of these companies will be analysed, based on the reports produced in each region, by the Bioeconomy expert, and matched with research options that can lead to investments. During the 3rd IPL, in Helsinki, esearch infrastrucutres from Finland and other partner countries will come together with respective businesses, to discuss and undertsand better cooperation opportunities. These findings will be analysed further during the 3rd IPL session that follows the matching event, and decisions will be made by the regional stakeholder group meetings that will follow the 3rd IPL. The decisions of these meetings will clarify 1) what type of innovations to prioritise in the region and therefre 2) what type of projects should be generated and 3) which one(s) of these projects whould be seleced to be part of the field action of the action plan.

The regional maps will be compared and synthesised (capitalisation action), and made available through the project IE web site.

## Conceptual background: why this report and how do we measure the innovation potential of regions and businesses?

### *Why this report*

The issue of firms' innovation absorptiveness capacity is equivalent to the discussion on firms' absorptiveness capacity of external information. The issue has been disucssed since 1950s, and the connection to innovation since the late 1980s. The term 'absorptive capacity' was introduced in 1990 by Cohen and Levinthal[1]: "The ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends is critical to its innovative capabilities. We label this capability a firm's absorptive

[1] Wesley M. Cohen; Daniel A. Levinthal (1990) **Absorptive Capacity: A New Perspective on Learning and Innovation,** *Administrative Science Quarterly*, Vol. 35, No. 1, Special Issue: Technology, Organizations, and Innovation. (Mar., 1990), pp. 128-152, page129.http://links.jstor.org/sici?sici=0001-8392%28199003%2935%3A1%3C128%3AACANPO%3E2.0.CO%3B2-5

capacity and suggest that it is largely a function of the firm's level of prior related knowledge". Absorptive capacities are also used to explain technology transfer among nations (interregional parnershps are such examples) and the success of strategic alliances for innovation[2].

Absorptive capacity is related to the knowledge pillover theory (knwoeldge spillovers can happen iff a firm can appreciate / grasp good practices, successful patterns of other firms). In BRIDGES project, we adopt a more voluntaristic approach. However, the findings from BRIDGES project, would be useful –we feel, to any staged, mediated approach aiming at innovation-based growth.

***Measurements of innovation potential***

Knowledge spillover and innovation absorptiveness literature stresses the cumulativeness of knowledge as a value and precondition of absorptive capacity. Measurements of innovation potential include, for example: patents by businesses and patent families, IPR, resources devoted to research and development, technology balance of payments and international trade in R&D-intensive industries3.

In BRIDGES project, we want to identify those fields (clusters, business concentrations) of RIS3 bioeconomy industries that have the highest innovation potential. We are addressing the micro level. In the next section we propose some possible measurements for partners to review and agree during the 1st IPL session.

## Suggestions for measurement indicators and justification

(1) Bio-economy businesses that have received public support (as appliers or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years. (Input-Output indicator)

(2) Bio-economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation. (Output indicator)

(3) Bio-economy businesses that have been developing products through Research2Business innovation partnerships during the last 3 years; long term, comprehensive cooperation. (Output indicator)

[2] Vega-Jurado, J., Gutierrez-Gracia, A. and Fernandez-de-Lucio, I. (2008) Analyzing the determinants of firm's absorptive capacity: beyond R&D. R&D Management 38, 4, 392-405.
Narula, R. (2002) Understanding Absorptive Capacities in an "Innovation Systems" Context: Consequences for Economic and Employment Growth. DRUID Working Paper nr. 04-02.

[3] https://www.innovationpolicyplatform.org/content/patent-data-performance-firms-regions-and-countries?topic-filters=12243 and Oslo Manual (OECD/Eurostat, 2005)

(4) Bio-economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years. (Output indicator)

(5) Bio-economy businesses that have applied for Phase 1 SME or Phase 2 SME Instrument (TRL 6 and higher). (Performance indicator).

## TABLE INDEX

# The case of W. Macedonia, Greece, focused in Agri-sector.

## 1. General description of the region and its profile

### 1.1. Socio – Economic profile

Western Macedonia is a mountainous, landlocked, region, situated in north-west Greece, having borders with Albania and FYROM and 2.5% of the country's population (2015). The region is endowed with rich natural resources such as energy and metallic minerals that have shaped its productive identity as one of the most important electric energy production plants in Greece (50% of country's total electric power is produced in the Region).

In 2013, the tertiary sector accounted for 45.3% of the regional GVA, while the secondary sector share was 48.8% far above all other regions in Greece, and that of the primary one was 5.9%.

It has to be mentioned that, the rest of manufacturing activities concern traditional sectors, including renowned regional products such as marble, saffron, fruits, local wines, furs and leather manufacturing and specialised arts and crafts, while in the services sector, retail and wholesale trade, tourism and public administration services are the most important sub-sectors in terms of value added and the health and financial intermediation sectors are gradually growing in importance.

The regional economy faces significant challenges related to the need for restructuring of the economy towards higher value added activities, the absence of foreign direct investments, the declining manufacturing sector and the pollution and degradation of the natural environment resulting from decades of mining and energy production activities.

The recent economic crisis along with discontinuities in regional research and innovation policies have magnified the structural deficiencies of the local economy, characterised by small companies, traditional industries, high unemployment, and low competitiveness.

Scientific specialisation is limited and focused essentially on energy technologies. From the economic side, the region has a very strong sectoral specialisation in energy and has implemented a number of targeted projects.

Despite this focus, the region has not managed to create a competitive advantage and is trapped in a vicious circle where efforts towards differentiation and development in the energy sector have reinforced the dominance of the public sector.

The economic crisis led the unemployment rate in 2016 to 31%, ranking the region second concerning this indicator. This accentuated the problems of the previous decade, when the region already faced the highest unemployment rate in Greece due to de-industrialization and the migration of labour intensive industries to neighbouring Balkan low labour cost countries.

After 2008, it is estimated that over 20% of regional firms have ceased their operation, while the turnover of regional firms, particularly in the trade sector, has dropped over 40%. Indicatively, in 2013 there were 8,299 wholesale and retail trade firms in the region, a decrease of 9.7% compared to 2008.

Over 2001-2009, the average annual growth of GDP was 5.1%, while during the period 2010-2013 due to the crisis the relevant index was decreasing annually by 3.4%. In 2014, the region accounted for 2.3% of the country's GDP. In terms of GDP per capita, the region was positioned 4th among the 13 Greek regions and below the EU28 average (66%).

Moreover, 2.3% of the country's workforce is employed in the region, 54.30% in the services, 27.90% in the secondary sector and 17.80% in the primary sector (B’semester2016).

### 1.2. Governance

Until 2011 regions had limited autonomy in terms of policy formulation and design and no legislative autonomy. With "Kalikratis reform", regions gained significant autonomy in designing and implementing their regional policy, within the context of the national legislation. The head of the region is the Governor and the Regional Council, both elected.

The Region of Western (Dytiki) Macedonia (RWM) is a self contained administrative unit of the regional government with jurisdictions and competences regarding the design, programming, coordination and implementation of policies for the economic, social and cultural development of the region, following in many cases (e.g. employment, energy, entrepreneurship etc) central guidelines and choices.

RWM is responsible for the elaboration, programming and management of development strategies for the region, including those co funded by the structural funds as articulated within its Regional Operational Programme.

More specifically the responsibilities of the Region include the programming and implementation of policies regarding the economic, social and cultural development of the region, including Research Technology Development and Innovation (RTDI) actions. Among the responsibilities is the design and implementation of the Regional Operational Programme (ROP).

In addition, the Region is responsible for the management and implementation of projects and initiatives with exclusively regional dimension such as transportation and Internet Communication Technologies (ICT) infrastructures, urban planning and environment, commerce, tourism and employment, natural resources, energy and industry.

Due to the low capacity of Regions to design their own RDTI policies, over the programming period 2007-2013, RTDI policy design was centralized.

However, in the new programming period 2014-2020 the design and implementation of RTDI remains in the Region. Currently, the REDM has prepared its Regional Innovation Smart Specialization Strategy (RIS3). The design of RIS3 has been appointed to the Intermediate Managing Authority (IMA) of W. Macedonia under the supervision of the Regional Authority.

### 1.3. Main Financial Instruments supporting Entrepreneurship and RTDI in W. Macedonia

Entrepreneurship and RTDI in W. Macedonia are financially supported by:

- National Funds, under the Investment Law (N. 4399/2016)
- Regional Funds, under the Local Development Programme of W. Macedonia
- Structural Funds, co-funded by EU, as follows:

#### 1.3.1. Operational Programme Competitiveness, Entrepreneurship and Innovation (EPAnEK) 2014 - 2020

The "Competitiveness, Entrepreneurship and Innovation" (EPAnEK) Operational Programme is one of the five sectoral operational programmes of the Partnership and Cooperation Agreement (the new NSRF) for the period 2014-2020, which along with the 13 Regional Operational Programmes, were approved on 18/12/2014 by the European Commission.

The pivotal strategic objective is to enhance the competitiveness and extroversion of enterprises, to facilitate transition to quality entrepreneurship with innovation and the growth of domestic added value as the cutting edge.

The Operational Programme for Competitiveness, Entrepreneurship and Innovation occupies a central position to the Country's efforts to create a new production model that will lead to development and will strengthen the competitiveness of the Greek economy by leveraging private financing.

The new model brings to the fore productive, competitive and outward-looking sectors of the economy, such as:

1. Tourism
2. Energy
3. Agri-food
4. Environment
5. Supply chain
6. Information and communication technologies
7. Health and the pharmaceutical industry
8. Creative and cultural industries
9. Materials – construction

EPAnEK contributes to the 'Europe 2020' strategy, it is harmonised with the EU's Blue Growth Strategy and has taken into account the European Commission's Recommendations for Greece with regard to focusing on reforms that strengthens Competitiveness, boost potential high-growth sector s and the creation of sustainable jobs, and serve as a driving force for private investment.

The Operational Programme is connected to and operates in a complementary manner with the other sectoral and regional operational programmes of the NSRF 2014-2020 and supports the National Strategy for Research, Technology and Innovation (ESETAK, RIS3 national strategy) and the National Strategy for Digital Development.

The Programme's funds originate from two structural funds: the European Regional Development Fund (ERDF) and the European Social Fund (ESF) covering all 13 Regions with a total Budget of 823 mEuro for Thematic Objective 1 and 884 mEuro for Thematic Objective 3, both ERDF Funds.

### 1.3.2. Regional Operational Programme 2014 - 2020

Regional Operational Programmes (ROPs) are the major tools available to regional authorities in order to implement not only their RTDI strategy, but also their overall development strategies. Consequently, the ROP of W. Macedonia 2014-2020 provides a thorough picture of the RTDI policy framework for the region.

The OP has a Total Budget of 330.737.741€ (EU Contribution 80%, 92,9% from ERDF and 7,1% fro ESF) and its support will substantially contribute to promoting the following key EU and national development priorities (Thematic Objectives):

1. "Strengthening research, technological development and innovation" (ERDF – 3.13% of EU allocation).
2. "Enhancing access to, and use and quality of, ICT" (ERDF – 3.13% of EU allocation).
3. "Enhancing competitiveness of SMEs" (ERDF – 9.40 % of EU allocation).
4. "Supporting the shift towards a low-carbon economy in all sectors" (ERDF – 8.26% of EU allocation).
5. "Promoting climate change adaptation, risk prevention and management" (ERDF – 7.36% of EU allocation.
6. "Preserving and protecting the environment and promoting resource efficiency" (ERDF – 18.48 % of EU allocation).
7. "Promoting sustainable transport and removing bottlenecks in key network infrastructures" (ERDF – 16.34% of EU allocation).
8. "Promoting sustainable and quality employment and supporting labour mobility" (ESF – 0.53% of EU allocation).
9. "Promoting social inclusion, combating poverty and any discrimination" - ERDF" (ERDF – 7.03% of EU allocation).
10. "Promoting social inclusion, combating poverty and any discrimination" - ESF" (ESF – 6.44% of EU allocation).
11. "Investing in education, training and vocational training for skills and lifelong learning" (ERDF – 18.06% of EU allocation).
12. "Technical Assistance" (ERDF – 1.71 % and ESF – 0.13% of EU allocation respectively): provision of technical assistance.

### 1.3.3. Community Led Local Development – CLLD (Former LEADER Initiative)

Since its launch in 1991 by the European Commission as a Community Initiative, the LEADER local development approach has provided rural communities in the EU with a method for involving local partners in shaping the future development of their area. The LEADER approach has attracted a high level of interest within the EU, not only in rural but also in urban and coastal areas. During the first years of implementation, funding was received from EU Structural Funds as a separate Rural Community Initiative. Since 2007 it is being implemented under Rural Development Programmes, co-funded under the European Agricultural Fund for Rural Development (EAFRD).

The success of LEADER in rural areas led other EU Funds to open up applying this approach in other types of areas. In Programme period 2007 – 2013 it was successfully to the European Fisheries Fund and from 2014 to the European Maritime and Fisheries Fund, (EMFF), compiling also funds from ERDF and ESF. However, the application of this approach is mandatory only in the EAFRD.

In 2014 – 2020 the term "Community-Led Local Development" (CLLD) is used, while the Actions are mainly funded by EAFRD supported by several EU Funds (known as multi-funded CLLD). As a result, Locan Action Groups (LAGs) can comprehensively integrate local needs and solutions linking rural, urban and fisheries areas.

The proposed programmes by LAG in the Region are under evaluation from the Ministry of Rural Development, with estimated Budget approximately 30 mEuros.

## 1.4. Research Technology Development and Innovation (RTDI) in the Region

### 1.4.1. Main RTDI and other Regional Stakeholders

The University of Western Macedonia (www.uowm.gr), founded in 2003, the Technological Education Institute Western Macedonia (www.teiwm.gr) since 1976 with its research branch Technological Research Centre (TRC,www.ktedm.gr) and the Institute for Solid Fuels Technology and Applications (http://www.lignite.gr) , one of the five institutes of the National Centre for Research and Technology Hellas (CERTH), are the main regional research performers.

In terms of scientific specialization the bulk of RTDI efforts of the research organizations in the region are concentrated mainly in energy related issues such as energy production, clean energy technologies, hydrogen and alternative energy sources, energy saving and related environmentally friendly technologies and ICT.

This clearly is in line with a main player in the regional economy, the public power company (DEI SA), and with the push to develop renewable energy but nevertheless suggest other key clusters may not be so well served.

Additionally, other main Regional Stakeholders related to RTDI and Regional policy Making are the:

- Department of Rural Economy of Western Macedonia Region: Farmers, breeders and SME's in food sector get assistance and information on the utilization of EU funding and the implementation of national and regional legislation
- Planning Directorate of Region of Western Macedonia: SME's get assistance and information on the utilization of EU funding (www.pdm.gov.gr).
- Managing Authority of ROP 2014 – 2020 (www.pepdym.gr)
- Chambers of Commerce and Industry (Kozani, Kastoria, Florina, Grevena): Chambers enhance and promote business initiatives for their members (SMEs)
- Economic Chamber – Department of Western Macedonia: The Chamber for economy enhances and promotes business initiatives on behalf of its members
- ANKO SA – Development Agency of Western Macedonia (www.anko.gr): SMEs in food sector get assistance and information on the utilization of EU funding in rural areas.

### 1.4.2. <u>Regional Innovation Performance</u>

According to the EU Innovation Scoreboard (2016) the region of Western Macedonia is a Moderate Innovator. Although innovation performance has been improved between 2004 and 2010, the region still lacks the resources, networks and measures needed for its up growth.

In particular, main weaknesses refer to the relevant figures of the following factors:

- population with academic education,
- European Patent Office (EPO) patent applications,
- employment in medium-high/high-tech manufacturing and knowledge-intensive services and
- SMEs introducing product or process innovations.

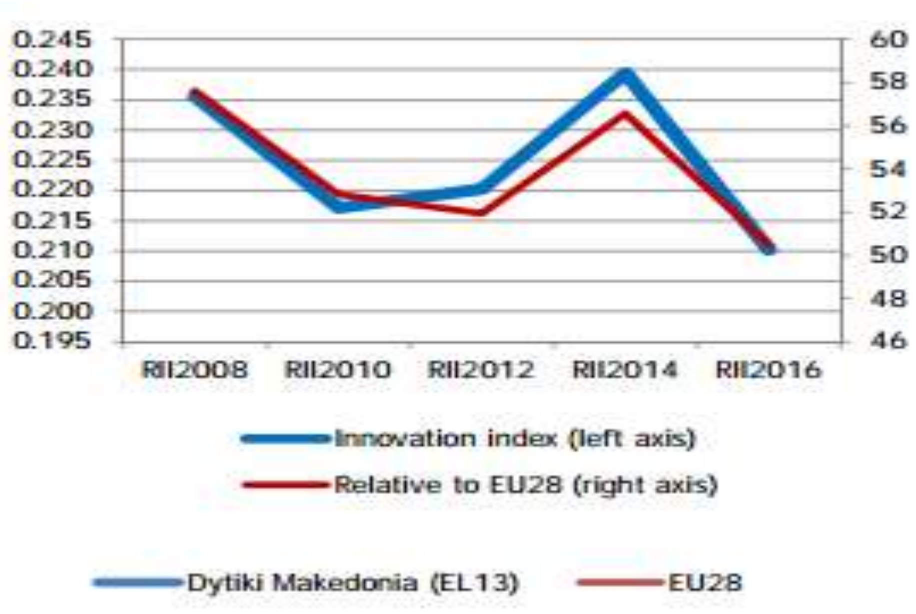
In general, relative strengths are:

- non-R&D innovation expenditures,
- SMEs innovating in-house,
- innovative SMEs collaborating with others,
- SMEs introducing marketing or organizational innovations and
- sales of new to firm innovations.

Innovation performance in W. Macedonia has decreased strongly (-12%) compared to two years ago (data July 2016), as the previous strengths, compared to the EU28, in the Region are in Non-R&D innovation expenditures, SMEs with marketing or organizational innovation, and Innovative SMEs collaborating with others. Also the relative strengths in the regional innovation system (i.e. the indicators which are most above the shaded area showing the region's Regional Innovation Index) are Non-R&D innovation expenditures.

Specifically the Innovation performance of W. Macedonia is being illustrated in the following Chart and Tables:

**Chart 1: Innovation Index of W.Macedonia relative to EU28**




Source: *EU Regional Innovation Scoreboard 2016*

**Table 1 : Innovation Index of W. Macedonia on main factors (1)**

| POPULATION WITH TERTIARY EDUCATION | R&D EX-PENDITURE PUBLIC SEC-TOR | R&D EX-PENDITURE BUSINESS SECTOR | NON-R&D INNOVATION EXPENDITURE S | SMES INNOVATING IN-HOUSE | INNOVATIVE SMES COL-LABORATING WITH OTH-ERS |
|---|---|---|---|---|---|
| **0.511** | **0.170** | **0.035** | **0.503** | **0.294** | **0.335** |

Source: *EU Regional Innovation Scoreboard 2016*

**Table 2 : Innovation Index of W. Macedonia on main factors (2)**

| EPO PATENT APPLICATIONS | SMES WITH PRODUCT OR PROCESS INNOVATIONS | SMES WITH MARKETING OR ORGANISATIONAL INNOVATIONS | EMPLOYMENT MEDIUM-HIGH/ HIGH TECH MANUFACTURING & KNOWLEDGE-INTENSIVE SERVICES | EXPORTS IN MEDIUM-HIGH/ HIGH TECH MANUFACTURING | SALES OF NEW-TO-MARKET AND NEW-TO-FIRM INNOVATIONS |
|---|---|---|---|---|---|
| **0.090** | **0.257** | **0.382** | **0.084** | **0.131** | **0.261** |

Source: *EU Regional Innovation Scoreboard 2016*

### 1.4.3. <u>Smart Specialization Strategy (RIS3) in W. Macedonia</u>

#### 1.4.3.1. RIS3 Regional Assessment. Report to the European Commission, Directorate General for Regional Policy (2012).

In 2012 the, the above mentioned Regional Assessment report recognized that the RIS3 level of Western Macedonia was still at early stage. However, the orientations of the Regional Authority and stakeholders were towards a strategy that set innovation and knowledge-based development priorities with outward looking promoting critical mass potential (notably in the energy field).

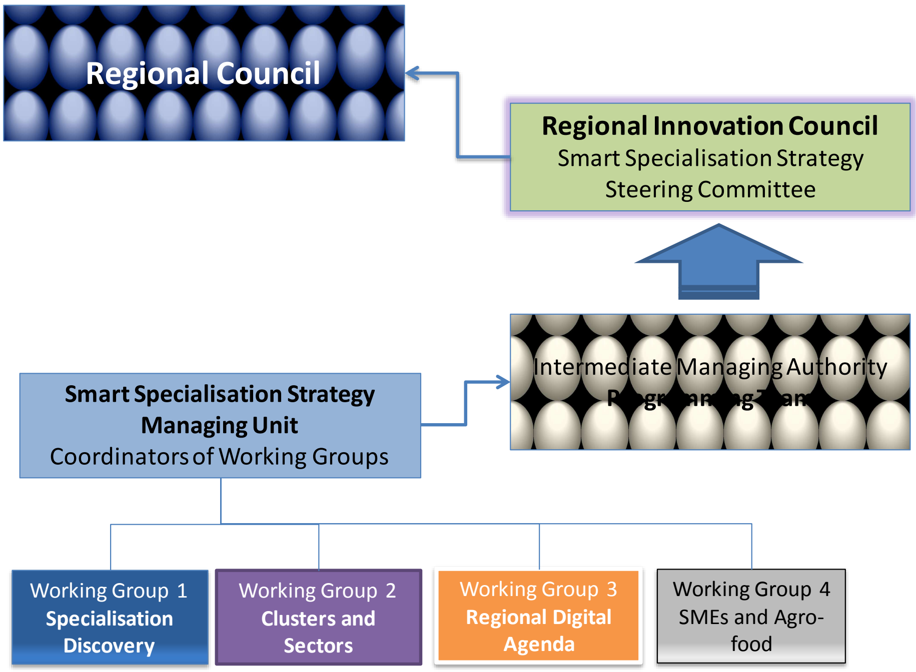
The Region, then and now, is one of the less dynamic regions in Greece in terms of R&D and innovation activities. While in 2005, the regional Gross Domestic Expenditure on Research and Development (GERD) accounted for 0.11% of the regional GDP and Business Expenditure on Research and Development (BERD) 0.00% respectively; in 2011 the corresponding rates were 0.41% and 0.02%, showing the low R&D performance of the region. In fact, 41.3% of the regional firms are innovative in terms of product / process or organizational innovation / marketing services (2010-2012).

A general remark was that in the Region of West Macedonia, during the programme period 2007-2013, numerous actions have been implemented related to research, innovation and entrepreneurship. However, the innovation actions did not manage to assimilate the results into the production process and add significant value in businesses; the key features of the production system of the Region still depend on conventional industries (energy, fur), the limited range of sectoral specialization (metal, wood), the very small size of companies, the inability to identify and cover with the necessary infrastructure the business needs, the lack of investment in RTDI, the absence of and interface between RTDI actors and business activity and low competitiveness.

In the programme period 2014-2020 it was mentioned that the region should adopt a holistic strategy towards a new long-term sustainable development vision, given the environmental degradation. So far, initiatives undertaken were of a circumstantial character and lacked a long term perspective. The RIS3 should involve a wide participation of local stakeholders and representatives of various clusters that exist in the area.

As a result it was proposed that the region should adopt the following RIS3 implementation structure:

**Chart 2: RIS3 Assessment in W. Macedonia – Proposed Implementation Structure**




Source: RIS3 Regional Assessment. Report to the European Commission, Directorate General for Regional Policy (2012)

Also it was highlighted that successful examples in the area (e.g. the organization of the Association of Saffron producers, the revival of old agricultural species in Voio area, the innovation actions of the wine sector, etc.) should be diffused and the knowledge acquired should be transferred to other areas.

The RTDI innovation potential and specialization of W. Macedonia was summarized through its SWOT analysis in the following Table:

**Table 3 : Regional innovation potential and specialization**

| **Strengths** | **Weaknesses** |
| --- | --- |
| • Natural endowments<br>• Level of education of the population rapidly growing<br>• Presence (even if recent) of regional academic research capacities<br>• Key player in the energy production sector | • Quasi inexistent R&D investments by businesses<br>• Very low level of overall R&D investment<br>• Traditional structure of the economy<br>• Low level of ICT diffusion and use<br>• Low level of life-long learning practices<br>• No data on patenting activities<br>• Low level of science-business collaboration<br>• Lack of innovation culture within firms |
| **Opportunities** | **Threats** |
| • Better incentives for business investments in R&D activities<br>• Increased coordination of national and regional policies to support ICT diffusion<br>• Smart specialisation in the energy area<br>• Improved support to upgrading of SMEs technological capacity<br>• Attraction of foreign direct investments | • Economic specialisation in low-tech sectors (agriculture, tourism)<br>• Pollution and environmental damages associated to mining activities and energy production<br>• Brain drain |

Source: RIS3 Regional Assessment. Report to the European Commission, Directorate General for Regional Policy (2012)

Finally the expert team generally recommended that:

- Policies for regional innovation should be based on the priorities defined by previous projects such as RIS, RIS+, K-Clusters, which still remain relevant. The strategy should include a long-term vision for the region with measures of diversification but also of technological modernization of existing companies.
- Support to existing clusters should be the central element of the RIS3 of Western Macedonia. However, clustering should be organized from a bottom-up perspective, as emerging networks among companies.

- As the region does not have significant RDTI infrastructures, platform mechanisms could be considered as a solution for offering market and technology intelligence, incubation of new companies, export advice and support etc.
- Innovation actions and initiatives should be carefully selected with respect to criteria of (1) sustainability in the long run and mainly after the initial support period; (2) creation of capabilities and know how in the region; (3) offering integrated solutions to technology-production-market-funding; (4) leading to high leverage of private investments; (5) involving a large number of beneficiaries; and (6) contribution to development goals of competitiveness and employment.

At the same report Regional stakeholders highlighted the following issues:

- Creation of sustainable research infrastructures
- Targeted actions supporting entrepreneurship and business clusters
- Collaboration of research and production organizations
- Creation of a pool of innovation ideas – Transfer of solutions from other regions
- Ongoing measurement of innovation policy impact and ongoing measurement of innovation policy impact and adjustment
- Mapping of investment and resources in networks and applications
- Opening of networks to private investors
- Use of local funds for innovation
- Use of modern marketing practices to promote local products and clusters
- Support to existing clusters should be the central element of the RIS3 of Western Macedonia. However, clustering should be organized from a bottom-up perspective, as emerging networks among companies.
- As the region does not have significant RDTI infrastructures, platform mechanisms could be considered as a solution for offering market and technology intelligence, incubation of new companies, export advice and support etc.
- Using the European Cluster Observatory rating system, the sectors in West Macedonia with the highest combined scores for size, specialization and focus are:
    - Leather products with 3 stars;
    - farming & animal husbandry with 2 stars and
    - Oil & gas, agricultural products, processed food, construction with 1 star.

- Furthermore, in the Region of West Macedonia there is one mature cluster, the Metal-manu (metal products clusters) and an emerging one, the Bio-energy and Environment of Western Macedonia, named "Clube" cluster.

#### 1.4.3.2. RIS3 2014 – 2020 Policy in W. Macedonia

Although Western Macedonia and its regional stakeholders have been engaged in several programs and initiatives, both at national and European level (e.g. Innovative Actions, ERDF, Regional Innovation Poles), which focused in boosting innovation capacity among SMEs as well as to transfer good practices among the policy makers, the RTDI policy design and implementation in the Greek regions, so far, was centralized and launched by the central government.

Not that rarely the regional authority was not systematically informed about the projects implemented in the region, through the national OP and the project did not take into account recommendations and priorities arising from previous initiatives. Most of these priorities still remain relevant for the region and form a useful foundation for the RIS3.

Western Macedonia has a limited, but significant, number of stakeholders that have been successively engaged in the previous regional innovation initiatives. These include the regional development agency (ANKO), the UOWM, the TEIWM, the ISFTA, business clusters and business associations.

In the programme period 2014-2020 the region has adopted a holistic strategy towards a new long-term sustainable development vision, given the environmental degradation. So far, initiatives undertaken were of a circumstantial character and lacked a long term perspective. The vision for the new strategy should be towards the post-mining era and should include mechanisms that will help the region reduce the over-dependence on the operations of the Public Power Corporation (DEH) S.A.

As previously mentioned Western Macedonia is one of Greek regions with lowest R&D intensity, notably in the business sector. Scientific specialization is limited and focused essentially on energy technologies. According to the assessment elaborated by a team of experts, the RIS3 strategy should not focus exclusively on energy industry/technologies, while this is clearly a core regional specialization, but needs to adopt a more diversified approach building on existing clusters of business activity and seeking to shift such 'niche' into higher-value added.

According to the approved by EC Strategy, the RIS3 priorities comprise a mix of sectors and subsectors as follows:

1. **Energy / RES – District Heating**
2. **Integrated waste management**

3. **Traditional sectors of Agricultural Development and Manufacturing**
   - Manufacturing – Standardization of characteristic agricultural products
   - Fur farming - leather products
   - Agri-food, drinks / beverages, metal constructions
4. **Tourism**

The RIS3 Strategy is funded under Thematic Objectives 1 – 4 of the ROP 2014 – 2020 (see above), including also Thematic Objective 8 for the promotion of self-employment and entrepreneurship with emphasis in RIS3 priority sectors.

#### 1.4.3.2.1. RIS3 policy progress in the Region

On 24/10/2016 took place in Florina the 2nd meeting of the Steering Committee of ROP of W. Macedonia 2014 – 2020 where, among other issues, the progress of RIS3 in the Region was presented.

Specifically, the process of Entrepreneurial Discovery, being responsibility of the Governance System of RIS3 under the co-ordination of the Regional Council for Research and Innovation in the Region of W. Macedonia and the technical support of the Managing Authority of ROP, has been started. Entrepreneurial Discovery is a dynamic and systemic process that is main precondition of every call for proposals that follows and consists of organizing specified thematic workshops and focused technical meetings referring to the former priority sectors of RIS3.

In these workshops / meetings per sector is foreseen the participation of expertise researchers and consultants along with stakeholders coming from the research and academic community in regional, national and European level, along with representatives of local and regional authorities, entrepreneurs, chambers and civil society. Their basic aim is to identify the specific needs and potentials for the improvement/development of each sector, submitting ideas for projects with mandatory element the implementation and exploitation of innovation and the promotion of new technologies. The topics for discussion consist of thematic areas of holistic approach of each sector, with emphasis on:

1. Justified analysis of the current situation of each RIS3 sector / sub-sector and its perspectives in W. Macedonia.
2. Mapping of the level of research and innovation endorsement in each RIS3 sector / sub-sector, presenting also the results of surveys of other similar cases.
3. Presenting relevant good practices in other regions.
4. Presenting the perspectives each RIS3 sector / sub-sector for extroversion and finding of new markets.

5. Presenting the potentials of new technologies and the perspectives of their implementation in the enterprises of W. Macedonia.
6. Holistic approach of the total value chain from the first raw material, the processing and the production till the promotion and the placement of final products in other markets.

The outcomes of these workshops / meetings will be finalized by writing and presenting the results, including, among others, specific ideas – proposals with the needs and implementation potentials of research, innovation and technology Actions in W. Macedonia's enterprises. These proposals will be the basis for the identification of Actions at the open calls for proposals under the relevant Priority Axes of ROP 2014 – 2020.

In the period September – December 2015, three (3) Thematic Workshops were organized and took place focused in the Fur farming - leather products, the winery and viticulture and Agri-food. Specifically for the second and third ones, the main topics of interventions were:

Winery and viticulture

1. Support of the winery and viticulture sector (creation of integrated information system of innovative techniques for Precision Agriculture in the zones of grapes cultivation, provision – by implementing innovative measurements – of superior quality first raw materials etc.)
2. Networking and Development of wine – tourism (genotyping of local vine varieties, production of high quality sparkling wines, identification of appropriate viticulture techniques etc.)
3. Creation of Insects Observatory (development of strategies and methods for plant-protection in the zones of grapes cultivation etc.)

Agri-food

1. Creation of an exemplar for demonstration innovative agro-farm (operating in parallel as agro-touristic centre for networking and promotion of agro-tourism products etc.)
2. Creation of Community Co-operative Enterprise on local sectors of employment (i.e. beekeeping)
3. Improvement of cultivation techniques (i.e. exploitation of Sideritis – type of tea, exploitation of herbs and cosmetic plants etc.)

In conclusion the Steering Committee decided that the open call for RIS Actions with beneficiaries the enterprises of W. Macedonia will be launched during the current year (2016). Nevertheless there is strong skepticism referring to the speed-up of the procedure (calls, etc.) but also to the capability of the beneficiaries - enterprises of W. Macedonia to meet the requirements of the calls. Finally, the need for networking among along RIS actors and stakeholders, administrative and others, in terms of governance, was highlighted along with the clearance of roles and communication – collaboration terms, along with the use of financial investment instruments.

## 1.5. The profile of Agri-food sector in the Country and in the Region

### 1.5.1. The Agri-Food sector in Greece

Greek food and agriculture has traditionally been one of the major export sectors for Greece, with a strong presence in the European and a growing presence in the US food markets and a number of companies with strong export growth.

It is also an area where Greek companies have managed to innovate and differentiate themselves, both in terms of the product but also in terms of packaging. Over the past 10 years, there are several examples of companies in the food sector who have achieved significant market shares abroad by leveraging the combination of traditional Greek ingredients and innovative marketing and packaging.

Over the next years, the food & agriculture sector in Greece is expected to be a significant contributor to GDP growth and value added, driven by several key market trends and competitive advantages, such as:

**Brand value / positioning** - Greek diet is regarded as a pre-eminent example of Mediterranean diet, which has been globally accepted as one of the healthiest and most nutritional.

**Geography and climate conditions** – Greek geography and climate can sustain some of the most diverse, high-quality natural raw materials and produce, including such exotic ingredients as saffron and truffles.

**Traditional high-quality ingredients** – Greece has a number of recognizable POP or other local ingredients and foods whose quality is recognized by some of the greatest Chefs in the world.

**Specialized know how and expertise** – agriculture and food production is a traditional Greek occupation, which has led to a significant amount of food research departments, agricultural schools, trained food technologists and chemists, and skilled farmers.

**Research and Innovation** - Greece's universities and research institutes focus heavily on providing assistance to the food and beverage industry. A number of highly specialized research centers such as the University of Thessaly, the Food Industrial Research & Technological Development Company (ETAT), the Institute of Agro biotechnology and the

Institute of Aquaculture, assist manufacturers and processors in developing innovative solutions to meet the needs of today's marketplace.

**Key investment opportunities**

- Repositioning and consolidation of primary food production using new technologies (hydroponics, greenhouses etc.) and high-value crops
- Participation in the growth and consolidation of smaller, organic producers with strong export potential.
- Investment in the packaging, export and marketing of traditional staples of Greek diet such as olive oil, herbs and aquaculture
- Investment in boutique and niche market goods, leveraging the abundant high-quality raw materials, the EU-level production standards and the low operating costs
- Development of high-value product lines based on the global "Mediterranean Diet" trends and the exploding organic food sector
- Investment in mass-market food production for private-label or branded use, taking advantage of Greek access to the emerging growth markets of Southeast Europe where Greek F&B companies have developed an extensive production and distribution network
- New product development, production and distribution based on the R&D facilities and know-how of Greek research centers and the familiarity of Greek consumers with international food products, brands and tastes

According to the estimates (published by the National Bank of Greece) there is potential for extra value added from the agro -food sector to the Greek economy of about €12.2 bn per year, equivalent to 6.9% of GDP (€9.1bn directly and €3.1bn through the indirect boost to the agricultural inputs and packaging industries).

However, this requires the formation of an efficient food value chain: Agricultural production should become more technologically sophisticated. In fact, the reformed CAP offers opportunities for a more professional approach to agricultural activity, with less dependence on income subsidies and more focus on upgrading the production process.

The limitation of small -sized farms could be overcome by a business-oriented operation of agricultural cooperatives, with managing boards including producers, marketers and researchers.

The vertical integration in the food supply chain should also aim towards the development of strong brands. In this context, the promotion of PDO products should be encouraged and synergies from sectors such as tourism for the successful branding of Greek agro-food products should be developed.

Most agricultural units in Greece are small, family -owned holdings. Specifically, the average farm is about 4.8 ha (compared with 12.5 ha on average in other Mediterranean countries), with more than ½ being extremely small, i.e. smaller than 2 ha (versus 44% in other Mediterranean countries). Sole holders and other family members cover 83% of employment (in terms of annual working units (AWU)), slightly higher than the Mediterranean average (74%). The most important effect of small holdings is the cost disadvantage since Greek farmers cannot benefit from economies of scale like many of their competitors.

In addition, the technological sophistication of agricultural production is inferior compared with other EU countries. Specifically, while global expenditure on agricultural R&D has doubled during the past two decades, reaching €27bn in 2012 (in PPP terms), Greece remained a laggard in this field.

In fact, R&D investments in Greek agriculture amount to just €38 mEuro annually or €11/ha (compared with €33/ha on average in the EU and €19/ha globally).An important factor hindering R&D is the poor links with research institutions. As a result, Greece has not take an advantage of the global trend for a more sophisticated and efficient agricultural production (e.g. improve production yield and quality as well as resistance to disease).

### 1.5.2. The Agri-food sector in W. Macedonia

Not far away from the national status, the agri-food sector characteristics in the region of W. Macedonia are as follows:

- The agricultural holdings are small and fragmented.
- Agriculture and animal husbandry represents a significant portion of the regional economic activity, with sizable growth potential, if combined with modern ICT tools.
- Livestock is one of the most important sectors in the region, the animal capital, as well as the milk production that ranks among the first in Greece, despite the fact that the livestock producers’ income is continuously declining the last decade
- Amyntaio plateau is considered as one of the most important vine-producing zones in Greece. The viniculture zone is known as the zone of Appointed Origin of Superior Quality (AOSQ).
- The manufacturing base is in traditional sectors, including renowned regional products such as saffron (Krokus Kozani), fruits, wines.

- Standardization of agri-food products still lack behind.
- Four (4) agri-food products have registered as PDO /PGI (Protected Designation of Origin & Protected Geographical Indication )
- The number of holdings practicing organic farming has increased.
- The cultivation and manufacturing of aromatic plants due to the region's unique nature, flora and fauna has also increased significantly.

Access to finance, lack of standardization, and limited access to foreign markets are considered as the main obstacles among Agi-food sector businesses.

# 2. Results from the mapping

## 2.1. Methodology of mapping

The primary source for mapping was the Europe Enterprise Network (EEN), hosted by ANKO (www.anko-eunet.gr). EEN's staff provided reliable and updated information of the companies to determine compliance with the structure of the proposed mapping table. In some cases signposting to other sources followed to detect more detailed information. As the mapping was based on 5 predefined (see Introduction) criteria, other sources being extensively used are:

- ANKO's database and studies, especially for Axis 3 & 4 of the RDP 2007-2013 (1st criterion)
- Ministry of Economy, Development and Tourism, regarding the Investment Laws (criteria 1-3)
- Regional authority of Western Macedonia, for projects funded by ROP 2007-2013 (criteria 1-3)
- Hellenic Industrial Property Organization – "OBI" for detecting companies that applied for patents / IPR the last 3 years (4th criterion)
- PRAXI Network, National Contact Point for HORIZON 2020 and EEN-Hellas co-ordinator, for detecting companies that applied for Phase I/II of the SME Instrument (5th criterion)

Additionally to the survey related directly to the 5 criteria, the mapping used useful info from:

- The TEI of Western Macedonia (TEIWM) for getting specific info on bio economy companies and infrastructures in the region.
- The outcomes of EU funded programmes 2007-2013 implemented in the region by several stakeholders, related to agri-food sector and the SMEs performance.
- The Experts' Team Review "Smart Specialization Strategies in Greece" –Regional assessment Dytiki Makedonia
- Official statistics, both from national and EU sources.

In parallel, to detect all information needed to better shape the innovation capacity of regional companies in agri-food sector, a number of meeting planned and carried out as follows:

- Contacts with regional stakeholders at ANKO premises after an official invitation

- Meetings and interviews with executive staff of sectoral companies
- Direct communication with entrepreneurs in agri-food sector

## 2.2. Results of mapping per BRIDGES criteria for measurement indicators and justification

The findings of mapping, according to the requested structure and also per related Company, are summarized in the following Table, while the specific results per each one of the 5 Criteria is following after.

**Table 4 : Mapping summary findings per company**

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| A.Pitenis Bros S.A.<br>http://www.pitenis.gr/ | Production & Trade of Gourmet delicacies | Development of bio-functional products –An international patent that combines two Greek POP, the award-winning Extra Virgin Oil Sitia Crete and extract from famous Kozani Crocus to increase the antioxidant properties of olive oil. | (1)+(2) +(3)+(4) | The company is certified by and implements the System Assurance & Quality Management "ISO - 22000:2005", which includes the Hazard Analysis and Critical Control Points "HACCP", the British Retail Consortium "BRC" Global Standards for safety and quality products, the International Food Standards "IFS" Global Food Safety System, and finally the USA Food & Drug Administration "FDA" (on site certification).<br>Recently the company has initiated the necessary process for"Kosher" and "HALAL" Lawful Certifications. | Founded in1973<br>Exports: EU, USA, Canada, Russia<br>Awards:<br>"Golden European Quality Award" in a competition between 15.000 Food Production Cos worldwide,<br>"First Nationwide Award" &"First Commendation" for the "Business Excellence and Distinction" by EOMMEX SA,<br>"Young Entrepreneur Award" by Kozani's Chamber of Commerce. |
| "Alfa" ATHANASSIOS KOUKOUTARIS AEVE<br>http://www.alfapastry.com/en | Food & Beverage Bakery | The leading frozen-to-oven baked food industry in Greece - Patented paper baking tray packaging- Trade Mark in 52 countries | (1)+(2)+(3)+(4) | The company meets the highest international standards of quality and safety.<br>It is the only company in the Greek industry of frozen pastry products holding the following accreditations: ISO 9001-2008 HACCP,IFS & BRC - Kosher" and "HALAL" Lawful Certifications.<br>Alfa has an in-house chemistry and microbiological laboratories possess | Founded in 1965<br>Exports: EU, Australia, Canada, Cyprus, Egypt, Israel, Mexico, Puerto Rico, Russia, Turkey, USA<br>Awards:<br>Awarding of alfa, as a True Leader!<br>The most admired enterprises |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | | | the latest and most advanced instruments for the analysis and control of raw materials and production sampling. Currently, Alfa employs more than 250 people in Kozani, and more than 150 all over Greece.<br>The company emphasizes in training seminars, specialization, information on new techniques and methods concerning production, supply, distribution, sales and service.<br>The employees had more than 15.600 hours of training. Regarding the company's environmental performance, its waste is send to managing companies and to a biological cleaning network. | PLMA - Private Label Manufacturers Association<br>Taste 09 - Anuga Frozen Food |
| Krokus Products Kozanis<br>www.crocuskozanis.com | Organic products (spice - super food) | Krokus Kozanis Products is a joint venture between the Cooperative de Safran of Kozani and the Greek cosmetics company Korres Natural Products (www.Korres.com)<br>Krokus Kozanis Cooperative operates under externally audited inspection and its quality processes are accredited to the ISO 9001:2000 Quality Management | (1)+(2)+(3)+(4 ) | The Krokus Cooperative is consisting of approximately 1,000 member families which have the exclusive rights to cultivate, harvest, process and distribute Krocus Kozanis saffron. Korres is a Greek skin care brand with roots in Athens' first ever Homeopathic Pharmacy with the aim to utilise its extensive scientific resources for the development of clinical effective and safe products. | Founded in 1971<br>Saffron (Crocus Sativus L.) is one of the rarest medicinal plants. Its curative properties are known from antiquity, even referred to in Egyptian scrolls dating to 1550 B.C. Scientific research continues as modern medicine is showing great |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | Standard. Saffron quality varies throughout the world and is graded according to laboratory measurements under ISO 3632* for characteristics such as crocin (colour), picrocrocin (taste) and safranal (fragrance) content.<br>*The International Organisation for standardisation (ISO) has a standard known as ISO 3632 TS which deals exclusively with the testing of saffron world-wide. Kozani's saffron samples from each harvest are measured through spectrophotometry at certified testing laboratories worldwide. The most important test criteria is the colour (crocin) strength grade, which enables quality comparisons to be made between different saffron producers across the world. Currently, Krocus Kozanis saffron is tested at the Agricultural University of Athens.<br>Krocus Kozanis has Protected Designation of Origin (PDO) status with total annual production varying between 1,500 and 3,000 kilograms, of which 40% | | The company today offers a range of natural and certified skin and hair products as well herbal tea preparations with saffron.<br>R&D activities:<br>-A new validated SPE-HPLC method for monitoring crocetin in human plasma - Department of Pharmacy, Laboratory of Pharmacognosy & Chemistry of Natural Products, University of Patras<br>-Effects of the active constituents of Crocus sativus L., crocins on recognition and spatial rats'<br>Memory Department of Pharmacology, School of Medicine, University of Thessaly, Greece Laboratory of Chemistry, Department of Science, Agricultural University of Athens, Greece<br>-Crocus sativus L. extracts antagonize memory impairments in different behavioural tasks in the rat, Department of Pharmacology, School of Medicine, University of Thessaly, Greece | Greek saffron is internationally considered to be amongst the best in the world and samples of each harvest are sent to a laboratory at the University of Athens for independent testing against the international ISO 3632 standard. The ISO 3632 laboratory results speak for themselves with the non organic crocin score of 278 and organic, 276.<br>The 2015-16 Krocus Kozanis saffron harvest is one of the best for over 30 years.<br>Published on https://www.greeksaffron.co.uk/health/ |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | is certified organic.<br>Colour grades range from absorbances less than 120 = category III saffron up to absorption rates of over 200, for Category I saffron. The world's finest samples receive absorbance scores in excess of 250 and the market prices of saffron are based directly on these ISO crocin scores.<br>GOLDEN KROCUS THE AGELESS SAFFRON ELIXIR UNIVERSAL ANTI-AGEING / TOTAL SKIN REPAIR: NATURAL hexapeptide-11 (PATENTED) biotechnology product, is the first natural polypeptide, proven doubles elasticity epidermidas1. Beneficial effect on collagen and elastin production mechanisms, resulting in visible tightening of the skin and correct wrinkles. | | | |
| Kourellas "Biopan"<br>www.kourellas.gr | Organic dairy | Local cheese with protected designation of origin (p.d.o.) "anevato", which has been established by Kourellas S.A<br>-It is the first company that starts the production of organic | (1)+(2)+(3)+(4) | Today the company collaborates with 90 selected and self-conscious organic agricultural-farming households and cultivates 20 km2 of land with breadstuffs and other various livestock feed, in order to self – | -Established in 1992, after the modification of the pre-existed company which was active in the same field since 1960.<br>-It is located in Grevena, at |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | dairy products with the commercial signature "BIOPAN" and with Naturland's German specifications, since there were no regulations concerning the animal organic products. Since then it builds an important for the organic agriculture, complete, self-supplied dairy production system.<br>Kourellas S.A. has implemented the HACCP (hazard analysis critical control point) for every production line so as to fully assure the safety of the product.<br>The company has a certified system of quality assurance in accordance with the prototype ISO 9001:2000 and BRC for dairy products production. It also carries out factory self examination checks under the EE guideline 89/662, with fully equipped and specialized scientific personnel for the carrying out of the controls.<br>-In 2016, Kourellas Dairy USA teamed up with trusted American farmers to produce a special range of organic Greek yogurts | | supply with Greek foodstuff the 20000 and more bio-fed sheeps and goats.<br>In total, 250 tones of organic cheese and 600 tones of conventional cheese are produced. 80% of these are exported to Europe.<br>Company's fixed policy remains the quality improvement and product standardization, and the elevation of the traditional, Greek flavor in cheese making. This is achieved with constant investments in modern technologies, with research and with strategic targets, in a way which ensures the balanced relationship of food quality with the local agricultural economy.<br>In order to control scientifically the animal feeding the development of organic and conventional foodstuff unit for the foodstuff production with right concentrations of ingredients, is needed. Intending to make foodstuff with the maximum quality a programme concerning the feed control and the determination of the relationship between the food quantity and quality and milk quantity is already developed in | the 1st km of the provincial road Grevena-Megaro, in privately owned plant.<br>-It has its own milk collection network, warehouse, pasteurization, processing, maturation, standardization and storehouse of ready products units. Also, it has a laboratory of quality control and follows strictly the tracing system.<br>-World Dairy Innovation Awards 2015, winner in the category: Best new cheese (for "Feta-bites" new product)<br>-World Cheese Awards 2014, Gold to Organic Feta cheese PDO, Kourellas S.A.<br>Anuga 2015 Report: Innovations in Yogurt, Cultured Dairy Foods and Dairy Desserts—It's all about Clean Label (http://berryondairy.blogspot.gr/2015/10/anuga-2015-report-innovations-in-yogurt.html) |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | with just fresh fruits, no added sugars, stabilizers, pectin, preservatives, colorings, added flavors.<br>-Registration (OBI) patent 20140100588 "Method of Milk Products with the Addition of ethereal oils.<br>The company collaborates with the University, especially with the Laboratory of Dairy Product Hygiene of Aristotle University of Thessaloniki and takes part in research programs concerning the standardization of traditional cheeses. | | collaboration with a team of researchers. | |
| Voion Land Products<br>http://www.voion.gr | Production, processing, packaging and distribution of Voion legumes, namely lentils, beans of various kinds and chickpeas. | The company applies a quality and food safety system according to EN ISO 22000:2005, and also a quality management system, including the Produce Handling, modeled on GLOPALG.AP (EUREPGAP), as for the producers who grow legumes.<br>The company also implements a system for recycling paper and packaging materials plant preparations used by producers.<br>Collaboration with "Basf" the | (1)+(2)+(3)+(4) | All the processes of the company are environmentally friendly, as from the beginning of construction of its facilities the owners placed a system for the collection and use of rainwater in the unit, which are mainly used in the beautification of the surroundings and cleanliness. | The company's plant is situated in Tsotyli, Kozani, in a privately owned property of 37.538 m2, and total coverage of 973,13 m2<br>Legumes have a prominent place in the Mediterranean diet, because of the profile of essential nutrients they provide to the body. For this reason legumes constitute the basis of the food pyramid and are among the |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | world's leading chemical company and with "Eurochem Agro" EuroChem Agro GmbH is part of the EuroChem Group and one of the leading providers of nitrogen and phosphate fertilizers.<br>Quality management system and food safety, according to the standard EN ISO 22000:2005 while the company will immediately proceed to implement the system in the standard EN ISO 9001:2000.<br>In the near future, the company, in cooperation with the Aristotle University of Thessaloniki, will carry out a research about the benefits of legumes flower. | | | foods that should be consumed with great frequency. The best Greek lentils are produced in the highlands of Northern Greece and particularly in the region of Western Macedonia |
| DIOSCURIDES<br>http://www.dioscurides.gr/ | Aromatic & medicinal plants and products | The DIOSCURIDES Co. is a modern unit, vertically integrated, unique in Greece and certified with ISO 22000, which grows, processes and produce products that are positioned at selected pharmacies and stores across Greece.<br>**DIOFARM - PROMIXTURE OF FEED ADDITIVES:** DIOFARM is the final product that was creat- | (1)+(2)+(3)+(4) | Organic Oregano and Oregano Essential Oil - New products<br>Oregano oil has been used for its medicinal properties since ancient Greece, when it was used to treat wounds, snake bites and respiratory conditions, according to New York University's Langone Medical Center. Oregano oil also kills a variety of fungi and parasites. This aromatic oil, native to the Mediterra- | Dioscurides Co. was founded in the area of Mouriki, Kozani, to crop production and processing of aromatic and medicinal plants and products based on them (drogues, teas, beverages, food supplements, beverages, essential oils, extracts, cosmetics, etc.) and used for physical health |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | ed after many years of intense research in the laboratories of our factory.<br>The main target of the research was to find which are the natural substances from herbal and aromatic plants that can substitute the antibiotics in animal feed without infecting or causing side-effects in the human<br>food chain. The bioenergetics substances included in DIOFARM like Carbachol, Thymol, Terpene, Anithole etc., have been proven to be effective by hundreds of university clinical studies on animals all over the world.<br>Collaboration with Attiki Pittas SA, Athens | | nean region, may also be effective at preventing and treating some forms of cancer. Consult your doctor before using oregano oil to treat a medical condition.<br>The raw materials used by the Greek company are strictly trained and cultivated by farmers with the standards of integrated management in selected areas in central and northern Greece. | and wellbeing. |
| ASEPOP VELVENDOS<br>HTTP://VELVITA.GR/ | Harvest and packaging local fruits | ASEPOP implements a total quality production system and is certified according to ISO, HACCP, GLOBALGAP and EUREPGAP.<br>Since 2002 ASEPOP VELVENTOS has implemented a total quality product management system according to AGRO 2.1 2.2. | (1)+(2)+(4) | Velvita, is from now on, the new brand name for fresh peaches and nectarines of ASEPOP Velventos Cooperative.<br>Fresh peaches and nectarines, for the first time ever became branded with a sticker carrying their own brand name.<br>Nowadays the producers of | In 1958 a group of producers from the area of Kozanis' Velventos establishes ASEPOP VELVENTOS for the purpose of improving the cultivation and marketing of the agricultural products of the Velventos area. |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | During the separation process, the fruits that don't observe the desired standards are returned to the suppliers.<br>ASEPOP has implemented a patent called 'Comfuzio', which is a trap for insects and bugs, in order to reduce the amount of pesticides at minimum. All the fruits are checked regarding their quality and the possible residuals of pesticides before selling them to the consumers.<br>Cooperation with the School of Agriculture/Department of Horticulture and Viticulture, Aristotle University Thessaloniki<br>IRTA, Research institute, Catalonia, Spain | | ASEPOP VELVENTOS cultivate approximately 6,500,000 m2<br>All administrative tasks of the Co-op function and are controlled through a fully computerized organizational system that is continuously upgraded to cover the ever increasing needs of the Co-op with respect to new products as well as such new products categorization.<br>ASEPOP VELVENTOS constitutes one of the most important driving forces for the economic development of the area, not only because it safeguards the income of hundreds of producers, but also because it offers jobs to tens of people especially during the summer period.<br>Its products can be found all over Greece while it achieves substantial exports in countries of Central and Eastern Europe with the main market that of Russia. The total volume of exports is over 3,250,000 kg. The percentage rate of exports touches 40% of total sales. | Over the years, peaches have become the main product of the area. After half a century of steady rise ASEPOP VELVENTOS counts approximately 400 active members and constitutes a healthy Co-operative that has managed to become known beyond the Greek borders thanks to its excellent quality products and the modern agricultural methods it applies.<br>ASEPOP has a very good CSR performance in many of its fields |
| AGRICULTURAL COOPERATIVE DIMITRA | Harvest and packaging fruits | Cooperative DIMITRA is certificated by the organization | (1)+(2) | The Rural Cooperative Producers Organization (A.S.O.P.) «Dimitra» | The Production Organization (POs) Agricultural Co- |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| http://dimitracoop.gr/ | | AGROCERT for the production of peaches and nectarines according to AGRO 1-2 and AGRO 2-2 standards, concerning Integrated Management System.<br>This particular certification guarantees that the fruits are as congested as possible with pesticides and fertilizers. The whole production is organized as to respect the environment as well as the consumers.<br>-The Cooperative «Dimitra» also has been certified and implements the systems BS EN ISO 9001:2008 & BS EN ISO 22000:2005.<br>-Cooperation with the School of Agriculture/Department of Horticulture and Viticulture, Aristotle University Thessaloniki | | in Velvento with more than 170 producers, follows all the modern methods of cultivation, harvesting, packing and distribution of the fresh fruits.<br>The strict control in the production process, the standardization, the packaging, the preservation and the transport, guarantee the supply of safe products that have a top quality, to their consumers.<br>Nowadays «Dimitra» distributes fresh fruits, especially peaches and nectarines, in the foreign markets of about 50% and respectively 50% in the internal market. | operative Velvendo DIMITRA was established in 1987<br>Regarding CSR attitude, the cooperative is very committed, promoting sustainable cultivation methods, and providing the customers with high quality and healthy products. It supports local suppliers as well as local environment, using eco-friendly methods. |
| ALPHA ESTATE<br>http://alpha-estate.com/ | Wine | The company devotes a tremendous effort in improving the quality of its wines, through carefully planned investments and research programs, in collaboration with the private research institute called AMPELOOENIKI, which covers all aspects of wine pro- | (1)+(2)+(3)+(4) | The high quality of the ALPHA ESATE wines has created awareness in the global wine market and especially to the wine industry. The company has succeeded in its short time of operation to arrange imports and distribution agreements in North America (USA and Canada), Europe (United Kingdom, Swe- | The **Alpha Estate** is the result of a collaboration of two visionaries, - second generation vintners oenologists and winemaker Their goal is to highlight and promote Greek vineyards and Greek wine on an international level. |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | duction.<br>The success of these programs allows the company to evaluate permanently the quality and the character of its wine from one "vintage" to the next.<br>-Cooperation with the Vine Nurseries Bakasieta (VNB) and the National Establishment for the Viticulture Amelioration of France (ENTAV) which today is a part of the IFV in France (Institute Frances for the Viticulture) are cooperating to a big project for clonal selection<br>of the Greeks varieties. The targets of this project in details are:<br>Sanitary selection of Greeks varieties<br>Genetic selection of Greeks varieties<br>Create of certified material on Greeks varieties<br>Rescue of rare Greeks local varieties<br>Diffusion of the Greeks varieties all over world | | den, Germany, Belgium, Netherlands, Austria, Russia, Belarus, Czech Republic, Bulgaria, Switzerland, Germany, Denmark, Cyprus, Romania, France, Albania, Serbia, Latvia, Estonia, Luxembourg, Poland), Bahrain, Far East (Japan, China, S. Korea) as well as Malaysia, Singapore and Australia.<br>Last year the company signed a 5-year contract with the Chinese «Anhui Wine Mall Trading Co Ltd». The value of the agreement is $ 4.11 million.<br>The winery is equipped with visitor reception and wine tasting facilities. | The estate's vineyards cover 65 hectares situated on a plateau between 620 and 710 meters above sea level. The soil is sandy clay, ideal for water drainage.<br>The estate is a member of ENOAM ('The Association of Macedonian Wine Producers'), which links up wineries with local hotels, restaurants, archaeological sites and other tourist attractions within an EU-funded network of agrotourism.<br>Awards:<br>-Regional Trophy. Decanter World Wine Awards [2008]<br>-Gold Medal. Decanter World Wine Awards [2012]<br>-Berliner Wein Trophy [2013]<br>-Thessaloniki International Wine Challenge [2013]<br>-Vinalies Internationales [2013] |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | So, one of the most important varieties in this project is Xinomavro They had been working in all the regions where today old vineyards from this variety exist, like Amyndeon, Naoussa, Velvedo and Siatista.<br>They studied 25 different vineyards and totally they marked 78 biotypes – clones.<br>This full-scale work, today shows that Xinomavro has a big genetic variability.<br>-Satellite system to monitor the vineyards and the winery operation. | | | |
| ESTATE VOGIATZI<br>**WWW.KTIMAVOYATZI.GR/** | Wine | The estate has a certification from ΔΗΩ, which is an organization for the inspection and certification of biological products.<br>All procedures of the production are eco-friendly as there are minimum Co2 emissions.<br>In addition the winery manages to have practically no waste, as it uses every component of the production as a fertilizer. | (1)+(2) | The Estate Vogiatzi follows a general CSR attitude, supporting also the local community by cultivating local varieties. It is an example of how a family enterprise is able to incorporate CSR tools, regarding the protection of the environment, the quality and safety of their products, the commitment to sustainability of production, as well as to the local community.<br>The winery is equipped with visitor reception and wine tasting facilities. | The 85 hectares vineyard, is situated between the Pieria mountains and Polyfytos lake, at an altitude of 340 meters. Its location next to the water that almost touches the vineyard (40 meters the shortest distance) is the powerful element, which makes the wines of the estate different.<br>The Wine Producers Asso- |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | | | Voyatzi Estate is a member of the Wine Producers Association of the Vineyard of Northern Greece, a winemakers' organization which has established "Wine Roads Of Northern Greece", a network of wineries which are open to visitors.<br>Visitors are guided by motorway signposts to the wineries bearing the "Wine Roads of Northern Greece" logo and providing guided tours and wine tasting. | ciation of the Northern Greece Vineyard was set up in 1993 by the name `Wine Producers Association of the Macedonian Vineyard` as a not-for-profit non-stock corporation by the joint efforts of the 15 visionary members of the Association. The Association's aim was to support the vine-growing and wine-making tradition and give the opportunity to Greek and foreign visitors to discover the hospitality of the vineyards of Northern Greece |
| RIZES Greek delicatessen<br>http://www.rizes.com.gr/en | **ARTISAN FOOD** | An artisan food, family run and owned company that produces tasty handmade products as pastes, pâtés and sauces with sweet red pepper (of Florina, northwest Greece) and 100% fruit spreads with concentrated grape juice and no added sugar or pectin.<br>New "READY-TO-EAT MEALS", "mezes" and side dishes: typical Greek Mediterranean diet tastes | (1)+(2)+(3) | It has built a collaborator - supplier network of local producers, who cultivate and produce safe products of excellent quality with responsibility and know-how.<br>2nd award in the category "Innovation and rural development" among the beneficiaries of the Rural Development Programme 2007-2013 of the Ministry of Productive Reconstruction, Environment & Energy | Established in 2012<br>-Winner of 3 prizes within the "Great Taste Awards 2014"<br>**-Among the suppliers of the "Greek Breakfast"**<br>Silver award in the packaging contest of the festival "Greece, Celebration, Spring Flavors 2015" |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | based on traditional or family recipes either followed without deviation or adjusted to the personal taste preferences.<br>In 2015 the company signed a new business agreement with Kourellas BIOPAN to produce, jointly, a new product and specifically a yogurt, which will contain 100% organic fruits, free of sugar and pectin and with no-additives. The product will be exported in USA.<br>Registered with the FDA (US Food & Drug Administration) as well as with the HALAL certification | | | |
| AROSIS<br>www.arosis.gr | Bio-Legumes | Organic farming<br>In 2013 AROSIS created a new range of ready meals and spreads with Greek pulses and Greek olive oil | (1)+(2)+(3) | Arosis has been exporting Greek legumes to USA since 1986. The last few years we have expand our exports to Norway, Sweden, Russia, United Kingdome, Germany, Switzerland, the Netherlands, Slovenia, Canada, China, Cyprus, Qatar, Luxembourg, Bulgaria etc | Excellence Awards 2016, "Excellent Supplier Of Greek Agricultural Products" |
| **Bagatzounis & Sons SA**<br>http://bagatzounis.com | Spices & drinks | Family owned business that produces, processes, packages and sells spices, scented plants, herbs, beverages and general | (1)+(2)+(3) | Included in the pilot project "Filepse tous" by the Aegean airlines<br>'Filepse Tous' is an online activation | Established in 1976<br>The company's priority is the Greek Aromatic Plants, which is the wealth of the |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | agricultural products.<br>-Certificated ISO: 22000<br>-Providing nationwide coverage in collaboration with the company melisokomiki **"**ATTIKI-PITTAS**"** in the distribution of products **"**Bagkatzounis Spices"<br>-New product "El Greco" Natural Herbs & Teas collection 100% natural<br>-The company works with many external partners such as chemists, certified laboratories, scientific collaborators educational institutions, etc., so as to ensure the establishment and measurement of all parameters needed to produce safe and quality products. | | where any Greek citizen can send a small gift to foreign passengers travelling home on Aegean Airlines, as an expression of gratitude for their visit. The custom of gift giving, particularly to visitors, has been a part of Greek culture since ancient times, and this is why Aegean Airlines and Greeks continue this tradition today with our own passengers. The basic aim is the promotion of fine Greek products. | Greek land, which specifically in Western Macedonia, with its rich flora and fauna, thrive and provide high quality organoleptic properties.<br>-Exports in nine countries |
| Amyndeon Oenos cluster<br><br>http://www.amyndeonoenos.gr | Non-for-profit organisation 'Amyntaion Wine' | In the prefecture of Florina, in Western Macedonia lies the Amyntaio plateau, one of the most important vine-producing zones in Greece.<br>The following companies are members of the organisation:<br>Association of Agricultural Cooperatives (EAS) of Amyntaion | | 'Programme for the Promotion of Wine to Third Countries (Russia) | The vine-growing region of Amyntaio is situated at an altitude of 600-700 meters, and covers an area of over 70,000 acres. It is a zone that has been accredited the Appellation of Origin of Superior Quality (OPAP) classification, while as a general rule the wineries of |

| Companies | Sub-sector | Type of innovation | Criteria acc.Mapping report table (1-2-3-4-5) | Highlights | Additional info |
|---|---|---|---|---|---|
| | | Alfa Estate S.A<br>Karanika Estate<br>Pavlou Estate<br>Kyr Yianni S.A.<br>Begoritis Winery<br>Ioannis Chatzis winery | | | Amyntaion avoid the use of pesticides. The area is dominated by the Xinomavro variety, a variety both exquisite and versatile, since it has the ability to produce different types of wine (red, white and rose), but it also produces other varieties, both international and local. |

Source: ANKO, own elaboration

### 2.2.1. <u>Bio-economy businesses that have received public support (as appliers or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years. (Input-Output indicator)</u>

Latest statistical data proves relatively poor performance in the specific indicator, as the previous programing period 2007-2013 extended on 2015 and the funding under the programme period 2014-2020 is not fully launched yet. The desk research was conducted in various public support programmes, including ROP 2007-2013, AXIS 3 and 4 (LEADER) of the RDP 2007-2013, as well as national investment laws 3299/04 and 3908/11.

Outcomes (13):

- ASEPOP Velventos – NACE class 10.39 "Other processing and preserving of food and vegetables"
- Agricultural Cooperative "Dimitra" – NACE class 10.39 "Other processing and preserving of food and vegetables"
- Rizes Greek Delicatessen – 10.39 "Other processing and preserving of food and vegetables"
- Kourellas Biopan – NACE class 10.51 "Operation of diaries and cheese making"
- Arosis – NACE class 10.61 "Manufacture of grain mill products"
- Voion Land Products – NACE class 10.61 "Manufacture of grain mill products"
- Alfa Pastry – NACE class 10.72 "Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes"
- Bagatzounis & Sons – 10.84 "Manufacture of condiments and seasonings"
- Krokus Products Kozanis NACE class 10.84 "Manufacture of condiments and seasonings"
- Pitenis Bros – NACE class 10.86 "Manufacture of homogenized food preparations and dietetic food"
- Alpha Estate – NACE class 11.02 "Manufacture of wine from grape"
- Estate Vogiatzi – NACE class 11.02 "Manufacture of wine from grape"
- Dioscurides – NACE class 21.20 "Manufacture of pharmaceutical preparations"

### 2.2.2. Bio-economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation. (Output indicator)

According to the database provided by the EEN/ANKO, the desk research and several direct interviews with businesses, just a very few companies in the region were found to use advanced services through assessing their internal labs. Most of these enterprises are small sized, mainly family run and they have limited capacity to host in-house research for product development.

Outcomes (14):

- ASEPOP Velventos – NACE class 10.39 "Other processing and preserving of food and vegetables"
- Agricultural Cooperative "Dimitra" – NACE class 10.39 "Other processing and preserving of food and vegetables"
- Rizes Greek Delicatessen – 10.39 "Other processing and preserving of food and vegetables"
- Kourellas Biopan – NACE class 10.51 "Operation of diaries and cheese making"
- Arosis – NACE class 10.61 "Manufacture of grain mill products"
- Voion Land Products – NACE class 10.61 "Manufacture of grain mill products"
- Alfa Pastry – NACE class 10.72 "Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes"
- Bagatzounis & Sons – 10.84 "Manufacture of condiments and seasonings"
- Krokus Products Kozanis NACE class 10.84 "Manufacture of condiments and seasonings"
- Pitenis Bros – NACE class 10.86 "Manufacture of homogenized food preparations and dietetic food"
- Alpha Estate – NACE class 11.02 "Manufacture of wine from grape"
- Estate Vogiatzi – NACE class 11.02 "Manufacture of wine from grape"
- Amyntaion cluster – NACE class 11.02 "Manufacture of wine from grape"
- Dioscurides – NACE class 21.20 "Manufacture of pharmaceutical preparations

### 2.2.3. Bio-economy businesses that have been developing products through Research2Business innovation partnerships during the last 3 years; long term, comprehensive cooperation. (Output indicator)

Quite a few enterprises are found to collaborate with research laboratories, technology institutions as well as specialized university departments in order to develop new products and / or services. Access to finance is a key to business development. Investment and innovation are not possible without adequate financing. The difficulty in getting finance is one of the main obstructions to the growth of many businesses, particularly small and medium sized enterprises (SMEs). The sources used to collect relevant info are similar to those of the previous section, specifically the EEN/ANKO database, an extensive desk research and several direct interviews.

Outcomes (10):

- Rizes Greek Delicatessen – 10.39 "Other processing and preserving of food and vegetables"
- Kourellas Biopan – NACE class 10.51 "Operation of diaries and cheese making"
- Arosis – NACE class 10.61 "Manufacture of grain mill products"
- Voion Land Products – NACE class 10.61 "Manufacture of grain mill products"
- Alfa Pastry – NACE class 10.72 "Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes"
- Bagatzounis & Sons – 10.84 "Manufacture of condiments and seasonings"
- Krokus Products Kozanis NACE class 10.84 "Manufacture of condiments and seasonings"
- Pitenis Bros – NACE class 10.86 "Manufacture of homogenized food preparations and dietetic food"
- Alpha Estate – NACE class 11.02 "Manufacture of wine from grape"
- Dioscurides – NACE class 21.20 "Manufacture of pharmaceutical preparations"

### 2.2.4. Bio-economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years. (Output indicator)

The key source to provide statistical data for patents was the Hellenic Industrial Property Organization (OBI). It is the only legally qualified institution for the protection of inventions and industrial designs. It also provides technological information from worldwide patent databases. Data provided by OBI show that just a few enterprises of the Agri-food sector have been applied for patents and/or IPR during the recent period. Data on non granted companies, so far, is not available, yet.

Outcomes (9):

- ASEPOP Velventos – NACE class 10.39 "Other processing and preserving of food and vegetables"
- Kourellas Biopan – NACE class 10.51 "Operation of diaries and cheese making"
- Voion Land Products – NACE class 10.61 "Manufacture of grain mill products"
- Alfa Pastry – NACE class 10.72 "Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes"
- Krokus Products Kozanis NACE class 10.84 "Manufacture of condiments and seasonings"
- Pitenis Bros – NACE class 10.86 "Manufacture of homogenized food preparations and dietetic food"
- Karakatsi – NACE class 11.01 "Distilling, rectifying and blending of spirits"
- Alpha Estate – NACE class 11.02 "Manufacture of wine from grape"
- Dioscurides – NACE class 21.20 "Manufacture of pharmaceutical preparations"

### 2.2.5. Bio-economy businesses that have applied for Phase 1 SME or Phase 2 SME Instrument (TRL 6 and higher). (Performance indicator).

Several enterprises of the agri-food sector have been found to apply for Phase I and Phase II of the SME Instrument in the Region. The data was provided by PRAXI Network, the National Contact Point for Horizon 2020.

Outcomes (4):

- (Firm names / brands not disclosed from PRAXI Network due to policy / confidentiality restrictions) – NACE class 10.XX "Manufacture of food products" or 11.XX "Manufacture of beverages"

## 2.3. Mapping summary table

The above findings are summarized in the following Table:

**Table 5 : Mapping summary**

| Criteria | Number of businesses that answered positively | Industries to which these businesses belong (add statistical identification) * |
|---|---|---|

| | | |
|---|---|---|
| (1) Bio-economy businesses that have received public support (as appliers or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years. (Input-Output indicator) | 13 | (10.39) (10.51) (10.61) (10.72) (10.84) (10.86) (11.02) (21.20) |
| (2) Bio-economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation. (Output indicator) | 14 | (10.39) (10.51) (10.61) (10.72) (10.84) (10.86) (11.02) (21.20) |
| (3) Bio-economy businesses that have been developing products through Research2Business innovation partnerships during the last 3 years; long term, comprehensive cooperation. (Output indicator) | 10 | (10.39) (10.51) (10.61) (10.72) (10.84) (10.86) (11.02) (21.20) |
| (4) Bio-economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years. (Output indicator) | 9 | (10.39) (10.51) (10.61) (10.72) (10.84) (10.86) (11.01) (11.02) (21.20) |
| (5) Bio-economy businesses that have applied for Phase 1 SME or Phase 2 SME Instrument (TRL 6 and higher). (Performance indicator). | 4 (Phase I)<br>3 (Phase II) | (10.XX) (11.XX) |

(*) NACE rev. 2 class description:

10.39 Other processing and preserving of food and vegetables

10.51 Operation of diaries and cheese making

10.61 Manufacture of grain mill products

10.72 Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes

10.84 Manufacture of condiments and seasonings

10.86 Manufacture of homogenized food preparations and dietetic food

11.01 Distilling, rectifying and blending of spirits

11.02 Manufacture of wine from grape

21.20 Manufacture of pharmaceutical preparations

# 3. Analysis of the mapping

## 3.1. What are the actual bio-economy strengths and do they form an economic base deserving an industrial policy commitment?

Summarizing the former, Agri-food as economic base but also as policy priority, has been formed as a policy commitment through Operational Programme EPANEK 2014 - 2020, in national level, and also as priority of RIS3 policy in W. Macedonia.

Additionally:

### 3.1.1. Agri-food sector in general

According to the analysis of the Agri-food sector (Chapter 1.2), the role of the domestic food industry is fundamental for the Greek manufacturing industry and more broadly for the Greek economy, along with the Regional one.

The Greek Food industry is one of the most important sectors of the domestic economy and a driving force of the Greek manufacturing, which significantly affects total production. It is a dynamic, competitive and extrovert industry, with significant investment activity in Greece, the Balkans and throughout Europe. The industry retains, even in the prolonged recession of the Greek economy, its fundamental role and remains a growth driver.

The direction of the domestic food and beverage industry must be such that it promotes openness and extraversion, product quality and the brand name for Greek food. The effective coordination and closer cooperation of the industry’s representatives can contribute to improving the promotion of the Greek products and to ensure the implementation of a long-term planning for the development of the industry, through the properly designed distribution channels.

Promoting the quality and diversification of the Greek / Mediterranean cuisine, linking the food industry with the domestic agricultural production, but also with the services sector, such as restaurants, hotels, and tourism in general, promoting the synergies inside the sector, are all crucial steps for the supporting the Greek food products, by adding value and a dynamic for exports.

Improving the competitiveness of Greek food industry and enhancing human resources, skills and the degree of specialization is another important factor for remaining a leading industry.

Since the beginning of the economic crisis, young people, burdened by the high cost of living, the risk of unemployment and the stress of managing everyday life in big cities, made conscious decisions to abandon the urban lifestyle and embark on a new way of living that involved the return to the countryside and an investment in agriculture.

Aside however from the involvement in traditional farming or the cultivation of organic products (which includes the use of eco-farming methods and new practices in bio-culture), and the cultivation of the most commonly known products that the Greek land offers, many people are willing to take risks and experiment not only with the farming of rare varieties but also with the incorporation of innovative methods such as biodynamic farming or the use of EM technology.

There is a growing number of "success stories" in agricultural entrepreneurship which involves young people who decided to experiment with new methods and worked restlessly in order to produce quality products and contribute to a new wave of "sophisticated entrepreneurship" in the agricultural sector allover Greece.

New technologies, innovation, research and development lead the trends at all stages of production and distribution in the food industry. The rapid changes make it necessary for the human capital of the sector to adapt quickly, flexibly and effectively to these changes and new requirements in the context of international competition.

### 3.1.2. Agri-food sector and RIS3 policy in W. Macedonia

As RIS3 policy document highlights, Agri-food sector in W. Macedonia has:

- significant contribution in the Regional GDP,
- high interconnection with other productive sectors,
- remarkable employment figures,
- production of qualitive and competitive products and
- contributes 13,5% in the region's exports, while
- Food and Biotechnology accounted for 31% of the total regional RTDI projects.

### 3.1.3. Key findings from mapping

The enterprises of Agri-food sector that meet specifically the 5 criteria of BRIDGES mapping are operating in the following sub-sectors:

- Dairy products
- Wine
- Bakery products
- Drinks & Beverages
- Fruits
- Legumes, namely lentils, beans of various kinds and chickpeas.
- Gourmet delicacies and spices
- Aromatic & medicinal plants and products

Generally, the key findings concerning the profile of these enterprises (see Table 4 above) are summarized in the following:

- Production of biological and organic products.
- Production of Protected Designation of Origin (P.D.O.) products
- Development of Patents and Trade Marks
- Endorsement of Quality Management Standards (ISO) and Certification
- Collaboration with Universities and Laboratories, outside the area of W. Macedonia, for research and development of new products and for monitoring safe and quality production
- Collaboration and participation in Networks
- Adoption of Greek Mediterranean Diet framework
- Exports in Europe and USA and other third countries

Also, a wine-cluster has been established to better handle and to promote the wine sector, while a successful joint venture of Krokus products highlights the growing potential of the Agri-food in the Region.

# 4. Conclusions

Based on the Regional Profile of Agri-food and the main priorities that RIS3 policy sets for W. Macedonia, concerning the:

- Enhancement of competitiveness of existing SMEs,
- Promotion of innovative start-up SMEs or/and new products,
- Promotion of RTDI among SMEs and enhancement of their extroversion,
- Development of incubators, clusters or/and networks of congener SMEs,
- Creation of Structures supporting SMEs and Entrepreneurship, considering also the lack of Competence Center

this mapping report sets the basis for the forthcoming BRIDGES Action Plan for Agri-food sector in the Region of Western Macedonia.